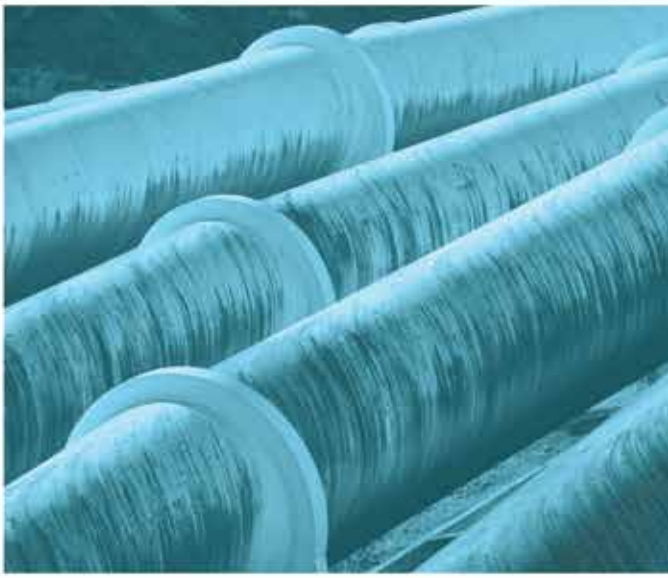



Luddenham Resource Recover Centre

Scoping Report

Prepared for Coombes Property Group and KLF Holdings Pty Ltd
March 2020

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Luddenham Resource Recovery Centre

Scoping Report

Report Number

J190749 RP#15

Client

Coombes Property Group and KLF Holdings Pty Ltd

Date

30 March 2020

Version

v2 Final

Prepared by	**Approved by**
	
Janet Krick Senior Environmental Planner 30 March 2020	**Dr Philip Towler** Associate Director 30 March 2020

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1 Introduction

1.1 Overview

Coombes Property Group (CPG) in partnership with KLF Holdings Pty Ltd (KLF) (the proponents) are seeking development consent for the construction and operation of a resource recovery centre (the project) on 275 Adams Road, Luddenham NSW (Lot 3, DP 623799) (the subject property). The subject property shares its southern and eastern boundaries with the Western Sydney Airport development site (Figure 1.1).

There is an existing clay and shale quarry on the subject property approved under Development Consent DA 315-7-2003 as modified. The quarry is currently inactive. CPG and KLF have commenced the application process to modify the quarry's consent to allow operations to recommence. It is proposed to develop the project in an area to the north of the existing quarry void. The project application area (herein referred to as the RRC site) is provided in in Figure 1.2.

A new State significant development (SSD) consent under Division 4.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) is required to establish the RRC on the subject property. This scoping report has been prepared by EMM Consulting Pty Ltd (EMM) on behalf of the proponents. It requests Secretary's Environmental Assessment Requirements (SEARs) in accordance with Part 4 of EP&A Act for the proposed RRC.

1.2 The site and surrounds

1.2.1 Regional context

The subject property is within the Liverpool LGA in the Greater Western Sydney region of New South Wales (NSW). The subject property is located at 275 Adams Road, Luddenham approximately 19 kilometres (km) north-west of the city of Liverpool, 25 km south-west of the city of Parramatta and approximately 43 km south-west of the city of Sydney. The regional and local context of the site are provided in Figure 1.1 and Figure 1.2.

The subject property is approximately 19 hectares (ha) and is zoned RU1 Primary Production under the Liverpool Local Environmental Pan 2008 (Liverpool LEP). The Western Sydney Aerotropolis Planning Package, shows the subject property also falls within the proposed Agribusiness zoning of the proposed Western Sydney Aerotropolis State Environmental Planning Policy (Aerotropolis SEPP). Land along the eastern boundary of the site is shown as Environment and Recreation zoning in the Aerotropolis SEPP.

Luddenham and its surrounds are within the Hawkesbury-Nepean catchment. Oaky Creek forms the eastern boundary of the subject property. The Oaky Creek catchment has a total area of approximately 382 ha. Oaky Creek rises approximately 2 km south of the subject property and flows generally north until it reaches Cosgrove Creek about 900 metres (m) north of the subject property. Cosgrove Creek flows into South Creek, which ultimately contributes to the Hawkesbury River and Broken Bay. Oaky Creek is an ephemeral creek which only flows following significant rainfall events (Epic Mining Pty Ltd 2016).

Under Division 1 of the Schedule 1 of Sydney Regional Environmental Plan (SREP) No 9 – Extractive Industries, the subject property is identified as being a clay/shale extraction area of regional significance.

1.2.2 Local context

The subject property is adjacent to Commonwealth-owned land to the east and south. The Western Sydney Airport (Figure 1.2) has been approved and construction, including bulk earthworks and road infrastructure upgrades, are currently underway.

The subject property is in a predominantly rural landscape. Surrounding land uses, in addition Western Sydney Airport, include a mix of agricultural, rural industrial and commercial, and residential development.

The area surrounding the subject property is sparsely populated, with the closest densely populated area being the residential area of the Sydney suburb of Luddenham approximately 2.2 km to the south-west. The closest occupied residence is about 70 m east of the proposed internal access road (Figure 2.1). Hubertus Country Club and pistol range is immediately west of the subject property. The closest agricultural property is a duck farm located to the north-west, about 300 m north-west of the intersection with Adams Road The closest school is Luddenham Public School located approximately 2.5 km south-west of the subject property.

1.2.3 The subject property (Lot 3 DP 623799)

The subject property is relatively flat, sloping gently from the south-west to the north-east. Its ground elevation varies between 55 m and 75 m Australian Height Datum (AHD). Much of the subject property is disturbed by the quarry (Photograph 1.1). The proposed RRC site is within the northern portion of the subject property, immediately north of the quarry void (Figure 1.2). There is a residence and an agricultural shed on the subject property, approximately 110 metres (m) north-west of the northern edge of the quarry void.

Quarry operations were originally approved as SSD by Development Consent DA No. 315-7-2003 issued by the Minister for Infrastructure, Planning and Natural Resources on 23 May 2004. The consent was subsequently modified three times (MOD 1–3), with the fourth modification (MOD 4) withdrawn. The quarry has approval to produce and transport up to 300,000 tonnes per annum (tpa) of clay and shale product up to 31 December 2024. The quarry has been inactive for approximately 18 months. With the change of ownership of the subject property, the proponents are seeking to reactivate quarry operations and extend the life of the quarry to 31 December 2029. This proposed modification (MOD 5) will also include a revised access road route and administrative changes to the consent.

The existing consent includes quarrying components that are on Commonwealth-owned leased land (Lot 1 DP 838361), which was leased by the previous operator, including the access road, quarry support facilities and stockpiling areas. However, Lot 1 DP 838361 has been rezoned as part of the Western Sydney Airport development and is now identified as part of a larger area under Lot 101 DP 1236319. This land is no longer available for use by the quarry.

Under previous ownership, the main access route was an access road built from the quarry to Elizabeth Drive. This access road was situated on Lot 1 DP 838361, but is no longer available for use. Currently, a narrow strip connects the bulk of the subject property to Adams Road, which is a local road joining Elizabeth Drive about 500 m north of the subject property and The Northern Road about 2.5 km south of the subject property. The proposed access road will be along this narrow strip (Figure 1.2) where there is currently the unsealed access road to the subject property. The access road intersection with Adams Road is not currently an engineered intersection. It is proposed to upgrade this intersection.

Other notable subject property features include 3-m-high earthen noise bunds to the west and north of the quarry void. The noise bund to the north of the quarry intersects the southern portion of the RRC site.

The subject property has an existing surface water management system. There are three sediment basins within the north-eastern part of the site. Two of the sedimentation basins were historically employed to collect runoff before discharge to Oaky Creek. One of these basins will be turned into leachate/stormwater detention on the RRC site. Oaky Creek forms the boundary between the adjacent Commonwealth-owned land and the subject property.

Photograph 1.1 Existing quarry – view to the south towards Western Sydney Airport development site

1.2.4 The resource recovery centre site

It is proposed to develop the RRC on the northern portion of the subject property. The RRC site is approximately 3 ha in area. This RRC site is currently grassed, and there are small vegetation patches in the northern portion with more extensive vegetation along Oaky Creek on the eastern part of the subject property (Photograph 1.2).

The RRC site will be surrounded by a wall. Sorting and processing of waste will be fully enclosed, with some inert materials stockpiled within an external walled yard (ie within product bays). The RRC will be designed to meet the requirements of Western Sydney Airport to ensure onsite activities do not impact airport operations. The RRC will operate independently of the quarry operations.

The RRC will utilise the same proposed internal access road as the quarry. This RRC application seeks approval to develop the access road and the intersection to Adams Road required for the operation of the RRC. A more detailed description of the project is provided in Chapter 2.

Photograph 1.2 Undeveloped land within the northern part of the site (ie the proposed site of the RRC)

Photograph 1.3 Internal access road to Adams Road

1.2.5 Future land use vision

The proponents have a long-term vision for the subject property, which would be achieved in stages (Figure 1.3). Following the extraction of the shale and clay resource, the proponents will seek approval to engineer the quarry void into a lined landfill complete with leachate collection and treatment systems. This will allow for the landfilling of unrecyclables (ie plastics, cardboard, treated timber) from the RRC as well as the direct landfilling of waste containing asbestos, excavated natural material (ENM) and virgin excavated natural material (VENM). Prior to approval and commissioning of the landfill (or if it is not approved), unrecyclables will be transported offsite for disposal at a licenced facility.

The infilling will provide a commercially viable means to infill the quarry void and achieve a stable, non-polluting developable final landform which will support the ongoing development of the Western Sydney Aerotropolis. The infilling is a step towards rehabilitating the subject property, while catering for the increased demand for inert waste disposal in the Sydney region.

The infilled and rehabilitated quarry will allow for the long-term commercial use of the subject property; providing additional developable land for long-term employment and commercial opportunities in the immediate vicinity of the Western Sydney Airport in alignment with the Draft Western Sydney Aerotropolis Plan (draft Aerotropolis Plan). The proponents envisage that a number of light industrial/commercial warehouses would be established on this land (Figure 1.3). The RRC would continue operations as part of the commercial estate, providing ongoing waste and recycling services to developing urban areas within the Aerotropolis.

1.3 The purpose of this report

The purpose of this scoping report is to provide an overview of the project, to consider the potential environmental issues associated with the construction and operation and to identify likely impacts for further investigation and assessment.

This scoping report has been prepared in accordance with the draft *Preparing a Scoping Report – Guidance for State Significant Projects* (DPIE 2019). This scoping report accompanies the application for SEARs for the preparation the EIS project.

KEY

- Subject property (Lot 3/ DP623799)
- RRC site
- Western Sydney airport
- Major road
- Minor road
- Vehicular track
- Watercourse/drainage line

Source: EMM (2020); DFSI (2017); GA (2011)

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Regional context

Luddenham resource recovery centre
Scoping report
Figure 1.1

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KEY

- Subject property (Lot 3/ DP623799)
- RRC site
- Western Sydney airport
- Former lot (Lot 1/DP838361)
- Cadastral boundary
- Watercourse

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Source: EMM (2020); DFSI (2017); GA (2011); Nearmap (2019)

0 100 200 m

GDA 1994 MGA Zone 56

N

Local context

Luddenham resource recovery centre
Scoping report
Figure 1.2

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Source:
Reid Campbell, 2020

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Future land use vision concept layout

Luddenham Resource Recovery Centre
Scoping Report

Figure 1.3

2 Project

2.1 Project description

The project consists of the construction and operation of an RRC as described below. A detailed project layout for the RRC is provided in Figure 2.2.

If the development application for MOD 5 is approved, the quarry will also continue to dispatch 300,000 tpa of clay and shale in parallel to the project. As previously noted, the RRC and the quarry would share the same access road to Adams Road.

2.2 Site components and activities

2.2.1 Construction

The RRC will be designed to meet the requirements of Western Sydney Airport to ensure onsite activities will not impact airport operations. This means that the height, perimeter and design of the wall surrounding the RRC will be designed in consultation with the Western Sydney Airport and DPIE to meet specific design requirements.

It is envisaged that RRC construction will consist of constructing and installing the following site components and infrastructure:

- constructing:
  - a wall surrounding the RRC site;
  - a main waste acceptance and processing warehouse (approximately 6,000 m^2);
  - dedicated product bays surrounding the warehouse to the north, north-east and east, which will be used for storing and processing waste:
    - bin storage;
    - clean timber;
    - concrete rubble/masonry;
    - fines (screened);
    - future aggregate screen and washing; and
    - future tyre shredding;
  - leachates/stormwater detention;
  - two offices covering a total of approximately 540 m^2;
  - pump room covering approximately 36 m^2;
  - sealed working surfaces (concrete or asphalt);

- surface water controls, including on-site detention and a water treatment plant to the south-east of the RRC; and
- access road and intersection with Adams Road.

- Installing:
  - an in-bound weighbridge situated to the north of the warehouse;
  - an out-bound weighbridge situated to the south of the warehouse;
  - waste, product and reject bays within the warehouse;
  - marked staff and visitor carparking spaces to the west and north-west of the warehouse;
  - marked traffic circulation;
  - demarcated pedestrian walk-ways;
  - fencing around the operational areas of the site and gates for the in-bound and out-bound driveways;
  - fire safety systems;
  - wheel wash; and
  - tanks to store and reuse rainwater from warehouse roof.

Given that the RRC site is currently vacant, the project will also require the establishment/construction of infrastructure for essential service (ie electricity, water and sewage).

Site establishment and construction are expected to take approximately 15 to 18 months.

KEY

- Subject property
- RRC site
- Cadastral boundary
- Indicative detailed layout

Proposed layout

- Bin storage
- Car parking
- Clean timber
- Concrete rubble/masonary
- Fine sediment (screened)
- Future washing/tyre shedding
- Hardstand
- Internal 13 m road
- Landscaping
- Leachate/stormwater detention
- Onsite detention
- Product bay
- Site office
- Warehouse
- Rainwater tank
- Water treatment plant
- Weighbridge

Source: EMM (2020); DFSI (2017); GA (2011); Nearmap (2019)

0 50 100 m

GDA 1994 MGA Zone 56

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Project layout

Luddenham resource recovery centre
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Figure 2.1

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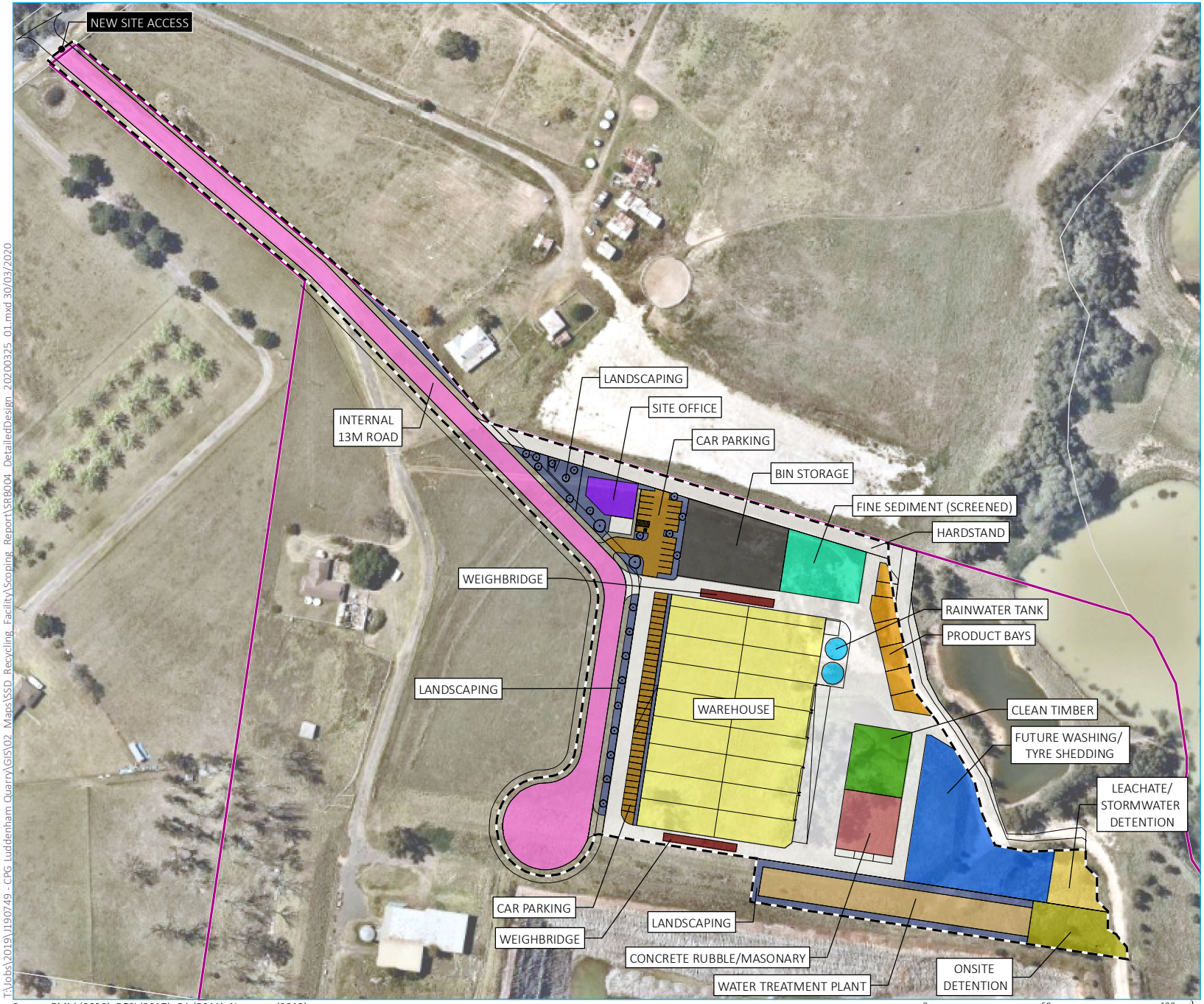

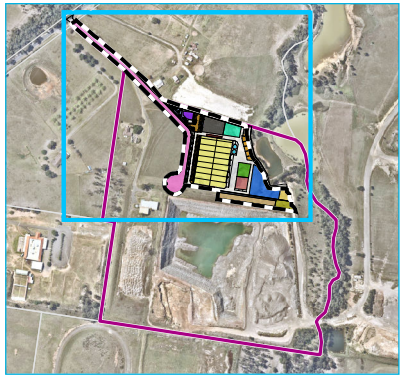

KEY

- Subject property
- RRC site
- Cadastral boundary
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Proposed elements

- Bin storage
- Car parking
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- Leachate/stormwater detention
- Onsite detention
- Product bay
- Site office
- Warehouse
- Rainwater tank
- Water treatment plant
- Weighbridge

Detailed project layout

Source: EMM (2020); DFSI (2017); GA (2011); Nearmap (2019)

0 50 100 m

GDA 1994 MGA Zone 56

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Luddenham resource recovery centre
Scoping report
Figure 2.2

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2.3 Operations

2.3.1 Waste receival

The RRC would predominately accept construction and demolition waste, with some commercial and industrial waste, including tyres. The RRC would accept ferrous and non-ferrous materials, timber, paper and cardboard, masonry (concrete, bricks, tiles), asphalts, soil, fireboards, sheeting, gyprock, fines and plastics. The RRC would use these waste materials to make recycled soil, aggregate, recycled bedding sand for pipe laying, wood mulch and road base. The RRC would accept up to 600,000 tpa of waste for recycling and dispatch up to 540,00 tpa of recycled products and approximately 60,000 tpa of non-recyclable materials offsite.

No special, liquid, hazardous, restricted solid waste or general solid waste (putrescible), as defined in the *NSW Protection of the Environment Operations Act 1997* (POAO Act) and the Environment Protection Authority 2014 *Waste Classification Guidelines Part 1: Classifying Waste*, will be accepted by the RRC. Unrecyclable materials will be dispatched offsite to an appropriately licensed centre or will be landfilled on the site subject to approval of the landfill.

The RRC site will be accessed from Adams Road. Elizabeth Drive and The Northern Road are major approved heavy vehicle routes. However, approval will be required for heavy vehicles to use Adams Road (Section 6.1).

Incoming waste first inspected before is accepted at the RRC.

The RRC will include parking for trucks, and employee and visitor light vehicles. Customer skip bins and skip-bin trucks will also be stored at the development.

2.3.2 Processing and dispatch

Waste will be processed (including sorting, screening, crushing, blending and shredding) on site with the aim of recovering up to 90% of the waste received. A range of mobile plant (eg excavators and loaders) and a screening and picking line, will be used to handle and process the waste and products within the warehouse. Waste will be tipped into the storage bin prior to being dispatched offsite.

Material processed in the warehouse will be stockpiled in the warehouse or segregated product bays prior to dispatch.

It is noted that:

- all waste will be handled and stored within the enclosed warehouse or walled product bays; and
- no composting will take place on the site.

2.3.3 Operating hours and workforce

Approval will be sought to operate up to 24 hours, 7 days per week. At this stage it is believed that given the wall surrounding the RRC site and the sparsely populated surroundings, these operating hours will not result in unacceptable noise, traffic or lighting impacts. However, this will be considered in detail in the EIS.

The RRC is expected to be operated by approximately 50 employees.

3 Strategic context

3.1 Strategic planning context

Luddenham is a suburb of 1,828 residents in the Liverpool LGA, situated in the Greater Western Sydney region about 19 km north-west of the City of Liverpool, 25 km south-west of the city of Parramatta and approximately 43 km south-west of the city of Sydney. In the past few years there have been a number of State Government initiatives to enhance infrastructure, housing, employment and liveability in the Greater Western Sydney region.

The project is a response to servicing market demand for construction and demolition resource recovery, which is expected to increase in the coming decades within the Greater Western Sydney region due to State Government investment and infrastructure upgrades. The project aligns with State Government's initiatives for a more efficient city. It is justified by the strategic trends outlined in this chapter.

3.2 Alignment with strategic planning instruments

The Greater Sydney Region Plan and Western Sydney District Plan are both prepared in accordance with Section 3.3 of the EP&A Act and form the basis of strategic planning, having regard to the region's economic, social and environmental needs. Both plans include provisions which point to need for suitable land to provide urban services, such as waste management, recycling and landfilling, into the future.

The project aligns with three Greater Sydney Region Plan objectives outlined in Table 3.1.

Table 3.1 Greater Sydney Region Plan objectives relevant to project

Objective no.	Objective description	Project alignment with objective
23	Industrial and urban services land is planned, retained and managed.	This objective supports industries that enable the city to develop and its businesses and residents to operate, including the waste recycling and transfer industry. The objective is for such services to be dispersed across Greater Sydney on varied sized lots, close to residential and commercial centres which they can directly serve.
33	A low-carbon city contributes to net-zero emissions by 2050 and mitigates climate change.	This objective encourages waste efficiency measures, with one of the pathways related to waste diversion from landfill.
35	More waste is re-used and recycled to support the development of a circular economy	This objective notes that waste services are an essential service to communities and that existing waste management facilities do not have the capacity to accommodate projected population growth in Sydney. The strategy encourages on protecting existing and identifying new locations for waste recycling and management.

The objectives and actions under the Greater Sydney Region Plan and the Western City District Plan unambiguously point to the need to safeguard the continuation of sites for urban services (such as waste management and recycling facilities), and in particular to ensure zoning schemes do not compromise the capacity for such services to continue to serve the needs of a growing city. For further discussion on land use and permissibility refer to Section 1.2.5.

3.3 Project justification

3.3.1 Economic need

The RRC will support the most recent *NSW Waste and Resource Recovery Strategy (2014–21)*. This strategy describes priority areas over the next seven years and aligns with the NSW Government's waste reforms in NSW 2021: A Plan to Make NSW Number One. As stated on the EPA website:

> The key areas identified in the strategy will support investment in much-needed infrastructure, encourage innovation and improve recycling behaviour. They will also help develop new markets for recycled materials and reduce litter and illegal dumping.

As an established recycling business, KLF supports these strategies and their ongoing implementation. The project represents "much needed infrastructure" and will contribute to meeting the NSW Government's recycling strategies and targets.

The proponents engaged MRA Consulting Group (MRA) to carry out high-level economic needs analysis. The projected inert waste volumes to be disposed in Sydney Metropolitan Area inert landfills are predicted to increase by the historical compound annual growth rate of 4.1% based on the latest NSW EPA construction and demolition waste data, with 23.7 million tonnes generated by 2040. With a maximum throughput of 600,000 tpa, the proposed construction and demolition resource recovery facility would only provide 20% of the required additional processing capacity required in the Sydney Metropolitan Area.

3.3.2 Need for recycling

The RRC will process a range of construction and demolition wastes, including timber, concrete, brick, soil and sand to make recycled soil, aggregate, recycled bedding sand for pipe laying, wood, mulch and road base. The centre will provide an environmentally beneficial means of dealing with construction and demolition (non-putrescible general solid) waste, with recycled products turned into vulnerable sustainable products and sold back into the industry for use in a variety of applications.

Recycling provides a wide variety of tangible and measurable environmental benefits compared to landfill disposal. These include energy savings, avoidance of greenhouse gas emissions, water savings, avoidance of waste, and significant reductions in natural resource use. Environmental benefits are most apparent in the two significant stages of the waste process which are avoided: extraction of raw materials and disposal of waste to landfill.

The NSW Government has announced the extension of the Waste Less, Recycle More initiative with a further $337 million over four years from 2017 to 2021. It aims to transform the waste and recycling sector and deliver economic and environmental benefits in NSW by responding to the targets set in the NSW Waste Avoidance and Resource Recovery Strategy 2014-21. These targets include:

- reduce the rate of waste generation per capita;
- increase recycling rates across all waste streams; and
- increase the proportion of waste diverted from landfill to 75%.

The intended use for the RRC site supports these strategies and their ingoing implementation. The proposed RRC will assist the NSW Government in meeting waste reduction targets and increase the recovery and reuse of material.

3.3.3 Site suitability

The site is ideally located for the proposed development because:

- it is located in the Western Sydney Aerotropolis to service the ongoing development of the Aerotropolis;
- it is readily accessible from major transport links including the Northern Road (A9), M4 Motorway, M7 Motorway, and the Great Western Highway (A44);
- the site has sufficient area to allow external manoeuvring of vehicles and also the handling and storage of materials;
- if landfilling on the site is approved under a separate application (future MOD 6), unrecyclable material will be able to be disposed within the quarry void, having the benefit of avoiding transportation of unrecyclable material to the alternative landfills while filling the quarry void, enabling its complete rehabilitation and the use of the quarry area for the commercial or industrial uses in the future; and
- the site is adequately separated from urban development to enable potential adverse environmental impacts (ie air and noise) to be managed and/or mitigated.

4 Statutory context

4.1 Planning and assessment process

The State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP) identifies development that is considered SSD. Clause 23 of the SRD SEPP states:

> (3) Development for the purpose of resource recovery or recycling facilities that handle more than 100,000 tonnes per year of waste.

The project is therefore SSD, requiring development consent is required under Division 4.1 of the EP&A Act.

4.2 Permissibility

The RRC site is zoned RU1 Primary production under the Liverpool LEP. The development for a resource recovery facility is not permissible in land zoned RU1 Primary production under Liverpool LEP. However, Clause 121 of the State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) provides that development for the purpose of waste or resource management facilities (which includes resource recovery facilities), may be carried out by any person with consent on land in a prescribed zone. Prescribed zones include land zoned RU1 Primary production. While the Liverpool LEP does prohibit development for the purpose of a resource recovery facility on land zoned RU1, that provision is switched off by the ISEPP, and the resource recovery facility is permitted with consent.

The Western Sydney Aerotropolis Planning Package, currently on exhibition, shows the RRC site falling predominantly within the proposed Agribusiness zoning of the proposed Aerotropolis SEPP. Land along the eastern boundary of the RRC site is shown as Environment and Recreation Zoning. As such, the proposed resource recovery centre may not be a permissible use under the proposed Aerotropolis SEPP based on the existing proposal. EMM and the proponents are currently in consultation with DPIE regarding EMM's *Submission on the Western Sydney Aerotropolis Planning Package with reference to 275 Adams Road, Luddenham* (February 2020) which requests a revision of the proposed zoning at the site. The proposed zoning is illustrated in Figure 4.1.

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Comparison of proposed Aerotropolis SEPP zoning and requested zoning revisions

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Figure 4.1

4.3 Other Commonwealth and State legislation and planning instruments

A summary of relevant legislation (including planning instruments) and policies and the development's permissibility is provided in Table 4.1.

Table 4.1 Legislation relevant to the development

Legislation/instrument	Relevant section	Comment
Commonwealth legislation		
Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)		The search results of the Commonwealth Protected Matters Search Tool (PMST) indicate that there are no world heritage properties or national heritage places within the vicinity of the site. The site does not contain wetlands of international importance. The PMST indicates the possibility of the following biodiversity values to be present within the site: four listed threatened ecological communities, 35 listed threatened species, and 15 listed migratory species. Native vegetation along Oaky Creek will be avoided. At this stage it is not proposed to submit an EPBC Referral for the project.
Commonwealth *Airports Act 1996* (Airports Act) and Airports (Protection of Airspace) Regulations 1996 (Airports Regulations)		Airspace in the vicinity of the Western Sydney Airport is protected under the Airports Act and the Airports Regulations. Given that the RRC site is located adjacent to airport land, the project will need to address the Obstacle Limitation Surface (OLS) for the Western Sydney Airport in the EIS. The project is considered a controlled activity within the airport's protected airspace and will therefore require approval from the airport operator, WSA Co Ltd. The proponents and EMM have met with the Western Sydney Authority to discuss the project (refer to Section 5.1.3). It was agreed that the RRC design (including heights) will be determined in consultation with the Western Sydney Airport.
State legislation		
Environmental Planning and Assessment Act 1979 (EP&A Act), Section 4.7		Refer to Section 4.1 of this report.
Protection of the Environment Operations Act 1997 (POEO Act), Schedule 1		Proposed activities at the development are listed under Schedule 1 of the POEO Act as 'resource recovery' activities. Accordingly, an environment protection licence will be required for the site.
State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP), Schedule 1 State significant development – general		Refer to Section 4.1 of this report.
State Environmental Planning Policy (Infrastructure) 2007 (ISEPP)		Refer to Section 4.1 of this report.

Table 4.1 Legislation relevant to the development

Legislation/instrument	Relevant section	Comment
State Environmental Planning Policy No. 33 - Hazardous and Offensive Development (SEPP 33)		SEPP 33 applies to development of potentially hazardous industry. It requires the consent authority to consider whether an industrial development is a potentially hazardous industry or a potentially offensive industry The EIS will consider if the development will be a potentially hazardous industry.
State and Environmental Planning Policy No. 55 - Remediation of Land (SEPP 55)		No significant excavations are proposed. Minor excavation may be required to install essential services such as electricity, water and sewage (sewage may be in the form of a septic tank), as well as warehouse footings. The existing sedimentation basin in the north-eastern corner of the site will be used for site surface water management. A preliminary contamination investigation is required where a change of land use is proposed.
Draft Western Sydney Aerotropolis State Environmental Planning Policy (Aerotropolis SEPP)		Refer to Section 4.2 of this report.
Liverpool Local Environmental Pan 2008 (Liverpool LEP) - Land use zones		The site is zoned RU1 Primary production.
Liverpool Local Environmental Pan 2008 (Liverpool LEP)- Land use table		The development for a resource recovery facility is not permissible in land zoned RU1 Primary production under Liverpool LEP. Refer to Section 4.2 of this report.
Liverpool Development Control Plan (DCP)	D Industrial Development	Compliance with the DCP will be considered in the EIS.

Table 4.2 provides an overview of approval and licence requirements considered for the project.

Table 4.2 Approvals and licences required

Approval	Relevance to project
Approvals required to be issued consistently under EP&A Act section 4.42	
An environment protection licence (EPL) under Section 3 of the NSW *Protection of the Environment Operations Act 1997* (POEO Act)	Likely to be required.
A consent under section 138 of the NSW *Roads Act 1993*	Likely to be required.
An aquaculture permit under section 114 of the NSW *Fisheries Management Act 1994*	Not relevant.
Approval under section 15 of the NSW *Mine Subsidence Compensation Act 1961*	Not relevant.
A production lease under the NSW *Petroleum (Onshore) Act 1991*	Not relevant.
A licence under the NSW *Pipelines Act 1967*	Not relevant.
Other licences, etc.	
Water Access Licences (WALs) under the WM Act	A WAL may be required if water is sourced from the site.

Table 4.2 Approvals and licences required

Approval	Relevance to project
Approvals not required under EP&A Act section 4.41	
A permit under section 201, 205 or 219 of the NSW *Fisheries Management Act 1994* (FM Act)	Not relevant.
An approval under Part 4 or an excavation permit under section 139 of the NSW *Heritage Act 1977*	Not likely to be relevant.
An Aboriginal heritage impact permit under section 90 of the NSW *National Parks and Wildlife Act 1974*	Potentially relevant but not required.
A bushfire safety authority under section 100B of the NSW *Rural Fires Act 1997*	Potentially relevant but not required.
A water use approval under section 89, a water management work approval under section 90 or a controlled activity approval (other than a groundwater interference approval) under section 91 of the NSW *Water Management Act 2000*	Potentially relevant but not required.
Approvals required to be issued consistently under EP&A Act section 4.42	
An environment protection licence (EPL) under Section 3 of the NSW *Protection of the Environment Operations Act 1997* (POEO Act)	Likely to be required.
A consent under section 138 of the NSW *Roads Act 1993*	Likely to be required.
An aquaculture permit under section 114 of the NSW *Fisheries Management Act 1994*	Not relevant.
Approval under section 15 of the NSW *Mine Subsidence Compensation Act 1961*	Not relevant.
A production lease under the NSW *Petroleum (Onshore) Act 1991*	Not relevant.
A licence under the NSW *Pipelines Act 1967*	Not relevant.
Other licences, etc.	
Water Access Licences (WALs) under the WM Act	A WAL may be required if water is sourced from the site.
Commonwealth	
Approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).	Unlikely to be required, as native vegetation along Oaky Creek will be avoided.

5 Engagement during scoping

5.1 Early engagement and consultation

The draft *Engagement in EIA* (DPIE 2019) guideline emphasises early engagement in the environmental impact assessment (EIA) process and improved participation throughout the assessment process. The proponents have started to consult with government agencies regarding the project. A community engagement strategy has been prepared as part of the scoping process for the EIS and is included in Appendix B.

A summary of consultation to date is provided in the following sections. Consultation involved discussions on the project, as well as MOD5 and MOD 6 which are both a part of the future land use vision at the subject property.

5.1.1 Western Sydney Aerotropolis Authority

The proponents and EMM met with the Western Sydney Aerotropolis Authority (Aerotropolis Authority) on 19 December 2019. The Aerotropolis Authority was not opposed to continued quarrying in the short-term or the proposed RRC but noted that the RRC would not be permissible within the draft Aerotropolis Agribusiness zone.

5.1.2 Western Sydney Planning Partnership Office

The proponents and EMM met with the Western Sydney Planning Partnership Office (WSPPO) at Mulgoa Hall on 4 February 2020 and subsequently in a combined meeting with Western Sydney Airport, DPIE and Liverpool City Council (the Council) on 18 February 2020 (see below). During both meetings, the WSPPO expressed that it is desirable to eventually fill the quarry void to allow its development to meet the land use objectives of the draft Aerotropolis Plan. Permissibility issues were also discussed.

5.1.3 Western Sydney Airport Corporation

The proponents met with Western Sydney Airport at the combined meeting with PPO, DPIE and the Council on Tuesday 18 February 2020. Western Sydney Airport raised concerns regarding the establishment of a RRC on the site but noted that an enclosed and appropriately screened resource recovery facility (as proposed) would substantially reduce/eliminate dust generation. The requirements to safeguard 24-hour operations, as described in Section 5 of the draft Aerotropolis Plan, were discussed. These include preventing wildlife strike, generation of wind shear/turbulence, preventing lighting impacts on pilots and maintaining a safe airspace were discussed. It was agreed that the development application for the RRC would need to address these issues but that there are likely to be feasible measures that can address any issues that could impact airport operations.

5.1.4 Liverpool City Council

As mentioned above, the proponents and EMM met with Western Sydney Airport, DPIE, PPO and the Council at the Council offices on 18 February 2020. As well as the matters described above, the Council noted that a range of other impacts will need to be assessed, such as transport- and noise-related impacts.

5.1.5 Department of Planning, Infrastructure and Environment

The proponents met with DPIE at the combined meeting on 18 February and subsequently at a project scoping in Parramatta on 21 February 2020 to discuss all site development components. Topics discussed included the planning pathways and the assessment of potential environmental impacts. The focus was the modification of the quarry consent. A scoping meeting for the RRC application was held on 24 March 2020 by teleconference.

5.1.6 Community consultation

The subject property has four adjacent neighbours:

- two residences;
- the Hubertus Country Club; and
- the Western Sydney Airport.

As described above, consultation with the Western Sydney Airport has commenced. Initial consultation will other adjacent neighbours commenced in February 2020. Ongoing face to face consultation is currently on hold due to current restrictions brought on by the COVID19 pandemic. Telephone and written consultation will continue throughout the preparation of the EIS.

6 Proposed assessment

Preliminary environmental investigations have been carried out to identify the relevant matters to be addressed in the EIS for the project and the required level of assessment. Based on these findings, issues have been defined as either key or other issues requiring a detailed or standard level of assessment. The proposed assessment for key issues are outlined in Table 6.1.

The preliminary impact identification and assessment has been informed by the draft *Preparing a Scoping Report – Guidance for State Significant Projects* (DPE 2019) and the supporting Scoping Tool (refer Appendix A). The process was informed by desktop assessment and limited field survey undertaken by the project team. The process included:

- consultation with DPIE and key stakeholders;
- undertaking a process of identifying and characterising relevant matters for assessment, involving an appraisal of likely environmental and social impacts; and
- reporting the outcomes of that assessment in this scoping report.

The full list of matters considered in the scoping assessment is provided in the Scoping Worksheet provided as Appendix A.

6.1 Preliminary impact identification and assessment

A preliminary review of environmental issues associated with the project is provided in Table 6.1.

Table 6.1 Preliminary environmental review and approach to assessment

Aspect	Preliminary environmental review	Approach to assessment
Air quality	The project is located in an area typical of a rural environment and the air quality is generally considered to be good. A few air pollutants would be emitted from the surrounding residential properties of Luddenham; most densely populated approximately 2.2 km from the site and sparsely populated surrounding the site. Some air pollutants would also be emitted from the surrounding commercial and agricultural properties, including the Hubertus Country Club and pistol range and the agricultural farm located approximately 300 m to the north-west of the site. The site establishment and construction of the Western Sydney Airport may impact the air quality (ie dust) in the short-term, and the operation of the airport will contribute to emissions in the surrounding environment in the long term. Some of the proposed activities at the site have the potential to produce airborne dust. However, dust emission levels are generally expected to be low as the site will be sealed, an irrigation system will be installed and a number of mitigation measures will be implemented during the construction and operation of the project. Some measures include, but are not limited to:	An air quality impact assessment will be prepared in accordance with relevant NSW EPA guidelines to address air quality impacts from the RRC and cumulative air quality impacts from all site operations.

Table 6.1 Preliminary environmental review and approach to assessment

Aspect	Preliminary environmental review	Approach to assessment
	• all waste/product stockpiling, processing and handling will be within enclosed walls to minimise dust emissions from the site; • misters will be used at warehouse entrance and along perimeter walls to minimise dust emissions from the RRC site; • the site will be regularly cleaned using a sweeper; • no composting (odour generating) will be undertaken on site as part of the project. Given that no putrescibles will be accepted and no composting will be occur, significant odours are not expected to be generated; and • dust levels at sensitive receivers will assessed in the EIS.	
Acoustic and vibration	The nearest representative noise sensitive locations to the RRC have been identified for the purpose of assessing potential noise and vibration impacts from the project in the EIS. These locations are shown in Figure 6.1 and were selected to represent the range and extent of noise impacts from the site, and include: • 2161-2177 Elizabeth Drive, Luddenham (R1 - residential); • 2111-2141 Elizabeth Drive, Luddenham (R2 - residential); • 285 Adams Road, Luddenham (R3 - residential); • 5 Anton Road, Luddenham (R4 - residential); • 185 Adams Road, Luddenham (R5 - residential); • 225 Adams Road, Luddenham (R6 - residential); • 161 Adams Road, Luddenham (R7 -residential); • 2510-2550 Elizabeth Drive, Luddenham (R8 -residential); • Hubertus Club – outdoor firing range (AR1- active recreation); and • Hubertus Club – restaurant including outdoor facilities (C1 - commercial). The RRC site will be surrounded by walls and all waste/product stockpiling, processing and handling will be within the warehouse or in walled product bays to minimise noise emissions from the site. Considering the site's location on the northern border on the Western Sydney Airport (WSA) within the ANEC/ANEF 20 contours, the direct application of the procedures of the NPfI for residential assessment locations is considered unreasonably onerous for the assessment of noise for the proposed future operation of the resource recovery centre. This is based on the transitional nature of intended land use in the vicinity of the WSA (as outlined in the Draft Western Sydney Aerotropolis Plan) and change in acoustic environment based on predicted noise level exposure for WSA ground running and taxiing operations scheduled to commence in 2026. A review of the Environmental impact statement for the WSA show noise contours for 2030 taxing activities confirm that residences and other land uses within 1500m of the Luddenham quarry operations would be exposed to noise levels from WSA	A noise and vibration assessment will be prepared in accordance with the relevant NSW EPA guidelines to address noise impacts from the resource recovery facility and cumulative noise from all site operations. Due to the RRC site's location within the ANEC/ANEF 20 contour of the WSA, and the changing acoustic environment, it is proposed to adopt commercial or industrial noise criteria. This will be done in consultation with DPIE's noise technical specialist and the EPA. Road traffic noise will be assessed.

Table 6.1 Preliminary environmental review and approach to assessment

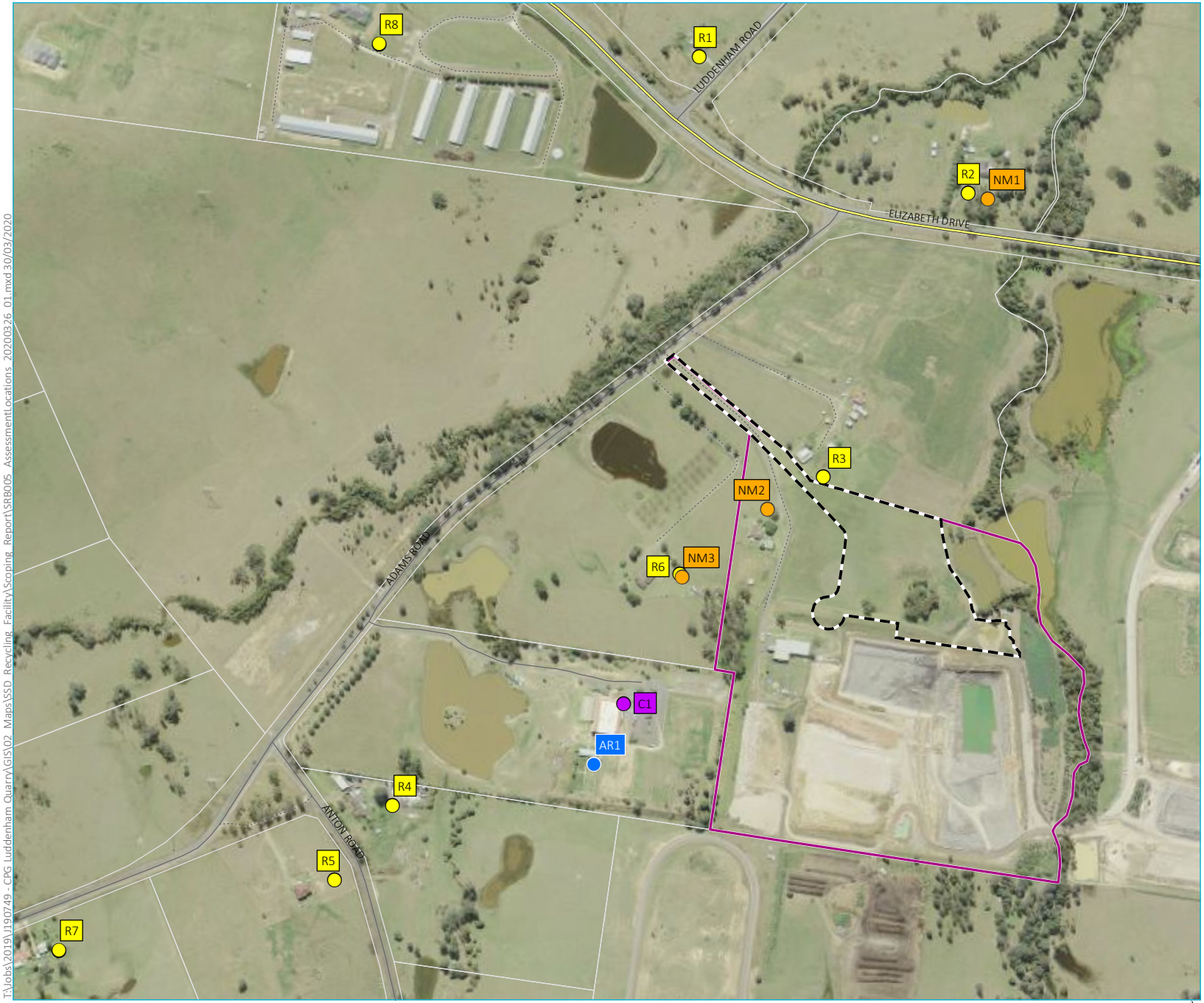
Aspect	Preliminary environmental review	Approach to assessment
	activities of $L_{Aeq,15min}$ 50-60dBA. Considering the continuous 24/7 operation of WSA it would also be expected that airport operations would also significantly increase ambient background noise levels. Based on these predicted noise levels it is anticipated that the existing residential properties in closest proximity to the site are unlikely to remain in the medium term (3-5 years), transitioning to a land use more compatible to the WSA.	
Surface water and groundwater	As noted, surrounding land uses include rural residences, agricultural and commercial. The site elevation ranges from approximately 75 m to 55 m AHD and is predominantly flat, sloping generally from the south-west to the north-west. Generally, there is about a 10 m fall across the 500 m distance between he western and eastern site boundaries. The lowest points are at the Oaky Creek, which is at the eastern boundary of the site. A number of mitigation measures will be implemented on site to control the surface water quality and runoff, including: • the RRC site will be sealed; • waste/products that could generate leachate will be stockpiled under cover so rain will not be able to fall on, or percolate through, stockpiles; • water treatment plant and water controls at the site will be designed and installed to separate clean and dirty water and to prevent uncontrolled release of water from the site; and • the site will be sealed and regularly cleaned using a sweeper. Given that the site has a history of quarrying, potential impacts on the groundwater system, groundwater dependent ecosystems (GDEs) and groundwater users have been addressed over time, in consultation with government regulators. There are three monitoring bores present on site. Previous investigations show that previous site activities (quarrying) had a low impact on the groundwater system due to intrinsic nature of the rock which has low permeability, low yield and poor water quality. The project area will be sealed, and thus impacts are expected to be negligible to groundwater sources.	A water cycle management study will be prepared. Potential impacts on the quality and quantity of surface water due to the recycling centre will be assessed. A flood assessment will be prepared. The RRC will be designed to prevent water discharges or seepage to groundwater so it is not proposed to prepare a groundwater assessment.
Contamination	Minor excavation will be required during construction as part of installing surface water controls, for warehouse and shed footings and for the weighbridges if it is decided to install in-ground weighbridges. The operational area of the site will be sealed so there will be no opportunity for infiltration of surface water to the underlying soils or groundwater during operation. There are no acid sulfate soils mapped as occurring near the site.	A preliminary contamination assessment will be prepared as part of the EIS. It will include a preliminary contamination investigation to identify any past or present potentially contaminating activities, to provide a preliminary assessment of any site contamination and, if required, to provide a basis for a more detailed investigation.

Table 6.1 Preliminary environmental review and approach to assessment

Aspect	Preliminary environmental review	Approach to assessment
Traffic and transport	Approved site access under previous ownership, and under the current site consent for quarry operations, was via the leased Commonwealth-owned land (Lot 1 DP 838361). The project will alter the point at which trucks are approved to access the road network to enable access via Adams Road (Figure 2.1). Marked staff and visitor carparking spaces are proposed to the west and north-west of the warehouse (Figure 2.1). The site will be designed to include designated vehicle movement corridors and will separate light vehicles and heavy vehicles as far as practicable. Pedestrian walkways will be demarcated. The inbound and outbound weighbridges will be located within the warehouse. The site will be designed so that there is ample queuing space onsite.	A traffic impact assessment will be prepared in accordance with relevant RMS guidelines. An approach to assessing the staged changes to the road network has been discussed with DPIE, Transport for NSW and Liverpool City Council.
Hazard and risk	Small amounts of other hazardous materials (eg acetylene for cutting) will also be stored on site. Hazardous waste will not be accepted at the RRC site. The RRC site is within a designated bush fire prone area. Previous bushfire assessments have found the property suitable for development.	A preliminary risk screening will be completed in the body of the EIS in accordance with SEPP 33. An assessment of the risk of bushfire addressing the requirements of the NSW Rural Fire Service *Planning for Bush Fire Protection 2018* will be prepared.
Biodiversity	There are two plant community types (PCTs) on site (Figure 6.2): • Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter Valley; and • Grey Box – Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion. These will be largely avoided through project design but some clearing will be required (refer Figure 6.2).	A BDAR will be prepared to address vegetation clearance.
Heritage	An Aboriginal Heritage Due Diligence Assessment (AHDD) has been prepared to inform discussions with the DPIE and to accompany this scoping report. (**Error! Reference source not found.**). This found: • There is one registered AHIMS site within the subject property. The site inspection confirmed that the coordinates do not correspond with the location of the RRC site. • The existing environmental context and a review of archaeological information indicates that it is possible for archaeological deposits to occur within the riparian corridor of Oaky Creek. • A site inspection identified that the riparian corridor of Oaky Creek is the area most likely to have potential archaeological deposit although no Aboriginal cultural material was located during the site inspection. The proposed project disturbance footprint is over 100 m from Oaky Creek and has been subjected to repeated topsoil disturbance from its use as a turf farm and the construction of a dam. As such, Aboriginal objects are unlikely to occur generally in this area and are even less likely to be traceable through archaeological investigation.	The AHDD followed the DPIE guideline *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (DECCW 2010) which recommends that a due diligence assessment in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DECCW 2010) as a first step to identify whether Aboriginal objects or places are likely to be harmed by a proposed activity.

Table 6.1 Preliminary environmental review and approach to assessment

Aspect	Preliminary environmental review	Approach to assessment
	Based on the existing environment and project disturbance footprint, the assessment concluded that Aboriginal objects are unlikely to be harmed by the project and further investigation beyond the scope of a due diligence assessment is not warranted.	
Visual	The primary potential visual impacts are: • Temporary construction activities will mostly impact the two residential dwellings close to the site (225 and 285 Adams Road, Luddenham) and Hubertus Country Club and pistol range. • Light and heavy vehicle traffic will be visible along the upgraded access road. These will mostly impact the above-mentioned residential dwellings, and, to a much lesser extent, the Hubertus Country Club and pistol range. • The RRC will be new feature in the surrounding landscape. However, most site activities will not be visible from local Adams Road and Elizabeth Drive due to the surrounding topography and the wall surrounding the site. • Other potential visual impacts include lighting during construction and operation. The wall and the topography may block out some of the lighting depending on the final design of the RRC site. Although the RRC will be visible from the surrounding land holdings, it will fit in with the future land uses surrounding the site (ie the Western Sydney Aerotropolis). The Western Sydney Airport is currently under construction. Therefore, the scale of the proposed modification in relation to the surrounding construction works and development are minor.	A basic visual impact assessment from private receptors and public vantage points will be provided within the body of the EIS.
Social	The project is expected to have a number of social and economic benefits for the Greater Western Region. For example, it will create 50 new jobs at the RRC site. The project is also expected to fulfil economic and recycling needs that align with State goals, as outlined in Section 3.3 of this report. Stakeholders will be consulted during the preparation of the EIS as described in the Stakeholder Engagement Plan (Appendix B).	The level of assessment will be commensurate with the anticipated impacts of the project in the context of the broader social impacts of the Western Sydney Aerotropolis development.



KEY

- Subject property
- RRC site
- Cadastral boundary
- Major road
- Minor road
- Vehicular track
- Noise monitoring location

Assessment location type

- Active recreation
- Commercial
- Residential

T:\Jobs\2019\J190749 - CPG Luddenham Quarry\GIS\02 Maps\SSD Recycling Facility\Scoping Report\SRB005 AssessmentLocations 20200326 01.mxd 30/03/2020

Source: EMM (2020); DFSI (2017); GA (2011); Nearmap (2019)

0 100 200 m

GDA 1994 MGA Zone 56

N

Noise sensitive receptors

Luddenham resource recovery centre
Scoping report
Figure 6.1

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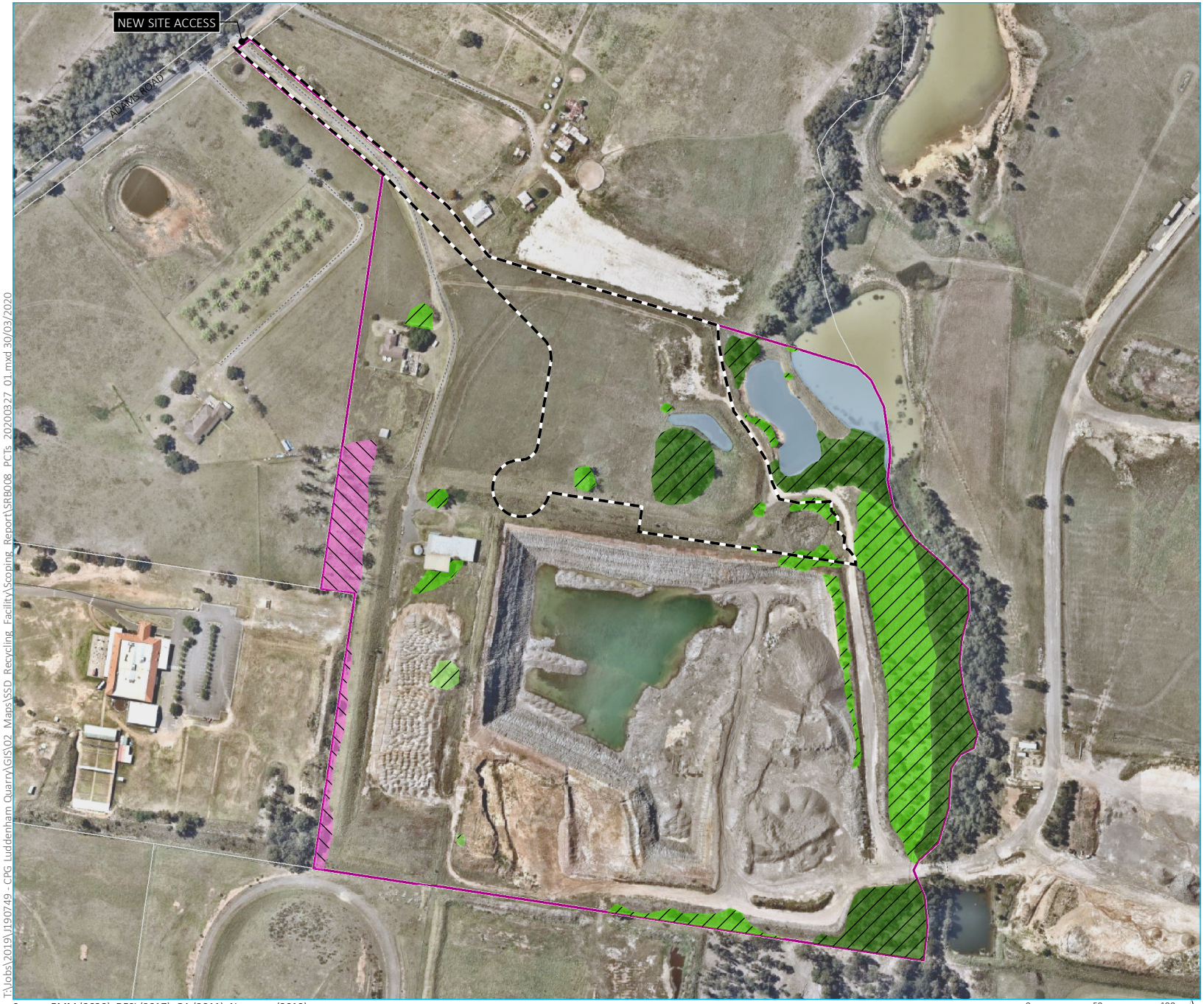

KEY

- Subject property
- RRC site
- Waterbody
- Cadastral boundary

Plant community type (PCT)

1800 - Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter Valley

- Poor (disturbed)
- Poor
- Medium

849 - Grey Box Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion

- Poor

Threatened ecological community (TEC)

- Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin, South East Corner bioregions
- Cumberland Plain Woodland in the Sydney Basin Bioregion

T:\Jobs\2019\J190749 - CPG Luddenham Quarry\GIS\02 Maps\SSD Recycling Facility\Scoping Report\SRB008 PCTs 20200327 01.mxd 30/03/2020

Source: EMM (2020); DFSI (2017); GA (2011); Nearmap (2019)

0 50 100 m

GDA 1994 MGA Zone 56

N

Plant community types in the project area

Luddenham resource recovery centre
Scoping report
Figure 6.2

EMM
creating opportunities

7 Proposed engagement

A Community Engagement Strategy (CES), prepared in accordance with Section 2 of the Draft Engagement in EIA – Guidance for State Significant Projects (DPIE 2019), is provided in Appendix B.

8 Justification

The project is aligned with the Greater Sydney Region Plan and the Western City District Plan which both include provisions which point to the need for waste and recycling facilities within the Greater Sydney/Western Sydney region.

The project is justified both on economic, social and environmental terms (ie the need for recycling and reuse of waste). Taking into account the staged approach for the subject property proposed by the proponents, the project will align with a future land use vision for the site, which will have short- and long-term benefits for the Western Sydney Aerotropolis and the region in general.

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Appendix A

Scoping worksheet

Project : Luddenham Resource Recovery Centre

MATTERS		IMPACTS		ASSESSMENT LEVEL	CUMULATIVE IMPACTS	COMMUNITY ISSUES	ASSESSMENT APPROACH	SCOPING REPORT
Potential matters that could be affected by the project		Is the project (without mitigation) likely to cause an impact?	Are the impacts (without mitigation) likely to be significant based on the magnitude of the impacts and/or sensitivity of receivers?	What level of assessment is required to assess impacts and determine mitigation measures?	Will cumulative assessment be required?	Did the community raise any concerns about the impacts?	Indicative approach to assessment in EIS	Where was this addressed in the Scoping Report?
Group	**Specific**	**Impact?**	**Significant Impact?**	**Assessment Level**	**Cumulative Impact?**	**Concerns?**	**Category**	**Section**
ACCESS	access to property	No				No	None (include short explanation in Scoping Report)	Section 6
	parking	No						
	port / airport facilities	No						
	road / rail network	Yes	Likely	Standard	Yes	Yes	Standard Assessment and CIA with focussed engage	Section 6
	other - please specify							
AIR	atmospheric emissions	Yes	Unlikely			No	Scoping Report	Section 6
	gases	No						
	particulate matter	Yes	Likely	Standard	Yes	Yes	Standard Assessment and CIA with focussed engage	Section 6
	other - please specify							
AMENITY	noise	Yes	Likely	Standard	Yes	No	Standard Assessment and CIA	Section 6
	odour	Yes	Unlikely			No	Scoping Report	Section 6
	vibration	No				No	None (include short explanation in Scoping Report)	Section 6
	visual	Yes	Likely	Standard	No	Yes	Standard Assessment with focussed engagement	Section 6
	other - please specify							
BIODIVERSITY	conservation areas	No				No	None (include short explanation in Scoping Report)	
	native vegetation	Yes	Unknown			No	Scoping Report with focussed engagement	Section 6
	native fauna	Yes	Unknown			No	Scoping Report with focussed engagement	Section 6
	other - please specify							
BUILT ENVIRONMENT	private property	N/A					None (include short explanation in Scoping Report)	
	public domain	N/A					None (include short explanation in Scoping Report)	
	public infrastructure	N/A					None (include short explanation in Scoping Report)	
	other - please specify	N/A					None (include short explanation in Scoping Report)	
ECONOMIC	livelihood	Yes	N/A			No	Scoping Report	Section 6
	natural resource use	N/A					None (include short explanation in Scoping Report)	
	opportunity cost	N/A					None (include short explanation in Scoping Report)	
	other - please specify	N/A					None (include short explanation in Scoping Report)	
HAZARDS & RISKS	biosecurity	N/A					None (include short explanation in Scoping Report)	
	bush fire	Yes	Unlikely			No	Scoping Report	Section 6
	coastal hazards	N/A					None (include short explanation in Scoping Report)	
	dams	N/A					None (include short explanation in Scoping Report)	
	dangerous goods	Unknown	Unlikely			No	Scoping Report	Section 6
	environmental hazards	No				No	None (include short explanation in Scoping Report)	
	floods	Yes	Unlikely			No	Scoping Report	Section 6
	groundwater contamination	Yes	Unlikely			No	Scoping Report	Section 6
	hazardous / offensive development	Unknown	Unlikely			No	Scoping Report	Section 6
	land contamination	No				No	None (include short explanation in Scoping Report)	
	land movement	N/A					None (include short explanation in Scoping Report)	
	waste	Yes	Unlikely			No	Scoping Report	Section 6
	other - please specify							
HERITAGE	Aboriginal cultural	Yes	Unlikely			No	Scoping Report	Section 6
	historic	No					None (include short explanation in Scoping Report)	
	natural	No					None (include short explanation in Scoping Report)	
	other - please specify							
LAND	land capability	No				No	None (include short explanation in Scoping Report)	Section 6
	soil chemistry	No				No	None (include short explanation in Scoping Report)	Section 6
	stability / structure	No				No	None (include short explanation in Scoping Report)	Section 6
	topography	No					None (include short explanation in Scoping Report)	Section 6
	other - please specify							
SOCIAL	community services / facilities	No				No	None (include short explanation in Scoping Report)	
	health	No				No	None (include short explanation in Scoping Report)	
	housing availability	No				No	None (include short explanation in Scoping Report)	
	safety	No				No	None (include short explanation in Scoping Report)	
	social cohesion	No				No	None (include short explanation in Scoping Report)	
	other - please specify							
WATER	ground water quality	No				No	None (include short explanation in Scoping Report)	Section 6
	hydrological flows (including flooding)	Yes	Unlikely			No	Scoping Report	Section 6
	surface water quality	Yes	Likely	Standard	No	No	Standard Assessment	Section 6
	water availability	No					None (include short explanation in Scoping Report)	Section 6
	other - please specify							

Appendix B

Community engagement strategy

Community Engagement Strategy

Luddenham Quarry

Prepared for Coombes Property Group and KLF Holdings
March 2020

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Community Engagement Strategy

Luddenham Quarry

Report Number

J190749 RP20

Client

Coombes Property Group & KLF Holdings

Date

30 March 2020

Version

v2 Final

Prepared by

Alice Meng
Planner
30 March 2020

Approved by

Janet Krick
Senior Environmental Planner
30 March 2020

Table of Contents

1 The project

1.1 Overview

Coombes Property Group (CPG) in partnership with KLF Holdings Pty Ltd (KLF) are seeking State significant development (SSD) consent for the construction and operation of a Resource Recovery Centre (the project) on 275 Adams Road, Luddenham NSW (Lot 3, DP 623799) (the subject property). The subject property shares its southern and eastern boundaries with the Western Sydney Airport development site.

There is an existing clay/shale quarry on the subject property approved under DA 315-7-2003 as modified. The quarry is currently inactive however an application will be submitted to modify the quarry's consent to allow operations to recommence. It is proposed to develop the project in an area to the north of the existing quarry void.

The project is integral in achieving the intended future commercial/industrial land use for the subject property as the project provides a commercially viable means to infill the quarry void (subject to separate development consent). This will support the Western Sydney Airport and ongoing development of the Western Sydney Aerotropolis.

The draft *Engagement in EIA – Guidance for State Significant Projects* (Draft Engagement in EIA Guideline) (DPE 2019), requires proponents to prepare a Community Engagement Strategy (CES) to ensure the community has the opportunity to be involved in the planning, design and assessment of SSD projects.

EMM Consulting Pty Ltd (EMM) has prepared this CES in accordance with the Draft EIA Guideline on behalf of CPG and KLF to guide the planning, scheduling and evaluation of consultation activities during the planning, design and assessment phases of the project.

Stakeholder engagement will occur during the COVID-19 pandemic and associated social distancing requirements. The engagement strategy has been prepared in consideration of these social distancing requirements.

1.2 Community engagement objectives

The objectives of the community engagement align with the Community Participation Plan (CPP) published by DPIE in November 2019, as shown in Table 1.1.

Table 1.1 Objectives of community engagement

Objectives	Actions	Comment
Open and inclusive	• Keep the community informed • Promote participation • Seek community input and accurately capture community views • Build strong partnerships with the community • Incorporate culturally appropriate practices when engaging Aboriginal Torres Strait Islander and culturally and linguistically diverse communities • Conduct community participation initiatives in a safe environment	This CES outlines various engagement mechanisms to appropriately engage with and provide opportunities to cater for the different age groups, ethnicity, and individual mobility of identified community stakeholders at the convenience of the individual stakeholder.

Table 1.1 Objectives of community engagement

Objectives	Actions	Comment
Easy to access	• Outline in advance how and when the community can participate • Use best practice community participation techniques • Make relevant information available in plain English and translate information when engaging linguistically diverse communities or people living with disabilities • Incorporate visual representations to clearly illustrate possible impacts of a proposal • Ensure information is assessible for groups who find it difficult to participate in usual community participation activities • Stage events at convenient times and locations	This CES outlines how and when identified community stakeholders can be involved. A proactive approach will be taken to issue the stakeholder with an information sheet, which outlines the project, and provide them with enough time to express concerns and comments. The information sheet will be prepared in plain English and use clear maps and illustrations, if appropriate. Contact details will be provided on the information sheet.
Relevant	• Establish what is up for discussion • Ensure as many community members as possible can participate • Recognise previous community input on the project and similar issues • Tailor activities to the: – context, which could include location, type of application, stage of the assessment process, previous engagement undertaken; and – scale, nature and known impacts for the proposal • Adjust activities (if necessary) in response to community interest and participation preferences	The information sheet will be tailored to not only provide generic information of the project, but also include information that is most relevant to the key stakeholders.
Timely	• Start community participation as early as possible, and continue for an appropriate period • Provide regular project updates to the community • Ensure the community has reasonable time to provide input • Facilitate ongoing discourse with local community networks • Consider holidays and other community events when setting dates for engagement initiatives	All identified key stakeholders will be given the opportunity to participate wherever possible through various channels. A reasonable timeframe will be set aside to conduct engagement activities thoroughly. It will aim to avoid public holiday and school holiday periods when conducting engagement activities, however, if these periods are scheduled in, an extended engagement period may be considered.

Table 1.1 Objectives of community engagement

Objectives	Actions	Comment
Meaningful	• Always explaining at the end of projects how community views were considered when reaching decisions • Be clear about what aspects of a plan, project or proposal the community can inform • Have planners and decision makers engage directly with the community • Ensure responses to community input are relevant and proportionate • Give genuine and proper consideration to community input • Keep accurate records of community input and participation activities • Regularly review the effectiveness of community participation initiatives • Integrate community input into the evaluation process • Comply with statutory obligations, protect privacy and respect confidentiality	The purpose of community engagement will be explained to the key stakeholders. A recording device may be used subject to the agreement with the stakeholder. Use of information collected during the community engagement activities will also be explained to the stakeholders and with reference to the Privacy Act.

2 Approach to community engagement

The approach to community engagement outlined in this CES follows the process illustrated in Figure 2.1 below and described in the following subsections.

Figure 2.1 Community engagement process

2.1 Identification

Identification of stakeholders involves identifying anyone interested in the project or process. The two broad categories of stakeholders are those who contribute to a project and those who are affected by a project.

2.2 Analysis

Analysis of the stakeholders involves consideration of the potential sensitivity of stakeholders and the potential real or perceived impacts of the project. This is done by mapping stakeholder on the matrix shown in Figure 2.2. Where stakeholders fall on the matrix, informs the level of engagement required.

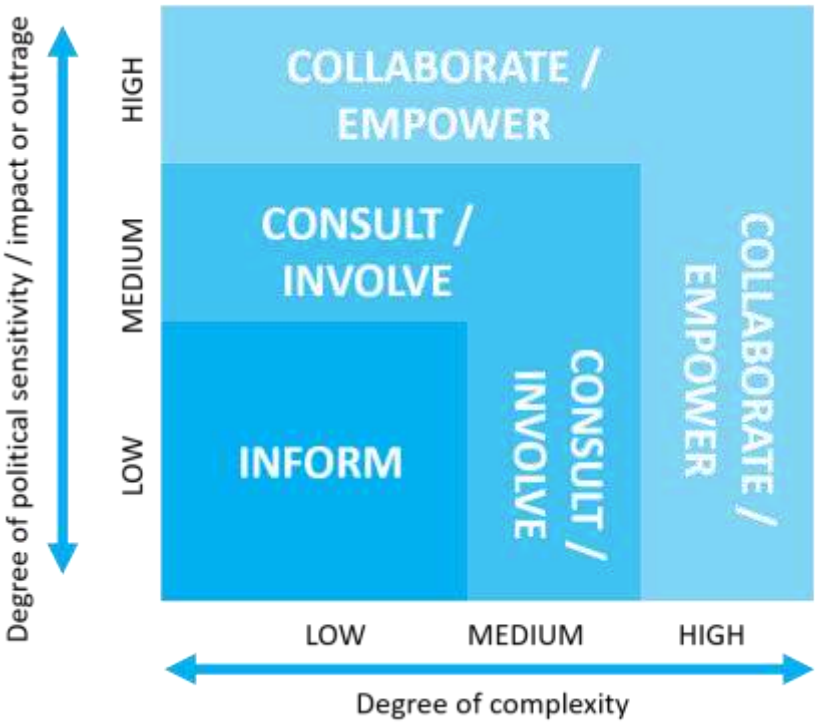

Figure 2.2 Stakeholder mapping matrix

2.3 Prioritisation

Prioritisation of the stakeholder's communication and engagement needs is incorporated in the matrix in Figure 2.2. Those who are assessed as 'low' need to be kept informed; 'medium' need to be consulted and/or involved; and 'high' need to be engaged using collaborative and/or empowerment methods.

2.4 Report

The Environmental Impact Statement (EIS) report and subsequent submissions report will document the following:

- the methods of engagement;
- range of issues raised by stakeholders;
- responses to these issues, including assessment of identified potential impacts; and
- proposed management and monitoring strategies.

2.5 Monitoring and evaluation

Ongoing monitoring and evaluation are achieved by developing and maintaining an issue register for the life of the project. This will allow for the monitoring of stakeholder sentiment, and in liaison with the client understand and respond to issues as they arise, re-prioritise stakeholders if required and adapt engagement methods where appropriate. Stakeholders will be provided the opportunity to evaluate the engagement activities through the consultation process as well as the complaints mechanism.

3 Identify stakeholders to be consulted

3.1 Government authorities

The following local, state and federal government authorities have been and will continue to be consulted throughout the project:

- Department of Planning, Industry and Environment (DPIE);
- Environment Protection Authority (EPA);
- Western Sydney Planning Partnership Office (PPO);
- Western Sydney Airport Corporation (WSA);
- Western City and Aerotropolis Authority;
- Transport for NSW (TfNSW); and
- Liverpool City Council.

The following government authorities will also be consulted during the preparation of the EIS:

- DPIE Biodiversity and Conservation Division (BCD);
- Penrith City Council;
- Sydney Water;
- NSW Rural Fire Service; and
- Fire and Rescue NSW.

3.2 Community and business stakeholders

The following community and business stakeholders have been identified:

- adjacent neighbours:
  - Workers Hubertus Country Club;
  - 225 Adams Road, Luddenham; and
  - 285 Adams Road, Luddenham;
- nearby neighbours:
  - 185 Adams Road, Luddenham;
  - 161 Adams Road, Luddenham;

- 5 Anton Road, Luddenham;
- 2161-2177 Elizabeth Drive, Luddenham;
- 2111-2141 Elizabeth Drive, Luddenham; and
- 2150-2550 Elizabeth Drive, Luddenham.

- Luddenham Rural Fire Brigade.

Adjacent and nearby neighbours are most likely to experience potential impacts related to noise, dust, traffic and visual amenity.

Adoption of a proactive approach to engage with the potentially impacted stakeholders allows for greater understanding of the project, builds rapport and support for the project, and reduces risk to potentially impacted stakeholders and the project.

4 Issue identification

The scoping phase of the project has identified potential issues that may be of concern to identified stakeholders.

Initial consultation with adjacent residences has not raised any concerns to date.

Initial consultation with WSA has raised concerns regarding the design of the RRC site and potential impacts on WSA operations.

Issues raised during initial consultation and through the preliminary environmental review as part of the scoping report are summarised in Table 4.1. Engagement activities will focus on clearly communicating the assessment methodology, results and proposed mitigation to address these issues.

Table 4.1 Issue identification

Environmental aspect	Potential impact on community
Noise and vibration	• daytime noise • night-time noise • sleep disturbance • vibration
Air quality/dust emission	• dust emissions • impacts to airport operations
Traffic and transport	• additional light and heavy vehicle movements • road safety • road network capacity • traffic congestion (particularly to emergency services) • road surface damage
Hazards and risks	• dangerous goods transportation • attraction of wildlife/vermin • fire hazard • risks to safe airspace
Visual	• change in visual landscape character • lighting impacts • design of RRC • potential for litter
Surface water	• erosion and sediment control • surface water contamination • attraction of wildlife
Biodiversity	• impacts to native vegetation • impacts on the Oakey Creek riparian corridor

5 Engagement strategy

This engagement strategy meets the requirements of DPIE's Draft Engagement in EIA Guideline and have adopted the approach outlined in Section 2.

5.1 When to engage?

Community engagement will occur concurrently with project design and preparation of the EIS. It will be ongoing during construction and operations. However, post-approval community engagement is not the included in this community engagement strategy.

5.2 How to engage?

5.2.1 Method

The proposed engagement activities for the identified stakeholders are presented in Table 5.1.

Table 5.1 Engagement mechanism

Stakeholder	Method	Potential issues of concern	Goal
Department of Planning, Industry and Environment	Ongoing project discussion	• impact that causes detrimental environmental and social outcome	• informing DPIE of project progress • resolving of issues during EIS preparation • applying DPIE guidelines to engagement activities
Environment Protection Authority	Ongoing project discussion	• impact that causes significant environmental damage • licensing	• informing EPA of project progress • following EPA technical assessment guidelines
Western Sydney Planning Partnership Office	Ongoing project discussion	• project design • project compatibility with Aerotropolis vision	• informing PPO of project progress • incorporating PPO input into the detailed design of the RRC
Western Sydney Airport Corporation (WSA)	Ongoing project discussion	• potential impact on WSA operations	• informing WSA of project progress • incorporating WSA input into the detailed design of the RRC
Western City and Aerotropolis Authority	Project discussions as required	• project design • project compatibility with Aerotropolis vision	• informing Aerotropolis Authority of project progress
Biodiversity Conservation Division	Project discussions as required	• impacts to biodiversity or heritage	• informing BCD of project progress • application of BCD technical assessment guidelines

Table 5.1 Engagement mechanism

Stakeholder	Method	Potential issues of concern	Goal
Transport for NSW	Ongoing project discussion	• impacts to road network, intersection capacity and road safety	• informing TfNSW of project progress • application of TfNSW and Austroads technical assessment guidelines
Liverpool City Council	Ongoing project discussion	• environmental and social impacts in the Liverpool LGA	• informing Council of project progress • application of relevant council guidelines
Penrith City Council	Project discussions as required	• environmental and social impacts in the Penrith LGA	• informing Council of project progress
Luddenham NSW Rural Fire Service	Project discussions as required	• fire hazard and emergency access	• informing Luddenham RFS of project progress • following relevant RFS guidelines
Fire and Rescue NSW	Project discussions as required	• fire hazard and emergency access	• informing Fire and Rescue NSW of project progress • application Fire and Rescue NSW guidelines
Workers Hubertus Country Club	Information sheet In-depth consultation	• potential impacts that affect patrons or operations	• informing Workers Hubertus Country Club of project design, progress and potential impacts • open discussion of concerns
Neighbouring residences	Information sheet In-depth consultation (selected stakeholders)	• potential impacts that affect stakeholder's quality of living, physical and mental health, or daily routine	• informing neighbouring residences of project design, progress and potential impacts • open discussion of concerns

Further detail regarding the content and process for information sheet and in-depth consultation is provide in the following subsections.

i Information sheet

An information sheet will be posted to the stakeholders identified in Section 3.2. It will provide the following information:

- project description;
- proponent details;
- approval process;
- purpose of community engagement;
- community engagement mechanism; and

- contact details.

The information sheet will be prepared in plain English and provide clear maps and illustrations. Contact details will be provided with an invitation to comment on the project or request additional information.

5.2.2 In-depth consultation

CPG and KLF, with assistance from EMM as required, will seek to discuss the project directly with the most affected stakeholders. The aims will be to:

- build relationships;
- to describe the proposed project;
- listen to stakeholder's concerns; and
- revise project design and management measures where possible and reasonable.

It is acknowledged that not every stakeholder will want to participate. However, a wide view of the project and potential revisions, will be gained through the consultation strategy.

Given the current global health advice, in-depth consultation will generally be through electronic mediums, particularly telephone calls and emails.

6 Evaluation

6.1 Evaluation of information collected

All personal identifications and feedbacks collected during community engagement activities will be reviewed, screened, saved and documented in accordance to the NSW *Privacy and Personal Information Protection Act 1998*. When the result of community engagement is released to the public, comments that reveal personal identify will be de-identified unless permission is provided by the stakeholder.

6.2 Evaluation of this Strategy

This Strategy will be reviewed and updated throughout the assessment process as needed, for example:

- following receipt of SEARs;
- change of project scope and design; and
- external factors influence the process of engagement strategy.

References

DPE 2019, Guideline 7 Draft Engagement in EIA – Guidance for State Significant Projects, June 2019, reviewed 17 March 2020, EMM database, Department of Planning and Environment (now Department of Planning, Industry and Environment).

DPIE 2019, Community Participation Plan, November 2019, reviewed 17 March 2020, https://shared-drupal-s3fs.s3-ap-southeast-2.amazonaws.com/master-test/fapub_pdf/Community+Participation+Plan/DPIE+CPP.pdf, Department of Planning, Industry and Environment.


FIELD
NOTES

Appendix C

Aboriginal due diligence assessment

Luddenham Resource Recovery Centre

Aboriginal heritage due diligence assessment

Prepared for Coombes Property Group & KLF Holdings
March 2020

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Luddenham Resource Recovery Centre

Aboriginal heritage due diligence assessment

Report Number

J190749 RP#19

Client

Coombes Property Group & KLF Holdings

Date

30 March 2020

Version

v2

Prepared by

Pamela Chauvel
Consultant Archaeologist
30 March 2020

Approved by

Ryan Desic
Associate Archaeologist
30 March 2020

Executive Summary

ES1.1 Overview

Coombes Property Group (CPG) in partnership with KLF Holdings Pty Ltd (KLF) are seeking development consent for the construction and operation of a Resource Recovery Centre (RRC) (the project) on 275 Adams Road, Luddenham NSW (Lot 3, DP 623799) (the subject property). The subject property shares its southern and eastern boundaries with the Western Sydney Airport development site. There is an existing clay/shale quarry on the subject property approved under DA 315-7-2003 as modified. The quarry is currently inactive. It is proposed to develop the project in an area to the north of the existing quarry footprint. The project application area (herein referred to as the RRC site) is illustrated in Figure 1.2.

As there is a potential for the RRC to disturb areas that are not currently disturbed by quarry activities, EMM Consulting Pty Limited (EMM) has been engaged by CPG and KLF to prepare an Aboriginal due diligence assessment to support the proposed SSD application. The two main aims of this assessment were to determine if Aboriginal objects will be harmed by the proposed activity and determine if further Aboriginal heritage investigations are required.

ES1.2 Site inspection

On 30 January 2020, the study area was archaeologically surveyed to validate the desktop analysis results. The location of the previously recorded Aboriginal site (#52-5-2280) was ground-truthed and the correct location established. The survey effort confirmed the archaeological potential of the site location has been retained since its original recording. No new Aboriginal sites were identified. Levels of disturbance varied across the study area. Pastoral activities in the northern half of the study area has resulted in moderate disturbance, while the southern half of the study area has experienced heavy disturbance to any culturally bearing soil profile as a result of quarrying. The riparian corridor beside Oaky Creek (outside the proposed disturbance footprint) is deemed to have a moderate archaeological potential.

ES1.3 Potential impacts to Aboriginal heritage

The study area has been subject to a high level of disturbance and it is unlikely for Aboriginal objects to occur within the study area apart from the area beside Oaky Creek. The AHIMS site within the study area (#52-5-2280) is outside the area likely to be impacted by the proposed development and is currently protected by fencing.

Specifically, the proposed location for the RRC, upgraded access roads, is in the northern part of the study area. This area is currently a cleared paddock sown with exotic grasses and a small grove of young trees. Prior to the 1990s, the land was used to grow turf, an activity that would have resulted in topsoil stripping and subsequent loss of potential archaeological deposit in the upper soil stratum. The upgraded roads will be laid over existing gravel roads and therefore, will not result in additional ground disturbance. The proposed activity will be located to the west of Oaky Creek. At its closest point it will be 100 metres (m) from the creek. While this is within the DPIE guidelines for potential archaeological deposit to occur within 200 m of water, other local studies (eg Navin Office 2016) have found that sites occurred most frequently within 100 m (rather than 200 m) of reliable, higher order streams. In addition, the land around Oaky Creek has been subject to land clearance, introduced fill and the construction of dams resulting in a much narrower area (~50 m wide) of relatively undisturbed land with moderate archaeological potential.

ES1.4 Recommendations

In accordance with the Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (DECCW 2010), a due diligence assessment in accordance with the Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (DECCW 2010) has been completed as a first step to identify whether Aboriginal objects or places are likely to be harmed by the project. Based on the current available project design and disturbance footprint, this assessment concludes that Aboriginal objects are unlikely to be harmed by the project and further investigation beyond the scope of a due diligence assessment is not currently warranted for the project.

Further investigation in accordance with the Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW (the Code) is unlikely to build upon the findings of this assessment, unless test excavation is explored. However, the project impact footprint would not meet the pre-conditions warranting test excavation because potential archaeological deposit (PAD) was not identified and this is why further investigation is currently not recommended.

The following recommendations are based on the proposed activity in its current design:

1. AHIMS site #52-5-2280 continues to be avoided and protected by fencing.

2. The corrected coordinates for AHIMS site #52-5-2280 are entered in the AHIMS database.

3. The riparian corridor along the western bank of Oaky Creek continues to be avoided.

4. If works are to proceed, the following should occur:

    a) In the event that unexpected Aboriginal objects, sites or places are discovered in the study area, it is a requirement that DPIE is notified of the existence of Aboriginal objects as soon as practicable after they are first identified. Under s85A of the NPW Act, Aboriginal objects remain the property, and under the protection of, the Crown until formal transfer to a person or persons of a class prescribed by the regulations occurs.

    b) In the event that known or suspected human skeletal remains are encountered within the study area, the immediate vicinity should be secured, appropriate procedures followed, and the Department of Planning Industry and Environment be contacted for advice.

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1 Introduction

1.1 Overview

Coombes Property Group (CPG) in partnership with KLF Holdings Pty Ltd (KLF) are seeking development consent for the construction and operation of a Resource Recovery Centre (the project) on 275 Adams Road, Luddenham NSW (Lot 3 DP 623799) (the subject property). The subject property shares its southern and eastern boundaries with the Western Sydney Airport development site and is illustrated at a regional scale in Figure 1.1.

There is an existing clay/shale quarry on the subject property approved under DA 315-7-2003 as modified. The quarry is currently inactive however an application will be submitted to modify the quarry's consent to allow operations to recommence. It is proposed to develop the project in an area to the north of the existing quarry void. The project application area (herein referred to as the RRC site) is illustrated in Figure 1.2.

The project is integral in achieving the intended future commercial/industrial land use for the subject property as the project provides a commercially viable means to infill the quarry void (subject to separate development consent). This will support the Western Sydney Airport and ongoing development of the Western Sydney Aerotropolis.

The subject property has previously been assessed for Aboriginal Heritage as part of the application for DA 315-7-2003. As there is a potential for the RRC to disturb areas that are not currently disturbed by quarry activities, EMM Consulting Pty Limited (EMM) has been engaged by CPG and KLF to prepare an Aboriginal due diligence assessment for the project. This assessment determines if Aboriginal objects are likely to be harmed by the project and if further Aboriginal heritage investigations are required.

EMM has prepared the current version of this report in draft to inform discussions with the Department of Planning, Industry and Environment (DPIE) and to accompany the scoping report/request for Secretary's Environmental Assessment Requirements (SEARs). This assessment has followed the DPIE guideline *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (DECCW 2010) which recommends that a due diligence assessment in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DECCW 2010) as a first step to identify whether Aboriginal objects or places are likely to be harmed by a proposed activity.

Based on the existing environment and project disturbance footprint, this assessment concludes that Aboriginal objects are unlikely to be harmed by the project and further investigation beyond the scope of a due diligence assessment is not warranted for the project.

1.2 The resource recovery centre site

The RRC site is within 275 Adams Road, Luddenham NSW (described as Lot 3 in DP 623799) in the Liverpool City Council local government area (Figure 1.1). The RRC site is approximately 3 hectares (ha). The subject property is zoned RU1 Rural under the Liverpool Local Environmental Plan 2008 (Liverpool LEP). A review of the Western Sydney Aerotropolis Planning Package shows the RRC site and the surrounding land to the west of the Western Sydney Airport as being within the proposed Agribusiness Precinct with the RRC site zoned Agribusiness in the Western Sydney Aerotropolis State Environmental Planning Policy (SEPP) draft mapping.

1.3 Project overview

A more detailed description of the project is provided in Chapter 2 of the Scoping Report (EMM 2020). The key components of the project are as follows:

- construction and operation of a construction and demolition resource recovery centre (RRC);
- accepting and processing up to 600,000 tonnes per annum (tpa) of waste for recycling;
- despatch of up to 540,000 tpa of recycled product;
- despatch of up to 60,000 tpa of unrecyclable material either to a licensed waste facility or to the adjacent quarry void (the later would be subject to separate approval);
- use of the quarry access road to Adams Road;
- the project will not accept putrescibles, liquid or hazardous waste; and
- the project will operate up to 24 hours a day, 7 days per week.

The proposed project layout is shown in Figure 1.2.

1.4 Study area definitions

The study area is shown in Figure 1.1. The study area encompasses the whole of Lot 3 DP 623799, including the existing clay/shale quarry. The RRC site is a smaller area within the study area illustrated in Figure 1.2.

KEY

- Subject property
- Western sydney airport
- Major road
- Minor road
- Vehicular track
- NPWS reserve (see inset)
- State forest (see inset)

Source: EMM (2020); DFSI (2017); ASGC (2006)

0 0.5 1 km

GDA 1994 MGA Zone 56

N

T:\Jobs\2019\J190749 - CPG Luddenham Quarry\GIS\02 Maps\SSD Recycling Facility\Heritage\HA001 StudyArea 20200317 01.mxd 27/03/2020

Location and study area

Luddenham resource recovery centre
Aboriginal heritage due diligence
Figure 1.1

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KEY

- Subject property
- RRC site
- Cadastral boundary
- Indicative detailed layout

Proposed layout

- Bin storage
- Car parking
- Clean timber
- Concrete rubble/masonary
- Fine sediment (screened)
- Future washing/tyre shedding
- Hardstand
- Internal 13 m road
- Landscaping
- Leachate/stormwater detention
- Onsite detention
- Product bay
- Site office
- Warehouse
- Rainwater tank
- Water treatment plant
- Weighbridge

Source: EMM (2020); DFSI (2017); GA (2011); Nearmap (2019)

0 50 100 m

GDA 1994 MGA Zone 56

N

Project layout

Luddenham resource recovery centre
Aboriginal heritage due diligence
Figure 1.2

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1.5 Legislative context

1.5.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1974* (EP&A Act) provides the statutory framework for the environmental impact assessment of development in NSW. The statutory trigger for development consent is provided for under section 4.2(1) of the EP&A Act.

The EP&A Act and NSW *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) form the statutory framework for planning approval and environmental assessment in NSW. This legislation is supported by Environmental Planning Instruments (EPIs) including State Environmental Planning Policies (SEPPs) and Local Environmental Plans (LEPs).

Under the provisions of clause 8(1) and clause 5 to Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP) the proposed activity is a State Significant Development (SSD). SSD requires the approval of the Minister for Planning (or his delegate – eg Independent Planning Commission (IPC) or DPIE. Before the Minister can approve an SSD project, an environmental impact statement (EIS) is required to be prepared. The EIS is required to be made available for public exhibition. Following public exhibition, the applicant is required to respond to issues raised in submissions received by the DPIE during the exhibition period.

Although Aboriginal cultural heritage values are required to be appropriately assessed and managed for SSD developments in accordance with project SEARs, an Aboriginal heritage impact permit (AHIP) is not required to harm Aboriginal objects or places. Instead Aboriginal cultural heritage values are typically managed through an Aboriginal heritage management plan (AHMP) prepared to the satisfaction and endorsement of DPIE.

1.5.2 National Parks and Wildlife Act 1974

Aboriginal objects and places are protected in New South Wales (NSW) under Part 6 of the NSW *National Parks and Wildlife Act 1974* (NPW Act). Section 90 of the NPW Act requires an AHIP for harm to an Aboriginal object or Aboriginal place. Significant penalties are in place for harm to Aboriginal objects or places or regardless of whether the harm was committed knowingly or not. Defences against prosecution include impacts in compliance with an AHIP, acting in accordance with specified codes of practice or the conduct of certain low impact activities. The Act defines an Aboriginal object as:

> any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises NSW, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains.

Harm is defined as:

> any act or omission that: (a) destroys, defaces or damages the object or place, or (b) in relation to an object—moves the object from the land on which it had been situated, or (c) is specified by the regulations, or (d) causes or permits the object or place to be harmed in a manner referred to in paragraph (a), (b) or (c), but does not include any act or omission that: (e) desecrates the object or place, or (f) is trivial or negligible, or (g) is excluded from this definition by the regulations.

1.5.3 National Parks and Wildlife Regulation 2009

The NSW National Parks and Wildlife Regulation 2009 (NPW regulation) is subsidiary legislation made under its parent act, the NPW Act. The *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (due diligence guidelines) (DECCW 2010) is adopted by the NPW Regulation under Clause 80A. Compliance with the due diligence guidelines provide a defence for harming Aboriginal objects and places.

The due diligence guidelines provide a generic code of practice used to determine whether activities will harm an Aboriginal object and, if so, what measures can be taken to avoid that harm. A summary of the due diligence is shown in Figure 1.3.

The advantages of due diligence for assessing potential harm to Aboriginal objects are that it:

- provides a defence against prosecution for inadvertent impacts if the process is followed;
- assists in avoiding unintended harm to Aboriginal objects;
- provides certainty to land managers and developers about appropriate measures for them to take;
- encourages a precautionary approach; and
- results in more effective conservation outcomes for Aboriginal cultural heritage.

If the due diligence assessment determines that Aboriginal objects or places are likely to be harmed, an Aboriginal cultural heritage assessment (ACHA) is required and may be used to support an AHIP application to manage harm as defined by Part 6, Section 86 of the NPW Act (unless the project is SSD or SSI).

Section 80D of the NPW Regulation requires an ACHA report to be completed to accompany any AHIP application. The *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (the Guide) (OEH 2011) sets out the information required to support an AHIP, but is also often adopted in project SSD or SSI SEARs to set out best practice methods for Aboriginal heritage assessments. The Guide sets out steps in the assessment process ranging from a due diligence assessment to an ACHA requiring formal Aboriginal consultation and archaeological investigation.

The *Aboriginal Consultation Requirements for Proponents 2010* (DECCW 2010c) set out the consultation requirements for proponents seeking an AHIP (unless the project is SSD or SSI where an AHIP is not required). These requirements are under section 80C of the NPW regulation.

The *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (the Code) (DECCW 2010b) has been adopted by clause 3A of the NPW Regulation. Acts carried out in accordance with the Code are excluded from the definition of harm.

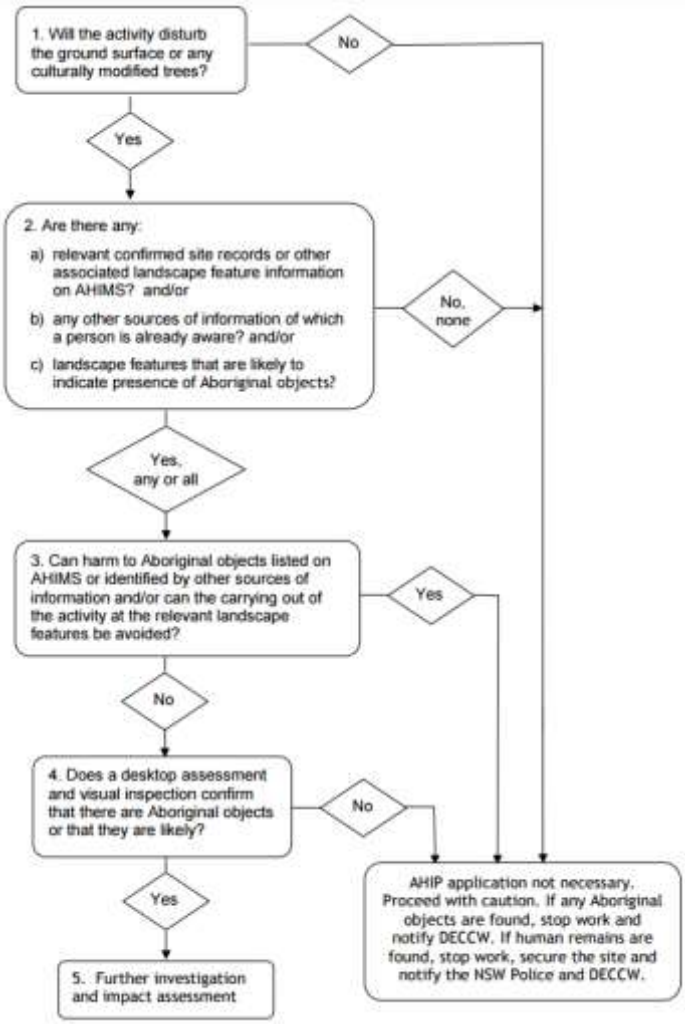


Figure 1.3 Due diligence process summary (source: due diligence guidelines (DECCW 2010)

1.6 Assessment methods

This assessment has been completed in accordance with the Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (DECCW 2010).

In summary, the assessment involved:

- a search of the Aboriginal Heritage Information System (AHIMS) database to identify whether registered Aboriginal sites are present within the study area;
- consideration of existing regional and local Aboriginal cultural heritage studies;
- consideration of the environmental context of the study area to assess the likelihood of Aboriginal objects or places being present;
- a visual site inspection of the study area completed by an EMM archaeologist to identify any Aboriginal objects or areas of potential archaeological deposit (PAD) are present or likely to occur within the project area; and

- determination of whether further heritage investigation and impact assessment is required to explore whether Aboriginal objects would be impacted by the project.

1.7 Authorship

This report was written by Pamela Chauvel (Consultant Archaeologist, BA Archaeology), who also inspected the study area; and it was reviewed by Ryan Desic (Associate Archaeologist – Heritage Team Leader, BA Hons Prehistoric and Historical Archaeology).

2 Environmental context

2.1 Key findings

This assessment identified the following key findings:

- The study area is characterised by undulating Cumberland Plain topography that is widely documented to have been used by Aboriginal people in the past. There is no evidence of significant elevation, escarpments or exposed sandstone, which constrains a range of archaeological site types.
- The study area is bounded to the east by Oaky Creek, a third order stream, that would have been attractive to Aboriginal people in the past.
- High levels of historic land use and disturbance has occurred over the last 200 years which has resulted in de-vegetation and modification of waterways (usually in the form of dams). Much of the study area is disturbed by the quarry and stockpiles.
- There is limited evidence of remnant vegetation present, with the possible exception of the riparian corridors of Oaky Creek.

2.2 Rationale

The environmental context is used to predict the spatial distribution, preservation and likelihood of archaeological material. Landscape features were an important factor for the choice of camping, transitory and ceremonial areas used in the past by Aboriginal people. Natural resources, including raw stone materials and local flora and fauna, would have provided food, tools and material resources. These resources are linked to the topography, hydrology, geology and soil types in the region. Additionally, natural and cultural (human-made) site formation processes influence the present location of archaeological material (eg if moved through disturbance), along with its preservation and archaeological integrity.

A landscape consisting of suitable topography, hydrology, geology and soils has strong links with natural resources that would have been available to, and sought after, by Aboriginal people. Flora and fauna would have provided food, tools and ceremony (culturally modified trees); proximity to fresh water was necessary for life and growing crops, as well as gathering fish and eels. Landscape features, such as sandstone overhangs, were useful for shelter; stone artefacts were manufactured from raw stone material that was collected from quarry sites; and stone arrangements relied on the landscape.

2.3 Landform and topography

The study area is situated within the Sydney Basin bioregion and Cumberland Lowlands region. It is characterised by gently undulating rises with broad rounded crests and ridges in a rain shadow area below the Blue Mountains.

The study area is located on Wiannamatta Group shales formed on the Ashfield and Bringelly Shales. There is no outcropping of the underlying rock and Aboriginal site types, which are commonly found on sandstone formations, such as grinding grooves and rockshelters are unlikely to occur.

The study area has a gently inclined slope with a gradient of less than 5% and local relief is up to 30 m.

2.4 Hydrology

The study area is located within the upper reaches of the Hawkesbury River catchment, adjacent the Nepean catchment boundary. The eastern boundary of the study area follows Oaky Creek, a third order stream, which runs from south to north to join Cosgroves Creek outside the study area, to the north of Elizabeth Drive. The catchment for Oaky Creek is small and water persists in the creek for only a few weeks after rain (Dean-Jones 1991). A dam has been constructed on Oaky Creek in the north-east corner of the study area and collects surface water runoff from the property.

Hydrological features are the most likely to indicator of archaeological potential within the study area. Access to water and the natural resources associated with it will have dominated the distribution of habitation throughout the area. This is corroborated by previous archaeological works in the area and ethnographic accounts of the area.

2.5 Geology and soils

Soil landscapes and their boundaries provide pre-defined areas that are classified by several geographic features, and which are informative for the archaeological investigation. They provide localised information including landform patterns, soils, geology, rock outcrop percentage, land use and vegetation. This information provides another layer to categorise the landscape for the predictive model, additional to what a topographic description can provide. Soil landscape information builds on underlying geology and describes the depths of residual soils and colluvial soils and identifies areas that are characterised by erosion or skeletal soils and exposed bedrock versus those that may contain a deeper profile where cultural material may be buried.

The study area is situated on the Blacktown (bt) soil and Second Ponds Creek (spz) soil landscapes which are defined in the *Soil and Land Resources of the Hawkesbury-Nepean Catchment* (DECCW 2008). Blacktown soil landscape comprises the western portion of the study area (Figure 2.1). Geology typically consists laminate shales and siltstone, with underlying sandstone of fine to medium grained quartz. Outcropping does not occur naturally on the surface however can become exposed as a result of extensive land use disturbances and accelerated erosion. Soils comprise up to 30 centimetres (cm) friable loam to clay loam (A1 Horizon), overlying 10–30 cm of clay loam to silty clay loam hard-setting A2 Horizon. Subsoils are 40–100 cm of light to medium clay B2 Horizon subsoils with fine to coarse gravel size shale fragments. Silty clay to heavy clay usually occurs as deep subsoil above shale bedrock (B2 or C Horizon).

The eastern part of the study area is situated on the Second Ponds Creek landscape which is found on the footslopes and plains on colluvium/alluvium and Wianamatta Group Shale in the Cumberland Plain. Soils are yellow podzolic rock outcropping is nil. Local relief of this landform is low (5−30 m) with slopes of less than 3%.

Low relief and low slope areas would have originally presented as favourable for Aboriginal occupation; however, for the same characteristics these areas have been targeted for agricultural land use and as such exhibit extensive levels of disturbance.

2.6 Vegetation

Prior to agricultural and subsequent quarrying land use, the area would have comprised cleared open forest and woodland. Remnants of Cumberland Plain Woodland occur on the eastern margin of the study area. This plant community type was dominated by Eucalyptus trees including *Eucalyptus tereticornis* (forest red gum), *E. crebra* (narrow-leaved ironbark), *E. moluccana* (grey box) and *E. maculata* (spotted gum). Today the study area has been extensively cleared and farmed. The remaining vegetation along Oaky Creek forms a riparian corridor of Swamp Oak Floodplain Forest along the eastern boundary of the study area.

2.7 Land use history

Early land use consisted of forestry and grazing in the wood and scrubland of the Cumberland Plain. Settlement expansion and the search for suitable agricultural land soon led to the establishment of Parramatta and Liverpool townships, driving the development of Sydney's west as a key area for pastoral and agricultural exploitation. Land use and associated disturbance of the study area has accelerated from the early nineteenth century onwards, with the study area included in an initial land grant to John Blaxland of 6,710 acres in 1813.

In recent years, the study area has been used as a dairy farm, trotting track and rubbish dump. It has been subject to extensive vegetation clearance, and earthworks for water management and for the quarry. Plate 2.1 shows land use within the study area prior to 1991. At this time, the northern part of the study area, primarily where the project footprint is proposed, was a former turf farm which means that repeated topsoil stripping is likely to have removed any potential archaeological deposit from the A1 soil horizon. To the south-west were horse yards and stables, while a rubbish dump and fill with bulldozed margins for a trotting track were located on the eastern side of the study area. Construction of the track involved excavation of a large dam, building up an embankment on the eastern end, and the addition of fill along the southern side near the creek (Dean-Jones 1991). All these activities would have had a significant impact on any surface or sub-surface archaeological resource.

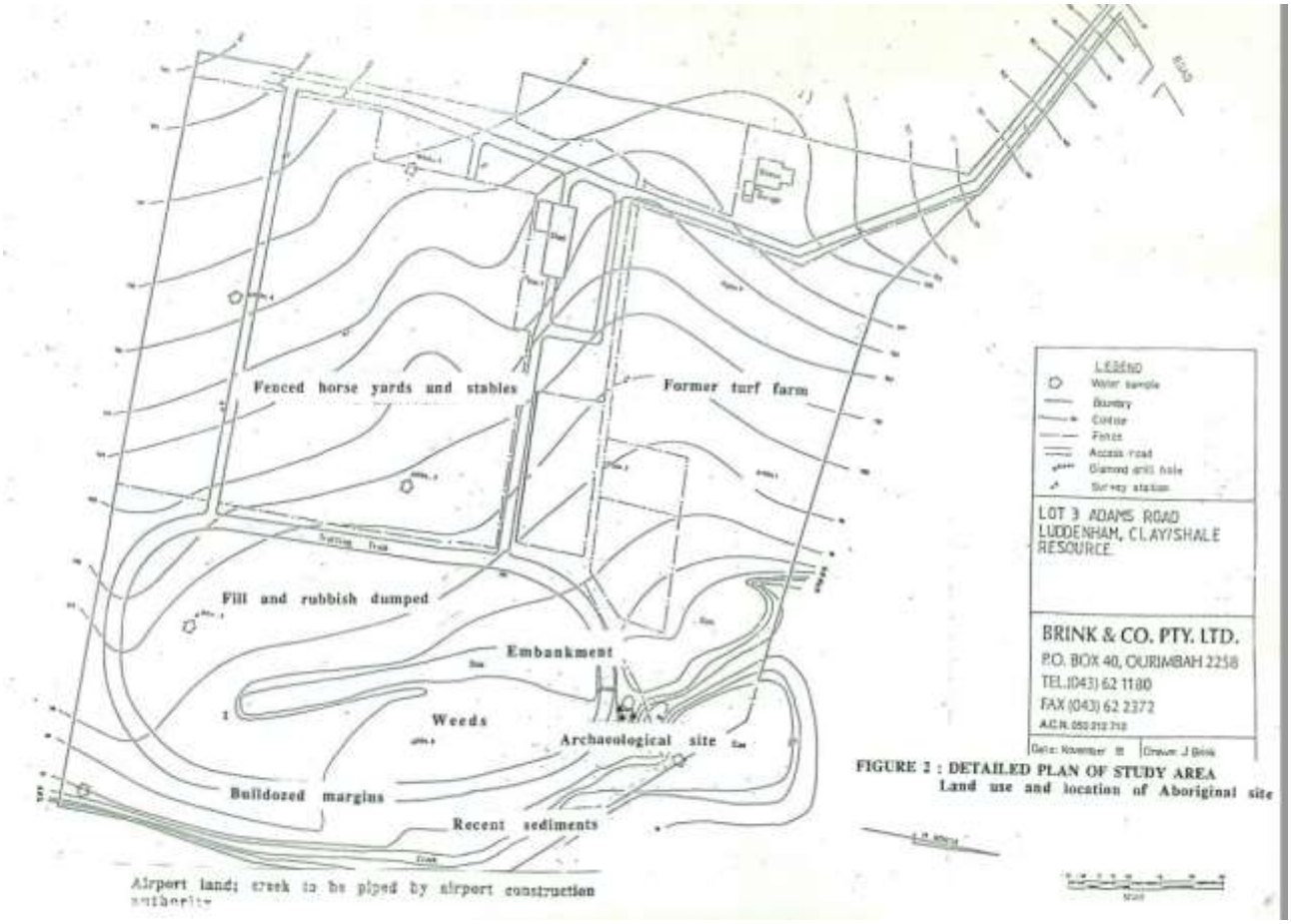


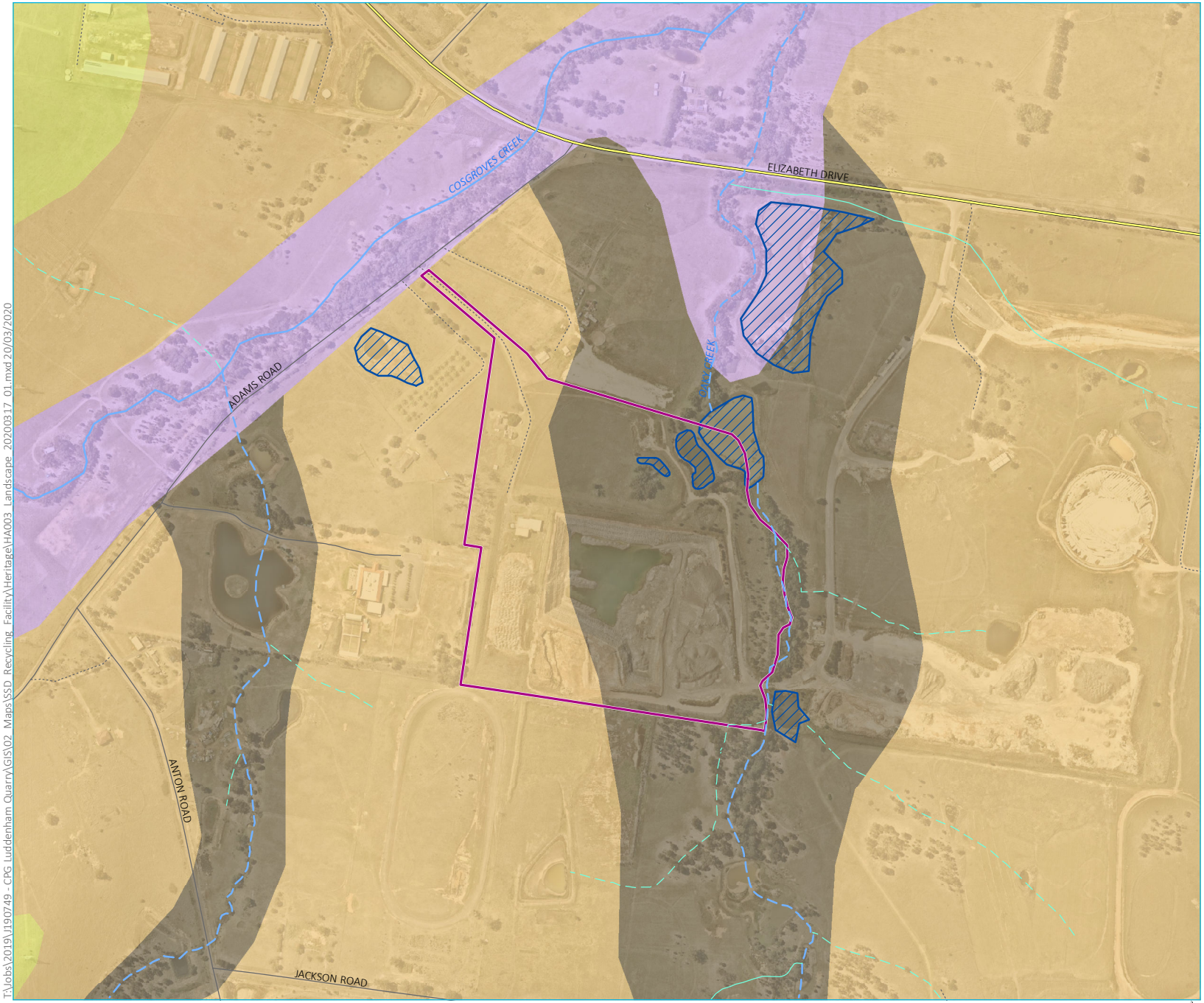
Plate 2.1 Map of the study area showing land use in 1991. Note that the map is rotated, and north is to the right. (Source: EIS Appendix 7, Pam Dean-Jones 1991)

More recent disturbance has been most intensive in the southern half of the study area with the establishment of a clay/shale quarry which was approved in 2003 (Plate 2.2). The quarry extraction footprint is bordered by a

stockpiling area and earth noise bund to the west, an earth noise bund to the north and internal access roads to the south and east.

More specific details of current land use and disturbance levels are provided in the site inspection results section (refer section 4.3).

Plate 2.2 Existing quarry. View north-east.



KEY

- Study area
- Waterbody
- Major road
- Minor road
- Vehicular track

Strahler stream order

- 1st order
- 2nd order
- 3rd order
- 4th order

Soil landscape

- Blacktown
- Luddenham
- Second Ponds Creek
- South Creek

T:\Jobs\2019\J190749 - CPG Luddenham Quarry\GIS\02 Maps\SSD Recycling Facility\Heritage\HA003 Landscape 20200317 01.mxd 20/03/2020

Source: EMM (2020); DFSI (2017); Nearmap (2019)

0 100 200 m

GDA 1994 MGA Zone 56

N

Landscape, hydrology and soils

Luddenham Resource Recovery Centre
Aboriginal heritage due diligence
Figure 2.1

EMM
creating opportunities

3 Archaeological context

3.1 Key findings

A summary of the key findings concerning the archaeological context of the study area is provided below:

- A large number of previous archaeological studies have been undertaken within, or in close proximity to the study area. Of note are extensive works for Badgerys Creek airport site encompassing much of the south-east of the study area.

- These studies indicate that elevated areas – terraces, levee banks, low hills – adjacent third and fourth order creeklines formed a focus for past Aboriginal activity, and that sites are generally located within 100 m of these creeks. Cultural material is found in a range of other environments but will often reflect transient use.

- Some 115 Aboriginal sites have been documented within the general area, one is within the study area. This AHIMS spatial coordinates for this site are incorrect. A site inspection confirmed the correct location of the site which is situated outside the disturbance footprint. Apart from two culturally modified trees and a grinding groove site, all previously recorded sites in the AHIMS can be characterised as artefactual sites of surface and/or subsurface stone artefact deposits.

3.2 Ethno-historical background

Information about the socio-cultural structure of Aboriginal society prior to European contact largely comes from ethno-historical accounts made by colonial settlers. These accounts and observations were made after massive social disruption due to disease and displacement. As a result, this information is often contentious, particularly in relation to language group boundaries. Therefore, it is likely that language group boundaries were far more diffuse than the arbitrary demarcations drawn by colonial observers and this likelihood must be taken into consideration when using the existing literature.

Over thirty separate Aboriginal groups populated the wider Sydney Basin in 1788 CE, each with their own country, practices, diets, dress, and dialects. We now know of these groups as 'clans' and each identified with broader cultural-linguistic groups known as 'tribes. The study area sits within Darug clan country which extended from around Parramatta through to the Blue Mountains and from the Hawkesbury River in the north to Appin in the south. The many rivers acted as natural demarcation of this area and the flat terrain of the Cumberland Plain was favourable to the livelihood of the peoples.

> "The inland clans fished for mullet and eels in rich lagoons, but much of their food came from yams dug out from the riverbanks and worms known as 'cah-bro' extracted from river driftwood. Colebee and Ballederry called these people the 'climbers of trees' after their practice of skilfully ascending gums in pursuit of animals, cutting footholds in the trunks with a stone axe." (Collins 1798)

The central location and ease of movement through this area thanks to suitable topography meant that Darug country was a frequented by travelling groups and used as a place of meeting. "Corroboree" the word for meeting and ceremony now associated with Aboriginal meetings in the modern era stems from the Darug language group (Troy 1994).

Environmental conditions in this region throughout the last 10,000 years were relatively stable and evidence suggests that population densities pre contact were high (Williams 2013). In the late eighteenth century smallpox and other European diseases are likely to have wiped out a significant percentage of Aboriginal peoples (>50%). In May 1789 William Bradley recorded the 'dreadful havoc' that smallpox had wrought amongst Aboriginal communities: 'we did not see a Canoe or a Native the whole way coming up the Harbour and were told that scarce

any had been seen lately except laying dead in and about their miserable habitations' (Bradley 1969). Traditional burial practices broke down and clans merged as entire communities were taken by the virus (Hunter 1793). The impact of smallpox and other European diseases continued to ripple across the country, reducing communities in the Hunter 'from about 200, to 60' (Backhouse, 1843, p. 401). This is large scale decrease in population accounts the discrepancies seen between the distribution of archaeological remains and the ethnographic accounts of Aboriginal populations.

The Cumberland Plain was a point of first contact between many Aboriginal peoples and the Europeans, the same environmental factors that supported Aboriginal peoples also made for favourable lands for settlement and agriculture. The expedition by Governor Phillip to Prospect Hill in 1788 found the lands to the west more agreeable to farming than those of the Sydney Cove area and the township of Rose Hill (renamed Parramatta the following year) was established and settler colonialism rapidly expanded the European footprint in the area. Competition for resources quickly flared tensions, with violence escalating throughout the region. On 1 May 1801 Governor King issued a public order requiring that Aboriginal people around Parramatta, Prospect Hill and Georges River should be 'driven back from the settlers' habitations by firing at them'.

The conflicts and subsequent reprisals by both sides spread across the region and would eventuate in the Appin Massacre, 1816; these actions would come to be known as the Cumberland Plain war. The area was not only a site of conflict but also served as an important reconciliation place even as early as 1805 during a meeting organised by the reverend Samuel Marsden and the local tribes in a bid to cease the hostilities between settlers and Aboriginals.

3.3 Regional archaeological overview

The first peopling of Australia occurred ~50 kilo annum (ka), and likely consisted of reasonably large groups of technologically advanced hunter-gatherers (Bradshaw et al. 2019; O'Connell et al. 2018). The peopling of the continent was rapid, with sites such as Devil's Lair (WA), Warratyi (SA), and Lake Mungo (NSW) all occupied within a few thousand years of arrival (Bowler et al. 2003; Hamm et al. 2016; Turney et al. 2001). Genomic research has shown that following these initial explorations of the continent, regional populations or nomadic sedentism, was established by ~40 ka (Tobler et al. 2017). These small populations were highly mobile, but remained within a broad spatial geographic area, dictated in general by the nature of resources and water availability. In the case of some of the arid parts of the continent, mobility encompassed thousands of square kilometres (Gould 1977), while major riverine corridors such as the Murray River had near permanent settlements (Pardoe 1993).

In NSW, the earliest evidence of Aboriginal people are human remains recovered from the lunette in Lake Mungo and dating to ~42 ka (Bowler et al. 2003; O'Connell et al. 2018). The presence of red ochre covering the remains representing a society with significant cultural and symbolic complexity (Langley et al 2011). Near the coastal edge, the earliest populations were found at Cranebrook Terrace, near Penrith (Western Sydney). Here a handful of rudimentary stone tools were found in an alluvial unit, some 8m below the current surface, which were dated to ~40-45 ka (Williams et al. 2017). However, it is not until ~35 ka, that regional populations appear to have become established in the Sydney Basin, and which appeared to consist of small bands of people focussed mainly along major river systems, including the Hawkesbury-Nepean River, Georges River, and Hunter River (Hughes et al. 2014; Williams et al. 2012, 2014). These rivers formed key ecological refuges that hunter-gatherer groups used to survive major climatic events such as the Last Glacial Maximum (21±3 ka) – a cool and arid climatic period. Well-established archaeological models suggest populations experienced a major reduction in size (by as much as 60%), and settlement contraction and abandonment across much of the continent during this time (Veth 1993; Williams et al. 2013). Although recent research suggests that the story may be more complex than this (eg Tobler et al. 2017).

The terminal Pleistocene and early Holocene (~18–8 ka) was characterized by significant environmental change, notably the rapid inundation of much of the coastal shelf, resulting in the reduction of the continent by ~21% (~2 million km^2) (Williams et al. 2018), in tandem with improving climatic conditions – the Holocene climatic optimum (Williams et al. 2015a, 2015b). More broadly, these conditions resulted in increasing population growth, expansion of ranging territories, increasing sedentism (longer patch residence time) and the beginnings of low-level food

production (eg aquaculture), and ultimately the initiation of social and cultural groupings observed in the late Holocene (Williams et al., 2015b). Within the Sydney Basin, a large number of sites are first initiated during this time, including Burrill Lake (~20 ka), Bass Point (~17 ka), and Loggers Shelter in Mangrove Creek (~11 ka) (Bowdler 1970; Lampert 1971; Attenbrow 2004; AMBS 2006, p. 87). More broadly, we see a much broader range of archaeological site types occurring, such as the Roonka Flat burial ground on the banks of the Murray River within which some 147 individuals were interred through the Holocene (Pate et al. 1998), and the increasing use of marine resources. Many of the previous refuges were subject to abandonment or a re-structuring of land use (Dortch 1979; Fitzsimmons et al., 2019). These activities suggest the ability to undertake large-scale movements to mitigate environmental distress was becoming increasingly difficult and was addressed through diversification of hunter-gathering behaviours and, at least in part, technological advances and investment (Williams et al. 2015b).

The late Holocene saw significant population increase, with hunter-gatherers reaching their zenith of ~1.2 million at 0.5 ka, a tenfold increase on Pleistocene levels (Williams, 2013). Data suggests that the highest populations during this time were in the south-east of Australia. Williams et al. (2015) suggest that this increase was likely a result of intensification of earlier technological advancements, including hafting-technology, plant and seed processing, and localized landscape management (using fire), allowing climatic downturns to be successfully weathered. These included strong arid El Nino Southern Oscillation (ENSO) conditions between 4−2 ka, and increasingly turbulent climatic conditions during the Medieval Climatic Anomaly (1.3−1 ka) (generally wetter) and Little Ice Age (0.3−0.5 ka) (generally drier) (Williams et al. 2010, 2015b). A result of these denser populations was decreasing freedom of movement and the formation of strong classificatory kinship systems, complex cultural and symbolic landscapes based on geographic totemism (the 'Dreaming'), distinctive graphic art systems, land rights in the form of ritual property, and formalized exchange networks (Williams et al. 2015b). For the Sydney Basin, these conditions resulted in a significant increase in the archaeological visibility of past Aboriginal populations, with sites occurring in a much wider range of locations; and generally indicative of a more intensive use of the landscape.

There have been an extensive number of archaeological investigations on the Cumberland Plain in the last four decades. Most of these investigations have been in response to the continual spread of urban development throughout the greater Sydney region. With an increasingly large dataset available, predictive models for Aboriginal sites have been established and continually tested, developed and refined. The predictive models have formed from archaeological surveys and excavations which are discussed below.

3.4 Local studies

The most relevant archaeological investigations of the study area are a study undertaken in 1991 for the original Environmental Impact Statement (EIS) and an assessment for Badgerys Creek airport site in 2016 that encompassed the current study area. Relevant assessments are summarised in the following sections.

3.4.1 Archaeological assessment of the study area (Dean-Jones 1991)

In 1991 an archaeological survey of the study area (Dean-Jones 1991) was undertaken as part of an EIS to support an earlier application for Luddenham Quarry. Ground surface visibility was higher than it is today, with 70% visibility in the horse yards, 40% in the north-west paddock and 20% along Oaky Creek.

One archaeological site was located during the survey (#45-5-2280) (Figure 3.1). It was identified on the banks of a dam, within an area that would originally have been on the edge of the floodplain of Oaky Creek (see Plate 2.1). The site comprises a surface scatter of 22 flaked stone artefacts of indurated fine sandstone and mudstone. However, the assessment determined that the artefacts were not *in situ*. They were scattered around the shoreline of a small pond created by fill and dam construction. No artefacts were identified as having retouch and on the whole, if cortex was present, it occurred on 10% of less of the artefact's surface. The medium density stone artefact scatter was deemed to be the remnant of a much larger site that had been destroyed by past earthworks. Moreover, the report concluded that site #52-5-2280 had low scientific, educational and cultural significance because of the disturbed landscape context.

The report predicted that the probability of other sites being present within the study area (including the proposed disturbance footprint for the RRC) was low. The area around #52-5-2280 has subsequently been fenced to prevent vehicle access, and stormwater or other discharges being directed across the site (Plate 4.9).

Importantly, the report assessed that:

> Because of this land use history, preservation of archaeological evidence is considered unlikely over almost the entire property. A small area of relatively intact lower footslope colluvium remains in the north eastern corner, surrounded by earthworks associated with dam construction (Dean-Jones 1991, p.3-4).

Therefore, the only areas of relatively undisturbed ground surface within the study area are located in the north-east around the margins of existing dams. It is possible for ground surface exposures to occur due to past earthworks and fluctuating water levels in the dams.

3.4.2 Environmental Impact Statement (Nicolaisen 2003)

In 2000, Umwelt conducted an Aboriginal assessment, in consultation with the Gandangara Local Aboriginal Land Council (LALC) (Nicolaisen 2003, p60-61). During the site inspection, #52-5-2280 was re-located. The assessment determined that the condition of the site had not deteriorated significantly since 1991, and that the site had moderately low scientific significance. However, it noted that the site is valued by the local Aboriginal community. Gandangara LALC requested that the site be conserved *in situ.*

The report recommended that the site by fenced and marked on all plans and design drawings for the quarry, and any subsequent uses of the property, as an area that is not to be disturbed. In addition, a protocol for the protection of the site should be included in the Environmental Management Plan for the quarry. The report concluded that no further archaeological investigation of the site relating to Aboriginal heritage was required prior to the development proceeding.

3.4.3 Badgerys Creek airport site

i Environmental Impact Statement (Navin Officer 1997)

In 1997, an archaeological investigation of two alternative potential airport locations was conducted by Navin Officer Heritage Consultants at Badgerys Creek and the Holsworthy Military Training Area. The Badgerys Creek study area comprised the composite footprint of the three airport options (Plate 3.1) and included the current study area. The assessment was based on Aboriginal cultural values reported by Aboriginal stakeholders and an archaeological survey of surface archaeological features.

During the 1997 EIS field survey program, 110 Aboriginal sites were identified, in addition to a previously recorded site (#45-5-0517), producing a total inventory of 111 recordings. The majority (92%) comprised surface artefact sites (44 isolated finds and 58 artefact scatters). These sites were characterised by low artefact numbers and low artefact densities. The number of recorded artefacts ranged from 2 to 31, with approximately half (46%) containing 3 – 5 artefacts and 22% containing only two artefacts. The remaining recordings consisted of eight scarred trees and an open potential archaeological deposit (PAD).

Just over half of the sites were assessed as having a moderate or high potential for *in situ* artefactual material. These were sites predominantly within fluvial corridor contexts. Thirty-one per cent of sites occurred on alluvial flats or valley floor contexts within the corridor zone. Crests and ridgeline zones contained proportionately low artefact densities (12%), with highest percentages (7%) occurring on minor watersheds situated close to fluvial corridor zones.

In summary:

- sites and varying artefact densities occur in all topographic zones;

- site density was found to be higher in topographies associated with permanent water sources;
- alluvial flats were a zone of high site density and appeared to have been a focus of Aboriginal occupation; basal slopes adjacent to valley floor contexts were also found to have relatively high site densities;
- sites in association with permanent water (secondary or higher order fluvial corridors) tended to be larger, and have higher artefact densities and greater technical complexity, than those associated with lesser order drainage lines;
- in line with the results of the Rouse Hill investigations (JMCHM 2005) all of the fluvial corridor zones were identified as zones of archaeological potential relative to adjacent topographies. These zones were considered likely to contain larger and more complex sites, as well as the least disturbed sub-surface deposits below the plough zone;
- ridgetops in general contained fewer sites; and
- minor gullies (ie drainage lines outside of fluvial corridors), tended to have low site densities.

3.4.4 Aboriginal cultural heritage assessment (Navin Officer 2016)

In 2016, Navin Officer completed an Aboriginal cultural heritage assessment (ACHA) including Aboriginal consultation, survey and a three week fieldwork programme of test excavation at the Badgerys Creek airport site. Their assessment incorporated the proposed 2015 airport site (outlined in red in Plate 3.1) which is adjacent to the current study area to the south and east. The report noted that Oaky Creek, within the current study area, was identified as an area with moderate or high archaeological potential in the 1997 EIS assessment for Badgerys Creek airport site (Plate 3.1).

Test excavation was conducted at 11 locations, resulting in 23 new recordings of Aboriginal sites. These comprised 9 recordings with surface artefacts only; and 14 recordings where subsurface artefacts were confirmed through test excavation. One previously recorded site was subject to test excavation which confirmed the presence of subsurface artefacts (#45-5-2665). Distribution was uneven and consistent with a random sampling of a population that is sparsely and unevenly distributed (p.102).

The depth of subsurface artefacts, typically in Western Sydney, occur in the top 30 cm. In valley floor deposits can be much deeper. Where there is a distinct clay layer, artefacts tend to move through the soil profile and rest just above the clay layer (Navin Officer 2016, p.238).

Artefacts recovered from the test excavation predominantly comprised unretouched flakes. Retouched flakes made up 12% of the assemblage and of these, the majority were backed artefacts. Only two of the 91 artefacts recovered during test excavation were cores. Raw materials identified within the stone artefacts recovered were predominantly silcrete, with vein quartz, igneous rock and fine-grained siliceous rock also present. The low proportion of cortex on the artefacts is consistent with an assemblage produced in a situation where people had limited access to raw material and intensively flaked and reduced the stone they did have.

The investigation found that proximity to water, and the size of nearby water sources, was the major factor influencing where Aboriginal groups chose to focus their activities. Artefact density increases with the size of nearby drainage lines (within 100 m). Other variables, such as elevation and valley context, that are also associated with changes in artefact density, are closely linked to the size of drainage lines in the landscape. The assessment found a consistent signal of increasing artefact density associated with proximity to water, and proximity to higher order drainage lines. They concluded that access to stable sources of water, and consequently plant and animal resources, associated with higher order drainage lines was the major determining factor in where Aboriginal activity was focused.

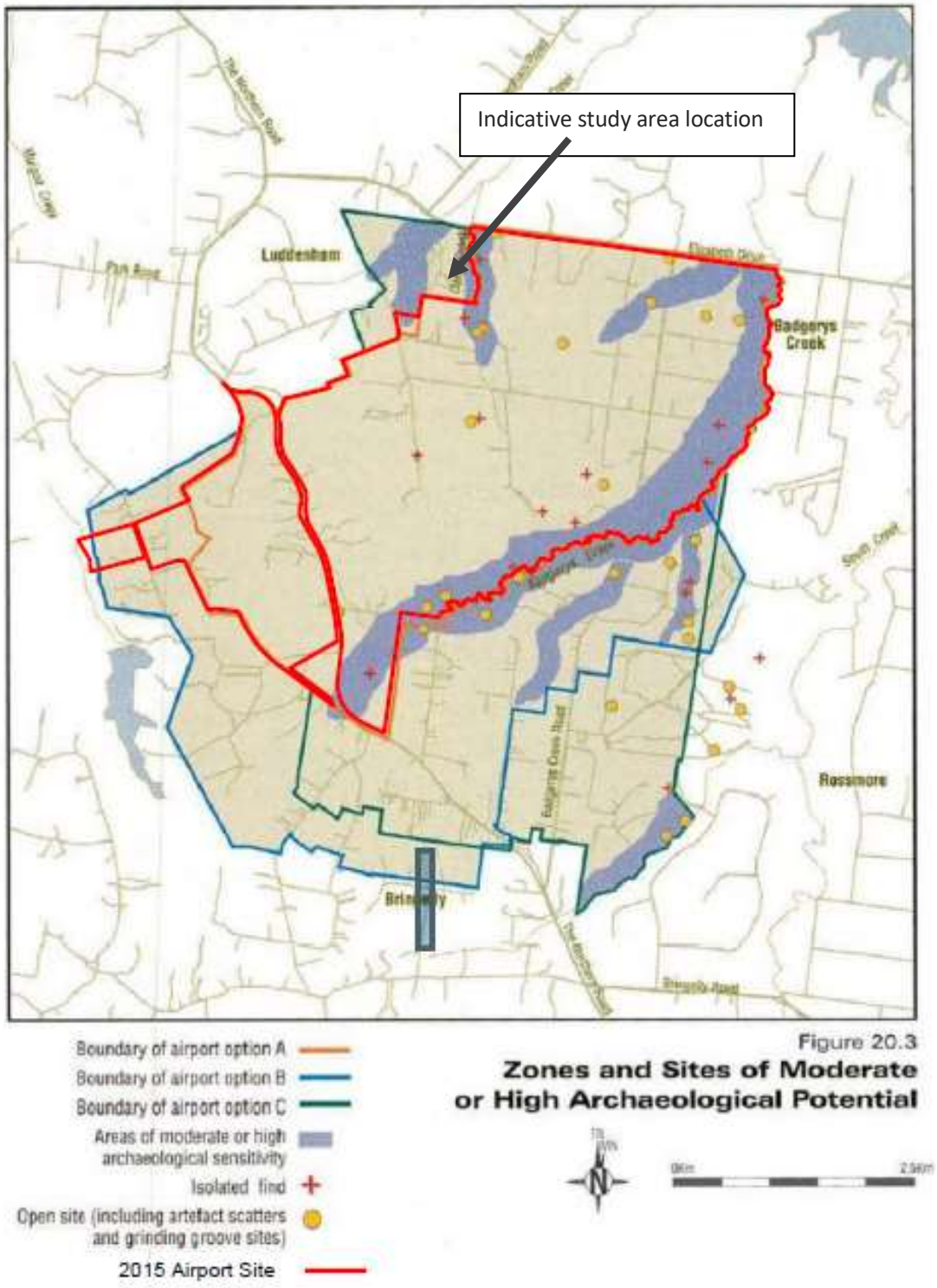


Plate 3.1 **Zones and sites identified in the 1997 EIS assessment with predicted subsurface Aboriginal archaeological potential (Source: Navin Office 2016 Figure 5.5)**

3.4.5 Due diligence heritage assessment for stockpiling site at 285 Adams Rd, Luddenham (Epic 2016)

An Aboriginal due diligence assessment report was prepared in 2016, to support a modification (Mod 4) for the clay and shale quarry. The proposed modification involved the relocation of already approved stockpiling of excavated material to 285 Adams Road, directly to the north of the study area and the relocation of composting activities to the site now proposed for the resource recovery centre within the northern part of the current study area. The assessment reviewed landscape disturbance levels and the potential for Aboriginal objects within the proposed Mod 4 area.

The report noted that two archaeological assessments were carried out as part of the original Luddenham Quarry EIS during which an area adjacent to the Riparian Zone (within the previously approved site) was identified as containing items of Aboriginal Heritage. Consequently, this area is fully segregated and protected from the remainder of the site, fenced and locked. Access to this zone is available to authorised people and the Aboriginal community only. In addition, other sites of Aboriginal cultural values have been identified within the Commonwealth land east of Oaky Creek, but none were identified within the proposed Mod 4 area.

The report concluded the site was very disturbed and unlikely to have any place or object of Aboriginal cultural or archaeological value.

3.4.6 Mamre South Precinct State Significant Development (Biosis 2019)

Biosis (2019) prepared an Aboriginal cultural heritage assessment (ACHA) for a State Significant Development (SSD) at 657-769 Mamre Road, Kemps Creek, 7 km to the north-east of the study area. Their study included both surface and sub-surface investigations, and consultation with 19 Aboriginal organisations.

The assessment identified nine Aboriginal sites (MSP-01 to MSP-11 inclusive), all consisting of various densities of stone artefacts. Excavations across the site recovered 691 artefacts, of which 666 were recovered from MSP-02 (#45-5-5188), located on a high point some 100 m from South Creek (a sixth order stream). These artefacts were characterised as of late Holocene age, dominated by silcrete raw materials and a higher than average proportion of formal tool types. While excavations demonstrated that much of the site exhibited a ≤30cm soil profile, occasional test pits in MSP-02 extended to 80cm. Although even in these locations, artefacts were primarily found within the upper 40 cm (~98%).

This assessment demonstrated that artefact densities were generally low across most landforms in the local area, apart from at a single location within 100 m of a high order stream.

3.4.7 Oakdale South Estate (Artefact 2015) and Oakdale West Estate (Artefact 2017)

Oakdale precinct is a development of industrial properties, approximately 9 km north-east of the study area. Oakdale West lies to the west of Ropes Creek (a third order stream) and Oakdale South lies to the south-east of a tributary. Findings by Artefact's test excavation at Oakdale South in 2015 are applicable to the study area and offer a model of the archaeological potential within the precinct.

The Oakdale South investigations included a series of test excavations conducted within areas identified as of archaeological significance. These included tributaries to Ropes Creek and in proximity to previously identified sites. A total area of 27.5m^2 was excavated and identified a soil profile commonly about 60 cm in depth. These soil profiles were consistent with a shallow duplex or fabric contrast soil, demonstrating a pale grey loam topsoil (A1 horzion) grading into a hard, brownish orange clay subsoil (B2 horizon). Some 341 artefacts were retrieved during test excavation primarily from the upper 20 cm, resulting in an overall artefact density of 12.29 artefacts/m^2.

The report concluded that the results reflected a transient use of the region by Aboriginal people in the past, with only one testing area revealing higher densities. Specifically, some 49 artefacts were recovered from a single test pit, although other densities were generally <10/m^2.

A subsequent stage of work was undertaken for Oakdale West Estate. This consisted of a desktop review and field survey of the site and documented eight sites, all consisting of artefact scatters and/or isolated Aboriginal objects. In general, none of these sites exceeded 5 artefacts in a single locale, and most were in disturbed locations. However, the sites were primarily adjacent to Ropes Creek, and the report ultimately identified a large area of archaeological sensitivity along this tributary.

3.5 Aboriginal Heritage Information Services (AHIMS)

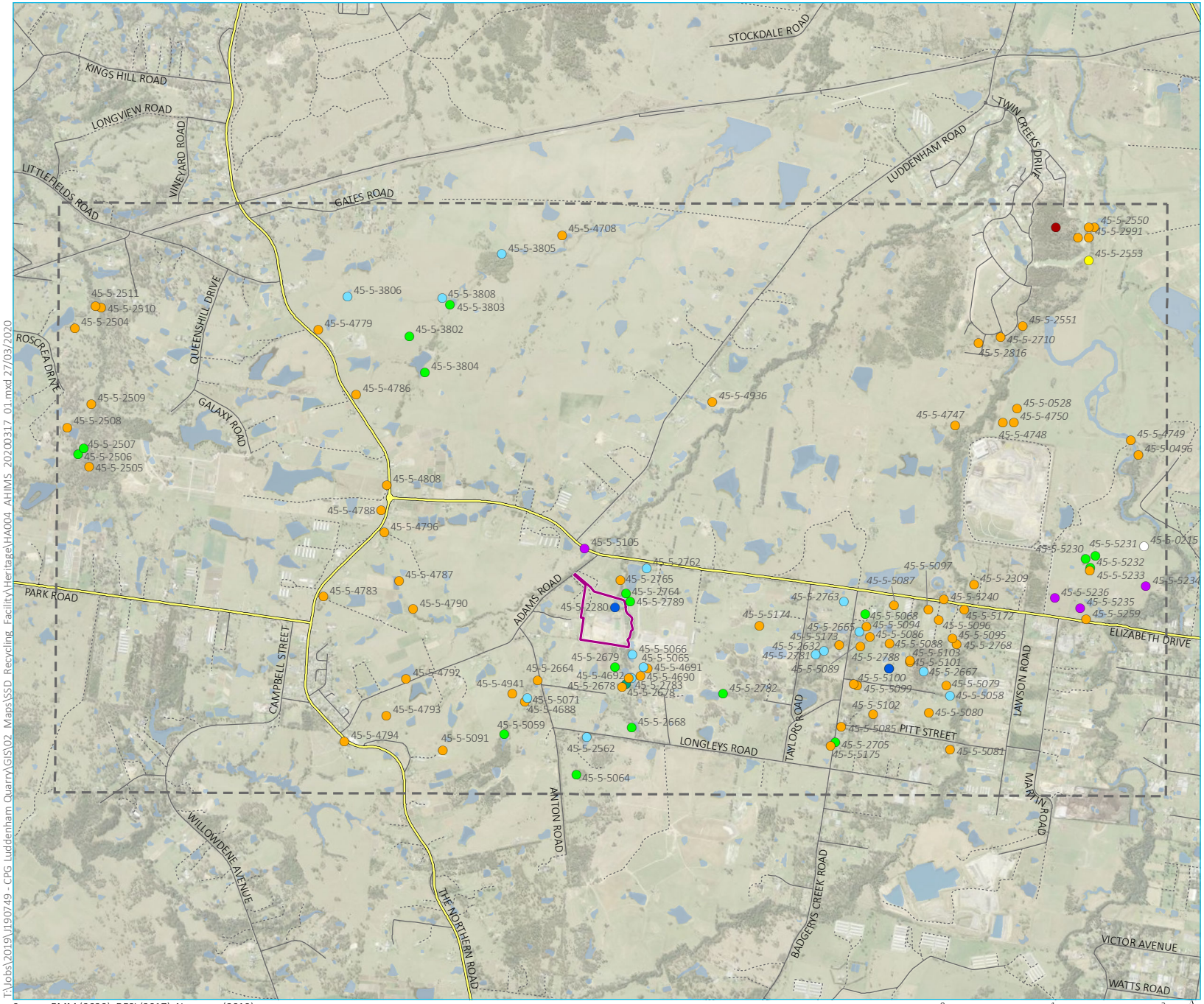
A search of the AHIMS database on 20 January 2020, identified 110 sites within a 10 x 5 km search area centred on the study area (refer to Figure 3.1 and Appendix A).

Apart from an axe grinding groove site, two culturally modified trees and four areas of potential archaeological deposit (PAD), all the sites identified in the search area were artefactual sites (n=103). A summary of the site types recorded on AHIMS is provided in Table 3.1.

The only registered AHIMS site within the study area is Oaky Creek 1 (#45-5-2280), a medium density artefact scatter identified in 1991 (Dean-Jones 1991). See Section 3.4.1 for a site description.

Table 3.1 AHIMS site results

Site type	count
Axe grinding groove	1
Culturally modified tree	1
Culturally modified tree, undefined artefactual site	1
Artefact sites	103
- *Isolated Find*	*17*
- *Low density artefactual site (<10)*	*16*
- *Low density artefactual site (10–20)*	*1*
- *Medium density artefactual site (20–50)*	*2*
- *Undefined artefactual site*	*67*
Potential archaeological deposit	4
TOTAL	**110**



T:\jobs\2019\J190749 - CPG Luddenham Quarry\GIS\02 Maps\SSD Recycling Facility\Heritage\HA004 AHIMS 20200317 01.mxd 27/03/2020

AHIMS search results

Luddenham resource recovery centre
Aboriginal heritage due diligence
Figure 3.1

EMM
creating opportunities

3.6 Site predictions

Based on the distribution of sites and finds by previous investigations and the AHIMS data, a number of predictions in relation to cultural material within the study area can be developed.

At a generic level, the criteria as outlined in DPIE's The *Due Diligence Code of Practice* (DECCW 2010) can be utilised, which includes:

- within 200 m of waters;
- located within a sand dune system;
- located on a ridge top, ridgeline or headland,
- located within 200 m below or above a cliff face; or
- within 20 m of or in a cave rockshelter or cave mouth; and
- is on land that is not disturbed.

The data presented in Section 3.4 and 3.5 are not significantly different from these criteria. However, they can be further refined. Of note is that while cultural material is often found in the vicinity of water, it is more commonly located on third and fourth order creeks, and less so on smaller tributaries. While results do not support significant deposits being present on ephemeral creeklines, a medium density artefact scatter has been identified on Oaky Creek, and as such, may contain additional cultural material (although in lower densities than would be expected adjacent to higher order creeks). The ACHA completed for Badgerys Creek site that adjoins the study area (Navin Office 2016) found that sites occurred most frequently within 100 m (rather than 200 m) of reliable, higher order streams. It is also worth highlighting that the land around Oaky Creek has been subject to land clearance and water management, including the construction of dams may have altered the course of the steam from pre-contact times.

In summary, prior to modern land-use disturbance, the study area was likely to have contained low to moderate subsurface artefact densities within 100 m of Oaky Creek. However, land use disturbance has extensively disturbed the land within 100 m of Oaky Creek through dam construction which has exposed stone artefacts not *in situ* in a small area directly next to the stream channel. The proposed project disturbance footprint within the study area is over 100 m from Oaky Creek and has been subjected to repeated topsoil disturbance from its use as a turf farm and the construction of a dam. As such, Aboriginal objects are unlikely to occur generally in this area and are even less likely to be traceable through archaeological investigation.

4 Site inspection

4.1 Key findings

The key findings of the site inspection are summarised below.

- The study area was inspected to validate the desktop analysis results.
- The location of the previously recorded Aboriginal site was ground-truthed and the correct location established. The site inspection confirmed the site location has been retained since its original recording.
- No new Aboriginal sites were identified.
- Levels of disturbance varied across the study area. Pastoral activities, damming of the creek, and the pre-1990s turf farm in the northern half of the study area have resulted in moderate disturbance, while the southern half of the study area has experienced heavy disturbance to any culturally bearing soil profile as a result of quarrying.
- The riparian corridor beside Oaky Creek, which varies in width up to approximately 50 m west of the creek (outside the proposed disturbance footprint) is deemed to have a moderate archaeological potential.

4.2 Overview

On 30 January 2020, EMM archaeologist Pamela Chauvel completed a visual inspection of the study area. This involved walking over the accessible areas of the site and recording landscape information, as well as targeting ground exposures for the presence of Aboriginal objects.

The main aims of the inspection were to:

- identify Aboriginal sites and/or potential Aboriginal places;
- characterise the landscape to aid predictions of subsurface archaeological potential; and
- assess the potential impacts of the proposed development.

4.3 Results

The study area gently slopes from the west to east. It is bounded to the east by Oaky Creek and, within the study area, this section has been the least disturbed from previous mining and agricultural activities. The northern part of the study area, and a narrow corridor on the western boundary, have been cleared for agricultural use. Assessment of this area was impeded by extremely low visibility at the time of survey. Grass covered most of the study area, limiting ground surface exposure (Plate 4.1 Where trees where present they were inspected for scars. One eucalypt tree, within a grove of Grey Box Forest Red Gum grassy woodland near the western boundary, bore an even, oval shaped scar. Trees in this area had been affected by dieback; although the tree with the scar is alive, and the scar, which is 1 m in length, retains a dry face. However, the tree is not considered to be culturally modified and cannot be classified as a scar tree. Not only is the survival of scar trees extremely rare in the local area (Table 3.1) because of the historically high level of vegetation clearance, but the tree itself is quite young. It is likely that the scar has been caused by termite activity or incidental damage (Plate 4.2; Plate 4.3). Furthermore, it is outside the proposed activity and will not be impacted by it.

The majority of the study area is dominated by the clay/shale quarry, not only the mine itself but the bund walls and stockpiles that surround it. These areas of disturbance have rendered the probability of Aboriginal artefacts surviving in intact contexts as negligible. If artefacts were to be identified, it is highly unlikely they would be *in situ* in the southern half of the study area.

However, the eastern corridor of the study area, encompassing the riparian zone on the west side of Oaky Creek, has been less disturbed (Plate 4.4; Plate 4.5). Site inspection confirmed the assessment of previous reports (Navin Officer 2016) that this area has higher potential for Aboriginal cultural material to be present. However, it should be noted that a series of dams and earthworks, in the north-east corner of the study area, has impacted the flow of Oaky Creek and disturbed the ground surface. At the time of the site inspection, Oaky Creek was dry. Ground surface visibility was limited by a dense coverage of casuarina needles. An access track that runs north to south between the quarry and Oaky Creek has been raised and levelled with introduced fill (Plate 4.6).

The one recorded AHIMS site in the study area (#45-5-2280) was inspected. However, the site inspection found that the spatial coordinates on the AHIMS database do not match its physical location in the study area (Plate 4.7). The recorded AHIMS location was inspected and found to have a high level of disturbance from creation of the road, the dam walls and a nearby noise bund. High grass limited the ground surface visibility. No artefacts were identified. Approximately 50 m to the east of the recorded AHIMS location is a fenced area that marks the true location of the AHIMS site. The corrected location of #45-5-2280 is shown on Figure 4.1. The securely fenced area is located beside Oaky Creek and contains an area approximately 2.5m x 6m (Plate 4.8). At the time of the site visit, the ground was covered in a deep layer Casuarina needles and no artefacts were identified (Plate 4.9).

The location of the proposed RRC is a grassy paddock in the northern part of the study area that has been heavily impacted by pastoral activities, particularly grazing. Evidence of the pre-1990s turf farm were not visible on the surface. The paddock has a dense cover of exotic grass and surface visibility was limited (Plate 4.10). This riverflat area slopes gently to the east and towards Oaky Creek. A small grove of predominantly young casuarina trees is located to the east of the paddock between a small dam and the bund of the mine. The area to the north of this dam has been highly modified with introduced fill for the road and a mound of soil and gravel in the north east.

Overall, the field investigation indicated that the study area has a range of moderate and heavy ground disturbance as a result of modern activities in most locations. This is especially the case in the southern half of the study area, where quarrying, and related activities such as stockpiles and noise bunds, have altered the landscape significantly.

The only area of moderate archaeological potential includes a corridor, approximately 50 m wide along the section of Oaky Creek to the south of the dams. Oaky Creek runs south to north along the eastern boundary of the study area but is outside the proposed disturbance footprint of the project (Figure 1.2).

Plate 4.1 **Track exposure, cleared area with dense pasture grasses and low surface visibility in northern study area, where the proposed RRC will be located. View east.**

Plate 4.2 **Tree with scar to the west of stockpile area. Existing stockpile/bund in background. View north-east.**

Plate 4.3 **Woodland area of young trees affected by dieback, western study area. Tree with scar is in the background. View south.**

Plate 4.4 **Oaky Creek. View south.**

Plate 4.5 **Elevated terrace flat beside Oaky Creek. Potential for Aboriginal objects in this woodland area on the west side of Oaky Creek. Negligible surface exposure. View south.**

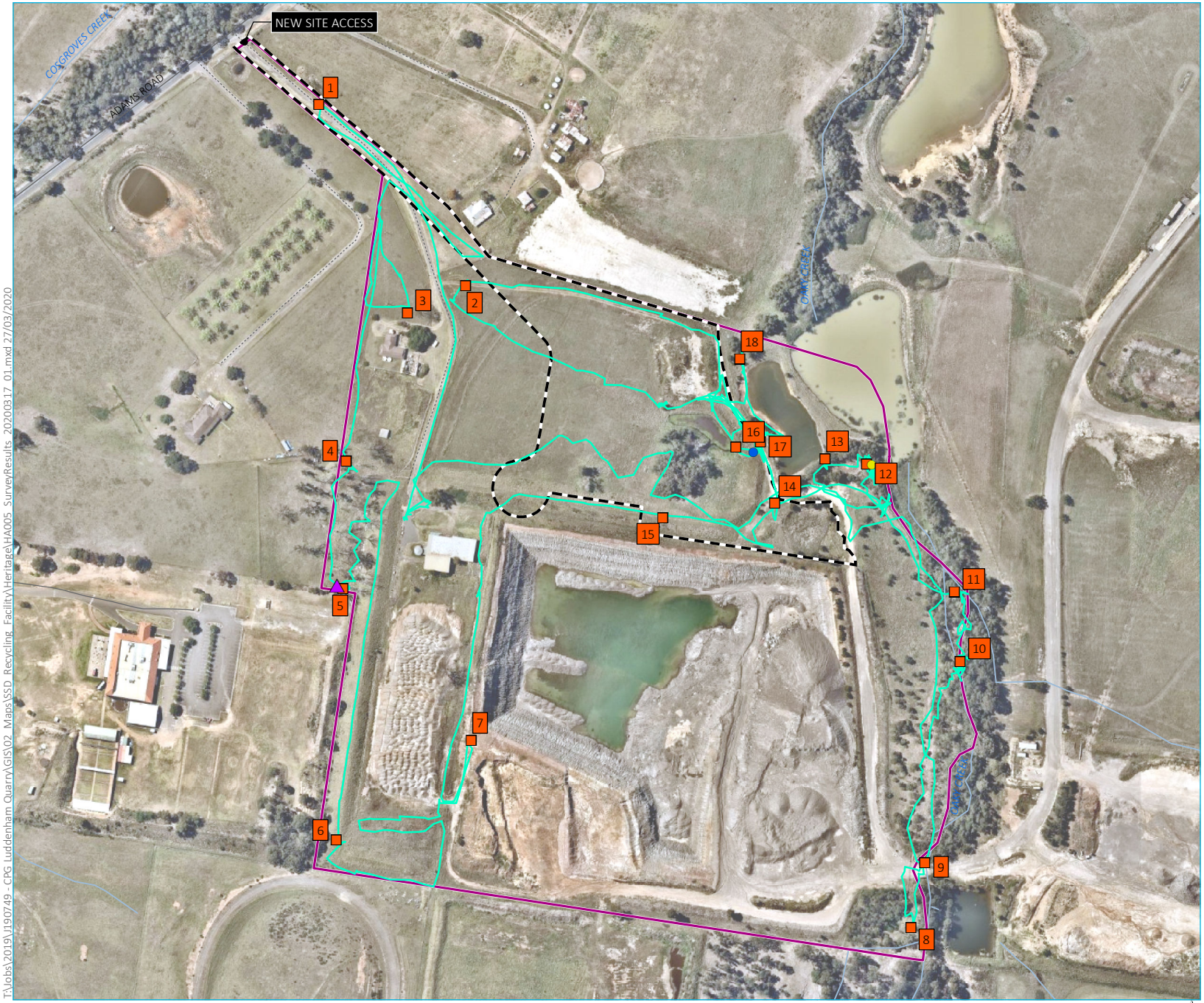
Plate 4.6 **Fill used to create a level surface for the road. Bund beside dam behind. View north-west.**

Plate 4.7 **Location of AHIMS site #52-5-2280 as recorded on the AHIMS database. View north.**

Plate 4.8 **Fenced area around AHIMS site #45-5-2280. View north.**

Plate 4.9 **AHIMS site #45-5-2280. Eroded bank within the enclosure where artefacts were identified. Area is now covered in a deep layer of Casuarina needles View north.**

Plate 4.10 **Grassed paddock in northern part of the study area. View west.**



KEY

- Subject property
- RRC site
- Indicative detailed layout
- Minor road
- Vehicular track
- Watercourse
- Heritage survey track
- Photo location
- Tree with scar

AHIMS site ID 45-5-2280

- Incorrect location
- Correct location

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Source: EMM (2020); DFSI (2017); Nearmap (2019)

0 50 100 m

GDA 1994 MGA Zone 56

N

Site Inspection results

Luddenham resource recovery centre
Aboriginal heritage due diligence
Figure 4.1

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5 Conclusions and recommendations

5.1 Assessment of archaeological potential

The desktop and field survey investigations for this due diligence assessment demonstrate that the study area is comparable with the wider cultural landscape of the Cumberland Plain. As outlined in Section 3, the Cumberland Plain is one of the most intensely archaeologically studied regions in Australia, and as such we have a good understanding of past Aboriginal activity. Specifically, while there is evidence of people in the Sydney Basin by at least 36ka, much of the Cumberland Plain appears to have become established only in the late Holocene (5-0ka). This was likely in response to increasing population pressures and improving climatic conditions driving more permanent occupation of this region, and away from the major river systems, such as the Hawkesbury-Nepean River.

Archaeological evidence suggests that people utilised a wide range of resources across the region, and especially the silcrete raw materials from the Blacktown, Riverstone and Plumpton Ridge areas. These materials were moved along the major river systems across much of the Sydney Basin. Foci of occupation also appears to be primarily associated with the major river systems, although a transient use of all environments was known to occur. While a range of archaeological sites types are found across the Cumberland Plain reflecting these activities, much of the landscape constrains cultural material to stone artefacts located on the surface and/or in the upper soil profile.

With specific reference to the study area, the following findings can be made:

- there is one registered AHIMS site within the study area; however, the site inspection confirmed that the coordinates do not correspond with the location of the fenced area where the site is physically located which is outside of proposed activity areas;
- the existing environmental context and a review of archaeological information indicates that it is possible for archaeological deposits to occur within the riparian corridor of Oaky Creek;
- a site inspection identified that the riparian corridor of Oaky Creek is the area most likely to have potential archaeological deposit although no Aboriginal cultural material was located during the site inspection;
- the proposed project disturbance footprint within the study area is over 100 m from Oaky Creek and has been subjected to repeated topsoil disturbance from its use as a turf farm and the construction of a dam. As such, Aboriginal objects are unlikely to occur generally in this area and are even less likely to be traceable through archaeological investigation; and
- there is negligible potential for surface and/or subsurface material to be present in the southern half of the study area where the landscape has been modified by quarrying and other earthworks.

5.2 Potential impacts

The study area has already been subject to a high level of disturbance and it is unlikely for Aboriginal objects to occur within the study area apart from the area beside Oaky Creek. The AHIMS site within the study area (#52-5-2280) is outside the area likely to be impacted by the proposed development and is currently protected by fencing.

The tree with a scar that was identified during the site inspection is deemed not to have been culturally modified. It is situated near the western boundary of the study area, outside the proposed activity to the west of an existing noise bund (Figure 1.2) and will not be impacted by the proposed development.

Specifically, the proposed location for the RRC, including the access road, is in the northern part of the study area. This area is currently a cleared paddock sown with exotic grasses and a small grove of young trees. Prior to the 1990s, the land was used to grow turf, an activity that would have resulted in topsoil stripping. The upgraded access road will be laid over existing gravel roads. The proposed activity will be 100 m to the west of Oaky Creek at its closest point. While this is within the DPIE guidelines for potential archaeological deposit to occur within 200 m of water, other local studies (eg Navin Office 2016) have found that sites occurred most frequently within 100 m (rather than 200 m) of reliable, higher order streams. In addition, the land around Oaky Creek has been subject to land clearance, introduced fill and the construction of dams and turf farming resulting in a much narrower area (~50 m wide) of relatively undisturbed land with moderate archaeological potential.

5.3 Recommendations

In accordance with the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (DECCW 2010), a due diligence assessment in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DECCW 2010) has been completed as a first step to identify whether Aboriginal objects or places are likely to be harmed by the project. Based on the current available project design and disturbance footprint, this assessment concludes that Aboriginal objects are unlikely to be harmed by the project and further investigation beyond the scope of a due diligence assessment is not currently warranted for the project.

Further investigation in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (the Code) is unlikely to build upon the findings of this assessment, unless test excavation is explored. However, the project impact footprint would not meet the pre-conditions warranting test excavation because a potential archaeological deposit (PAD) has not been identified in the current or previous investigations of the study area. As such, further investigation is not considered to be warranted as Aboriginal objects are unlikely to be harmed by the proposed modification.

The following recommendations are based on the proposed activity in its current design:

1. AHIMS site #52-5-2280 continues to be avoided and protected by fencing.

2. The corrected coordinates for AHIMS site #52-5-2280 are entered in the AHIMS database.

3. The riparian corridor along the western bank of Oaky Creek continues to be avoided.

4. If works are to proceed, the following should occur:

    a) In the event that unexpected Aboriginal objects, sites or places are discovered in the study area, it is a requirement that DPIE is notified of the existence of Aboriginal objects as soon as practicable after they are first identified. This is done through the completion of an DPIE Aboriginal Site Card which is submitted to the Registrar of AHIMS for inclusion on the Aboriginal site database. Under s85A of the NPW Act, Aboriginal objects remain the property, and under the protection of, the Crown until formal transfer to a person or persons of a class prescribed by the regulations occurs.

    b) In the event that known or suspected human skeletal remains are encountered within the study area, the following procedure should be followed:

    - the immediate vicinity will be secured to protect the find and the find will be immediately reported to the work supervisor who will immediately advise the site supervisor or other nominated senior staff member;

    - the environmental manager or other nominated senior staff member will notify the police and the state coroner on the same day of the find (as required for all human remains discoveries);

- the environmental manager or other nominated senior staff member will contact DPIE for advice on identification of the skeletal material as Aboriginal and if so, management of the material;
- if it is determined that the skeletal material is ancestral Aboriginal remains, the Aboriginal community will be contacted, and consultative arrangements will be made to discuss ongoing care of the remains;
- the site will be recorded in accordance with the NPW Act and DPIE guidelines; and
- if the remains are historical and not of Aboriginal origin, the Heritage Division of DPIE will be notified for further instruction.

5.4 Conclusion

In accordance with Step 4 of the due diligence guidelines (DECCW 2010), this assessment concludes that no further Aboriginal heritage investigations are required for the proposed activity.

Table 5.1 describes the basic steps of a due diligence assessment as set out in Section 8 of the due diligence guidelines (refer Figure 1.3). It provides an overview of the assessment results in accordance with these steps and lists the section(s) in the report where each of these is addressed in full.

Table 5.1 Due diligence summary

Step	Results	Section in report
STEP 1: Check for records of Aboriginal objects and places in area of proposed activity.	An AHIMS search was conducted on 20 January 2020. There is one previously recorded site (52-5-2280) within the study area.	Section 3.5 Figure 3.1
STEP 2: Is the activity a 'Low Impact Activity', as defined in the National Parks and Wildlife Regulation?	The proposed activity is not considered to be a 'Low Impact Activity' as defined by the guidelines, since it will involve earthworks and ground disturbance.	Section 4
STEP 3: Are there any landscape features on undisturbed land that are likely to indicate the presence of Aboriginal objects?	The landscape feature likely to indicate the presence of Aboriginal objects is the elevated, level area to the west of Oaky Creek, within 100 m of the creek. However, the areas where ground disturbance is proposed is unlikely to contain Aboriginal objects due to the high level of previous subsurface disturbance and that the disturbance footprint is over 100 m from Oaky Creek.	Section 4
STEP 4: Does a desktop assessment and visual inspection confirm that there are Aboriginal objects present or likely to be present?	One site #52-5-2280 is located within the study area. The spatial coordinates recorded on AHIMS for this site are incorrect. The site location was ground truthed during the site inspection and confirmed to be outside the proposed disturbance footprint. Visual inspection indicated that there is moderate potential for other Aboriginal objects to be present within the riparian corridor beside Oaky Creek.	Sections 3.4; 3.5; 4
STEP 5: Can the activity be relocated away from the known/likely area for Aboriginal objects?	The proposed activities are not in areas where known Aboriginal sites occur or in areas where Aboriginal objects are likely to occur. #52-5-2280 is already fenced and will be avoided by the proposed activities.	Section 5.2, 5.3

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Appendix A

AHIMS

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Luddenham ADD MOD

Client Service ID : 478315

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-5-2788	B 112	AGD	56	291490	6248790	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**		
45-5-2789	B 94	AGD	56	289140	6249400	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**		
45-5-2562	EG6	AGD	56	288745	6248166	Open site	Valid	Artefact : 6	Open Camp Site	
	Contact	**Recorders**	Annie Nicholson					**Permits**		
45-5-2781	B86	AGD	56	290820	6248920	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**		
45-5-2782	B84	AGD	56	289980	6248560	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**		
45-5-2710	DUKE 9	AGD	56	292500	6251800	Open site	Valid	Artefact : -		1345,1539,4737
	Contact	**Recorders**	Dominic Steele Archaeological Consulting					**Permits**		
45-5-2711	CDG1	AGD	56	293300	6252800	Open site	Valid	Artefact : -		1345,1539,4737
	Contact	**Recorders**	Dominic Steele Archaeological Consulting					**Permits**		
45-5-2816	IF/1	AGD	56	292300	6251750	Open site	Valid	Artefact : -		4737
	Contact	**Recorders**	Dominic Steele Archaeological Consulting					**Permits**		
45-5-2632	B 44	AGD	56	290900	6248950	Open site	Valid	Artefact : -		
	Contact Gandangara LALC	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**		
45-5-2783	B43	AGD	56	289150	6248700	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**		
45-5-5240	Elizabeth Drive AFT 2	GDA	56	292088	6249612	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Kelleher Nightingale Consulting Pty Ltd,Miss.Kristen Taylor					**Permits**		
45-5-2762	B95	AGD	56	289290	6249700	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**		
45-5-2763	B87	AGD	56	291080	6249400	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**		
45-5-2764	B82	AGD	56	289100	6249470	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**		
45-5-2765	B83	AGD	56	289050	6249590	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**		
45-5-2768	B41	AGD	56	292100	6249010	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd					**Permits**		
45-5-4708	SSP 2	GDA	56	288626	6252917	Open site	Valid	Artefact : -		

Report generated by AHIMS Web Service on 20/01/2020 for Ryan Desic for the following area at Datum :GDA, Zone : 56, Eastings : 284000 - 294000, Northings : 6248000 - 6253000 with a Buffer of 0 meters. Additional Info : Due Dil Assessment. Number of Aboriginal sites and Aboriginal objects found is 110

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Matthew Kelleher,Kelleher Nightingale Consulting Pty Ltd,Ms.Cristany Milicich					**Permits**		
45-5-4688	B137	GDA	56	288290	6248680	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes					**Permits**		
45-5-4689	B138	GDA	56	289169	6248810	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes					**Permits**		
45-5-4690	B139	GDA	56	289336	6248914	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes					**Permits**		
45-5-4691	B140	GDA	56	289400	6248982	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes					**Permits**		
45-5-4692	B141	GDA	56	289232	6248893	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes					**Permits**		
45-5-5259	Elizabeth Drive AFT 1	GDA	56	293377	6249426	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Kelleher Nightingale Consulting Pty Ltd,Miss.Kristen Taylor					**Permits**		
45-5-5230	Elizabeth Precinct Isolated Find 03 (EPIF 03)	GDA	56	293375	6249980	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management ,Miss.Jennifer Norfolk					**Permits**		
45-5-5231	Elizabeth Precinct Isolated Find 02 (EPIF 02)	GDA	56	293466	6250004	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management ,Miss.Jennifer Norfolk					**Permits**		
45-5-5232	Elizabeth Precinct Isolated Find 01 (EPIF 01)	GDA	56	293416	6249892	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management ,Miss.Jennifer Norfolk					**Permits**		
45-5-5233	Elizabeth Precinct Artefact Scatter 01 (EPAS 01)	GDA	56	293412	6249873	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management ,Miss.Jennifer Norfolk					**Permits**		
45-5-5234	Elizabeth Precinct PAD 03	GDA	56	293924	6249724	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management ,Miss.Jennifer Norfolk					**Permits**		
45-5-5235	Elizabeth Precinct PAD 02	GDA	56	293327	6249529	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management ,Miss.Jennifer Norfolk					**Permits**		
45-5-5236	Elizabeth Precinct PAD 01	GDA	56	293094	6249617	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Artefact - Cultural Heritage Management ,Miss.Jennifer Norfolk					**Permits**		
45-5-2550	CGD1	AGD	56	293350	6252800	Open site	Valid	Artefact : -	Open Camp Site	98435
	Contact	**Recorders**	Dominic Steele Archaeological Consulting					**Permits**		
45-5-2551	CGD6	AGD	56	292700	6251900	Open site	Valid	Artefact : -	Open Camp Site	

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Dominic Steele Archaeological Consulting					**Permits**		
45-5-2552	CGD3	AGD	56	293000	6252800	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	98435
	Contact	**Recorders**	Dominic Steele Archaeological Consulting					**Permits**		
45-5-2553	CGD4	AGD	56	293300	6252500	Open site	Valid	Artefact : -, Modified Tree (Carved or Scarred) : -	Open Camp Site,Scarred Tree	98435
	Contact	**Recorders**	Dominic Steele Archaeological Consulting					**Permits**		
45-5-2504	RC 8 - "Roscrea 8"	AGD	56	284100	6251880	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Stephanie Garling					**Permits**		
45-5-2505	RC 7 - "Roscrea 7"	AGD	56	284230	6250620	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Doctor.Jo McDonald,Stephanie Garling					**Permits**		
45-5-2506	RC 6 - "Roscrea 6"	AGD	56	284130	6250740	Open site	Valid	Artefact : -	Isolated Find	
	Contact	**Recorders**	Doctor.Jo McDonald,Stephanie Garling					**Permits**		
45-5-2508	RC 4 - "Roscrea 4"	AGD	56	284030	6250980	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Doctor.Jo McDonald,Stephanie Garling					**Permits**		
45-5-2509	RC 3 - "Roscrea 3"	AGD	56	284250	6251190	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Doctor.Jo McDonald,Stephanie Garling					**Permits**		
45-5-2510	RC 2 - "Roscrea 2"	AGD	56	284340	6252070	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Doctor.Jo McDonald,Stephanie Garling					**Permits**		
45-5-2511	RC 1 - "Roscrea 1"	AGD	56	284290	6252080	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Doctor.Jo McDonald,Stephanie Garling					**Permits**		
45-5-2309	BC/ED1	AGD	56	292260	6249550	Open site	Valid	Artefact : -	Open Camp Site	3346
	Contact	**Recorders**	Helen Brayshaw					**Permits**		
45-5-2280	Oaky Creek 1	AGD	56	289000	6249350	Open site	Valid	Artefact : -	Open Camp Site	2378
	Contact	**Recorders**	Pam Dean-Jones,P Jones					**Permits**		
45-6-1775	Lec 9;	AGD	56	293200	6252700	Open site	Valid	Artefact : -	Open Camp Site	1345,98435
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists (MDCA)					**Permits**		
45-5-0215	South Creek	AGD	56	293800	6249900	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	362
	Contact	**Recorders**	Ms.Laila Haglund					**Permits**		
45-5-0496	Fleurs1 Fleurs Radio Telescope	AGD	56	293750	6250730	Open site	Valid	Artefact : -	Open Camp Site	961,1018,98435
	Contact	**Recorders**	University of Sydney					**Permits**		
45-5-0528	Fleurs 2 (Fleurs Prospect)	AGD	56	292650	6251150	Open site	Valid	Artefact : -	Open Camp Site	1018

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Richard Wright					Permits		
45-5-2991	TCE 1	AGD	56	293300	6252700	Open site	Valid	Artefact : -		99352
	Contact T Russell	Recorders	Dominic Steele Archaeological Consulting					Permits	2056	
45-5-5066	B129	GDA	56	289263	6249105	Open site	Valid	Artefact : 1		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Jo Dibden					Permits		
45-5-5068	B131	GDA	56	291374	6249478	Open site	Valid	Artefact : 1		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Jo Dibden					Permits		
45-5-5071	B134	GDA	56	288311	6248711	Open site	Valid	Artefact : 1		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Jo Dibden					Permits		
45-5-5086	B164	GDA	56	291416	6249269	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Jasmine Fenyvesi					Permits		
45-5-5087	B165	GDA	56	291638	6249555	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Jasmine Fenyvesi					Permits		
45-5-5088	B166	GDA	56	291597	6249204	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Jasmine Fenyvesi					Permits		
45-5-5089	B163	GDA	56	291331	6249177	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Jasmine Fenyvesi					Permits		
45-5-5091	B145	GDA	56	287546	6248235	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Jasmine Fenyvesi					Permits		
45-5-5094	B154	GDA	56	291387	6249360	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Jasmine Fenyvesi					Permits		
45-5-5095	B153	GDA	56	292169	6249253	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Jasmine Fenyvesi					Permits		
45-5-5096	B152	GDA	56	292043	6249416	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Jasmine Fenyvesi					Permits		
45-5-5097	B151	GDA	56	291950	6249517	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Jasmine Fenyvesi					Permits		
45-5-5099	B146	GDA	56	291304	6248825	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Jasmine Fenyvesi					Permits		
45-5-5100	B147	GDA	56	291272	6248841	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Jasmine Fenyvesi					Permits		
45-5-5101	B149	GDA	56	291781	6249036	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Jasmine Fenyvesi					Permits		
45-5-5079	B155	GDA	56	292110	6248827	Open site	Valid	Artefact : -		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Jasmine Fenyvesi					Permits		
45-5-5080	B156	GDA	56	291953	6248581	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Jasmine Fenyvesi					Permits		
45-5-5081	B157	GDA	56	292146	6248243	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Jasmine Fenyvesi					Permits		
45-5-5085	B162	GDA	56	291157	6248456	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Jasmine Fenyvesi					Permits		
45-5-5102	B148	GDA	56	291448	6248568	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Jasmine Fenyvesi					Permits		
45-5-5103	B150	GDA	56	291780	6249055	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Jasmine Fenyvesi					Permits		
45-5-5105	PAD 1	GDA	56	288830	6250071	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Jasmine Fenyvesi					Permits		
45-5-4941	LU-IA-17	GDA	56	288175	6248750	Open site	Valid	Artefact : -		
	Contact	Recorders	AECOM Australia Pty Ltd - Sydney,Mr.Luke Wolfe					Permits		
45-5-5022	B113	GDA	56	291594	6248980	Open site	Valid	Artefact : 1		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Jo Dibden					Permits		
45-5-5172	B170	GDA	56	292275	6249513	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Jasmine Fenyvesi					Permits		
45-5-5173	B169	GDA	56	291139	6249197	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Jasmine Fenyvesi					Permits		
45-5-5174	B168	GDA	56	290418	6249371	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Jasmine Fenyvesi					Permits		
45-5-5175	B167	GDA	56	291064	6248281	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Jasmine Fenyvesi					Permits		
45-5-5058	B121	GDA	56	292147	6248734	Open site	Valid	Artefact : 1		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Jo Dibden					Permits		
45-5-5059	B122	GDA	56	288102	6248382	Open site	Valid	Artefact : 1		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Jo Dibden					Permits		
45-5-5064	B127	GDA	56	288754	6248012	Open site	Valid	Artefact : 1		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Jo Dibden					Permits		
45-5-5065	B128	GDA	56	289363	6248993	Open site	Valid	Artefact : 1		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Jo Dibden					Permits		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-5-2507	RC 5 - "Roscrea 5"	AGD	56	284180	6250790	Open site	Valid	Artefact : -	Isolated Find	
Contact	Recorders	Doctor.Jo McDonald,Stephanie Garling						Permits		
45-5-2664	B89	AGD	56	288300	6248680	Open site	Valid	Artefact : -		
Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
45-5-2665	B88	AGD	56	291220	6249120	Open site	Valid	Artefact : -		
Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
45-5-2667	B90	AGD	56	291800	6248760	Open site	Valid	Artefact : -		
Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
45-5-2668	B93	AGD	56	289150	6248250	Open site	Valid	Artefact : -		
Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
45-5-2678	B80	AGD	56	289100	6248650	Open site	Valid	Artefact : -		
Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
45-5-2679	B81	AGD	56	289000	6248800	Open site	Valid	Artefact : -		
Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
45-5-2705	B15	AGD	56	291000	6248120	Open site	Valid	Artefact : -		
Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
45-5-3802	Isolated Artefact 1 (Penrith)	GDA	56	287238	6252000	Open site	Valid	Artefact : 1		
Contact	Recorders	Ms.Mary Dallas						Permits		
45-5-3803	Isolated Artefact 2 (Penrith)	AGD	56	287504	6252095	Open site	Valid	Artefact : 1		
Contact	Recorders	Ms.Mary Dallas						Permits		
45-5-3804	Isolated Artefact 4 (Penrith)	AGD	56	287276	6251479	Open site	Valid	Artefact : 1		
Contact	Recorders	Ms.Mary Dallas						Permits		
45-5-3805	OS 1	AGD	56	287973	6252553	Open site	Valid	Artefact : 3		
Contact	Recorders	Ms.Mary Dallas						Permits		
45-5-3806	OS 2	AGD	56	286575	6252169	Open site	Valid	Artefact : 2		
Contact	Recorders	Ms.Mary Dallas						Permits		
45-5-3808	OS 3	AGD	56	287435	6252155	Open site	Valid	Artefact : 4		
Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
45-5-4779	TNR AFT 13	GDA	56	286413	6252059	Open site	Valid	Artefact : -		
Contact	Recorders	Kelleher Nightingale Consulting Pty Ltd,Mr.Benjamin Anderson						Permits		
45-5-4783	TNR AFT 18	GDA	56	286462	6249630	Open site	Valid	Artefact : -		
Contact	Recorders	Kelleher Nightingale Consulting Pty Ltd,Mr.Benjamin Anderson						Permits		
45-5-4786	TNR AFT 14	GDA	56	286758	6251468	Open site	Valid	Artefact : -		
Contact	Recorders	Kelleher Nightingale Consulting Pty Ltd,Mr.Benjamin Anderson						Permits		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Luddenham ADD MOD

Client Service ID : 478315

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-5-4787	TNR AFT 17	GDA	56	287144	6249775	Open site	Valid	Artefact : -		
Contact	Recorders	Kelleher Nightingale Consulting Pty Ltd,Mr.Benjamin Anderson						Permits		
45-5-4788	TNR AFT 15	GDA	56	286985	6250420	Open site	Valid	Artefact : -		
Contact	Recorders	Kelleher Nightingale Consulting Pty Ltd,Mr.Benjamin Anderson						Permits		
45-5-4790	TNR AFT 19	GDA	56	287276	6249519	Open site	Valid	Artefact : -		
Contact	Recorders	Kelleher Nightingale Consulting Pty Ltd,Mr.Benjamin Anderson						Permits		
45-5-4792	TNR AFT 20	GDA	56	287212	6248889	Open site	Valid	Artefact : -		
Contact	Recorders	Kelleher Nightingale Consulting Pty Ltd,Mr.Benjamin Anderson						Permits		
45-5-4793	TNR AFT 22	GDA	56	287032	6248550	Open site	Valid	Artefact : -		
Contact	Recorders	Kelleher Nightingale Consulting Pty Ltd,Kelleher Nightingale Consulting Pty Ltd,Mr						Permits		
45-5-4794	TNR AFT 23	GDA	56	286651	6248317	Open site	Valid	Artefact : -		
Contact	Recorders	Kelleher Nightingale Consulting Pty Ltd,Mr.Benjamin Anderson						Permits		
45-5-4796	TNR AFT 16	GDA	56	287012	6250214	Open site	Valid	Artefact : -		
Contact	Recorders	Kelleher Nightingale Consulting Pty Ltd,Mr.Benjamin Anderson						Permits		
45-5-4808	TNR IF 04	GDA	56	287033	6250644	Open site	Valid	Artefact : -		
Contact	Recorders	Kelleher Nightingale Consulting Pty Ltd,Mr.Benjamin Anderson						Permits		
45-5-4936	M12-AS-02	GDA	56	289990	6251404	Open site	Valid	Artefact : -		
Contact	Recorders	Mr.Neville Baker,Sydney Water-Parramatta						Permits		
45-5-4748	M12 A2	GDA	56	292624	6251214	Open site	Valid	Artefact : -		
Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes						Permits		
45-5-4749	M12 A4	GDA	56	293785	6251051	Open site	Valid	Artefact : -		
Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes						Permits		
45-5-4750	M12 A3	GDA	56	292725	6251214	Open site	Valid	Artefact : -		
Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes						Permits		
45-5-4747	M12 A1	GDA	56	292194	6251184	Open site	Valid	Artefact : -		
Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes						Permits		

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Appendix B

Photos from site assessment

Photographs from site inspection

Photo ID	Description	Photo direction
01.1	Entry to property	East
02.1	Track exposure on cleared area with pasture grasses	East
03.1	High grass coverage. Low exposure	North
04.1	Trees. Bund of quarry to the left	South
05.1	Scar on tree	North
05.2	Scar on tree	North
05.3	Canopy of tree with scar	North
06.1	Stockpiles	North
06.2	Stockpiles	North east
06.3	South east corner of the site, from the bund.	South
07.1	Quarry	Northeast
07.2	Quarry	North east
08.1	Vegetated area. Brambles, tall grass(exotic) and natives	West
09.1	Vegetated area. Young eucalypts	North west
09.2	Oaky Creek, from the bridge	North
09.3	Oaky Creek, from the bridge	South
09.4	Oaky Creek, from the bridge	South
10.1	Oaky Creek, dry	South
10.2	Oaky Creek, flood area to the west	South west
10.3	Road, built up with introduced material	North west
11.1	Possible PAD. Elevated area beside drainage line.	South
11.2	Possible PAD. Elevated area beside drainage line.	South east
12.1	Fenced area location of #45-5-2280.	South
12.2	Fenced area location of #45-5-2280, dam to the east	North
12.3	Inside the fenced area, no surface exposure, eroded bank.	North
12.4	Vegetation surrounding fenced area	North
13.1	Dry creek bed lined with casuarinas.	East
13.2	Dry creek bed lined with casuarinas.	South east
13.3	Raised area at north end to create dam on other side	North
14.1	Wetland	South east
15.1	Casuarina woodland, north of quarry	North
15.2	Quarry	South
16.1	Dam near recorded locale of #45-5-2280;	North west

Photographs from site inspection

Photo ID	Description	Photo direction
16.2	Grove of trees south of dam	West
17.1	Locale of #45-5-2280. No fences or pegs or surface visibility	North west
17.2	Locale of #45-5-2280. No fences or pegs or surface visibility	South east
17.3	Locale of #45-5-2280. No fences or pegs or surface visibility	North west
18.1	Dam. North east corner of site.	South
18.2	Dam. North east corner of site.	West
18.3	Gravels and introduced rocks. Southern end of dam	South

Photograph 1.1

Photograph 2.1

Photograph 3.1

Photograph 4.1

Photograph 5.1

Photograph 5.2

Photograph 5.3

Photograph 6.1

Photograph 6.2

Photograph 6.3

Photograph 7.1

Photograph 7.2

Photograph 8.1

Photograph 9.1

Photograph 9.2

Photograph 9.3

Photograph 9.4

Photograph 10.1

Photograph 10.2

Photograph 10.3

Photograph 11.1

Photograph 11.2

Photograph 12.1

Photograph 12.2

Photograph 12.3

Photograph 12.4

Photograph 13.1

Photograph 13.2

Photograph 13.3

Photograph 14.1

Photograph 15.1

Photograph 15.2

Photograph 16.1

Photograph 16.2

Photograph 17.1

Photograph 17.2

Photograph 17.3

Photograph 18.1

Photograph 18.2

Photograph 18.3


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