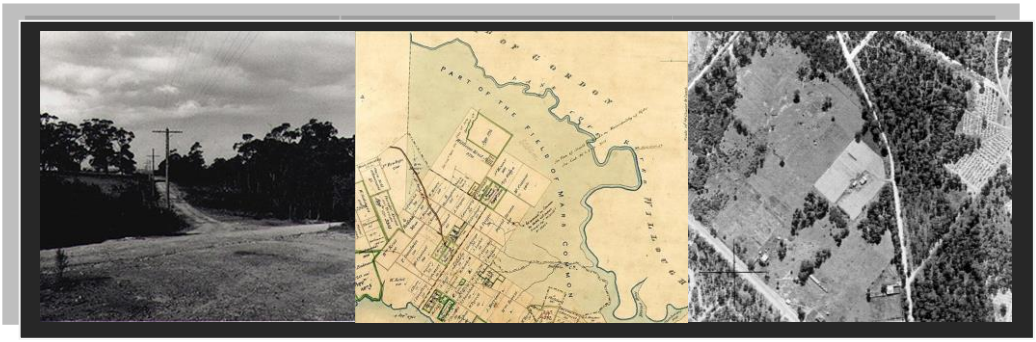
North Ryde Station Precinct, M2 site, State Significant Development

Archaeological Assessment, Excavation and Monitoring Methodology

Report to UrbanGrowth NSW

May 2014



Artefact Heritage
ABN 73 144 973 526
Lvl 1/716 New South Head Rd
Rose Bay 2029
PO BOX 772 Rose Bay
NSW Australia 2029
+61 2 9025 3958

office@artefact.net.au
www.artefact.net.au

Executive Summary

Artefact Heritage has been commissioned by UrbanGrowth NSW to undertaken an Archaeological Assessment for the site of a cistern/well uncovered on the M2 Site at North Ryde, part of the North Ryde Station Precinct. The aims of this archaeological assessment are to assess the archaeological potential and historical significance of the M2 Site, undertake additional background research where required, review previous reports, and assess any proposed impacts. This report will recommend if further actions are required to fulfil statutory heritage obligations. This assessment will also incorporate a research design for the management of the archaeological resource, and an updated Aboriginal heritage assessment. The cistern/well has been assessed as having local significance.

Overview of findings

- The study area has low potential to contain non-Indigenous archaeological remains other than those of the cistern/well that were identified and re-buried in 2002. The area has been severely disturbed through its earlier use as a stockpile and compound site, and during the construction of the M2 Motorway.
- The cistern/well has some local significance (after assessment under the *NSW Heritage Manual* and the *Archaeological Assessment Guidelines).* As the proposal will irreparably damage or remove the archaeological resource, a program of archaeological monitoring and excavation has been deemed the most appropriate mitigation.
- There are no recorded Aboriginal sites within the study area, and the M2 site has low Aboriginal archaeological significance.

Recommendations

- A short program of archaeological monitoring will be required to re-identify the cistern/well, and ensure it is uncovered without further damage. The monitoring program will commence within the 15 metre perimeter buffer around the known location of the cistern/well. The monitoring program will also identify any additional archaeological remains within the study area. If unexpected archaeological remains are encountered during the monitoring phase, adequate time and resources should be afforded to the archaeologist/s on site to identify, excavate and record the remains (if necessary).
- Archaeological excavation of the cistern/well should be conducted by a suitably qualified archaeologist. It is recommended that the material within the structure be manually excavated to a depth of 1.5 metres. This excavation phase will allow the archaeologist/s to identify and record the structure, and take samples of any material within the fill. If the structure is more than 1.5 metres in depth the remainder of the fill will need to be excavated

by machine to meet occupational health and safety requirements. Appropriate samples will be taken. Artefacts will be collected and examined by specialists.

- This is a State Significant Development and therefore permits not required. DGRs and Ministers Conditions of Consent would be fulfilled.
- There are no constraints on the proposal in regard to Aboriginal heritage.
- If Aboriginal objects are located during future construction, work should stop immediately and the OEH, the Aboriginal stakeholder groups, and an archaeologist should be contacted. Further archaeological work may be required. This process should be outlined in the Construction Environmental Management Plan

Contents

Figures

Tables

1.0 Introduction and background

1.1 Background

Artefact Heritage has been commissioned by UrbanGrowth NSW to undertaken an Archaeological Assessment for the site of a cistern/well uncovered on the M2 Site at North Ryde, part of the North Ryde Station Precinct. The aims of this archaeological assessment are to assess the archaeological potential and historical significance of the M2 Site, undertake additional background research where required, review previous reports, and assess any proposed impacts. This report will recommend if further actions are required to fulfil statutory heritage obligations. This assessment will also incorporate a research design for the management of the archaeological resource, and an updated Aboriginal heritage assessment.

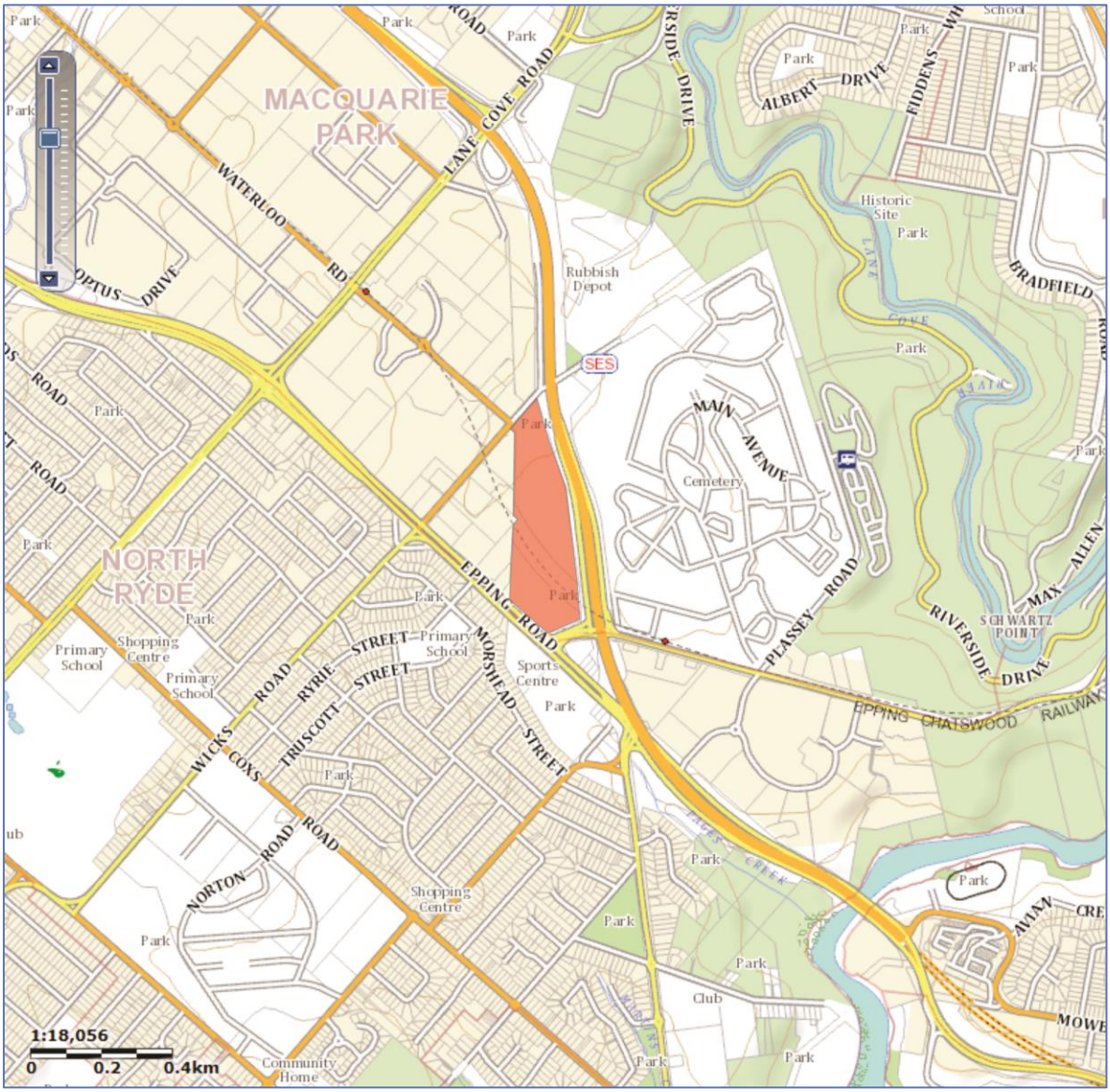
This assessment will support the State Significant Development Application for the project. The report will also address the relevant policies outlined in the North Ryde Station Precinct Development Control Plan 2013 (NRSP DCP 2013) and the revised Director General's Environmental Assessment Requirements (DGRs) for the North Ryde Station project.

This assessment will also draw on the findings outlined in the preliminary assessment of the cistern/well site prepared by Dr Iain Stuart for HLA-Envirosciences in November 2002, and the North Ryde Station Precinct Rezoning Study Aboriginal and Non-Indigenous Archaeological Assessment prepared for Transport for New South Wales (TfNSW) by Artefact Heritage in November 2012.

1.2 The study area

The M2 Site forms part of the North Ryde Station Precinct. The M2 site is located at North Ryde and is bound to the west by Epping Road, to the south by Delhi Road, to the north by Wicks Road and to the east by the M2 Motorway. It is legally described as Lot 101 in DP 1131776.

Figure 1: The study area (outlined in red). (source SIX Maps)



1.3 The approvals process

The North Ryde Station Precinct Lands are identified in Part 12 of Schedule 2 of *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP). Schedule 2 of the SRD SEPP states:

Development on land identified as being within the North Ryde Station Precinct Site on the State

Significant Development Sites Map if the development is for the purposes of:

(a) a principal subdivision establishing major lots or public domain areas, or

(b) the creation of new roadways and associated works.

As the M2 forms part of the North Ryde Station Precinct and the proposed works include subdivision, public domain works and creation of new works, the application constitutes State Significant Development under SRD SEPP.

Director General Requirements were issued on 19 February 2014 to guide technical inputs and key assessment areas. These requirements have been addressed in this document, as outlined in Table 1.

Table 1: Fulfilment of the requirements of this assessment.

Director General's Requirements	Where addressed within this report
Identify and assess any impacts of the proposal on the bricked domed well or cistern located within the Mixed Use Sub-Precinct in accordance with section 8.9 of the NRSP DCP 2013.	Section 6
If the proposal will potentially impact on this item a report is to be provided that details the arrangements for archaeological monitoring, including consultation with the City of Ryde Council.	Section 7

1.4 Statutory context

There are several pieces of State legislation that are relevant to the current study. A summary of these Acts and the implications for the proposed development follow.

The *Heritage Act 1977*

The *NSW Heritage Act 1977* (the Heritage Act) is the primary piece of State legislation affording protection to items of environmental heritage (natural and cultural) in New South Wales. Under the Heritage Act, 'items of environmental heritage' include places, buildings, works, relics, moveable objects and precincts identified as significant based on historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic values. State significant items are listed on the NSW State Heritage Register (SHR) and are given automatic protection under the Heritage Act against any activities that may damage an item or affect its heritage significance.

The Heritage Act also protects 'relics', which can include archaeological material, features and deposits. Section 4(1) of the Heritage Act (as amended 2009) defines 'relic' as follows:

"relic means any deposit, artefact, object or material evidence that:

(a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and

(b) is of State or local heritage significance."

Section 139[1] of the Heritage Act states that:

"A person must not disturb or excavate any land knowingly or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, damaged or destroyed unless the disturbance or excavation is carried out in accordance with an excavation permit."

Permits to disturb or excavate 'relics' are issued by the NSW Heritage Council or a Delegate of the NSW Heritage Council under Section 140 (for relics not protected by an SHR listing) or Section 60 (for relics protected by an SHR listing) of the Heritage Act. Exceptions or exemptions to these permits may be applicable under certain conditions.

As this project is approved as a State Significant Development permits to impact heritage items will not be required.

The Heritage Act also requires all government agencies to identify and manage heritage assets in their ownership and control. Under Section 170 of the Heritage Act, government instrumentalities must establish and keep a register which includes all items of environmental heritage listed on the SHR, an environmental planning instrument or which may be subject to an interim heritage order that are owned, occupied or managed by that government body. Under Section 170A of the Heritage Act, all government agencies must also ensure that all items entered on its register are maintained with due diligence in accordance with State Owned Heritage Management Principles approved by the NSW Minister for Planning and Infrastructure on advice of the NSW Heritage Council. These principles serve to protect and conserve the heritage significance of identified sites, items and objects and are based on relevant NSW heritage legislation and statutory guidelines.

The *Environmental Planning and Assessment Act 1979*

The *Environmental Planning and Assessment Act 1979* (EP&A Act) establishes the framework for cultural heritage values to be formally assessed in the land use planning and development consent process. The EP&A Act requires that environmental impacts are considered prior to land development; this includes impacts on cultural heritage items and places as well as archaeological sites and deposits. The EP&A Act also requires that Local Governments prepare planning instruments (such as Local Environmental Plans [LEPs] and Development Control Plans [DCPs]) in accordance with the Act to provide guidance on the level of environmental assessment required.

This project will be approved as a State Significant Development under Division 4.1 of Part 4 of the EP&A Act.

Ryde Local Environmental Plan 2010

The Ryde Local Environmental Plan 2010 (LEP 2010) notes the following requirements for archaeology under clause Section 5.10 (7) Archaeological Sites;

> **Archaeological sites**
>
> The consent authority must, before granting consent under this clause to the carrying out of development on an archaeological site (other than land listed on the State Heritage Register or to which an interim heritage order under *the Heritage Act 1977* applies):

(a) Notify the Heritage Council of its intention to grant consent, and
(b) Take into consideration any response received from the Heritage Council within 28 days after the notice is sent.

North Ryde Special Precinct Development Control Plan 2013

Those policies outlined in the North Ryde Special Precinct Development Control Plan (NRSP DCP) 2013 relevant to this archaeological assessment are as follows;

> **Section 8.9 Heritage and Archaeology**
>
> Control 2: Where works are proposed in the vicinity of the bricked domed well or cistern located within the mixed use precinct (as identified in Figure 16 of the *North Ryde Station Precinct Rezoning Study – Aboriginal Heritage Assessment and Non-Indigenous Archaeological Assessment* (Artefact Heritage, November 2012)), a report is to be provided detailing the arrangement for the archaeological monitoring of the cistern. These should include that:
>
> a. When the well/cistern is located during construction excavation works, all works within 15 m of the well/cistern are to cease immediately and a heritage/archaeological consultants is to be engaged.
> b. The archaeological consultant it to prepare a report on the condition of the item and its significance. This heritage assessment is to be submitted to Council and a site visit undertaken by council; and
> c. Once Council is satisfied the appropriate research works and methodology have been prepared, written approval is to be issued by Council prior to any works commencing within the 15 m restricted zone.
>
> Control 3: Protective fencing is to be installed at the 15 m perimeter setback from the well/cistern whilst the investigation works are being undertaken.

This document fulfils the Control 2 requirements of the NRSP DCP 2013.

1.4.1 Heritage listings

Statutory registers provide legal protection for heritage items. In NSW, the *Heritage Act 1977*, and the *Environmental Planning and Assessment Act 1979* give legal protection. The State Heritage Register, the S170 registers, and heritage schedules of Local Environment Plans are statutory listings. Places on the National Heritage List are protected under the *Environment Protection and Biodiversity Conservation Act 1999*.

Register of the National Estate

The Register of the National Estate is a list of natural, Indigenous and historic heritage places throughout Australia. It was originally established under the *Australian Heritage Commission Act 1975*. Under that Act, the Australian Heritage Commission entered more than 13,000 places in the register. Following amendments to the *Australian Heritage Council Act 2003,* the Register of the National Estate was frozen on 19 February 2007, which means that no new places can be added, or removed. The Register continued as a statutory register until February 2012.

There are no items within the study area listed on the Register of the National Estate.

National Heritage List

On 1 January 2004, a new national heritage system was established under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This led to the introduction of the National Heritage List, which was designed to recognise and protect places of outstanding heritage value to the nation. It includes natural, historic and Indigenous places that are of outstanding national heritage value to the Australian nation.

There are no items within the study area listed on the National Heritage List.

The State Heritage Register

The State Heritage Register is a list of places and objects of particular importance to the people of NSW and is administered by the Heritage Branch of the Department of Planning. The register lists a diverse range of over 1,500 items, in both private and public ownership. To be listed, an item must be deemed to be of heritage significance for the whole of NSW.

There are no items or archaeological areas within the study area listed on the State Heritage Register.

Section 170 Registers

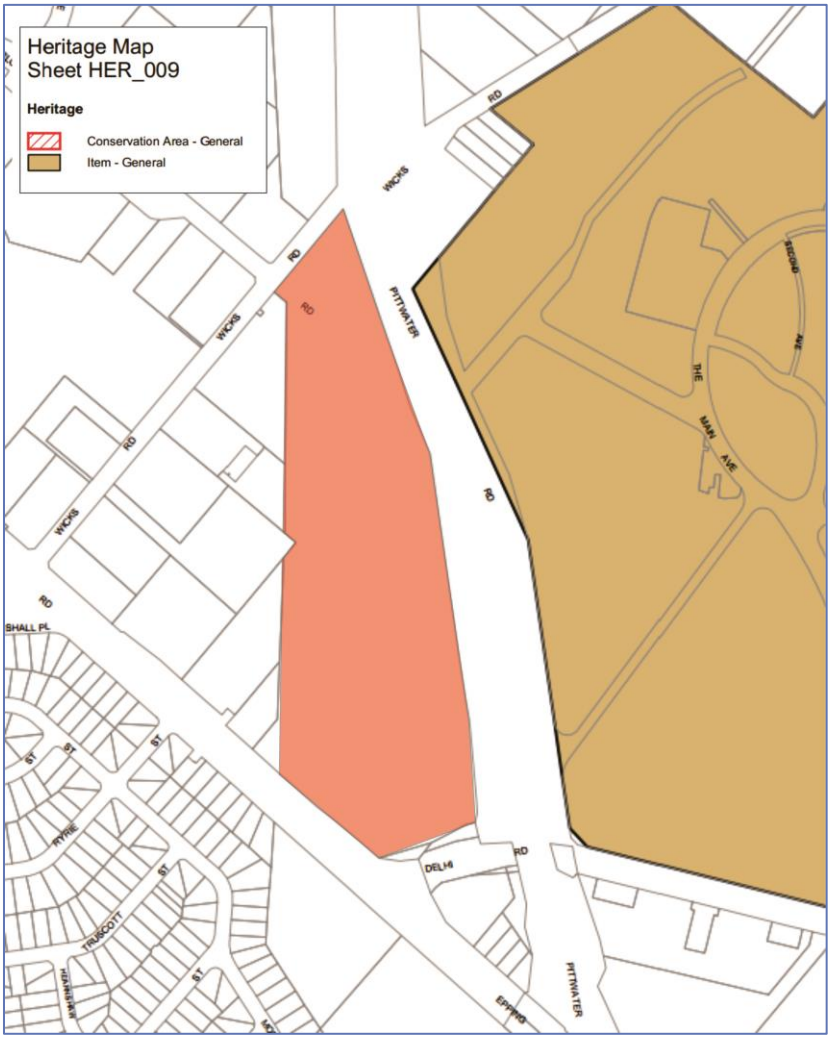
Section 170 requires government agencies to keep a Register of heritage items. A s170 Register is a record of the heritage assets owned or managed by a NSW government agency.

There are no items or archaeological areas within the study area listed on the s170 registers.

Ryde LEP 2010

There are no items within the M2 site listed on the LEP 2010.

Figure 2: Heritage map from the Ryde LEP 2010. Heritage items are shaded in brown. The study area shaded in red.



1.4.2 Implication of Legislation and Heritage Listings

The implication of the legislation for the study area is that under the Heritage Act any item listed on the statutory registers is protected from direct harm, or harm to its heritage significance. This applies to archaeological deposits and relics that are not listed but may be presently buried. This is also reflected in the Ryde LEP. As the current project is being assessed as a State Significant Development, approvals would not be required to impact on heritage items, including non-Indigenous archaeological deposits.

1.5 Report authorship

Archaeologist Jenny Winnett prepared this report with management input from Dr Sandra Wallace.

2.0 Historical context

2.1 Aboriginal occupation

The study area is within the territory of the Wallumedegal (or Wallumattagal) clan. The exact boundaries of the territory are not known, and may have been fluid, but the Wallumedegal area is thought to have extended around Sydney Harbour from Lane Cove along the northern bank of the Parramatta River.[1]

European appropriation of Wallumedegal territory occurred very early in the colonization period. Boats were sent along the harbour up the Lane Cove and Parramatta Rivers within days of the arrival of the First Fleet. Numerous overland parties quickly arrived to explore the potential of land surrounding the harbour. Information about the way that Aboriginal people lived before white settlement can be gained from observations of these early parties of explorers.

Lieutenant William Bradley wrote on his observations of Aboriginal people during an expedition up the Lane Cove River in February 1788. He noted that Aborigines were plying the river in canoes, but it is not known what their activities were.

> 'We did not meet with any Natives again 'till this day, at day light saw several canoes in the Cove we were surveying; they all fled, some out of the Cove and others up to a Cove above'[2]

The first reference to the people of the Ryde area was by Governor Philip on 13 February 1790. He wrote:

> 'The South side of the Harbour from the above-mentioned Cove [now Darling Harbour] to Rose-Hill, which the natives call Par-ra-matta , the district is called Wann, and the tribe, Wanngal. The opposite shore is called Wallumetta, and the tribe, Wallumedegal.'[3]

In May 1788 Surgeon George Worgan described the landscape of Wallumedegal country. He describes 'the trees are small and grow in almost regular rows so that together with the evenness of the land to a considerable extent it resembles a beautiful park'.[4] Aboriginal people through selective use of fire had shaped the countryside described. This 'fire stick farming' was designed to modify the landscape to attract game, which was seen to be plentiful and to is said to have supported a pre-contact population of approximately 3000-5000 people in the Sydney region. The small pox epidemic of 1789 had a profound effect on the population of the Sydney region, and would have decimated groups in the Ryde area. From

[1] Smith 2005: 1, Attenbrow 2010: 23
[2] Bradley 1969: 74
[3] Smith 2005:1 quoting Philip
[4] Worgan quoted in Smith 2005:1

1790 any Aboriginal people remaining in the Ryde area would have been further disenfranchised, as convicts were moved in to harvest the timber and lime resources of the area.

2.2 Early European settlement

European colonisation of the Ryde area began in 1792, when small land grants were made to ex-convicts in an area called Eastern Farmlands.[5] This area became important for supplying fruit, vegetables and poultry to the growing colony of Sydney. Many of the settlers complained of the difficulties in making a living on such small land grants, and in 1804 a large area of land along the Lane Cove River remained vacant and was set aside for the common use of all residents. Called the Field of Mars Common, this land was used by settlers to graze their animals and encompassed the study area. An 1849 survey found that the Commons covered 6235 acres, and was roughly one mile wide. The common extended from present-day Boronia Park to North Epping and Pennant Hills and included a substantial amount of North Ryde.

By the 1840s the common had gained a reputation for harbouring unsavoury characters and was known for illegal timber-getting, squatting and the production of sly grog.[6] In 1874, under "The Field of Mars Common Resumption Act", a portion of the Common was surveyed and a plan made with roads, reserves and allotments marked.[7] The gradual subdivision and sale of the Field of Commons began in 1885 and continued until 1900 (Figure 3, Figure 4). In September 1889 all of the parcels of land within the study area were put up for public auction in Sydney. Some of the lots sold immediately, while others were purchased later in 1898. It can be safely assumed that no major structures were located within the study area prior to this time. The subdivision and sale of the common caused dramatic change as streets were laid out and allotments of one to four acres were offered for sale. These were not designed for farming or orchards and attracted a different type of resident to the area.[8]

The alignment of roads running through the study area has changed relatively little since 1898. The current M2 Motorway follows the route of Pittwater Road, while Cabul and Lucknow Roads were simply renamed Wicks Road and Epping Road respectively. The only major changes were the extension of Delhi Road to meet Lucknow/Epping Road prior to 1928, and the shortening of Waterloo Road, which had originally continued through the M2 site to meet Pittwater Road (Figure 5).

[5] Farlow, M, 2008, 'North Ryde' in *Dictionary of Sydney*. Accessed online 9/12/2013.
[6] Farlow, M, 2008, 'North Ryde' in *Dictionary of Sydney*. Accessed online 9/12/2013.
[7] Land Titles Office [LTO] Old System Records Vol. 1342 Fol. 202
[8] Farlow, M, 2008, 'North Ryde' in *Dictionary of Sydney*. Accessed online 9/12/2013.

Figure 3: Parish map of Hunters Hill, detail showing the Field of Mars Common. Date Unknown, source: Lands Department.

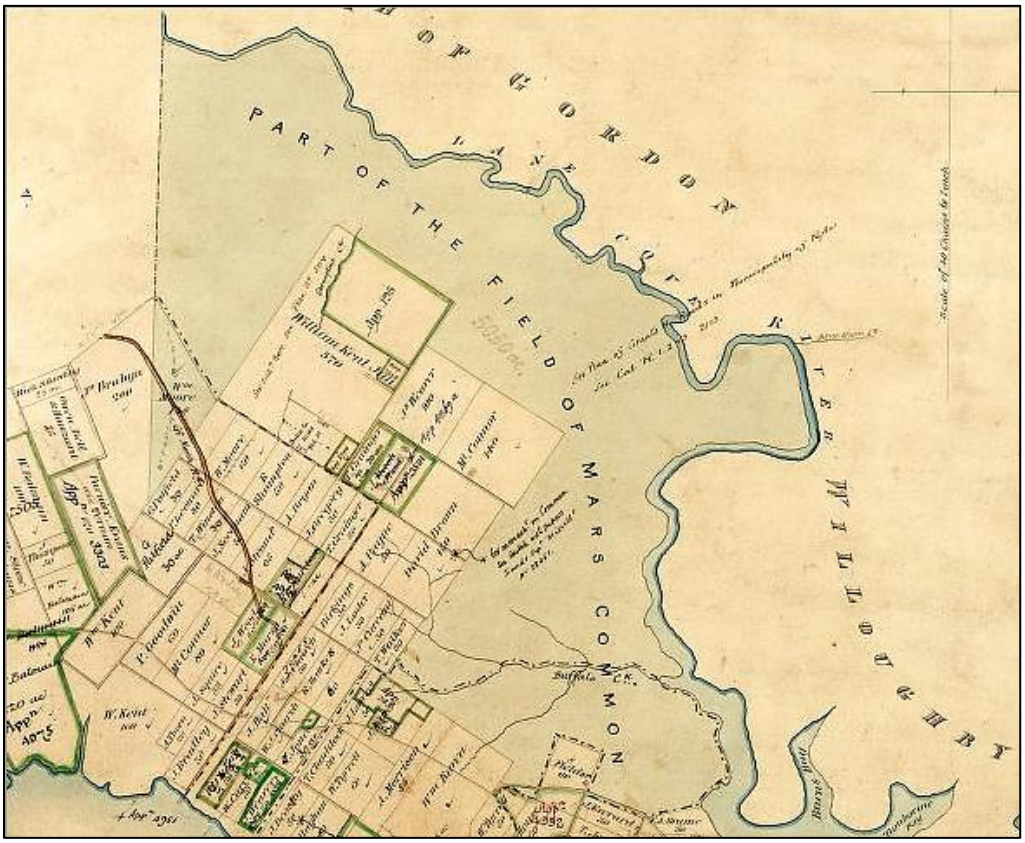
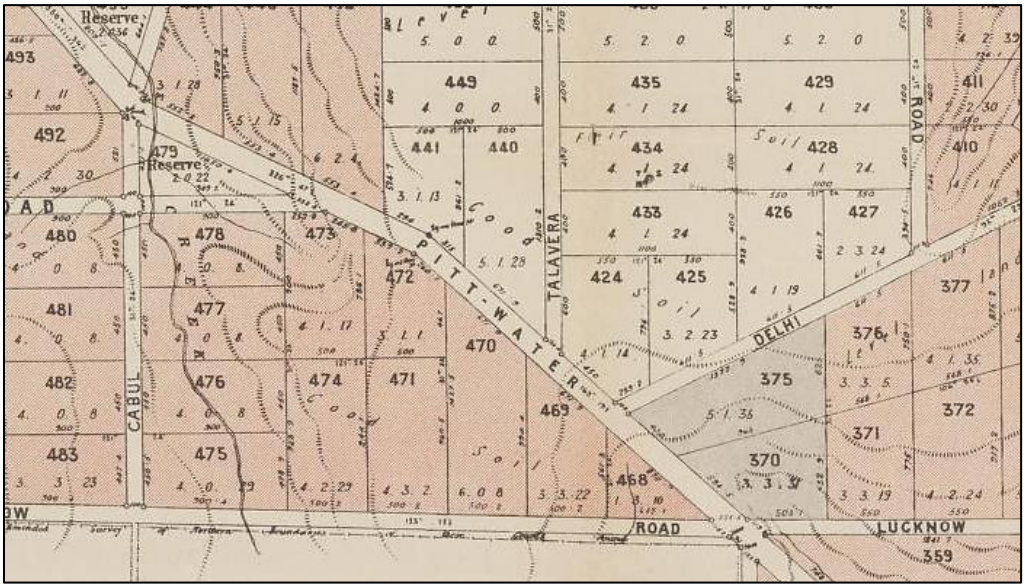


Figure 4: 1898 map of the study area[9]



[9] Detail from 'Field of Mars, Auction Sale, Crown Lands' 1898 (Source: NLA Digital Collection, MAP Folder 56, LFSP 821)

2.3 The late nineteenth and early twentieth centuries

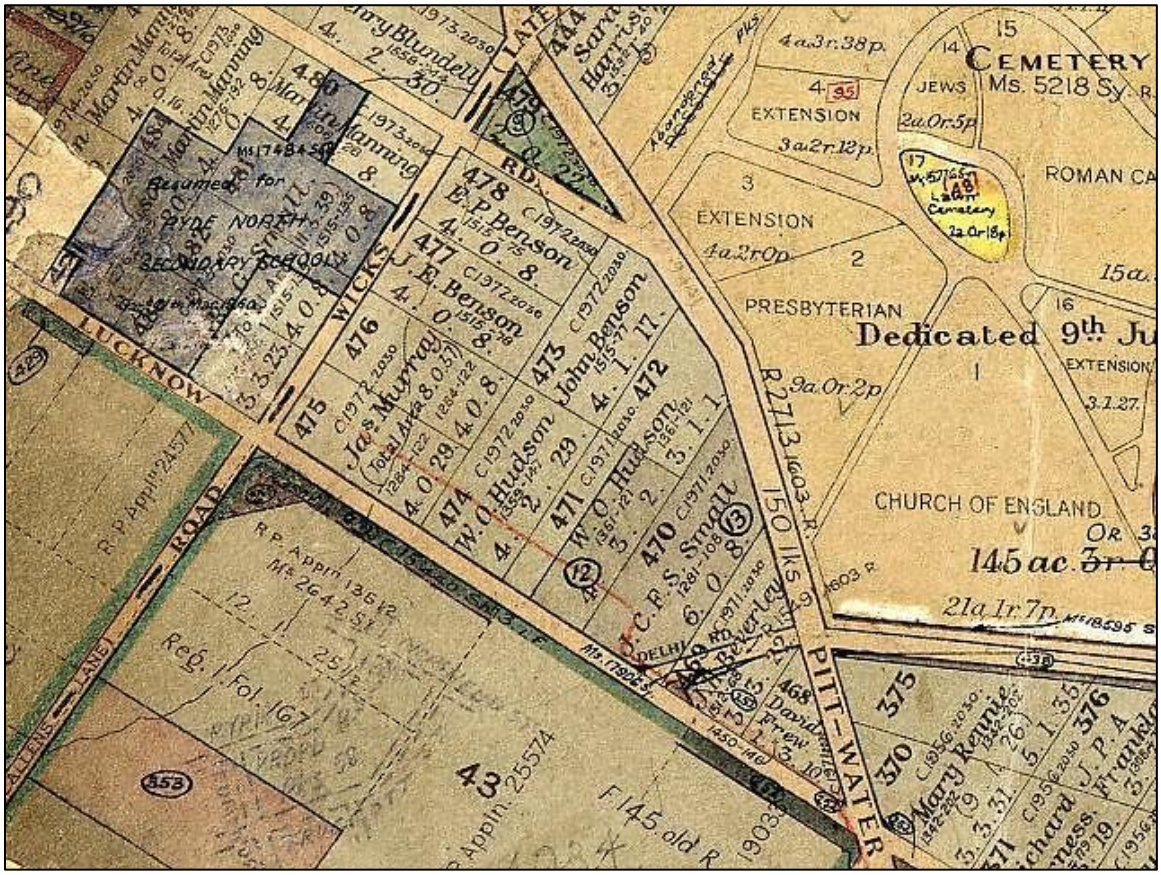
Few details regarding the use and occupation of the land in the ensuing years could be found, however the listed occupation of the land owners suggests that it was mainly used for orchards and poultry farming. It is difficult to ascertain whether major structures were present in the study area at this time, however, most of the landholders did not own other land in the local area and therefore it seems likely that they lived on these properties and ran them as small family farms. In this care it can be assumed houses, outbuildings, and infrastructure associated with agricultural pursuits were present in the study area at this time. Small farms, such as those likely to have existed within the study area, are usually under-represented in the historical record.

Table 2: Ownership details from the Old Title Register (Lands Department) on the M2 site.

Portion Number on 1898 plan	Timeline of ownership	Relevant LOT Old System Records
473	1898 – John Benson (orchardist) 1946 – A. W. Poole and C. E. Poole	Vol. 1515, Fol. 77 Vol. 5610, Fol. 196
478	1898 – Edwin Paul Benson (orchardist)	Vol. 1515, Fol. 75
472	1898 – William Oliver Hudson (poultry farmer) 1940 (7 Nov) – Harry Percy Hudson and David Frew (poultry farmer) 1940 (20 Nov) – Samuel Robert McConnell	Vol. 1361, Fol. 121
470	1898 – J. C. F. S. Small (orchardist) 1900 – Thomas Scriven (grazier) 1911 – Jane E. Scriven 1915 – Charles Aquila Hudson (poultry farmer) 1944 – Robert Henry Campbell (Grower) 1946 – The Crown (for school site)	Vol. 1281, Fol. 108

Early in the twentieth century the increasing population across the north shore led the government to consider establishing a second cemetery. Despite protest from the local community, the 145 acre on Delhi Road was chosen and dedicated in 1902, and opened as the Northern Suburbs Cemetery in 1922. The cemetery was established on gently sloping land surrounded by open forest in an industrial area adjoining the Lane Cove River, and originally accessed via a gateway on Delhi Road. In 1999, with the naming of Macquarie Park as a separate suburb, it was renamed Macquarie Park Cemetery

Figure 5: 1928 parish map of Hunters Hill showing Delhi Rd extension



2.4 After World War One

Although most of the properties within the study area changed hands several times during the first half of the 20th century, the land owners were still predominantly orchardists of poultry farmers.

Photographs taken at the junction of Delhi and Lucknow Roads in 1938 show that at least some parts of the study area were still heavily vegetated at this time (Figure 6, Figure 7).

A 1943 aerial photograph shows thick vegetation in the northern corner of the M2 site. The remainder of the site was cleared and divided into small paddocks. Crop or plough furrows can be seen in some areas of the site, however, no signs of significant cultivation are present. Four houses and several small outbuildings are visible on the property to the south, and a small square structure can be seen in the centre of the lot in which the cistern/well was uncovered during preliminary site works (Figure 8).

Figure 6: Junction of Delhi and Lucknow Roads, 1938. State Library of NSW (SLNSW), Government Printing Office 1 - 27227

Figure 7: Looking south-east along Pittwater Road at the Lucknow Road junction, 1938. State Library of NSW (SLNSW), Government Printing Office 1 – 27234.

In the mid-20th century, development in North Ryde began to increase. During World War Two, the area of land bounded by Wicks, Epping, Blenheim and Coxs Roads was used as a heavy vehicle park and transport workshop by the army. Living quarters and parade grounds were built on the eastern side of Blenheim Road. Following the war, the defence site was subdivided for war service housing, and the NSW Housing Commission resumed a large amount of land in the area and subdivided it for housing. However, relatively little subdivision has occurred within the study area. Since the 1960s the buildings located on the M2 site have been demolished.

Figure 8: A 1943 aerial of the M2 site. Source: SIX Maps.

3.0 Archaeological potential

3.1 Known impacts in the study area

In order to establish the archaeological potential or degree of survival of an archaeological resource, of a site or study area, impacts to the area need to be considered. Impacts can remove or damage archaeological remains, lowering the potential for a development to encounter or disturb them.

The construction of the M2 Motorway severely impacted the eastern side of the M2 Site, while earthworks across the remainder of the site have also had a significant impact (see Figure 9). It is therefore likely that most potential archaeological remains on the site have been disturbed or destroyed. The only portion of the site that is relatively undisturbed is the vegetated area to the north, although there is no documentary evidence to suggest that structures existed in this location.

Figure 9: Aerial photographs showing changes to the M2 Site since 1994[10]

[10] 1994 photograph from the Land and Property Information Division; 2011 photograph from www.nearmap.com.

3.2 Assessment of archaeological potential

Archaeological potential is defined as the potential of a site to contain archaeological relics, as classified under the *NSW Heritage Act* 1977. Archaeological potential is assessed by identifying former land uses and associated features through historical research, and evaluating whether subsequent actions (either natural or human) may have impacted on evidence for these former land uses. The potential impacts to the study area have been outlined in the previous section.

The following discussion of archaeological potential is not intended to be exhaustive. There is some probability that archaeological remains are located on the site that are not known from the historical records and are not shown on plans, as evidenced by the cistern/well uncovered in 2002. The following discussion is therefore indicative only.

3.2.1 The cistern/well

In 2002, a brick domed well or cistern, approximately 2.5 metres in diameter was uncovered during earthworks for the construction of the Epping to Chatswood Rail Link (ECRL) at the M2 Site (Figure 10). No direct historical reference has been found to the cistern, although examination of the 1943 aerial photographs shows an item in approximately the same location (Figure 10).

HLA Envirosciences (2002) assessed the heritage significance of the cistern and determined that it was probably associated with the small farms that existed in the area from as early as the 1880s. The cistern is built of wet-struck handmade bricks possibly dating to c. 1900. When HLA Envirosciences inspected the cistern, they noted that the domed top had collapsed inwards and that it had clearly been filled prior to the collapse, as the fallen bricks were resting on fill. The archaeological potential of the cistern lies in its possible contents. If these contents include discarded material known to be from an associated house, then they could yield significant information to artefact analysis. However, it is also possible that the cistern was filled with demolition rubble or material from an unknown source and would therefore have limited research potential. The nature and condition of the cistern's contents cannot be assessed without further archaeological investigation.[11]

HLA Envirosciences concluded that the cistern had moderate research significance and recommended that it should be filled with clean sand to stabilise it, and covered with shade cloth and steel mesh to allow for the creation of the proposed spoil stockpile without harm to the site.[12] This has since been done, and the cistern is currently located beneath a large stockpile and could not be examined during the current survey.

[11] HLA Envirosciences 2002:3
[12] HLA Envirosciences 2002:7

HLA Envirosciences did not identify any evidence for associated archaeological remains around the cistern, and speculated that the remains of any buildings had been removed earlier, probably during the construction of the M2.

Figure 10: Left: Centre of the M2 site – contemporary satellite photo. Right: 1943 aerial photograph showing unidentified structure (SIX viewer)

3.2.2 Archaeological potential of the surrounding area

Any archaeological potential within the M2 study area is most likely to relate to houses, outbuildings, and agricultural practices. Archaeological evidence may include building footings, structural material, domestic artefact scatters or under-floor deposits, privies, wells and cisterns, and the remains of infrastructure such as water pipes. Such remains would have the potential to yield information relating to major historic themes, including Agriculture, Accommodation, and Domestic Life.

However, the study area has been subject to substantial disturbance throughout the 20th century. The site has been impacted by the construction of the M2 Motorway, and earthworks to prepare the site for use as a construction compound and stockpiling site. In addition, HLA Envirosciences did not identify any remains in the vicinity of the cistern/well when it was uncovered in 2002. If the structure uncovered in 2002 is a cistern, the remains of a building would be expected to be in the immediate vicinity (cistern store rainwater run-off). The fact that no remains were identified in 2002, apart from those of the potential cistern, suggests that additional archaeological remains in the study area may have been removed by previous impacts.

There is low potential for archaeological remains associated with the earliest agricultural uses and occupation of the site to be located within the study area (with the exception of the cistern/well identified in 2002).

4.0 Assessment of significance

4.1 NSW heritage assessment guidelines

Determining the significance of heritage items is undertaken by utilising a system of assessment centred on the *Burra Charter* of Australia ICOMOS. The principles of the charter are relevant to the assessment, conservation and management of sites and relics. The assessment of heritage significance is outlined through legislation in the NSW *Heritage Act* 1977 and implemented through the *NSW Heritage Manual* and the *Archaeological Assessment Guidelines* (NSW Heritage Office 1996; 25-27). If an item meets one of the seven heritage criteria, and retains the integrity of its key attributes, it can be considered to have heritage significance. The significance of an item or potential archaeological site can then be assessed as being of Local or State significance, based on a series of criteria that have been developed for assessing significance relating to archaeological sites and their associated 'relics'. The criteria identify a series of questions that could be asked in relation to the item to assist in the identification of the appropriate level of significance to be applied.

'State heritage significance', in relation to a place, building, work, relic, moveable object or precinct, means significance to the State in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item.

'Local heritage significance', in relation to a place, building, work, relic, moveable object or precinct, means significance to an area in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item.[13]

The overall aim of assessing archaeological significance is to identify whether an archaeological resource, deposit, site or feature is of cultural value. The assessment will result in a succinct statement of heritage significance that summarises the values of the place, site, resource, deposit or feature.

The heritage significance assessment criteria are as follows:

Table 3: NSW heritage assessment criteria

Criteria	Description
A – Historical Significance	An item is important in the course or pattern of the local area's cultural or natural history.
B – Associative Significance	An item has strong or special associations with the life or works of a person, or group of persons, of importance in the local area's cultural or natural history.
C – Aesthetic	An item is important in demonstrating aesthetic characteristics and/or a high

[13] This section is an extract based on the Heritage Office Assessing Significance for Historical Archaeological Sites and Relics 2009:6.

Criteria	Description
Significance	degree of creative or technical achievement in the local area.
D – Social Significance	An item has strong or special association with a particular community or cultural group in the local area for social, cultural or spiritual reasons.
E – Research Potential	An item has potential to yield information that will contribute to an understanding of the local area's cultural or natural history.
F – Rarity	An item possesses uncommon, rare or endangered aspects of the local area's cultural or natural history.
G – Representative	An item is important in demonstrating the principal characteristics of a class of NSWs (or the local area's): - cultural or natural places; or - cultural or natural environments.

4.2 Fulfilment of the NSW heritage assessment criteria

The heritage significance of the cistern/well, assessed against the NSW heritage assessment criteria, is outlined below.

Table 4: Consideration against NSW heritage assessment criteria

Criteria	Description
A – Historical Significance	The remains of the cistern/well are not considered to be important to the course or pattern of the local areas cultural history. Structures of this type were ubiquitous in areas where municipal water were not connected until a later date, as was the practise in more rural parts of western Sydney. The remains of the cistern/well do not meet the local significance threshold under this criterion.
B – Associative Significance	The study area is associated with the Benson family, who were orchardists in the Ryde area in the late 19th and early 20th century. However, the potential archaeological resource is unlikely to have a strong or special connection to the family, unless it contains a substantial and identifiable artefactual assemblage that can be connected with the Benson period of ownership of the land. It is also unlikely that the date of the construction of the cistern will be able to be definitively pinpointed as occurring within the Benson family ownership of the study area. Cisterns and wells are structures that have changed little in their form or purpose throughout the historical period. The types of building materials used can provide a broad dating framework, although in areas west of Sydney it is often difficult to use building materials to definitively indicate a period of construction. Brick making technologies could be more localised, local clays used in the production of bricks can be of a poorer quality and materials were often re-used. Therefore, the cistern/well and the potential archaeological resource within the study area is unlikely to meet the local significance threshold under this criterion.
C – Aesthetic Significance	The potential remains within the study area, and the cistern/well, have little potential for aesthetic significance. Although exposed *in situ* archaeological remains may have distinctive/attractive visual qualities, these are not 'important in demonstrating

Criteria	Description
	aesthetic characteristics and/or a high degree of creative or technical achievement in NSW'. The potential archaeological resource does not meet the local significance threshold under this criterion.
D – Social Significance	The potential archaeological resource may hold some interest for descendants of the Benson family, some of which may remain in the surrounding area. Overall however, the cistern/well is unlikely to have a strong association with a particular community or cultural group in NSW for social, cultural or spiritual reasons. The potential archaeological resource does not meet the local significance threshold under this criterion.
E – Research Potential	The study area contains the remains of a cistern or well. It has the potential to contain a substantial artefactual assemblage relating to period of the structures use, and from the backfilling event that would effectively have decommissioned the structure. Cisterns and wells, when no longer in use for the storage of water, were often used as convenient locations to dispose of refuse. As cisterns and wells were generally associated with households, this material within them often consist of large amounts of domestic refuse including bottles, ceramics, kitchen waste and other discarded items. The location of this structure, in an area where no structures are known from historical sources, initially suggests that it may be a well. If the structure is found to be a cistern is can be assumed that a structure was originally located nearby, as cisterns generally store rainwater run-off from roofs. The archaeological resource within the study area has the potential to answer a series of research questions: • What is the nature of the structure? Is it a well or cistern? • What is the nature of the material within the structure? Does it represent discrete filling events, or does the material indicate that a single backfilling event occurred when the structure was decommissioned? • Are artefacts present within the fill material? Can these deposits provide an indicative date range for either the main period of use of the cistern/well, or indicate when the cistern/well went out of use? Do these artefacts indicate whether the water stored within the structure was utilised for domestic or agricultural purposes? • Is there evidence of how the structure was constructed? Can the building materials used in the construction of the cistern/well be associated with any specific manufacturer or do they indicate small-scale/local brick production? It should be noted that generally material used to decommission a cistern/well by backfilling has little association with the individuals who constructed or used the structure. This material is often much later in date the original construction of the cistern/well and often has little research potential. The presence of a structure on the 1943 aerial of Sydney in the location of the cistern/well, would suggest that it was still in useage at this time, and that the structure was decommissioned in the 20th century. The remains of the cistern/well, and any artefact bearing deposits that may be within it, has local significance under this criterion.
F – Rarity	The archaeological remains that may exist in the study area, including the cistern/well are not considered to be particularly rare, and remains of this type have

Criteria	Description
	been found on many archaeological sites. The potential archaeological resource does not meet the local significance threshold under this criterion.
G – Representative	The archaeological remains of the cistern/well is likely to be a representative example of a late 19th or early 20th century water storage system. Any additional remains are likely to demonstrate the principal characteristics of small domestic or agricultural buildings typical of this time period and region. The potential archaeological resource, however, is unlikely to be considered important for demonstrating these characteristics. Multiple examples of these types of archaeological remains have been excavated throughout the Sydney region. The remains of the cistern/well do not meet the local significance threshold under this criterion.

4.3 Statement of heritage significance

The following assessment of the heritage significance of the cistern/well within the M2 Site has been prepared in accordance with the 'Assessing Heritage Significance' (NSW Heritage Branch 2001) and 'Assessing Significance for Historical Archaeological Sites and Relics' (NSW Heritage Branch 2009) guidelines, based on the NSW Heritage Significance Criteria.

The cistern is not likely to be of significance according to Criteria A-D or F-G, however it is of moderate research potential as it may yield information to archaeological investigation.

The cistern could potentially provide information related to the history of agriculture and domestic life within the study area during the 20th century. Archaeological deposits contained within the cistern may be able to answer research questions based on some of the NSW historical themes. The themes that might be relevant to the site include:

- Developing local, regional and national economies
  - Agriculture (irrigation practices)
  - Technology (techniques and materials used to build the well)
- Developing Australia's cultural life
  - Domestic life (potential domestic refuse deposits could answer research questions about daily life in the local area during the 20th century)

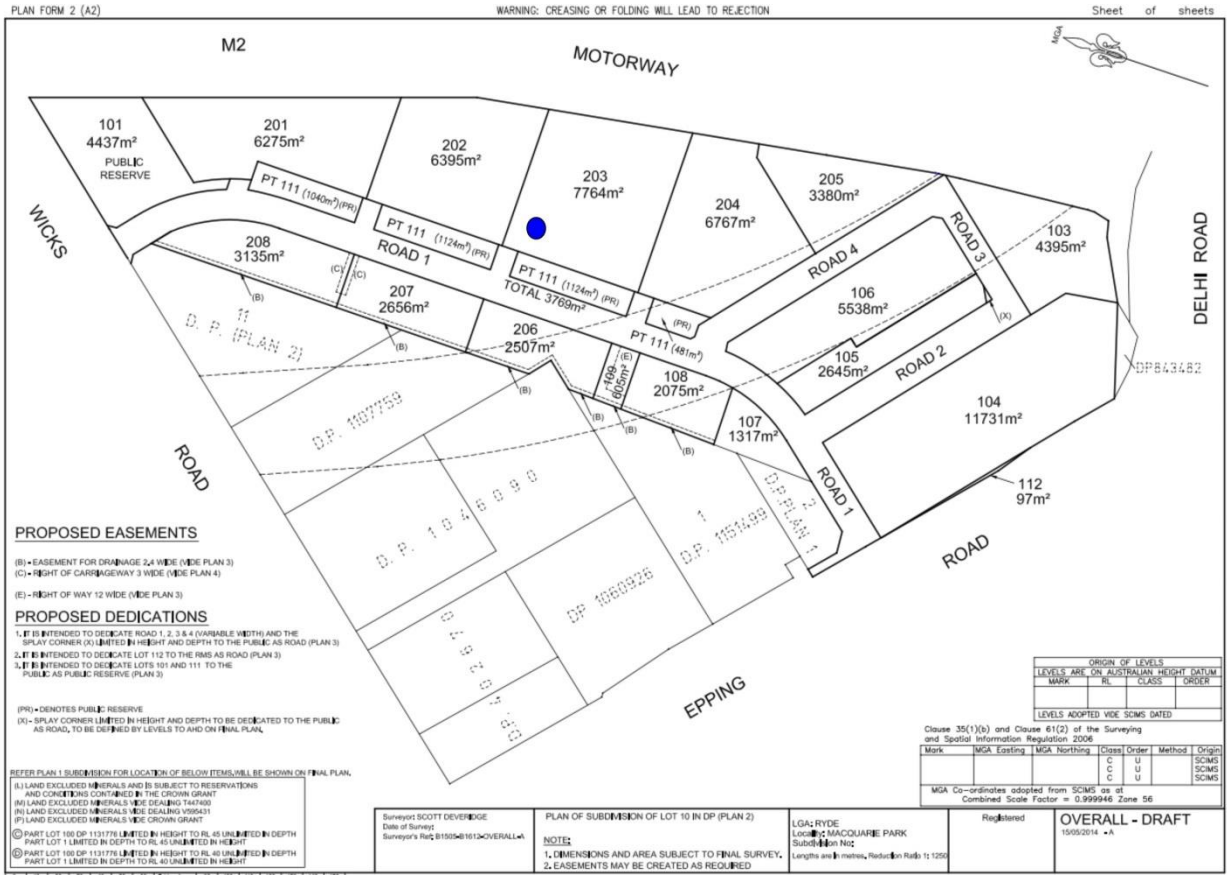
The amount of information that may be provided by the site, and its usefulness, cannot be accurately assessed without archaeological investigation.

5.0 The proposal

5.1 The proposal

The cistern/well was uncovered during site preparation works for the establishment of the site as a stockpile location for the Parramatta Rail Link project. Prior to this the study area had been in use as a stockpile for the construction of the M2 Motorway.

Figure 11: Draft plan of subdivision with approximate cistern location shown in blue.



With the discovery of the cistern/well, the following works were undertaken to preserve the remains *in situ* to prevent their disturbance or destruction.

- The steel/rubbish and fill that had accumulated on the surface and surrounding the archaeological item were removed to a depth of 100-200 millimetres to create an even surface.
- The void was then filled with clean sand to support the inward curving bricks and fill voids within the fill.

- A shade cloth and then steel mesh were placed over the item to further protect it, and act as a visual alert should future excavation works occur in the locality. This would also protect the item from the weight of the material in the stockpile.
- Approximately 300 millimetres of sand was the introduced to the area to create an even surface.

The draft plan of subdivision for the site indicates that a development lot is proposed to be located in the vicinity of the cistern/well remains (Figure 11). It is presumed that this development will remove, or substantially damage, any archaeological remains in this location.

5.2 Statement of heritage impact

With the exception of the cistern/well remains, the study area has been assessed as having low archaeological potential, and it is highly likely that substantially intact non-Indigenous archaeological deposits have been impacted or removed by development of the site. Table 5 provides a Statement of Heritage Impact (SoHI) for the proposed works.

Table 5: SoHI

Development	Discussion
What aspects of the proposal respect or enhance the heritage significance of the study area?	As the M2 Site has already been severely disturbed through earlier uses, the study area itself has little heritage significance.
What aspects of the proposal could have a detrimental impact on the heritage significance of the study area?	The proposal will have a detrimental impact on the archaeological remains by their removal and/or substantial disturbance. The proposal will therefore have a negative impact on the heritage significance of the archaeological resource. However, the study area has previously undergone substantial disturbance through the construction of the M2 Motorway and the use of the area as a stockpiling and compound site. It is highly likely that the cistern/well represents the only remaining archaeological resource within the M2 site. If the remains of the cistern/well are removed using the methodology outlined in the following sections, the maximum amount of information can be obtained from the archaeological resource. This information may answer a selection of research questions that can provide information regarding the occupation and use of the study area. The data obtained has the potential to supplement our knowledge of the occupation of the North Ryde area.
Have more sympathetic options been considered and discounted?	n/a

6.0 Management of the Archaeological Resource

6.1 Background

As the Statement of Heritage Impact has shown, the archaeological remains of the cistern/well are likely to be detrimentally impacted by future works on the M2 Site. As the item meets the threshold for local significance under Criterion E Archaeological research potential, a program of archaeological excavation with a preliminary monitoring stage to re-identify the location of the cistern/well is recommended. As the cistern/well is not deemed significant enough to warrant *in situ* conservation, and the ability of the resource to contribute to meaningful research questions would depend on the nature of the material within the cistern/well, excavation and recording of the remains is the most appropriate method for attaining maximum information from a resource that would otherwise be destroyed.

A description of the archaeological monitoring and excavation methodologies will be included in the following sections.

6.2 Aims of the archaeological investigation

The following research design has been divided into two sections reflecting the requirements of the site. A program of archaeological monitoring has been recommended for the 'exclusion zone', the 15 metre perimeter set back recommended in the NRSP DCP 2013 (Control 3). The program will allow for the identification of any additional archaeological remains in the locality, and re-identify the remains of the cistern/well. A program of archaeological excavation will then be implemented. This program will determine whether artefactual remains relating to the earlier phases of the use of the cistern/well are present within fill material. It should be noted that the 20th century decommissioning of a cistern/well is often evidenced by a single homogenous fill, and rarely contains evidence of subsequent filling events or stratigraphic layers of material. Backfilling in itself is not a significant event and is unlikely to have connection with the individuals who constructed or used the structure. Therefore the final excavation strategy adopted will be determined by the archaeologist on site after the nature of the material within the cistern/well has been determined, and the structure itself examined.

6.2.1 Archaeological monitoring research design

A program of archaeological monitoring has been recommended for the 15 metre buffer around the known location of the cistern/well. This area has limited potential to contain the archaeological remains of a structure associated with the cistern/well and when HLA Envirosciences examined the site in 2002 no additional archaeological remains were identified.

The primary aim of the monitoring program will be to identify the location of the cistern/well, and oversee the removal of the material covering it.

6.2.2 Archaeological excavation research design

The archaeological excavation of the cistern/well within the M2 site is required to allow archaeologists to determine the nature, extent and age of the structure. There is also the possibility that the material contained within backfilled material within the structure may have the potential to answer specific research questions regarding earlier occupants of the study area.

As the cistern/well will be damaged by the proposed works, this work is necessary to salvage as much information regarding the archaeological resource at the site as possible.

6.3 Methodology

As the previous section, the following methodology has also been divided into two sections reflecting the requirements of the site.

6.3.1 Archaeological Monitoring Methodology

Archaeological monitoring is a method of investigation that can have minimal disturbance to the works program of the contractor, as the nominated archaeologist/s observes the contractors works and generally does not require specific actions be carried out by the contractor. It is a method utilised where large areas are required to be excavated, and where structures encountered are likely to be contained and highly visible, such as wells and cisterns. If any archaeological remains are encountered, works in the area should cease until the archaeologist/s has investigated and recorded the structure/deposit.

Although the chance of encountering archaeological remains other than those of the cistern/well is unlikely, the extent of an archaeological monitoring program is difficult to determine as the duration of time required is dependent on many unknown factors. As a general rule, the contractor will be required to have an archaeologist present for the excavation of material within the 15 metre buffer surrounding the location of the cistern/well.

6.3.2 Archaeological Excavation Methodology

The nature of the archaeological resource cannot be identified until further intrusive investigation is undertaken. Initially archaeologists would remove introduced material to fully expose and record the upper levels of the structure.

If the structure is found to be a well it is likely to be relatively deep and possibly constructed into underlying bedrock. The material within the well would be manually excavated to a depth of 1.5 metres,

and the remaining fill would be excavated by machine to the base of the structure. As wells can be up to 5 metres in depth this may require the removal of material by machine via the excavation of a trench, with benched sides (if required), which would allow the operator to remove one side of the well and its fill somewhat systematically. This provides some measure of control over how the material is removed which would assist the archaeologist in the identification of stratigraphic relationships between deposits and artefacts as the excavation progresses.

If the structure is found to be a cistern it is more likely to have a formalised base constructed of brick or stone, and cisterns tend to be shallower structures than wells. Any material within the structure will be excavated manually to a depth of 1.5 metres, then by excavator under the supervision of the on-site archaeologist.

The contractor will be required to provide a qualified driver and 5 tonne excavator with batter bucket for the duration of the excavation, as areas may need to be backfilled or excavated by machine as dictated by the archaeological resource encountered The excavator may also be required to maintain site batters to comply with Occupational Health and safety requirements as the excavation progresses. The excavator will be under the supervision of an archaeologist at all times during operation.

The structural remains of the cistern/well would be recorded during the course of excavation. This recording would be undertaken using context recording forms, scale drawing and photography. The excavation area will be planned at a scale of 1:50. Any sections or elevations will be planned at 1:20. All artefacts would be collected and recorded according to context. All structural material would be sampled where possible (bricks, mortar, timber and plaster, for example).

It is possible that the lower fills within the structure may represent sediment that has accumulated throughout the functioning life of the cistern/well. It may be useful to take environmental samples of this material to obtain environmental information regarding the use of the surrounding area (such as pollen and soils analysis).

6.4 Research questions

The archaeological resource has the potential to answer a number of research questions. Additional research questions may be added if the archaeological resource allows for further, or more in-depth, investigation.

- What is the nature of the structure? Is it a well or cistern?
- What is the nature of the material within the structure? Does it represent discrete filling events, or does the material indicate that a single backfilling event occurred when the structure was decommissioned?

- Are artefacts present within the fill material? Can these deposits provide an indicative date range for either the main period of use of the cistern/well, or indicate when the cistern/well went out of use? Do these artefacts indicate whether the water stored within the structure was utilised for domestic or agricultural purposes?
- Is there evidence of how the structure was constructed? Can the building materials used in the construction of the cistern/well be associated with any specific manufacturer or do they indicate small-scale/local brick production?

6.5 Reporting

6.5.1 Reporting

A comprehensive excavation report will be produced outlining the results of the excavation and monitoring programs and interpreting the archaeological remains. A synthesis of artefactual information, contextual relationships and historical resources will be included in the report.

6.5.2 Artefacts

Artefacts will be analysed and catalogued by a specialist. Specialist artefact reports will be produced following outlining the findings of the cataloguing program which will inform the final synthesis and be included in the excavation report.

6.5.3 Staffing

The nominated excavation director is Mike Hincks, Senior Archaeologist at Artefact Heritage. Mike has been Excavation Director for test excavations at 2 Morton Street and monitoring in Church Street Mall Parramatta. He has been Area Supervisor on large scale open area excavations at Barangaroo South, Darling Quarter, and 15 Macquarie Street, Parramatta. He has managed state significant monitoring programs at Cumberland Hospital, Old Government House, Parramatta Park Gatehouse, Macquarie Lightstation, Cockatoo Island Convict Precinct and Richard Johnson Square. He has over 10 years' experience in Aboriginal and non-Indigenous archaeology in NSW.

Jenny Winnett is an Archaeologist at Artefact Heritage. She has over six years' experience in non-Indigenous archaeology in NSW including extensive fieldwork in Sydney.

7.0 Aboriginal Archaeological Assessment

7.1 Background

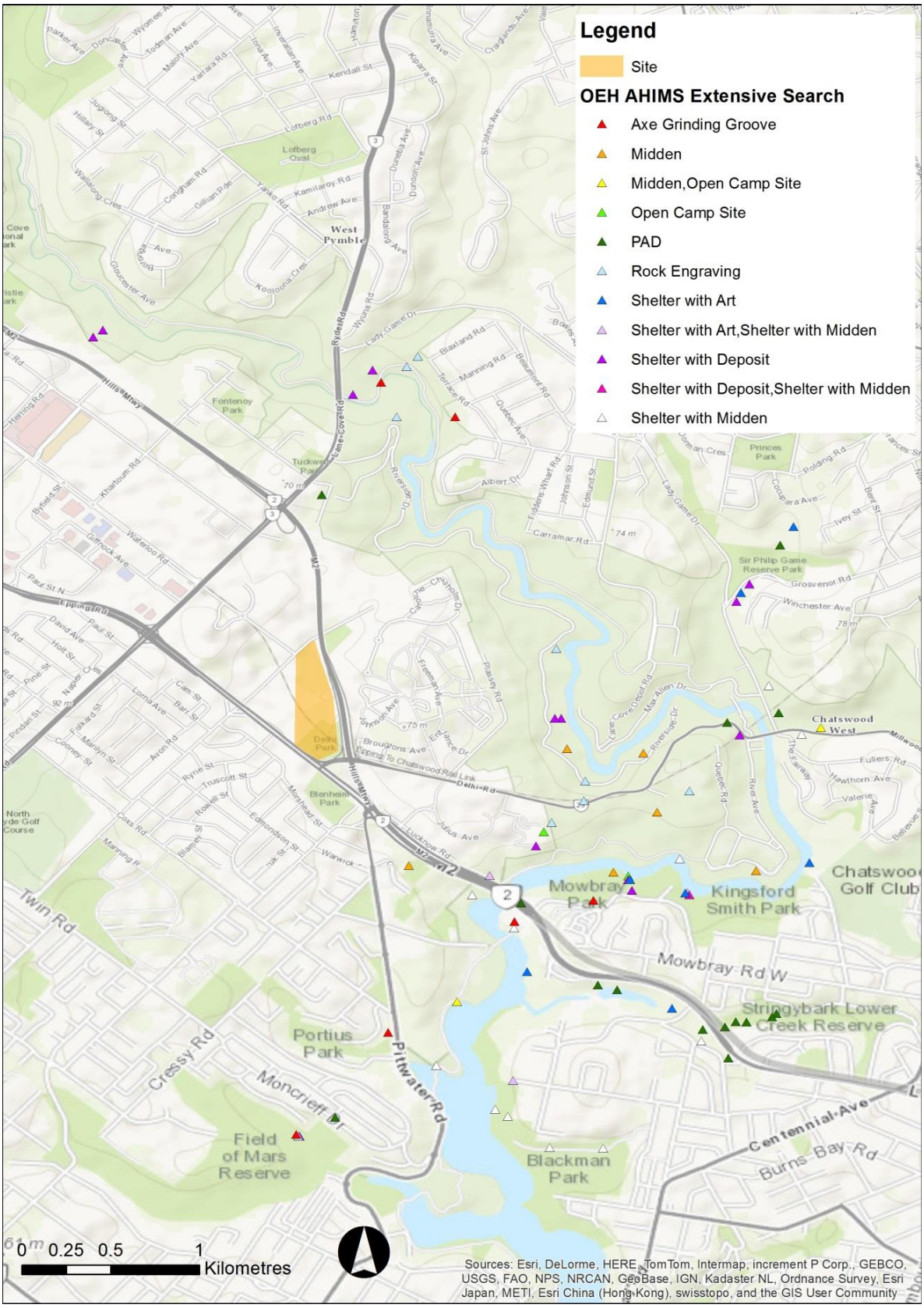
The following is a brief summary of the Aboriginal Archaeological Assessment included in the North Ryde Station Precinct Rezoning Study, prepared by Artefact Heritage in November 2012. The aim of the Aboriginal archaeological assessment was to assess the potential for Aboriginal sites to exist within the study area, whether on the surface or within buried archaeological deposits.

7.2 Registered Aboriginal sites in the local area – AHIMS search

A search of the Aboriginal Heritage Information Management System (AHIMS) was conducted on 15 July 2011, an additional AHIMS search was carried out on 27 June 2012 and another AHIMS search was undertaken in the 17 April 2014. This search fulfils OEH guidelines which state that a search is not valid for due diligence purposes after 12 months. The searches took in a 5 km radius of the study area. There are no Aboriginal archaeological sites registered within the study area. Seventy-six registered Aboriginal sites are located within the search area (Figure 12). Site types include axe grinding grooves, rock shelters, rock art, areas of potential archaeological deposit and open artefact scatters. The majority of the registered sites are rockshelters.

The location of Aboriginal sites is considered culturally sensitive information. It is advised that this information, including the AHIMS data map should be removed from this report if it is to enter the public domain.

Figure 12: Map of registered sites in the vicinity of the M2 Site.



7.3 Survey results and assessment of archaeological potential

The potential for archaeological deposits remaining within the study area is strongly correlated to the levels of previous ground disturbance as well as factors such as landform unit and soil type. As stone artefacts are generally found within the top 20-30cm of the soil profile and rarely within clayey subsoil, any disturbance of the topsoil is likely to have destroyed or disturbed existing archaeological deposit. Much of the study area has been subject to historical landscape modifications (levelling, building, horticulture etc.), or to subsurface earth works which would have impacted on any surface or subsurface archaeological deposits.

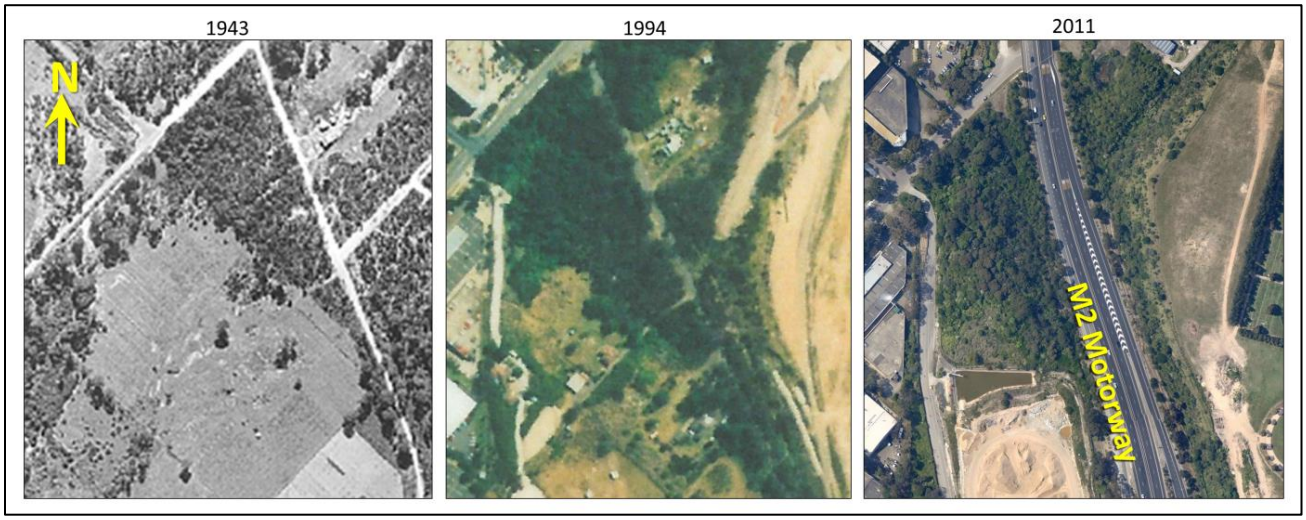
Assessments of archaeological potential should also consider the predictive statements as to which site types are most likely, and whether the landform units associated with these site types are present. For example, the most common site type within the vicinity of the study area is rock shelters with deposit. These would only occur in landform units that contain suitable rock outcrops with aggrading deposits.

7.3.1 Aboriginal archaeological potential

The majority of the M2 Site has been subject to various impacts, beginning with clearing and ploughing in the later 19th century. The construction of the M2 Motorway had a major impact on the eastern side of the site, while earthworks across the remainder of the site have also acted to strip away the top of the soil profile.

At the northern end of the site is an area of around five acres that is vegetated and appears to have been subject to low-moderate disturbance (see Figure 13). The eastern section of the northern end of the site, along the M2, appears to have the lowest levels of ground disturbance with the western section of the northern end of the M2 Site subject to clearing and agricultural activities, probably cultivation of orchards.

Figure 13: Aerial photos showing minimal disturbance in northern portion of M2 Site



It was observed that M2 Site was within a sandstone landscape with skeletal soils which are generally unlikely to contain buried archaeological deposits. Some sandstone platforms were located but the sandstone was relatively degraded and not ideal for engraving (Figure 14).

Porters Creek which runs across the northern end of the site was surveyed along its banks (Figure 15). At the entrance to the M2 Site, the creek passes through a large round culvert. The construction of the culvert has caused disturbance to the creek banks in this area. The creek banks are also highly eroded due to scouring caused by flooding and storm water run-off. Sandstone outcrops and boulders along the creek were examined for axe grinding grooves, but none were noted.

Figure 14: Sandstone outcrop in northern portion of M2 Site

Overall the M2 Site was assessed as having a low-no archaeological potential. The majority of the site has been subject to high levels of ground disturbance and has no Aboriginal archaeological potential, while the northern section of the study area has a low-moderate disturbance level but is assessed as having a low archaeological potential due to its skeletal soils and lack of rock shelters.

The M2 Site, including the northern less disturbed section were also investigated during previous studies such as the environmental assessments prior to the construction of the M2 and the M2 upgrade. None of these studies identified the M2 site as having Aboriginal archaeological sensitivity.

Figure 15: Creek at northern end of M2 Site

8.0 Conclusions and recommendations

8.1 Non-Indigenous heritage

8.1.1 Conclusions

On the basis of background research and adhering to all statutory obligations it was found that:

- The study area has low potential to contain archaeological remains other than those of the cistern/well that was identified and re-buried in 2002. The area has been severely disturbed through its earlier use as a stockpile and compound site, and during the construction of the M2 Motorway.
- The cistern/well has local significance (after assessment under the *NSW Heritage Manual* and the *Archaeological Assessment Guidelines).* As the proposal will irreparably damage or remove the archaeological resource, a program of archaeological monitoring and excavation has been deemed the most appropriate mitigation.

8.1.2 Recommendations

It is therefore recommended that;

- A short program of archaeological monitoring will be required to re-identify the cistern/well, and ensure it is uncovered without further damage. The monitoring program will commence within the 15 metre perimeter buffer around the known location of the cistern/well. The monitoring program will also identify any additional archaeological remains within the study area. If unexpected archaeological remains are encountered during the monitoring phase, adequate time and resources should be afforded to the archaeologist/s on site to identify, excavate and record the remains (if necessary)
- Archaeological excavation of the cistern/well should be conducted by a suitably qualified archaeologist. It is recommended that the material within the structure be manually excavated to a depth of 1.5 metres. This excavation phase will allow the archaeologist/s to identify and record the structure, and take samples of any material within the fill. If the structure is more than 1.5 metres in depth the remainder of the fill will need to be excavated by machine to meet occupational health and safety requirements. Appropriate samples will be taken. Artefacts will be collected and examined by specialists.
- This is a State Significant Development and therefore permits not required. DGRs and Ministers Conditions of Approval would need to be fulfilled.

8.2 Aboriginal heritage

8.2.1 Conclusions

Overall the M2 Site was assessed as having a low-no archaeological potential. The majority of the site has been subject to high levels of ground disturbance and has no Aboriginal archaeological potential, while the northern section of the study area has a low-moderate disturbance level but is assessed as having a low archaeological potential due to its skeletal soils and lack of rock shelters.

- There are no recorded Aboriginal sites within the study area.
- Overall the study area has low Aboriginal archaeological significance.

8.2.2 Recommendations

The following recommendations are based on consideration of:

- Statutory requirements under the *National Parks and Wildlife Act 1974* as amended.
- The results of the background research, site survey and assessment.
- The interests of the Aboriginal stakeholder groups.

It is recommended that:

- There are no constraints on the proposal in regard to Aboriginal heritage.
- If Aboriginal objects are located during future construction, work should stop immediately and the OEH, the Aboriginal stakeholder groups, and an archaeologist should be contacted. Further archaeological work may be required. This process should be outlined in the CEMP.

If sites are located during construction they must be recorded on an OEH site recording form and submitted to the Aboriginal Heritage Information System register.

9.0 References

Artefact Heritage (2011) *150 Epping Rd, Lane Cove West–Heritage Study Aboriginal Cultural Heritage Assessment and Assessment of non-Indigenous heritage for a Concept Plan application*. Report to Rose Group.

Artefact Heritage (2012) *North Ryde Station Precinct Rezoning Study*. Report to Transport for New South Wales.

Attenbrow, V. (2010) *Sydney's Aboriginal Past: Investigating the archaeological and historical records*. UNSW Press.

Bradley (1969) *A Voyage to New South Wales. The Journal of Lieutenant William Bradley RN of HMS Sirius 1786-1792.*

Collins, D. 1798. (1975). *An Account of the English Colony of New South Wales, Volume 1*, edited by B.H. Fletcher, A.H. & A.W. Reed in association with the Royal Australian Historical Society, Terry Hills, NSW.

Farlow (2008) 'North Ryde' *Dictionary of Sydney* Accessed on 27/7/11 at: < http://www.dictionaryofsydney.org/entry/north_ryde>

HLA Eurosciences (2002) *Archaeological Assessment, Cistern M2 Worksite, Parramatta Rail Link.* Report to Thiess Hochtief Joint Venture.

NSW Heritage Branch (2001) *Assessing Significance*.

NSW Heritage Branch (2009) *Assessing Significance for Historical Archaeological Sites and Relics*.

Redding, G. (1986) *A History of North Ryde, 1850-1950* (North Ryde Public School Ex-Pupils History Group).

Smith, V. (2005) *Wallumedegal: An Aboriginal history of Ryde*. City of Ryde.

The Sydney Morning Herald 6 June 1919 'Death notice of William Owen'