

# Appendix G

Heritage assessment

Googong Township water cycle project

Environmental Assessment

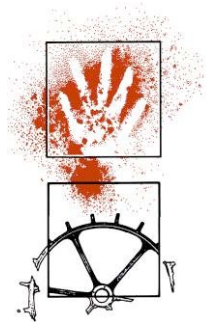
November 2010



# Googong New Town Trunk Water and Recycled Water System

## Aboriginal and Historical Archaeological Assessment

October 2009



**Navin  
Officer**

*heritage  
consultants Pty Ltd*

*acn: 092 901 605*

*Number 4  
Kingston Warehouse  
71 Leichhardt St.  
Kingston ACT 2604*

*ph 02 6282 9415  
fx 02 6282 9416*

A Report to Canberra Investment Corporation



## EXECUTIVE SUMMARY

The Googong Trunk Water and Recycled Water System is part of the Googong New Town project.

Most of the Googong Trunk Water and Recycled Water System study area has already been subject to cultural heritage survey and assessment.

The area of the water reticulation study area includes some areas that extend outside of previously assessed areas.

The current study, therefore, included field survey of the (previously unassessed) eastern section of the potable water supply main and pump station and the water recycling plant and pump station, and a review of the entire Googong Trunk Water and Recycled Water System study area.

### *The study found that:*

- Nine Aboriginal sites have previously been recorded within the Googong Trunk Water and Recycled Water System study area (GA6 and GA7, GA21-GA27).
- Artefacts have been collected from sites GA21, GA24, and GA26 (Navin Officer Heritage Consultants (NOHC) 2009b).
- Three Potential Archaeological Deposits (PADs) have previously been recorded within the Googong Trunk Water and Recycled Water System study area (PADs 16, 17 and 18).
- A program of archaeological test excavation has been conducted at each of the PADs (NOHC 2009b).
- Four Aboriginal sites (GWTP1-GWTP4) were identified in the course of current field investigations. The sites comprised three artefact scatters (GTWP1 - GTWP3) and one isolated find (GTWP4).
- No (previously unrecorded) areas of potential archaeological deposit were identified in the course of current field investigations.
- Three historic heritage sites (GH12 – a European Midden, GH13 – ‘Beltana’ Homestead, and GH14 – a hut site and ploughlands) have previously been recorded within the Googong Trunk Water and Recycled Water System study area.
- Site GH11 was previously identified as a possible historic heritage site. Subsequent investigation of GH11 has shown it to be a natural feature.
- Subsequent investigation of the ploughland feature associated with site GH14 has shown it to be a modern feature.
- An archaeological test excavation and historical investigation was undertaken at Site GH14 in February 2009 (NOHC 2009a). Further archaeological works are continuing at site GH14 independent of this current study.
- No (previously unrecorded) historic heritage sites were identified in the course of current field investigations.



*It is recommended that the following requirements form part of the Statement of Commitments for the Googong Trunk Water and Recycled Water System project.*

- No further works are required at (previously collected) Aboriginal sites GA21, GA24 and GA26.
- No further works are required at (previously investigated) Aboriginal PADs 16, 17 and 18.
- If impact is anticipated at Aboriginal sites GWTP1 - GWTP4, GA6, GA7, GA22, GA23, GA25 and GA27, then visible Aboriginal artefacts at the sites should be re-positioned away from areas of potential impact. These works should be completed by an archaeologist and representatives of the local Aboriginal community.
- Impact to historic sites GH12 – European Midden, and GH13 – ‘Beltana’ Homestead, should be avoided.
- If impact to historic sites is unavoidable, then further assessment including detailed site survey and archival research and recording is required. Some elements of these sites may require preservation.

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## 1.0 INTRODUCTION

### 1.1 Project Description

The Googong Trunk Water and Recycled Water System is part of the Googong New Town project (Figure 1.1). Major works associated with the Project, some aspects of which will relate to a potable water pumping station proposed to be contained within an existing Water Treatment Plant [WTP] site, include:

- Clearing and grubbing of land, stripping and stockpiling topsoil;
- Bulk earthworks (cut to fill) to design levels, including re-grading;
- Trench excavation for sewer, storm water, potable water main, recycled water main services and backfilling of all underground services;
- Construction of the WRP and pumping stations;
- Construction of rip rap and placement of other erosion protection material;
- Excavation for, and planting of trees, shrubs, grasses and for dry mulches; and
- Rehabilitation and re-installation of all disturbed and/or re-graded areas.

Specifically, the proposed works for the potable and recycled water delivery mains is related to the WTP. The construction activities associated with the trunk mains/delivery mains from the proposed pumping station (to be sited in the WTP) to the reservoirs (just east of Old Cooma Road, and south of Googong Dam Road) and back to NH1A (Neighborhood 1A) connections south of Googong Dam Road will involve:

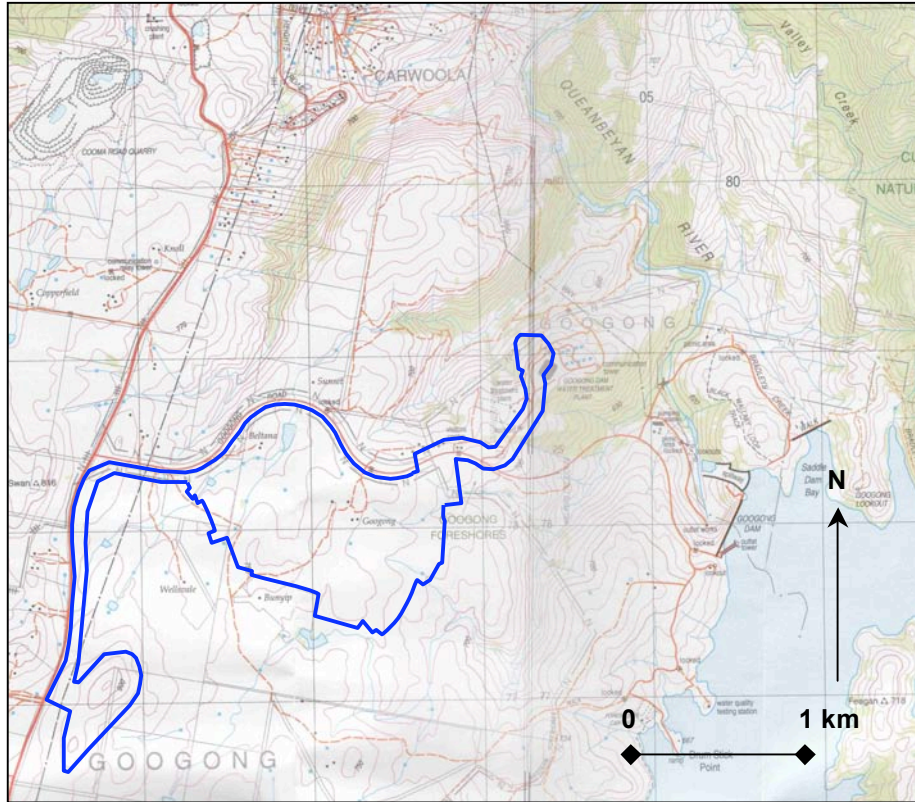
- Clearing of low value trees, as required, and excavation of a trench to place water mains (up to 675 mm diameter);
- Backfilling of trenches; and
- Reinstating the surface.

Most of the Googong Trunk Water and Recycled Water System study area has already been subject to cultural heritage survey and assessment (Navin Officer Heritage Consultants [NOHC] 2003 and 2008). The area of the water reticulation study area does, however, include some areas that extend outside of previously assessed areas. The current study, therefore, includes field survey of the (previously unassessed) eastern section of the potable water supply main and pump station and the water recycling plant and pump station (Figure 1.2), and a review of the entire Googong Trunk Water and Recycled Water System study area.

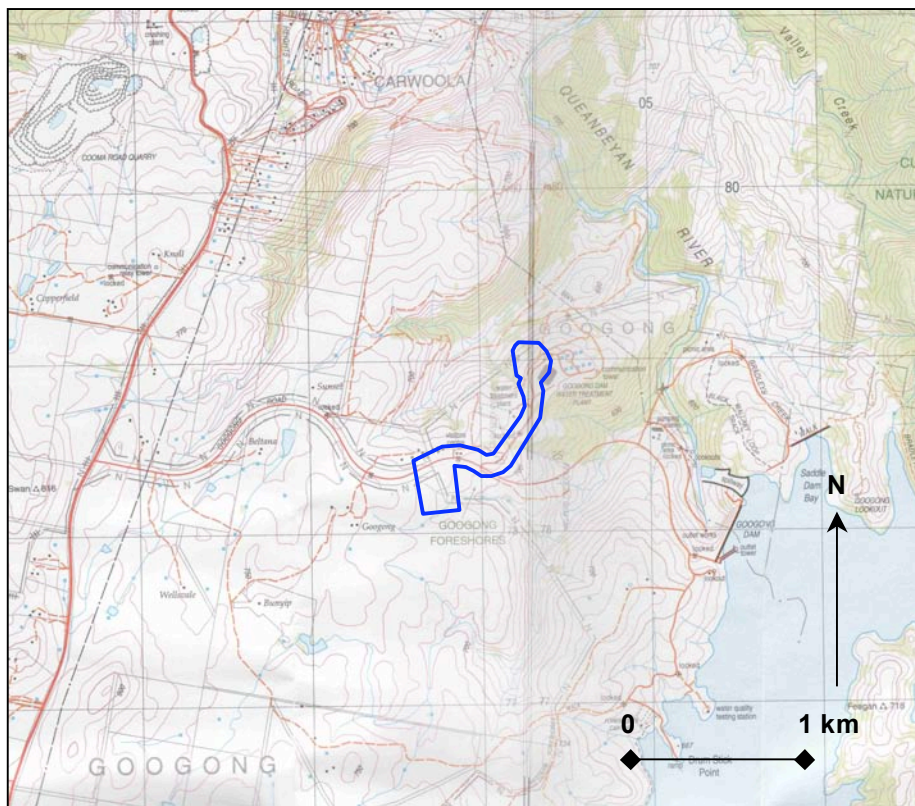
This report documents the results of the survey and review conducted for the Googong Trunk Water and Recycled Water System. The report was commissioned by Canberra Investment Corporation.

### 1.2 Legislative Approval and Requirements

The proposed Googong Trunk Water and Recycled Water System scheme will be assessed under part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A ACT).



**Figure 1.1** Location of the Googong Trunk Water and Recycled Water System (blue) (Tuggeranong 8727-3S and Hoskinstown 8727-2S 1:25,000 topographic maps)



**Figure 1.2** Googong Trunk Water and Recycled Water System study area subject to field survey in the current study (blue) (Tuggeranong 8727-3S and Hoskinstown 8727-2S 1:25,000 topographic maps)





## 1.3 Report Outline

This report:

- Documents consultation with local Aboriginal organisations carried out in the course of the archaeological assessment;
- Describes the environmental setting of the study area;
- Provides a background of local and regional archaeology and history for the study area;
- Describes the results of a field survey of the Googong Trunk Water and Recycled Water System study area; and
- Provides management recommendations based on the results of the investigation and the anticipated impacts of the proposed development on the archaeological resource.

## 2.0 ABORIGINAL PARTICIPATION

Canberra Investment Corporation engaged five Aboriginal organisations to participate in the field survey for the Googong Trunk Water and Recycled Water System scheme.

These groups were the:

- Buru Ngunawal Aboriginal Corporation (BNAC),
- King Brown's Tribal Group (KBTG);
- Little Gudgenby River Tribal Council (LGRTC),
- Ngambri Local Aboriginal Land Council (NLALC), and
- Yukembruk Merung (Ngarigo Consultancy Pty Ltd) (YMNC).

Contact was made with each of the above groups to inform them of the project and to organise representation during the field survey.

Subsequently, a representative from all of the groups attended and actively participated in the field program for the current investigation. The representatives were:

- Wally Bell (BNAC),
- Tina Williams (KBTG),
- Joe House (LGRTC),
- Geoffrey Murray (NLALC); and
- Ross Thomas (YMNC).

*Records of Aboriginal Field Participation* are provided in Appendix 1.

A copy of this report will be forwarded to each of the participating Aboriginal community organisations for their information.



## 3.0 STUDY METHODOLOGY

### 3.1 Literature and Database Review

A range of archaeological and historical data was reviewed for the Googong Trunk Water and Recycled Water System study area and its surrounds. This literature and data review was used to determine if known Aboriginal and historical sites were located within the area under investigation, to facilitate site prediction on the basis of known regional and local site patterns, and to place the area within an archaeological and heritage management context.

The review of documentary sources included heritage registers and schedules, local histories, and archaeological reports, including previous reports conducted for Googong New Town.

Searches were undertaken of the following statutory and non-statutory heritage registers and schedules:

- Statutory Listings:
  - : The National Heritage List (Australian Heritage Council);
  - : The Commonwealth Heritage List (Australian Heritage Council);
  - : The Register of the National Estate (Australian Heritage Council);
  - : The State Heritage Register (NSW Heritage Office); and
  - : Heritage Schedule(s) from the Queanbeyan Draft Local Environmental Plan (Googong) 2007.
- Non-Statutory Listings:
  - : The State Heritage Inventory (NSW Heritage Office); and
  - : Register of the National Trust of Australia (NSW).

### 3.2 Fieldwork

The Googong Trunk Water and Recycled Water System study area was inspected by archaeologists Nicola Hayes, Deirdre Lewis-Cook, and Aboriginal representatives in June 2009. All areas of ground surface visibility within the study area were inspected for Aboriginal objects (artefacts) and historical sites/features.

This report was prepared by Deirdre Lewis-Cook and edited by Kerry Navin.

### 3.3 Recording Parameters

The archaeological survey of the Googong Trunk Water and Recycled Water System study area aimed at identifying material evidence of Aboriginal and European occupation as revealed by surface artefacts and areas of archaeological potential unassociated with surface artefacts. Potential recordings fall into two broad categories: sites and potential archaeological deposits. (No European sites or features were identified in the study area so these recording parameters are not included in this report).



## Sites

A site is defined as any material evidence of past Aboriginal activity that remains within a context or place which can be reliably related to that activity. Most Aboriginal sites are identified by the presence of three main categories of artefacts: stone or shell artefacts situated on or in a sedimentary matrix, marks located on or in rock surfaces, and scars on trees.

Frequently encountered site types within southeastern Australia include stone artefact occurrences - including isolated finds and open artefact scatters, coastal and freshwater middens, rock shelter sites - including occupation deposit and/or rock art, grinding groove sites and scarred trees. For the purposes of this section, only the methodologies used in site identification for the recording types relevant to this investigation is provided below.

### Stone Artefact Occurrences

Stone artefact occurrences are the most commonly recorded site type in Australia. They may consist of single artefacts - described as isolated finds; or as a distribution of more than one artefact - often described as an artefact scatter or 'open camp site' when recording surface artefacts, or as a subsurface artefact distribution when dealing with an archaeological deposit.

Where artefact incidence is very low, either in terms of areal distribution (artefacts per square metre) or density (artefacts per cubic metre), then the differentiation of the recording from background artefacts counts or background *scatter* may be an issue.

#### *Isolated finds*

An isolated find is a single stone artefact, not located within a rock shelter, and which occurs without any associated evidence of Aboriginal occupation within a radius of 60 metres. Isolated finds may be indicative of random loss or deliberate discard of a single artefact, the remnant of a now dispersed and disturbed artefact scatter; and an otherwise obscured or sub-surface artefact scatter.

Except in the case of the latter, isolated finds may be considered to be constituent components of the *background scatter* present within any particular landform.

The distance used to define an isolated artefact varies according to the survey objectives, the incidence of ground surface exposure, the extent of ground surface disturbance, and estimates of *background scatter* or *background discard* densities. In the absence of baseline information relating to background scatter densities, the defining distance for an isolated find must be based on methodological and visibility considerations. Given the varied incidence of ground surface exposure and deposit disturbance within the study area, and the lack of background baseline data, the specification of 60 metres is considered to be an effective parameter for surface survey methodologies. This distance provides a balance between detecting fine scale patterns of Aboriginal occupation and avoiding environmental biases caused by ground disturbance or high ground surface exposure rates. The 60 metre parameter has provided an effective separation of low density artefact occurrences in similar southeast Australian topographies outside of semi-arid landscapes.

#### *Artefact scatters*

Artefacts situated within an open context are classed as an open artefact scatter (or 'open camp site') when two or more occur no more than 60 metres away from any other constituent artefact. The 60 metre specification relates back to the definition of an isolated find (*Refer above*). The use of the term *scatter* is intended only to be descriptive of the current archaeological evidence and does not infer the original human behaviour which formed the site. The term *open camp site* has been used extensively in the past to describe open artefact scatters. This was based on ethnographic modelling suggesting that most artefact occurrences resulted from activities at camp sites. However, in order to separate the description from the interpretation of field evidence, the terms *artefact scatter*, *artefact distribution* or *artefact occurrence* are now more extensively used. The latter two options can also be used to categorise artefacts occurring in sub-surface contexts.



## 4.0 ENVIRONMENTAL CONTEXT

The Googong New Town area comprises undulating terrain bordering a series of relatively steep gullies along Jerrabomberra Creek in the west, Gorge Creek in the north and a small portion of the Queanbeyan River in the northeast. Land elevations vary from approximately 600 m AHD along the Queanbeyan River to 816 m at Swan Hill, which forms part of a low series of ridges that run northwest to southeast through the centre of the Googong New Town area study area. Drainage to the west of these ridges runs from a series of minor tributaries into Jerrabomberra Creek, which then drains to the north. To the southeast of the ridges the land is drained to the east into the Googong Dam, while to the northeast water is drained to the north from Gorge Creek and another similar steep gully into the Queanbeyan River that flows to the north.

Bedrock in the Googong New Town area consists predominantly of Silurian aged rocks belonging to the Colinton Volcanics, as well as granites and Mt Pleasant Porphyry, the latter being restricted mainly to the vicinity of Gorge Creek. Soils in the Googong Trunk Water and Recycled Water System study area are characterised by massive earths consisting of Monga, Colinton, Springbank and Michelago soils, and texture contrast soils such as Nyora, Cowper and Reidsdale (Gunn et al 1969).

The soils are typically shallow and contain large quantities of bedrock gravels and cobbles, with bedrock also frequently exposed at ground level on crests and ridge slopes, or as outcrops along the creek lines and steeper ridge slopes. However, on the low gradient basal slopes and creek flats deposits tend towards deeper sandy or loamy soils.

Most of the area has been cleared for pastoral purposes, and indeed pastoralism has been the dominant activity in the area since European settlement in the early to mid nineteenth century. Vegetation in the study area consists of savannah woodland and pockets of dry sclerophyll forest. Canopy trees are predominantly Eucalyptus species (*E.melliodora* & *E.Bridgesiana*), most of which represent regeneration following nineteenth century clearance and firing of the original vegetation.



## **5.0 ABORIGINAL CONTEXT**

### **5.1 Contextual Information**

Information on tribal boundaries and ethno-history, regional overviews and previous archaeological investigations in the local Googong area has been included in previous Googong New Town reports (NOHC 2003, 2007). The reader is directed to these reports for this contextual information.

### **5.2 The Study Area**

Two archaeological assessments are relevant to the Googong Trunk Water and Recycled Water System study area.

In 2003 NOHC conducted a survey as part of a Local Environmental Study (LES) for a proposal to rezone approximately 1000 hectares of rural land at Googong for a new residential development. This study included the majority of the Googong Trunk Water and Recycled Water System study area.

Eighteen previously recorded Aboriginal sites were known to exist in the Googong LES study area prior to the 2003 field survey. A further thirty-four Aboriginal sites, comprising twenty artefact scatters and fourteen isolated finds, together with a further twenty-four areas of potential archaeological deposit, were identified in 2003.

Nine of the Aboriginal sites and three of the PADs recorded during the 2003 survey occur within the Googong Trunk Water and Recycled Water System study area.

In 2008 an archaeological excavation and collection program was conducted within Googong New Town Neighbourhood 1A and some creek stabilisation areas.

Excavations were conducted at PADs 16, 17 and 18 and artefact collections were conducted at GA21 (DECC Site No 57-2-0387), GA24 (DECC Site No 57-2-0390) and GA26 (DECC Site No 57-2-0392). These sites were within the excavation areas of GPAD 16 (GA24 and GA26) and GPAD17 (GA21).

The results of these collections and excavations are pending (NOHC 2009b).

### **5.3 Previously Recorded Sites**

Nine Aboriginal sites - GA6, GA7 and GA21-GA27 and three PADs - PAD16-18, recorded during in 2003 (NOHC 2003), occur within the Googong Trunk Water and Recycled Water System study area.

The locations of previously recorded Aboriginal sites and PADs within the Googong Trunk Water and Recycled Water System project area are shown in Figure 7.13.



## 6.0 HISTORICAL CONTEXT

### 6.1 Contextual Information

An outline of European nineteenth century land settlement and previous historical heritage investigations for the local Googong area has been included in previous reports (NOHC 2003, 2007 and 2008). The reader is directed to these reports for this contextual information.

### 6.2 The Study Area

The study area is located within the Parish of Googong, County of Murray (Figure 6.1). Charles Campbell is shown as holding the earliest land grant (Portion 3 - 1209 acres) within the study area. Other early land alienations were conditional purchases of 30 acres and 640 acres to John McCawley (Portions 16 and 97 respectively).

The remainder of the portions within the study area comprise a camping and water reserve, and land owned by the Bank of New South Wales. Table 6.1 below summarises the earliest land alienations as indicated by the 1905 third edition parish maps.

**Table 6.1** Early land alienations as indicated by the 1905 third edition parish maps

Parish	Portions	Name
Googong	3	Charles Campbell
Googong	1, 11	John Feagan
Googong	12	James Brown
Googong	16, 97	John McCawley
Googong	2	Camping and Water Reserve
Googong	62, 42	Bank of New South Wales

In 2003 NOHC conducted a survey as part of a Local Environmental Study (LES) for a proposal to rezone approximately 1000 hectares of rural land at Googong for a new residential development.

Five historic sites were recorded in the LES study area prior to the 2003 survey.

Seventeen historic sites, including several previously identified sites, were recorded in the course of the 2003 project. These sites comprised:

- a shearing shed complex (GH1);
- stone feature (GH2);
- European middens (GH3, GH12);
- fence lines (GH4, GH6);
- hut sites and associated features (GH5, GH8, GH11, GH14);
- homestead complexes (GH7, GH9, GH13, GH15);
- an abandoned tractor (GH10); and
- sites associated with mining (GH16, GH17).



### 6.3 Previously Recorded Sites

Four previously recorded European sites, a possible hearth (GH11); a European midden (GH12); 'Beltana' Homestead (GH13); and hut site and ploughlands (GH14) are located within the Googong Trunk Water and Recycled Water System study area.

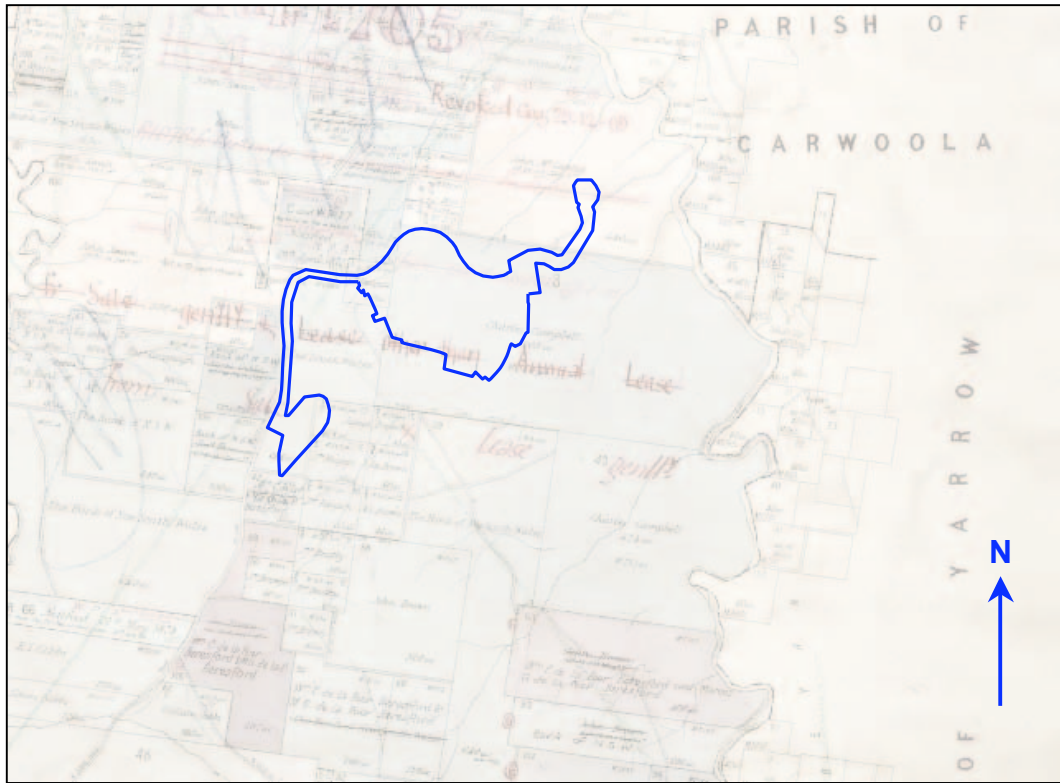
Subsequent investigation of site GH11 has shown it to be a natural feature.

An archaeological test excavation and historical investigation was undertaken into site GH14 in February 2009 (NOHC 2009a). Further archaeological works are continuing at site GH14 independent of this current study.

- The historical investigation showed that the former Portion 1, Parish of Googong [Lot 5 DP255492]), which includes site GH14:
  - : Was first acquired by Patrick Connolly in March 1862;
  - : By July 1863, the farm on that Portion included a hut, a cultivation area and fencing;
  - : By 1865, two houses and stockyards had been built and fencing carried out on the farm;
  - : In 1874, John Feagan acquired the title on the Portion;
  - : Following John Feagan's death, the title was transmitted to his son, William, in 1881;
  - : In 1903, the title was transferred to William's son, John, and to Albert Studdy;
  - : John Feagan transferred his share of the property to Studdy in 1907;
  - : In 1920, Studdy sold to John Caragh Gorman;
  - : A series of mortgages followed until 1957 when Farquhar Southern purchased it; and
  - : Contains the remains of a fireplace (site GH14) which is located in close proximity to the hut indicated on the 1866 plan of that Portion, and that they are probably the same site.
- The archaeological investigation showed that Site GH14:
  - : Contains the remains of a small random rubble fireplace with internal clay render and an earth and clay floor, which may have had a sandstock brick hob; and
  - : Through evidence provided by artefacts found during excavation, the now demolished dwelling associated with the fireplace may have been of timber construction with Crown glass windows and it was probably built in the early 1860s with improvements being made to it (or maintenance carried out on it) some time after 1890; and
  - : Was one of low-level domestic activity during its occupation from the early/mid-1860s to at least 1890.
- The heritage significance assessment for Site GH14 found that as it is probable that the fireplace remains at site are those of Patrick Connolly's 1860's hut/house then the feature has moderate heritage significance and fulfils the criteria for local and State listing; and

Further archaeological works are continuing at site GH14.

The locations of previously recorded historic sites within the Googong Trunk Water and Recycled Water System project area are shown in Figure 7.13.



**Figure 6.1** Extract from Parish map of Googong showing location of study area (blue) and landholdings in the early twentieth century (NSW LPI Map No. 102780 c.1905).





## 7.0 RESULTS

### 7.1 Summary

- Nine Aboriginal sites have previously been recorded within the Googong Trunk Water and Recycled Water System study area (GA6 and GA7, GA21-GA27).
- Artefacts have been collected from sites GA21, GA24, and GA26 (NOHC 2009b).
- Three PADs have previously been recorded within the Googong Trunk Water and Recycled Water System study area (PADs 16, 17 and 18).
- A program of archaeological test excavation has been conducted at each of the PADs.
- Four Aboriginal sites (GWTP1-GWTP4) were identified in the course of current field investigations. The sites comprised three artefact scatters (GTWP1 - GTWP3) and one isolated find (GTWP4).
- No (previously unrecorded) areas of potential archaeological deposit were identified in the course of current field investigations.
- Four historic heritage sites (GH11, GH12, GH13, and GH14) are recorded within the Googong Trunk Water and Recycled Water System study area.
- Historic site GH11 has been re-evaluated and is now considered to be a natural feature.
- The ploughland feature associated with site GH14 has been re-evaluated and is now considered to be a modern feature.
- No (previously unrecorded) historic heritage sites were identified in the course of current field investigations.

### 7.2 Aboriginal Sites

Thirteen Aboriginal sites are recorded for the Googong Trunk Water and Recycled Water System study area.

Three PADs have previously been recorded within the Googong Trunk Water and Recycled Water System study area.

Approximate site and PAD locations are shown on Figure 7.12.

#### ***Previously Recorded Sites and PADs***

Full descriptions of previously recorded Aboriginal sites GA6 and GA7, GA21-GA27 and PAD16-18 are provided in reports by NOHC (2003 and 2008). Summary descriptions of these sites and PADs are provided in below.

#### **GA6 (GDA 0701567.6077281)**

This is a small, low-density site consisting of two identified artefacts on a minor spur crest within a wide saddle to the east of Old Cooma Road. The artefacts are approximately 200 m apart, located in an exposure formed by the recent installation of a Telstra cable. The exposure is about 2 m wide and surface visibility within it is around 50%, while the surrounding visibility is approximately 2-5%.

The deposit in this area is brown loam with high gravel content; it appears to be generally less than 20 cm in depth. The potential for further artefacts to occur within the landform is moderate, however, due to the nature of the deposit there is only a low potential for *in situ* subsurface cultural material.



**GA7** (GDA 0701872.6078305)

This site comprises three artefacts located on an exposure formed by a recent Telstra cable installation running to the east of Old Cooma Road. Topographic context is a gently sloping spur slope with a south easterly aspect. Surface visibility within the exposure is 30% while the surrounding visibility is 2-5%.

Disturbance to the site is only moderate in that it is contained to a narrow corridor; however the deposit is a skeletal brown clayey loam with high gravel content. So while there is a moderate to high potential for the site to be larger than recorded, there is a generally low potential for subsurface deposits.

**GA21** (GDA 0703051.6077909)

Several artefacts from this site were collected during a subsurface testing program (NOHC 2008) with the aim that they would not be impacted by archaeological investigation.

The site comprises a low density scatter of at least seventeen artefacts located along an exposure formed by a vehicular track. Topographic context is the crest of a ridge to the west of Googong Homestead. The track on which the artefacts were located is cut up to 150 mm through the topsoil leaving a lag of quartz gravels, there are also numerous quartz cobbles outcropping across the crest. Artefacts were found over a 100 m stretch of track. Average surface visibility was approximately 75%, but effective visibility was in the order of 15% due to the presence of background gravels.

Local deposit is brown loam of approximately 5-10 cm in depth over a generally clayey B horizon. Disturbance to the site within the corridor of the vehicular track is moderate to high, however there is a high potential for the site to extend into adjacent areas where there is both less disturbance and less visibility; there is also a moderate potential for subsurface cultural material deposits.

**GA22** (GDA 0703686.6077937)

This site comprises a low-density scatter of at least nine artefacts located on stock tracks and areas of bare earth. Topographic context is a long flat spur crest with open aspect, to the southeast of GA21. Surface visibility across the crest is around 25%.

Local deposit is white/grey gravelly silty loam. While there is bedrock outcropping in the general locality, it is not extensive, so it appears that the soils on this crest may be somewhat deeper than that observed at GA21. Potential for the site to be larger than recorded is high, and it may indeed extend over the whole crest. Potential for subsurface cultural material is also high to moderate

**GA23** (GDA 0703825.6078278)

This site comprises a single artefact located on moderate gradient slopes on the eastern side of a spur above a minor creek line located approximately 100 m to the south. Visibility in the locality was in the vicinity of 5-10%.

Local deposit is brown sandy silt. Potential for further artefacts or subsurface deposits is considered to be moderate to low; potential is lowered by the gradient of the slope.

**GA24** (GDA 0703162.6078413)

Several artefacts from this site were collected during a subsurface testing program (NOHC 2008) with the aim that they would not be impacted by archaeological investigation.

This site comprises a scatter of at least eighteen artefacts located in a ploughed area to the south of Googong Road. Topographic context is the north shoulder and crest of a spur leading down to Talpa Creek. Visibility of up to 60% is afforded through areas of recent ploughing, artefacts were not observed in the unploughed areas, thus suggesting that the ploughing has brought subsurface artefacts to the surface.



Local deposit is clayey loam with quartz gravels that is in places disturbed by ploughing. Potential for further artefacts to occur in the locality is high, and the potential for subsurface cultural material deposits is also moderate to high.

**GA25** (GDA 0702618.6078311)

Site GA25 is a small low density artefact scatter comprising three visible artefacts on the terminal section of a spur crest between two minor creek lines feeding into Talpa Creek. Visibility across the crest is around 20%, with exposures consisting of denuded ground. Site extent is approximately 20 m by 50 m.

Local deposit is brown loam with moderate gravel content. There are scattered bedrock outcrops across the crest, indicating generally shallow topsoil. Potential for the site to be larger than recorded is high, while the potential for subsurface material is moderate.

**GA26** (GDA 0702888.6078374)

Several artefacts from this site were collected during a subsurface testing program (NOHC 2008) with the aim that they would not be impacted by archaeological investigation.

This is a large low-density site (30+ artefacts) covering the crest and slopes of the spur to the south of GA24. The site has a west to northerly aspect overlooking a tributary of Talpa Creek. Visibility across the site is approximately 20%. Artefacts were located across the crest and on the flatter sections of the upper middle and lower slopes leading down to the creek, but tended to be concentrated on the benches adjacent the creek. Extent of visible site is approximately 100 m by 200 m.

Local deposit is gravel filled clay of varying depth. Potential for additional artefacts to occur at the site is high, but due to the nature of the deposit the potential for *in situ* or stratified subsurface cultural material is only moderate.

**GA27** (GDA 0702371.6078348)

This site comprises a single artefact located in an exposure of bare earth in a ploughed paddock. Topographic context is the shoulder of a spur crest overlooking a tributary of Talpa Creek. Visibility across an area of some 500 m<sup>2</sup> was approximately 5%.

Local deposit is a silty brown loam; disturbance in the form of ploughing has impacted the top 20-30 cm of deposit across much of the landform. Potential for further artefacts to occur in this locality is moderate, while the potential for *in situ* subsurface deposits is, due to the disturbance caused by the plough lands, relatively low.

**PAD16** (Approximate centre GDA 0703100.6078500)

The identified area is approximately 350 m long x 350 m wide and incorporates a complex of the following landforms: crest, shoulder and slopes to the west of one of the major tributaries of Talpa Creek.

**PAD17** (Approximate centre GDA 0703050.6077950)

PAD17 corresponds to the crest of a ridge running to the south of PAD16 and to the west of PAD18. The identified area is approximately 300 m long x 150 m wide.

**PAD18** (Approximate centre GDA 0703450.6078000)

This recording incorporates the long flat spur crest on which site GA22 is located. The identified area is approximately 250 m long x 100 m wide. Deposit in the area is a white/grey gravelly silty loam of substantial depth.



PADs 16, 17 and 18 were subject to subsurface testing in 2009 (NOHC 2009b). The results of these investigations are pending.

### **Sites Recorded in 2009**

#### **GWTP1 (GDA 0703873.6078304)**

This site comprises four artefacts located on a slight rise above a gully (Figure 7.1). Ground surface exposure in the area was approximately 30%, with visibility in exposures of approximately 40% owing to the occurrence of natural gravels.

#### **Artefacts:**

1. grey volcanic river pebble, 80 x 70 x 50 mm
2. volcanic broken pebble, 70 x 41 x 20 mm
3. grey tuff flake, 13 x 10 x 1 mm
4. grey tuff flake, 23 x 10 x 5 mm



**Figure 7.1** Location of site GWTP1 - facing south

#### **GWTP2 (GDA 0703806.6078295)**

This site comprises six artefacts located mid slope above a steep gully, on a spurline (Figure 7.2). Ground surface exposure in the area was approximately 30%, with visibility in exposures of approximately 40% owing to the occurrence of natural gravels.

#### **Artefacts:**

1. grey volcanic cobble, 90 x 80 x 60 mm
2. grey volcanic cobble, 75 x 48 x 35 mm
3. grey volcanic cobble, 76 x 64 x 15 mm
4. grey volcanic cobble, 76 x 48 x 50 mm
5. grey volcanic cobble, 83 x 95 x 35 mm
6. brown silcrete flake, 20 x 15 x 6 mm



**Figure 7.2** Location of site GWTP2 - facing west



### **GWTP3** (GDA 0703255.6078324)

This site comprises eight artefacts located on a rocky spur crest above dry creek and gully (Figure 7.3). Ground surface exposure in the area was approximately 30%, with visibility in exposures of approximately 40%.

#### *Artefacts:*

1. grey volcanic flake, 41 x 18 x 6 mm
2. grey volcanic broken flake, 21 x 14 x 4 mm
3. grey volcanic broken pebble, 95 x 78 x 25 mm
4. grey volcanic flake, 30 x 20 x 7 mm
5. red/brown silcrete flaked piece, 20 x 20 x 7 mm
6. grey volcanic flaked piece 27 x 10 x 12 mm
7. grey silcrete flake, 30 x 12 x 6 mm
8. grey volcanic broken cobble 54 x 38 x 10 mm



**Figure 7.3** Location of site GWTP3 - facing northwest

### **GWTP4** (GDA 0704079.6078461)

This site comprises an isolated artefact located on a dirt track which joins onto Googong Dam Road (Figure 7.4). Ground surface exposure in the area was approximately 10%, with visibility in exposures of approximately 80%.

#### *Artefact*

1. grey volcanic broken flake, 17 x 9 x 4 mm



**Figure 7.4** Location of site GWTP4 - facing west



### 7.3 Historic Sites

Three historic heritage sites GH12 – a European midden; GH13 – ‘Beltana’ Homestead; and GH14 – a hut site - have been recorded for the Googong Trunk Water and Recycled Water System study area.

Approximate site locations are shown on Figure 7.12.

#### **GH12 – European Midden (Portion 3)**

*GDA 0703727.6078089*

This site comprises a collection of building material that has apparently been dumped in a drainage line to the east of GH 13). Material at this site includes tractor tyres, house bricks, galvanised iron gateposts, concrete slabs, and pieces of cement and plastic pipes (Figure 7.5).

The material is essentially indicative of the late twentieth century. Site condition is good, although the condition of the items within the site is generally poor.



**Figure 7.5** GH12 facing northeast

#### **GH13 – ‘Beltana’ Homestead (Portion 3)**

*GDA 0703727.6078089*

The ‘Beltana’ site complex comprises the homestead and dairy(?) (Plates 7.6 and 7.7). The homestead is a weatherboard building with a galvanised hip roof. It has a single brick chimney, a verandah on one side with a small fibro extension, and a weatherboard extension with gable roof and a wooden pergola on the opposite side. The building appears typical of the middle of the twentieth century and is in good condition.

Approximately 50 m south of the homestead there is a galvanised iron shed built on a frame of unmilled timber. The floor of the shed consists of a section of concrete flooring in an otherwise earthen floor. The shed is open on one side, and appears to have been an animal shelter and/or dairy. It appears to be roughly contemporary with the homestead, and once again site condition is generally good.



**Figure 7.6** GH13 – Beltana Homestead



**Figure 7.7** GH13 – Exterior view of shed

#### **GH14 – Hut site (Portion 1)**

*GDA 0702544.6078411*

This recording consists of the remains of a mid nineteenth century selectors hut. It is situated in a square paddock which corresponds to a 40 acre portion sold to John Feagan in 1874 (Crown Survey; Parish Map 1905). An archaeological test excavation was conducted at this site in early 2009 (NOHC 2009a).

The hut site comprises a rectangular mound of earth and stones, 3.5 m long, 2.5 m wide, and about 0.5 m high, and a sparse scatter of surface artefacts. The mound is orientated in a southwest/northeast direction, immediately north and adjacent a temporary modern timber post and wire fence (Plate 74). None of the surface stones appear deliberately shaped or placed.

The surface artefact scatter consists of fragments of Crown window glass (an early type of blown window glass formed by flattening and spinning), and a single green glass bottle sherd is located 14 m to the northeast of the mound (GDA 702557.6078419) (Scatter One). Another single fragment of glass – identified as Scatter Two – is situated about 6 m northeast of the mound at GDA 702550.6078417.

A narrow archaeological test pit located across the mound revealed:

- the remains of a small random rubble fireplace with internal clay render and an earth and clay floor, which may have had a sandstock brick hob;
- a total of 175 artefacts, including glass, sandstock brick, metal, bone and ceramic, with a weight of just over 2.0 kg;
- artefacts which indicated that the now demolished dwelling associated with the fireplace may have been of timber construction with Crown glass windows and it was probably built in the early 1860s with improvements being made to it (or maintenance carried out on it) some time after 1890; and
- the site was one of low-level domestic activity during its occupation from the early/mid-1860s to at least 1890.

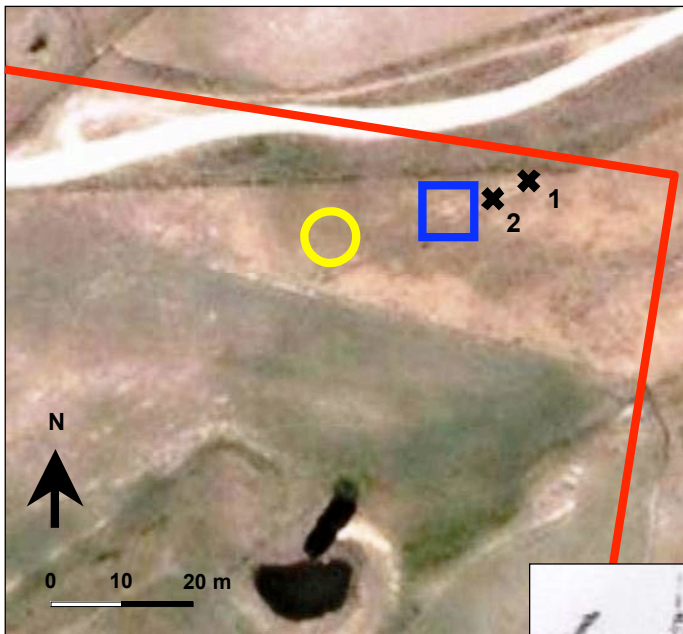
From historical records, the mound is located in close proximity to a hut site identified on an 1866 Portion plan of the site (Figures 7.8 – 7.12). Given possible inaccuracies in precisely locating the hut on that early plan, and relationships of scale between the early Portion plan and the modern-day mapping, it is probable that both the location of the 1866 hut and the current-day mound refer to the same site.



**Figure 7.8** GH14, A low mound of stone rubble marks the remains of a hearth, looking west.



**Figure 7.9** detail of the rear internal, southeastern back wall of the hearth, revealed during test excavation of the mound

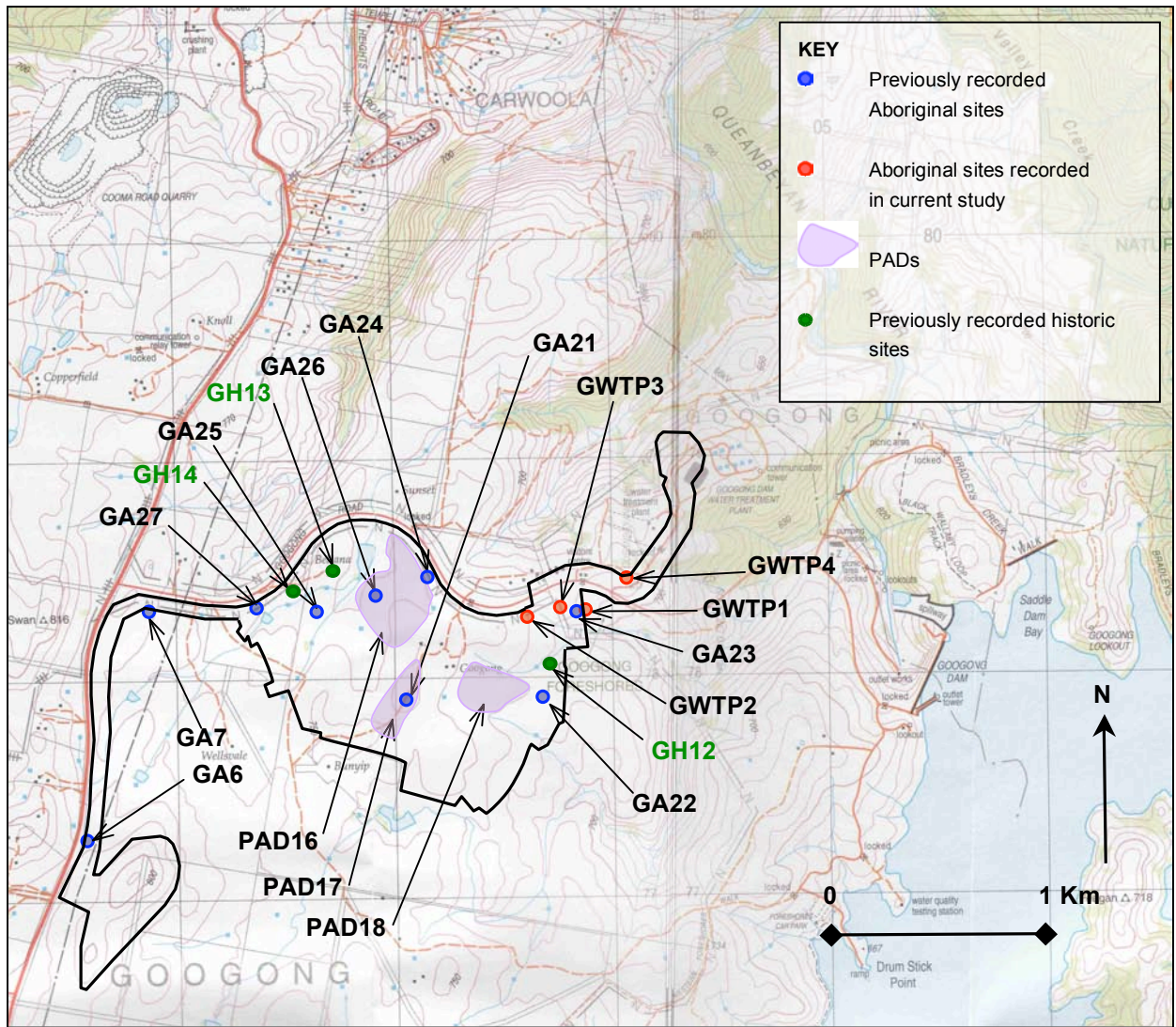


**Figure 7.10** Aerial photograph showing overlays of approximate locations of 1866 Portion boundary (red line), 1866 hut (yellow circle), current mound (blue square) and artefact scatters (black crosses) (base map Google earth 2008).

**Figure 7.11** Extract from the 1866 Crown Survey of Portion 1 showing hut location on Patrick and Julia Connolly's farm (LTO Crown Plan 916.743)







**Figure 7.12** Approximate locations of Aboriginal sites, PADs and historic sites within the Googong Trunk Water and Recycled Water System study area (Tuggeranong 8727-3S and Hoskinstown 8727-2S 1:25,000 topographic maps)



## 7.4 Site Inventory

<b>Recording Code</b>	<b>Recording Type</b>	<b>GPS References (GDA)</b>	<b>Comments</b>
GA6	artefact scatter	0701567.6077281	
GA7	artefact scatter	0701872.6078305	
GA21	artefact scatter	0703051.6077909	included in 2009 artefact collection program
GA22	artefact scatter	0703686.6077937	
GA23	isolated find	0703825.6078278	
GA24	artefact scatter	0703162.6078413	
GA25	artefact scatter	0702618.6078311	
GA26	artefact scatter	0702888.6078374	included in 2009 artefact collection program
GA27	isolated find	0702371.6078348	
PAD16	potential archaeological deposit	0703100.6078500	included in 2009 subsurface testing program
PAD17	potential archaeological deposit	0703050.6077950	included in 2009 subsurface testing program
PAD18	potential archaeological deposit	0703450.6078000	included in 2009 subsurface testing program
GWTP1	artefact scatter	0703873.6078304	
GWTP2	artefact scatter	0703606.6078295	
GWTP3	artefact scatter	0703755.6078324	
GWTP4	isolated find	0704079.6078461	
GH12	European Midden	0703727.6078089	
GH13	'Beltana' Homestead	0702664.6078495	
GH14	Hut site	0702544.6078411	subsurface testing of site conducted in 2009



## 8.0 SIGNIFICANCE ASSESSMENT

### 8.1 Aboriginal Sites

#### 8.1.1 Assessment Criteria

The Burra Charter of Australia defines cultural significance as 'aesthetic, historical, scientific or social value for past, present and future generations' (Aust. ICOMOS 1987). The assessment of the cultural significance of a place is based on this definition but often varies in the precise criteria used according to the analytical discipline and the nature of the site, object or place.

In general, Aboriginal archaeological sites are assessed using five potential categories of significance:

- significance to contemporary aboriginal people;
- scientific or archaeological significance;
- aesthetic value;
- representativeness; and
- value as an educational and/or recreational resource.

Many sites will be significant according to several categories and the exact criteria used will vary according to the nature and purpose of the evaluation. Cultural significance is a relative value based on variable references within social and scientific practice. The cultural significance of a place is therefore not a fixed assessment and may vary with changes in knowledge and social perceptions.

Scientific significance can be defined as the present and future research potential of the artefactual material occurring within a place or site. This is also known as archaeological significance.

There are two major criteria used in assessing scientific significance:

1. The potential of a place to provide information which is of value in scientific analysis and the resolution of potential research questions. Sites may fall into this category because they: contain undisturbed artefactual material, occur within a context which enables the testing of certain propositions, are very old or contain significant time depth, contain large artefactual assemblages or material diversity, have unusual characteristics, are of good preservation, or are a constituent of a larger significant structure such as a site complex.
2. The representativeness of a place. Representativeness is a measure of the degree to which a place is characteristic of other places of its type, content, context or location. Under this criteria a place may be significant because it is very rare or because it provides a characteristic example or reference.

The value of an Aboriginal place as an educational resource is dependent on: the potential for interpretation to a general visitor audience, compatible Aboriginal values, a resistant site fabric, and feasible site access and management resources.

The principal aim of cultural resource management is the conservation of a representative sample of site types and variation from differing social and environmental contexts. Sites with inherently unique features, or which are poorly represented elsewhere in similar environment types, are considered to have relatively high cultural significance.

The cultural significance of a place can be usefully classified according to a comparative scale which combines a relative value with a geographic context. In this way a site can be of low, moderate or high significance within a local, regional or national context. This system provides a means of comparison, between and across places. However it does not necessarily imply that a place with a limited sphere of significance is of lesser value than one of greater reference.



## 8.1.2 The Study Area

Aboriginal sites within the Googong Trunk Water and Recycled Water System study area have been assessed as shown in Table 8.1.

**Table 8.1** Aboriginal Site Significance

<b>Recording Code</b>	<b>Recording Type</b>	<b>Local Significance</b>	<b>Regional Significance</b>
GA6	artefact scatter	low-moderate	low
GA7	artefact scatter	low-moderate	low
GA21	artefact scatter with PAD	moderate-high	moderate
GA22	artefact scatter with PAD	moderate-high	moderate
GA23	isolated find	low-moderate	low
GA24	artefact scatter with PAD	high	moderate
GA25	artefact scatter	moderate	low
GA26	artefact scatter with PAD	high	moderate
GA27	isolated find	low-moderate	low
GWTP 1	artefact scatter	low	low
GWTP 2	artefact scatter	low	low
GWTP 3	artefact scatter	low	low
GWTP 4	isolated find	low	low

*Note:* Aboriginal sites GA6, GA7, GA21 - GA27) were assessed in 2003.

Aboriginal sites recorded in the current study (GWTP1 - GWTP4) are assessed as low local significance. This assessment is based on the following factors: artefact types and raw materials are common in the local area and region; site locations are generally disturbed; and, taking account of prior site collections and test excavations conducted in the Googong New Town Neighbourhood 1 area, it is unlikely that any additional information can be derived from the sites.

## 8.2 European Heritage

### 8.2.1 Assessment Criteria

The NSW Heritage Office and Department of Urban Affairs and Planning have defined a set of criteria and methodology for the assessment of cultural heritage significance for items and places, where these do not include Aboriginal heritage from the pre-contact period (NSW Heritage Office & DUAP 1996, NSW Heritage Office 2000). The assessments provided in this report follow the Heritage Office methodology.

The following heritage assessment criteria are those set out for Listing on the State Heritage Register. In many cases items will be significant under only one or two criteria. The State Heritage Register was established under Part 3A of the Heritage Act (as amended in 1999) for listing of items of



environmental heritage that are of state heritage significance. Environmental heritage means those places, buildings, works, relics, moveable objects, and precincts, of state or local heritage significance (section 4, Heritage Act 1977).

An item will be considered to be of State (or local) heritage significance if, in the opinion of the Heritage Council of NSW, it meets one or more of the following criteria:

- Criterion (a)** an item is important in the course, or pattern, of NSW' cultural or natural history (or the cultural or natural history of the local area);
- Criterion (b)** an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW' cultural or natural history (or the cultural or natural history of the local area);
- Criterion (c)** an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area);
- Criterion (d)** an item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons;
- Criterion (e)** an item has potential to yield information that will contribute to an understanding of NSW' cultural or natural history (or the cultural or natural history of the local area);
- Criterion (f)** an item possesses uncommon, rare or endangered aspects of NSW' cultural or natural history (or the cultural or natural history of the local area);
- Criterion (g)** an item is important in demonstrating the principal characteristics of a class of NSW'
- cultural or natural places; or
  - cultural or natural environments.
- (or a class of the local area's
- cultural or natural places; or
  - cultural or natural environments.)

An item is not to be excluded from the Register on the ground that items with similar characteristics have already been listed on the Register. Only particularly complex items or places will be significant under all criteria. In using these criteria it is important to assess the values first, then the local or State context in which they may be significant. Different components of a place may make a different relative contribution to its heritage value. For example, loss of integrity or condition may diminish significance. In some cases it is constructive to note the relative contribution of an item or its components.

### 8.2.2 The Study Area

Site GH12 - European Midden - is assessed as low local significance and low state significance.

Site GH13 – 'Beltana' Homestead is assessed as low moderate significance and low state significance.

Site GH4 – Hut site - is assessed as follows:

Archaeological evidence and historical research indicate that the fireplace at site GH14 is associated with the early 1860s occupation of the area by Patrick and Julia Connolly, and subsequently the Feagan family after 1874, and therefore is over 50 years old and classified as a relic, and thus protected under Section 139 of the NSW *Heritage Act 1977*.

The site may be considered to meet the following NSW Heritage Council criteria:

- Criterion (a)** Important in the course, or pattern, of the cultural history of NSW and the local area as a nineteenth-century selector's hut/house, the land having been selected by Patrick Connolly in 1862 who made improvements on it, including building a hut by July 1863, and two houses and stockyards had reportedly been built as well as fencing carried out on the Connolly's farm by 1865.



- Criterion (b)** A strong association with the life or works of a person of importance, being Patrick Connolly who originally selected the 40 acre Portion in 1862, and subsequently John Feagan from 1874; and a group of persons, being the selectors as an historical group of people and as part of the closer settlement movement in NSW, in the cultural history of NSW and the local area.
- Criterion (e)** Potential to yield (further) information that will contribute to an understanding of the cultural history of NSW and the local area, being an understanding of the nature of a nineteenth-century selector's farm, and in particular an 1860's selector's hut/house.
- Criterion (f)** Possess an uncommon aspect of the cultural history of NSW and the local area, being a nineteenth-century selector's hut/house.
- Criterion (g)** Important in demonstrating the principal characteristics of a class of cultural places in NSW and the local area, being the ability to demonstrate the principal characteristics of nineteenth-century selection and the construction attributes of a nineteenth-century selector's hut/house.

Under the NSW Heritage Council's guidelines for ascribing relative heritage values to an item, as it is probable that the fireplace remains at site GH14 are those of Patrick Connolly's hut/house then, due to the fireplace's partial destruction and the absence of a building, they have altered or modified elements and elements with little heritage value, but which contribute to the item's overall significance. As such is the case then the feature has moderate heritage significance and fulfils the criteria for local and State listing.



## 9.0 STATUTORY AND POLICY CONTEXT<sup>1</sup>

### 9.1 Environmental Planning and Assessment Act 1979

This Act (EP&A Act) and its regulations, schedules and associated guidelines require that environmental impacts are considered in land use planning and decision making. Environmental impacts include cultural heritage assessment. The Act was reformed by the *Environmental Planning and Assessment Amendment (Infrastructure and other Planning Reform) Act 2005*.

There are four main areas of protection under the Act:

- Planning instruments allow particular uses for land and specify constraints. Part 3 governs the preparation of planning instruments. Both Aboriginal and Historical (Non-Indigenous) cultural heritage values should be assessed when determining land use;
- A separate streamlined and integrated development assessment and approvals regime for major infrastructure and other projects of significance to the State is defined by Part 3A;
- Section 90 lists impacts which must be considered before development approval is granted. Part 4 relates to the development assessment process for local government authorities. Impact to both Aboriginal and Historical (Non-Indigenous) cultural heritage values are included; and
- State Government agencies which act as the determining authority on the environmental impacts of proposed activities must consider a variety of community and cultural factors in their decisions, including Aboriginal and Historical (Non-Indigenous) cultural heritage values. Part 5 relates to activities which do not require consent but still require an environmental evaluation, such as proposals by government authorities.

The EP&A Act, as amended, provides for the listing of heritage items and conservation areas and for the protection of these items or areas through environmental planning instruments (like REPs and LEPs) at the local government and State planning levels. These statutory planning instruments usually contain provisions for the conservation of these items and areas as well as an assessment process to reduce the impacts of new development on the heritage significance of a place, building or conservation area.

#### Part 3A of the EP&A Act

Part 3A of the Act is an amendment which establishes a separate streamlined and integrated development assessment and approvals regime for major State government infrastructure projects, development that was previously classified as State Significant development, and other projects, plans or programs declared by the Minister for Planning.

Part 3A removes the stop-the-clock provisions and the need for single-issue approvals under eight other Acts, including the NP&W Act and the Heritage Act 1977. Environmental planning instruments such as the heritage provisions within REP and LEPs, (other than State environmental planning policies) do not apply to projects approved under Part 3A.

Where warranted the Minister may declare any project subject to Part 3A to be a critical infrastructure project. These projects only require a concept approval in contrast to other Part 3A projects which require project approval. In most circumstances, a concept approval will be obtained to establish the environmental performance requirements and consultation requirements for the implementation of the subsequent stages of the project.

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<sup>1</sup> The following information is provided as a guide only. Readers are advised to seek qualified legal advice relative to legislative matters.



Under the provisions of Part 3A, proponents of major and infrastructure projects must make a project application seeking approval of the Minister. The application is to include a preliminary assessment of the project. Application may be for concept plan approval or full approval. Following input from relevant agencies and council(s), DoP will issue the proponent with requirements for the preparation of an Environmental Assessment and a Statement of Commitments. The Statement of Commitments will include how the project will be managed in an environmentally sustainable manner, and consultation requirements.

Following submission of an Environmental Assessment and draft Statement of Commitments to DoP, these documents are variously evaluated, reviewed, circulated and exhibited. The proponent may modify the proposal to minimise impacts in response to submissions received during this process. The proponent then provides a Statement of Commitments and, following any project changes, a Preferred Project Report. An assessment report is then drafted by the Director-General and following consultation with relevant agencies, a final report with recommendations for approval conditions or application refusal is submitted to the Minister. The Minister may refuse the project, or approve it with any conditions considered appropriate.

## **9.2 Implications for the Googong Trunk Water and Recycled Water System Scheme**

The heritage provisions of the NPW Act and the NSW Heritage Act will not apply when the project receives approval under Part 3A of the EP&A Act.

Any commitments relating to cultural heritage that may be stipulated in the *Statement of Commitments* made by the NSW Minister for Planning, as part of that approval, will apply to the project.





## 10. RECOMMENDATIONS

The following requirements should form part of the *Statement of Commitments* for the Googong Trunk Water and Recycled Water System project.

1. No further works are required at (previously collected) Aboriginal sites GA21, GA24 and GA26.
2. No further works are required at (previously investigated) Aboriginal PADs 16, 17 and 18.
3. If impact is anticipated at Aboriginal sites GWTP1 - GWTP4, GA6, GA7, GA22, GA23, GA25 and GA27, then visible Aboriginal artefacts at the sites should be re-positioned away from areas of potential impact. These works should be completed by an archaeologist and representatives of the local Aboriginal community.
4. Impact to historic sites GH12 – European Midden and GH13 – ‘Beltana’ Homestead – should be avoided.
5. If impact to historic sites GH12 and GH13 is unavoidable, then further assessment including detailed site survey and archival research and recording is required. Some elements of these sites may require preservation.
6. An archaeological test excavation and historical investigation was undertaken at Site GH14 in February 2009 (NOHC 2009a). Further archaeological works are continuing at site GH14 (independent of this current assessment).
7. A copy of this report should be sent to each of the participating Aboriginal organisations for their information and records.
8. Three copies of this report should be forwarded to the NSW DECC at the following address:

Cultural Heritage Officer  
Conservation Planning Unit  
EPRD  
NSW Department of Environment and Climate Change  
PO Box 2115  
Queanbeyan NSW 2620



## 11. REFERENCES

- Australia ICOMOS 1987 *The Australia Icomos Charter for the Conservation of Places of Cultural Significance (The Burra Charter), Guidelines to the Burra Charter: Cultural Significance and Conservation Policy*. Pamphlet, Australia Icomos (Inc).
- Gunn, R. H., R. Story, R. W. Galloway, P. J. B. Duffy, G.A. Yapp & J.R. McAlpine 1969 Lands of the Queanbeyan-Shoalhaven Area, ACT and NSW. *Land Research Series No 24, CSIRO*.
- Navin Officer Heritage Consultants (NOHC) 2003 Googong Local Environmental Study. Cultural Heritage Component. Report to Willana Associates Pty Ltd.
- Navin Officer Heritage Consultants (NOHC) 2007 Googong LES Review. (Letter) report to Canberra Investment Corporation.
- Navin Officer Heritage Consultants (NOHC) 2008 Googong New Town Development. An Cultural Heritage Review, Neighbourhood 1. Report to Canberra Investment Corporation.
- Navin Officer Heritage Consultants (NOHC) 2009a Archaeological Test Excavation, Googong New Town: Neighbourhood 1, NSW: Historic Site GH14. Report to Canberra Investment Corporation.
- Navin Officer Heritage Consultants (NOHC) 2009b Googong New Town Neighbourhood 1. An Aboriginal Archaeological Subsurface Testing and Collection Program. Report to Canberra Investment Corporation.

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## **APPENDIX 1**

### **RECORD OF ABORIGINAL FIELD PARTICIPATION**



**Record of Aboriginal Representative Participation\***

Name(s) of Aboriginal Representative: Wally Bell

Name of Aboriginal Organisation: **Buru Ngunawal Aboriginal Corporation**

Archaeologist(s): name & address Nicola Hayes .....  
Navin Officer Heritage Consultants Pty Ltd .....  
4/71 Leichhardt Street, Kingston, ACT 2604 .....

Project Name: **Googong New Town – Water Reticulation Survey** .....

Client: name & address: ...Michael Nolan,  
(please send your invoice ...CIC Limited,  
to this address) .....Level 8, St George Centre,  
.....Marcus Clarke Street, CANBERRA ACT 2600.  
.....Phone: (02) 6230 0800 Fax: (02) 6230 0811  
.....Email: [Michael.Nolan@ciclimited.com.au](mailto:Michael.Nolan@ciclimited.com.au)

- Type of participation:
- Guided inspection of study area and sites
  - Accompanied/participated in archaeological survey
  - Separate inspection or survey
  - Accompanied/participated in excavation program

Period of participation:

Date(s)	Start	Finish
4/6/09	8:30am	11:30am

Issues raised: Nil - need to be informed of works  
in relation to discovered artefacts.

Signed (archaeologist): N Hayes

Signed (Aboriginal representative(s)): Wally Bell

\* please note this form is not an invoice. For payment, please send an invoice from your organisation to the client name and address provided above.



### Record of Aboriginal Representative Participation\*

Name(s) of Aboriginal Representative: Tina Williams

Name of Aboriginal Organisation: - **King Browns Tribal Group**

Archaeologist(s): name & address Nicola Hayes .....  
Navin Officer Heritage Consultants Pty Ltd.....  
4/71 Leichhardt Street, Kingston, ACT 2604.....

Project Name: **Googong New Town – Water Reticulation Survey** .....

Client: name & address:..Michael Nolan,  
(please send your invoice ...CIC Limited,  
to this address) .....Level 8, St George Centre,  
.....Marcus Clarke Street, CANBERRA ACT 2600.  
.....Phone: (02) 6230 0800 Fax: (02) 6230 0811  
.....Email: [Michael.Nolan@ciclimited.com.au](mailto:Michael.Nolan@ciclimited.com.au)

- Type of participation:
- Guided inspection of study area and sites
  - Accompanied/participated in archaeological survey
  - Separate inspection or survey
  - Accompanied/participated in excavation program

Period of participation:

Date(s)	Start	Finish
<u>4/6/09</u>	<u>8.30am</u>	<u>11.30am</u>

Issues raised: .....

Signed (archaeologist): N Hayes

Signed (Aboriginal representative(s)): Tina Williams

\* please note this form is not an invoice. For payment, please send an invoice from your organisation to the client name and address provided above.



### Record of Aboriginal Representative Participation\*

Name(s) of Aboriginal Representative: Joe House

Name of Aboriginal Organisation: Little Gudgenby River Tribal Council

Archaeologist(s): name & address Nicola Hayes .....  
Navin Officer Heritage Consultants Pty Ltd .....  
4/71 Leichhardt Street, Kingston, ACT 2604 .....

Project Name: **Googong New Town – Water Reticulation Survey** .....

Client: name & address: Michael Nolan,  
(please send your invoice ...CIC Limited,  
to this address) .....Level 8, St George Centre,  
.....Marcus Clarke Street, CANBERRA ACT 2600.  
.....Phone: (02) 6230 0800 Fax: (02) 6230 0811  
.....Email: [Michael.Nolan@ciclimited.com.au](mailto:Michael.Nolan@ciclimited.com.au)

- Type of participation:
- Guided inspection of study area and sites
  - Accompanied/participated in archaeological survey
  - Separate inspection or survey
  - Accompanied/participated in excavation program

Period of participation:

Date(s)	Start	Finish
<u>4/6/09</u>	<u>8.30am</u>	<u>11.30am</u>

Issues raised: .....

Signed (archaeologist): Nicola Hayes

Signed (Aboriginal representative(s)): Joe House

\* please note this form is not an invoice. For payment, please send an invoice from your organisation to the client name and address provided above.



### Record of Aboriginal Representative Participation\*

Name(s) of Aboriginal Representative: ..... Jeff Murray .....

Name of Aboriginal Organisation: **Ngambri LALC** .....

Archaeologist(s): name & address Nicola Hayes .....  
Navin Officer Heritage Consultants Pty Ltd .....  
4/71 Leichhardt Street, Kingston, ACT 2604 .....

Project Name: **Googong New Town – Water Reticulation Survey** .....

Client: name & address: ...Michael Nolan,  
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  - Separate inspection or survey
  - Accompanied/participated in excavation program

Period of participation:

Date(s)	Start	Finish
<u>4/6/09</u>	<u>8.30am</u>	<u>11.30am</u>

Issues raised: .....

Signed (archaeologist): ..... N. Hayes .....

Signed (Aboriginal representative(s)): ..... Jeff Murray .....

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### Record of Aboriginal Representative Participation\*

Name(s) of Aboriginal Representative: ..... Ross Thomas .....

Name of Aboriginal Organisation: - **Ngarigo Consultancy Pty Ltd** .....

Archaeologist(s): name & address Nicola Hayes .....  
Navin Officer Heritage Consultants Pty Ltd .....  
4/71 Leichhardt Street, Kingston, ACT 2604 .....

Project Name: **Googong New Town – Water Reticulation Survey** .....

Client: name & address: ...Michael Nolan,  
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.....Marcus Clarke Street, CANBERRA ACT 2600.  
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Issues raised: .....

Signed (archaeologist): ..... N. Hayes .....

Signed (Aboriginal representative(s)): ..... Ross Thomas .....

\* please note this form is not an invoice. For payment, please send an invoice from your organisation to the client name and address provided above.





# Googong New Town Trunk Water and Recycled Water System

## Cultural Heritage Assessment of Additional Temporary Reservoir Proposal

### Addendum to October 2009 Assessment Report

*Navin Officer Heritage Consultants Pty Ltd*

*13 July 2010*

### **Addendum Report**

This document acts as an addendum to an Aboriginal and Historical Archaeological Assessment of the Googong New Town Trunk Water and Recycled Water System conducted by Navin Officer Heritage Consultants (NOHC) for Canberra Investments Corporation in October 2009 (NOHC 2009c). For more detailed information regarding previous assessments the reader is referred to the above report, and others listed in the References.

### **The Proposal**

Following the completion of the 2009 NOHC report, a design change has been proposed for the Googong township water cycle project. The design change involves the construction of a temporary reservoir site, to be constructed on a hill (RL 765m) south of the intersection of Googong Dam Rd and Old Cooma Rd.

The reservoir is described as temporary because as it would be demolished after the population of the Googong New Town Neighbourhood 1A (NH1A) reaches a certain number and the reservoirs in the existing design are commissioned.

The new temporary reservoir site location is within 50m of the existing subject site study area (approximately 37m from the previous 2009 NOHC study area boundary) (Refer Figure 1).

### **Assessment**

The area of the proposed temporary reservoir site was subject to comprehensive archaeological survey as part of a cultural heritage assessment of the Googong Local Environmental Study, conducted by NOHC in Sept 2003 for Willana Associates Pty Ltd (NOHC 2003).

No cultural heritage sites or potential archaeological deposits were recorded within or near this area.

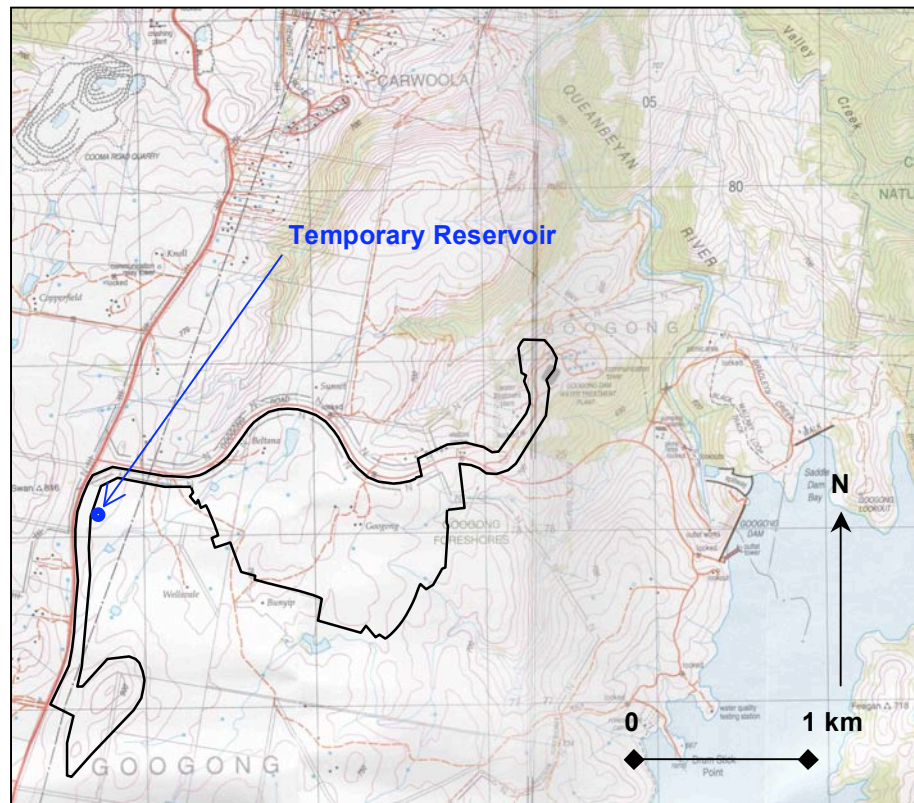
No cultural heritage recordings were subsequently made within or near this area during subsequent assessments conducted for the Neighbourhood 1A area (NOHC 2008, 2009a and 2009b)

### **Conclusions**

The area of the proposed temporary reservoir has previously been subject to archaeological survey. There is no need to replicate this assessment.

There are no known or predicted cultural heritage sites or potential archaeological deposits within the area of the proposed temporary reservoir.

There are no cultural heritage management requirements associated with the land which would be affected by the construction of the proposed temporary reservoir.



**Figure 1** Location of the proposed temporary reservoir site (blue) relative to the 2009 Googong Trunk Water and Recycled Water System study area (black) (Tuggeranong 8727-3S and Hoskinstown 8727-2S 1:25,000 topographic maps)

## References

- Navin Officer Heritage Consultants (NOHC) 2009c Googong New Town Trunk Water and Recycled Water System, Aboriginal and Historical Archaeological Assessment. A Report to Canberra Investment Corporation.
- Navin Officer Heritage Consultants (NOHC) 2009b Googong New Town Neighbourhood 1. An Aboriginal Archaeological Subsurface Testing and Collection Program. Report to Canberra Investment Corporation
- Navin Officer Heritage Consultants (NOHC) 2009a Archaeological Test Excavation, Googong New Town: Neighbourhood 1, NSW: Historic Site GH14. Report to Canberra Investment Corporation.
- Navin Officer Heritage Consultants (NOHC) 2008 Googong New Town Development. A Cultural Heritage Review, Neighbourhood 1. Report to Canberra Investment Corporation
- Navin Officer Heritage Consultants (NOHC) 2003 Googong Local Environmental Study Cultural Heritage Component. A Report to Willana Associates Pty Ltd.

# Appendix H

## Traffic and transport assessment

Googong Township water cycle project

Environmental Assessment

October 2010



# TTM Consulting (Vic) Pty Ltd



**GOOGONG NEW TOWN  
WATER CYCLE PROJECT  
TRAFFIC IMPACT ASSESSMENT**

**Prepared By**

**TTM Consulting (Vic) Pty. Ltd.  
Suite 301,  
2 Wellington Parade,  
East Melbourne Vic 3002**

**For**

**Canberra Investment Corporation  
PO Box 1000,  
Civic Square ACT 2608**

**August, 2009**

**Enquiries : Jim Higgs  
Phone : (03) 9419 0911  
Fax : (03) 9415 9456  
Email : [email@ttmconsulting.com.au](mailto:email@ttmconsulting.com.au)**

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## **EXECUTIVE SUMMARY**

The Googong Water Cycle Project will be constructed and operated in conjunction with the development of the Googong New Town. The Water Cycle Project includes :-

- Water Recycling plant (WRP), and associated pumping stations,
- Pumping station for potable water,
- Reservoir works,
- Sewage pumping stations, and
- Associated pipe works.

The works will coincide with development of Googong Neighbourhood 1A and the “Googong Dam Spillway” project, which is a remediation of the existing spillway and is likely to be completed late in year 2010.

This report provides a summary of potential traffic generation consequent to the works associated with the Water Cycle Project, the Spillway project and Googong Neighbourhood 1A construction, all superimposed on the existing traffic using Old Cooma Road and Googong Dam Road. Only traffic associated with Stage 1 of the Water Cycle Project is considered in this report, although it is highly unlikely that future Water Cycle Project traffic will be as intense as that associated with Stage 1 works, and it is further unlikely that coincidence with a major project such as the Spillway project will occur in later stages of the Water Cycle Project.

The following table provides a summary of Water Cycle Project components and their potential traffic generation :-

<b>Traffic Source</b>	<b>Water Recycling Plant</b>	<b>Potable Water PS</b>	<b>Reservoir Works</b>	<b>Sewage Pumping Stations</b>	<b>Pipe Works</b>	<b>Totals</b>
<b>Total Truck Attendances</b>	310	230	660	440	600	<b>2240</b>
<i>Peak Daily Vehicle Movements</i>						
<i>Trucks</i>	40	32	32	64	54	<b>222</b>
<i>Light Vehicles</i>	40	16	20	20	20	<b>116</b>
<b>AM Peak Hour</b>						
<i>Trucks In</i>	3	2	4	4	4	<b>17</b>
<i>Trucks Out</i>	3	2	4	4	2	<b>15</b>
<i>Light Vehicles In</i>	12	5	6	6	6	<b>35</b>
<i>Light Vehicles Out</i>	4	1	2	2	2	<b>11</b>
<b>PM Peak Hour</b>						
<i>Trucks In</i>	3	2	4	4	2	<b>15</b>
<i>Trucks Out</i>	3	2	4	4	4	<b>17</b>
<i>Light Vehicles In</i>	4	1	2	2	2	<b>11</b>
<i>Light Vehicles Out</i>	12	5	6	6	6	<b>35</b>

*Estimates of Spillway project traffic and Googong Neighbourhood 1A construction traffic have been taken from suitable sources and are added in the following table :-*

<b>Traffic Source</b>	<b>Water Cycle Project</b>	<b>Googong Neighbourhood 1A</b>	<b>Spillway Project</b>	<b>Totals</b>
<b>Peak Daily Vehicle Movements</b>				
<i>Trucks</i>	222	80	112	<b>414</b>
<i>Light Vehicles</i>	116	120	100	<b>336</b>
<b>AM Peak Hour</b>				
<i>Trucks In</i>	17	6	9	<b>32</b>
<i>Trucks Out</i>	15	6	3	<b>24</b>
<i>Light Vehicles In</i>	35	40	30	<b>105</b>
<i>Light Vehicles Out</i>	11	10	5	<b>26</b>
<b>PM Peak Hour</b>				
<i>Trucks In</i>	15	6	3	<b>24</b>
<i>Trucks Out</i>	17	6	9	<b>32</b>
<i>Light Vehicles In</i>	11	10	5	<b>26</b>
<i>Light Vehicles Out</i>	35	40	30	<b>105</b>

*Resultant traffic impacts are calculated on the basis that all of the contributing component projects generate peak period traffic at peak rates at the same time, which is highly unlikely.*

*Despite that conservatism the traffic impacts, as calculated using Sidra for intersections and AustRoads Guide to Traffic Engineering Practice methodology for mid-block conditions, will be such that Level of Service C is the worst case during peak hours.*

*Level of Service C is completely acceptable, and no amelioration works, other than for access from existing roads, are necessary.*



## 1. INTRODUCTION AND SCOPE

As part of the development of the Googong New Town, Canberra Investment Corporation (CIC) will construct and operate a trunk water and recycled water system, which is the Water Cycle Project that is the subject of this report.

The Director General of the NSW Department of Planning has a suite of requirements (DGR's) for the preparation of an Environmental Assessment (EA) for the project, pursuant to Section 75F of the Environmental Assessment and Planning Act 1979.

The DGR's include that the EA must include an assessment of key issues including traffic and transport.

This report provides the required Traffic and Transport Impact Assessment.

## 2. DGR SCOPE OF NECESSARY INCLUSIONS

The DGR requires that :-

*“the EA shall include an assessment of inputs to the local and regional road network and intersections, including direct impacts from any traffic rerouting and any access restrictions to property. The assessment must include details on the nature/mode of traffic generated from the construction or operation of the project, transport routes and traffic volumes. Construction must also be given to the impact of the project in the context of any other major construction traffic likely to be utilizing the same roads during the construction of the project”.*

## 3. DESCRIPTION OF WATER CYCLE PROJECT

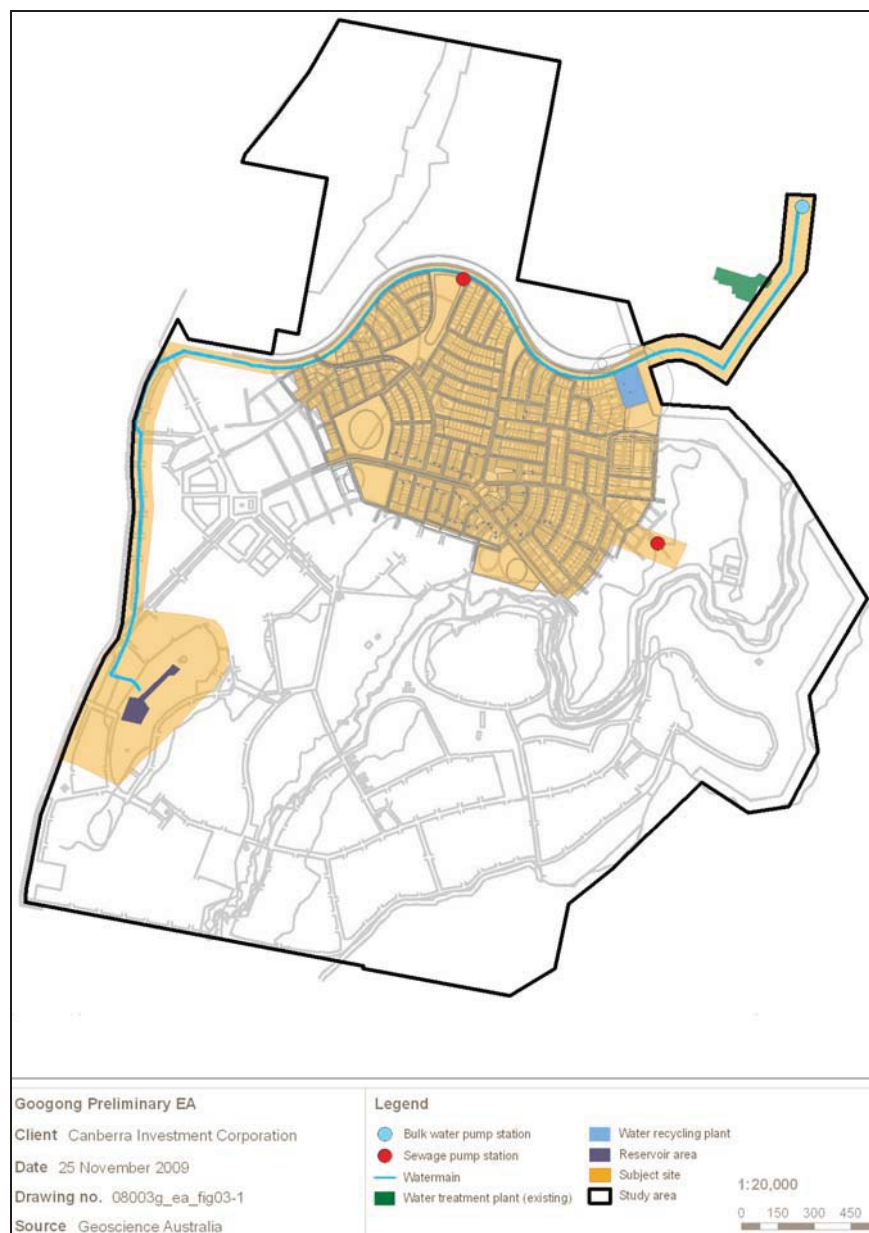
In summary the works involve :-

- Construction of the Water Recycling Plant (WRP) including a pumping station within Neighbourhood 1A of the Googong New Town Development, and a further pumping station to the south east of Neighbourhood 1A,
- Construction of a pumping station for potable water, near the existing Googong Water Treatment Plant,
- Construction of potable and recycled water rising mains and supply mains linking the pumping station with the distribution tanks, and the distribution tanks with Neighbourhood 1A,
- Construction of reservoir works adjacent tot Neighbourhood 3,
- Construction of 2 sewage pump stations in Stage 1 of the Water Cycle Project and then 2 further sewage pump stations in the ultimate Stage of the Water Cycle Project, and
- Construction of pipe works including rising and distribution mains to link the various elements of the project.

The project will be constructed in two stages, with the first to be completed by the time of occupation of the first stage of Neighbourhood 1A, which will comprise about 73 dwelling sites. Construction of the first Stage is currently programmed to commence around July 2010, and to be completed by July 2011.

This report concentrates on the traffic impacts of the first stage, which will coincide with a significant project on the Googong Dam Spillway. It is expected that the traffic impacts of the first stage will be greater than the ultimate stage, and it is unlikely that there will be coincidence with such a major project as the Spillway project during the ultimate stage of the Water Cycle Project.

The diagram at Figure 1 shows the works that are included in the Water Cycle Project.



**FIGURE 1 : THE GOOGONG INTEGRATED WATER CYCLE**

## **4. OTHER CONCURRENT PROJECTS OF RELEVANCE**

### **4.1 Googong Dam Spillway Remediation Works**

#### **4.1.1 Overview of Project and Implications**

The Googong Dam Spillway Remediation project is currently under construction and is likely to extend over a period of about 18 months up to late 2010. Some interaction of construction traffic associated with the spillway project and traffic associated with the Googong Water Cycle is possible, with the Googong Water Cycle project starting in July 2010.

It is expected that virtually all heavy haulage associated with the spillway project will be complete before commencement of the Googong Water Cycle project, and that the interacting traffic will be principally employee and trade related traffic.

GHD prepared a Traffic Impact Assessment for the spillway project in November 2008. That assessment provides traffic estimates for various scenarios of rock removal, concrete delivery and on-site concrete batching throughout the project. The assessment also provides the following timetable of work stages :-

- Site preparation/mobilization (1 to 2 months)
- Material excavation (4 months)
- Concrete placement (12 months), and
- Demolition (1 to 2 months)

Only the concrete placement and demolition stages will have any likelihood of overlap with the Googong Water Cycle project.

#### **4.1.2 Concrete Delivery Traffic**

GHD estimated peak loadings of up to 50 concrete trucks delivering per day (100 truck movements) when concrete pours are occurring.

#### **4.1.3 Other Construction Traffic**

GHD estimated other trucks carrying form work, reinforcement and other materials at up to 6 loads (12 truck movements) per day.

#### **4.1.4 Employee Traffic**

GHD estimated 50 employee arrival and departure trips per day, giving a two-way volume of 100 light vehicles trips per day on Googong Dam Road.

#### **4.1.5 Summary of Googong Dam Spillway Project Traffic**

The following table sets out the (GHD derived) Googong Dam Spillway Project traffic estimates applicable to the period when both Spillway and Googong Water Cycle projects will be under construction or operation. The table shows both peak hour movements as well as the total movements due to the Googong Dam Spillway project.

Traffic Source	Daily Movements	AM Peak Hour		PM Peak Hour	
		In	Out	In	Out
Concrete Trucks	100	8	2	2	8
Other Trucks	12	1	1	1	1
Employee Traffic (light vehicle)	100	30 *	5 *	5 *	30 *

\* GHD estimated 10% of total daily traffic during peak hours, with 80% in the peak direction. In our view that peak period proportion is likely to be exceeded in the case of employee traffic, and the estimates above reflect that opinion.

## 4.2 Goongong Neighbourhood 1A Development and Early Use

### 4.2.1 Overview and Implications

The first stage of development of Neighbourhood 1A (Stage 1) will be under construction from July 2010 and will be completed around August 2011, that is during the period of construction of the Water Cycle project.

There is also likely to be some construction of housing commencing February 2011, with an estimated 30 dwellings under construction from then onwards.

From the completion of the civil engineering works for Stage 1 of Neighbourhood 1A the interaction of project traffic will only be with operation of the Water Cycle project.

### 4.2.2 Civil Works Traffic

The traffic associated with the construction of streets, external road works, reticulated services, landscaping and earthworks is estimated as follows :-

- Concrete trucks, up to 10 per day when major pours are occurring (e.g. footpath, kerb and channel).
- Crushed rock delivered, up to 16 semi-trailers per day carrying crushed rock of various types when street pavements are being laid, which will not coincide with when concrete is being laid.
- Deliveries of pipes, precast pits, and other incidental materials, up to 3 semi-trailers per day.
- Delivery and removal of plant for concrete extrusion, earthworks, compaction, excavation, pipe laying and the like, 1 semi-trailer per day.
- Asphalt deliveries, up to 10 trucks per day when surfacing is being carried out. This will not coincide with either crushed rock deliveries or concrete deliveries.
- Employee traffic (light vehicles) will be up to 30 vehicle movements each way per day.

The peak traffic is likely to be when crushed rock pavement laying is occurring, with up to 16 semi-trailers for crushed rock, 4 semi-trailers for other deliveries, and 30 employee (light) vehicles attending the site daily. That is up to a likely peak of 20 semi-trailers (or 40 semi-trailer movements) and 60 employee vehicle movements for this aspect of construction of the residential development.

#### 4.2.3 House Building

House building is not likely to commence until most of the heavy infrastructure is in place.

An allowance of 30 light vehicles and 20 trucks attending the site daily for house building is made. That is 60 daily light vehicle movements and 40 truck movements.

#### 4.2.4 Summary of Googong Neighbourhood 1A Construction Traffic

The following table sets out the Googong Neighbourhood 1A traffic estimates for the period during which both Spillway and Water Cycle projects will be under construction. The table shows peak hour movements as well as total daily movements for the construction associated with the residential development :-

Traffic Source	Daily Movements	AM Peak Hour		PM Peak Hour	
		In	Out	In	Out
<u>Civil Works</u>					
Semi-trailer movements	40	3	3	3	3
Employee (light) vehicles	60	20	5	5	30
<u>House Building</u>					
Trucks	40	3	3	3	3
Light vehicles	60	20	5	5	20

## 5. WATER CYCLE PROJECT CONSTRUCTION TRAFFIC

### 5.1 Water Recycling Plant

#### 5.1.1 Total Traffic Generation

The Recycled Water System is the major site works project component of the Water Cycle Project. The site plan broadly indicates around 4,000 square metres of road paving and concrete tankage requiring an estimated 600 cubic metres of concrete. That will require 120 concrete truck loads generating 240 truck movements over the duration of the works.

Pavement construction will require 1,600 cubic metres of crushed rock and asphalt, equivalent to approximately 140 truck loads (or 280 truck movements) over the duration of the works.

Other deliveries including kerbing, drainage pits and pipes, building materials, pumps and associated electrical and pipe works are estimated to require a further 50 trucks (or 100 truck movements) for delivery.

In summary the works for the WRP will require around 310 truck deliveries, or 620 total truck movements, for deliveries of plant and equipment.

Employee (light) traffic is estimated at a maximum of 20 vehicles attending the site daily, equating to 40 vehicle movements per day.

### 5.1.2 Peak WRP Traffic Generation

All of the above listed activities will be staged throughout the construction period.

The highest daily rate of traffic generation for the WRP works will be when road pavement construction is occurring. That is the task requiring most intensive material deliveries. During road pavement construction at the WRP it is estimated that up to 20 trucks daily (or up to 40 truck movements) may attend the site to deliver crushed rock, equipment and incidental materials.

During intense periods of concrete construction, it is estimated that up to 2 concrete trucks per hour, or 10 per day, may attend the site. Other trucks delivering or removing formwork and other materials may approach 4 per day. Therefore, a total of up to 14 trucks per day are likely to attend the site during concrete construction. That is 28 daily truck movements, fewer than the truck traffic associated with pavement construction and accordingly the higher figure is used for impact assessment.

Truck attendances for building sheds and incidental site establishment works will be at lower volume than associated with the above activities.

## 5.2 Potable Water Pumping Station

The potable water pumping stations construction will require the following vehicle movements :-

- Excavation 1,200 cubic metres of rock removal requiring 120 trucks or 240 truck movements
- Concrete works 500 cubic metres of concrete requiring 90 concrete trucks or 180 truck movements

A further 20 large truck attending for delivery of plant and equipment are allowed.

Peak activity periods are likely to generate up to 16 truck attendances per day, wither for concrete delivery or rock removal. Peak hourly attendance is likely to be 2 trucks or 4 truck movements.

Employee (light) vehicles attendances of up to 8 attending per day (16 vehicle movements) are allowed.

### 5.3 Reservoir Works (Adjacent to Neighbourhood 3)

The reservoir works involve excavation and removal of up to 6,000 cubic metres of rocky material requiring 600 trucks or 1,200 vehicle movements over the course of the project.

Concrete base slab construction in Stage 1 will require 480 cubic metres of concrete, delivered in about 60 concrete trucks (120 truck movements).

Employee (light) vehicle attendances of 10 vehicles per day (20 movements) are allowed.

During peak activity periods up to 32 truck attendances per day can be expected, with a peak of 4 per hour (8 truck movements per hour).

A construction period of around 40 weeks is estimated.

### 5.4 Construction of Sewage Pumping Stations

The following requirements are estimated :-

SPS	Excavation		Concrete Works		General Delivery Trucks	Total Trucks Attending
	Volume	Trucks	Volume	Trucks		
SPS1	1,130	115	360	45	6	166
SPS2	800	80	260	30	6	116
SPS3	150	15	60	9	6	30
SPS4	500	50	150	20	6	76

A further 52 trucks for delivery of plant and equipment are allowed over the project.

Employee (light) vehicle attendances of 10 vehicles per day (20 movements) are allowed.

During peak activity periods up to 32 truck attendances per day can be expected, with a peak of 4 per hour or 8 truck movements oer hour.

The construction traffic associated with sewage pumping station works is not likely to coincide with that associated with the construction of the potable water pumping station, because it is likely that the same contractor would be engaged for both projects.

However, in the interests of extreme conservatism, it is assumed that overlap will occur. Consequently the construction traffic associated with SPS1 and SPS2 is included in the summary table at Section 5.6.

SPS1 and SPS2 are within Stage 1 of the project, whereas SPS3 and SPS4 will be constructed in the ultimate stage.

### 5.5 Pipe Works

The project involves installation of about 5 km of bulk water delivery mains, and 3.7 km of recycled water mains along Googong Dam Road and Old Cooma Road. The peak level of construction traffic for pipe works is estimated at :-

- Delivery and removal of equipment (ditching, compaction etc) 2 trucks per day
- Removal of excavated material 12 trucks per day
- Delivery of bedding material and concrete for incidental work 10 trucks per day
- Delivery of pipes, fittings and ancillary items 3 trucks per day
- Employee (light) vehicles 10 vehicles attending site daily
- Total Truck Attendances 600 trucks

This is a total of 27 trucks per day (or 54 truck movements) and 20 daily light vehicle movements. The pipeworks component of the project will be spread over several months, during the construction of the Neighbourhood 1A civil works, and will coincide with peak periods of traffic generation due to other works.

### 5.6 Summary of Water Cycle Project Construction Traffic

The following table provides a summary of the estimated water cycle related works traffic generation during peak activity periods. Traffic during peak hours is estimated on the basis of experience and intuition from the daily vehicle movements estimated.

Traffic Source	Water Recycling Plant	Potable Water PS	Reservoir Works	Sewage Pumping Stations	Pipe Works	Totals
<b>Total Truck Attendances</b>	310	230	660	440	600	<b>2240</b>
Peak Daily Vehicle Movements						
Trucks	40	32	32	64	54	<b>222</b>
Light Vehicles	40	16	20	20	20	<b>116</b>
<b>AM Peak Hour</b>						
Trucks In	3	2	4	4	4	<b>17</b>
Trucks Out	3	2	4	4	2	<b>15</b>
Light Vehicles In	12	5	6	6	6	<b>35</b>
Light Vehicles Out	4	1	2	2	2	<b>11</b>
<b>PM Peak Hour</b>						
Trucks In	3	2	4	4	2	<b>15</b>
Trucks Out	3	2	4	4	4	<b>17</b>
Light Vehicles In	4	1	2	2	2	<b>11</b>
Light Vehicles Out	12	5	6	6	6	<b>35</b>



## 6. WATER CYCLE PROJECT OPERATIONAL TRAFFIC

The WRP will not be fully operational until around 181 houses are occupied (equivalent to 550 equivalent population). Prior to full operation (nominally, 6 months into the development), trucks will cart sewage to an off-site treatment plant.

Allowing 400 litres per household per day, and tanker capacity of 20,000 litres, each tanker can carry the waste from 50 households. Consequently one semi-trailer attending the site daily will be initially adequate prior to full operation of the plant, and an additional daily load will be necessary when around 50 houses are occupied. Those truck movements will only occur on Googong Dam Road and Old Cooma Road near Googong.

Routine inspections, plant and grounds maintenance will generate fewer than 10 daily vehicle trips, primarily by light vehicles.

## 7. EXISTING TRAFFIC FACILITIES AND CONDITIONS

### 7.1 Roads

Old Cooma Road and Googong Dam Road are two lane/two way roads with sealed carriageways. Traffic volumes obtained from Queanbeyan City Council indicate the following :-

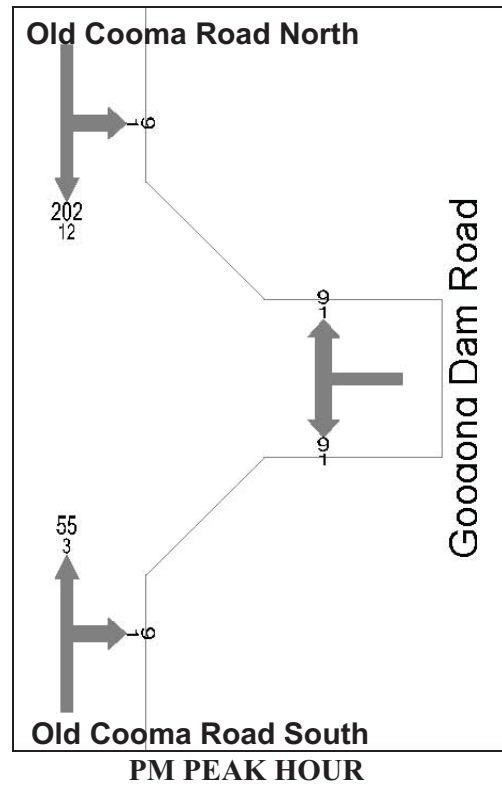
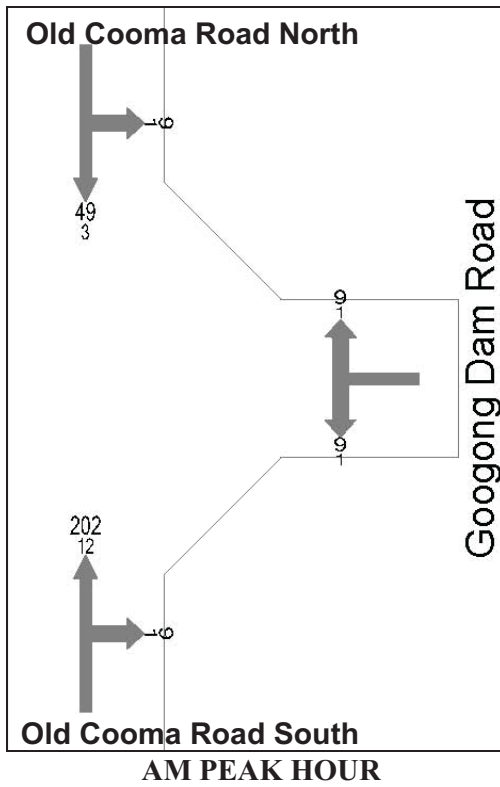
Location	Traffic Count Data	Average Weekday Traffic	Peak Two-Way Traffic (veh/hr)	Percentage Heavy Vehicle
Old Cooma Road south of Googong Dam Road	16/5/07-23/5/07	2,120	244	5.7%
Old Cooma Road north of Googong Dam Road	6/12/06-13/12/06	2,537	264	5.7%
Googong Dam Road	3/8/04-10/8/04	260	29	9.5%

### 7.2 Intersection Old Cooma Road and Googong Dam Road

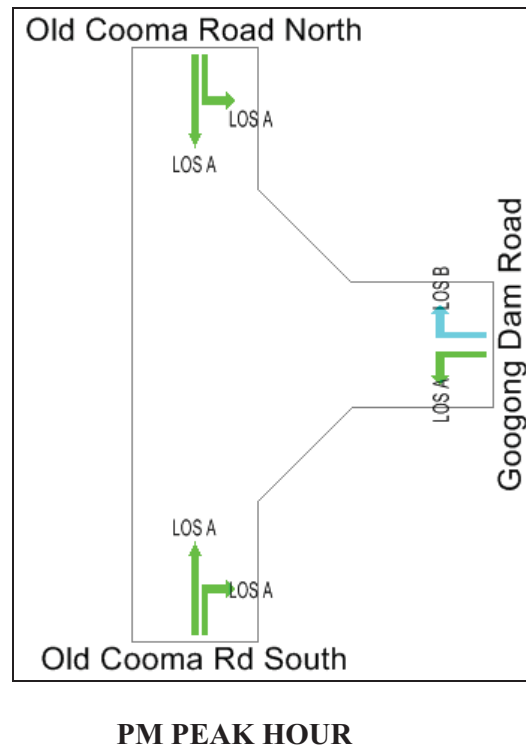
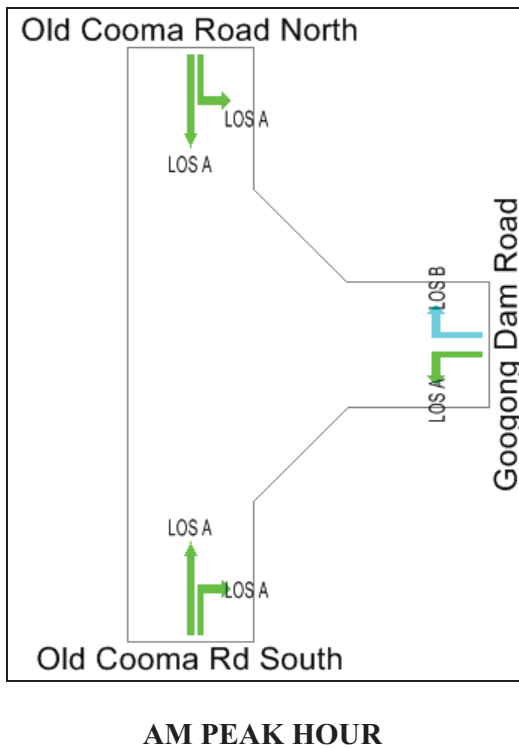
This intersection is constructed and linemarked as a typical AustRoads “CHR” intersection, with auxiliary lanes as follows :-

- For left turn, north to east 12 metres length deceleration lane
- For left turn, east to south 120 metres long acceleration taper
- For right turn, south to east 30 metres long right turn lane

Turning traffic volumes are derived from the counts listed at Section 6.1 on the basis of 80/20 peak directional bias, as follows :-



These volumes are extremely low in the context of the capacity of the intersection. Sidra analysis shows the following outputs for “Level of Service”, which is often used to evaluate intersection operational performance.



Level of Service is a qualitative measure describing operational conditions within a traffic stream or at an intersection.

AustRoads has adopted levels of service A through F, with Level of Service A presenting virtually free flow, and Level of Service F representing forced flow where capacity limits are exceeded by approaching traffic flows. Level of Service C represents stable flow where most drivers are restricted to some extent in their freedom to select their desired speed.

“Sidra” is a computer basis program for analysis of intersection performance, and is generally used by all Australian road authorities for analysis of intersection performance.

## 8. IMPACTS OF WATER CYCLE PROJECT TRAFFIC

### 8.1 Overview of Method of Analysis

The traffic generation for the various contributing components of total traffic generation, including the Spillway Project, Googong Neighbourhood 1A and the several elements of the Water Cycle Project, are not likely to all occur at peak levels at the same time. In reality the same contractors may be engaged on more than one contributing component, which would severely limit the potential for all traffic generation to coincide at peak rates.

Nonetheless the traffic generation summary table at Section 8.2 below is used to calculate possible impacts at Section 8.3. This is an extremely conservative approach, but generates a “maximum possible” impact scenario for consideration.

### 8.2 Summary of Potential Traffic Generation

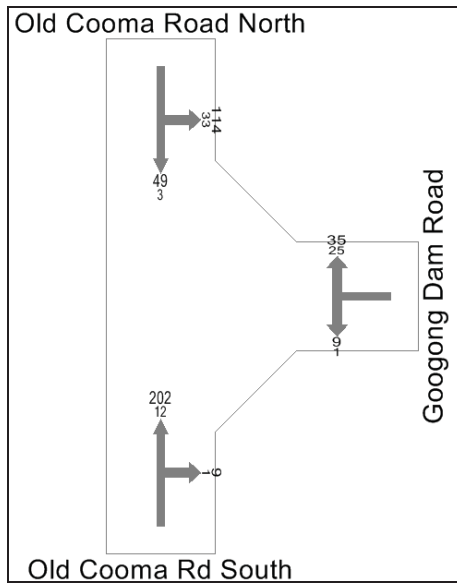
The following table provides a summary of water cycle, spillway and Googong Neighbourhood 1A construction traffic generation. These are peak rates for each project, and are not likely to coincide.

Traffic Source	Water Cycle Project	Googong Neighbourhood 1A	Spillway Project	Totals
<b>Peak Daily Vehicle Movements</b>				
Trucks	222	80	112	<b>414</b>
Light Vehicles	116	120	100	<b>336</b>
<b>AM Peak Hour</b>				
Trucks In	17	6	9	<b>32</b>
Trucks Out	15	6	3	<b>24</b>
Light Vehicles In	35	40	30	<b>105</b>
Light Vehicles Out	11	10	5	<b>26</b>
<b>PM Peak Hour</b>				
Trucks In	15	6	3	<b>24</b>
Trucks Out	17	6	9	<b>32</b>
Light Vehicles In	11	10	5	<b>26</b>
Light Vehicles Out	35	40	30	<b>105</b>

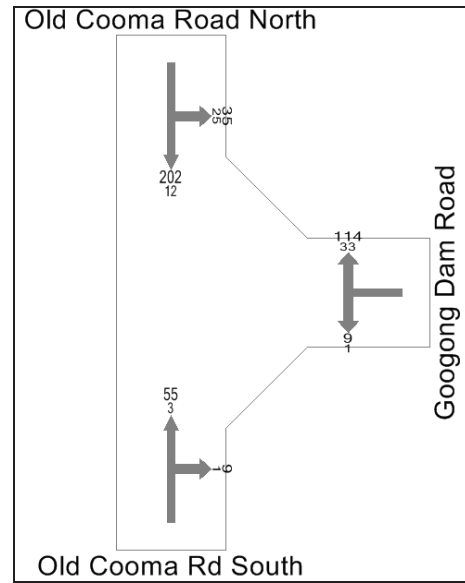
### 8.3 Traffic Impacts During Construction

#### 8.3.1 At Old Cooma Road and Googong Dam Road Intersection

Adding the movements outlined in the table in Section 8.1, conservatively assuming that all movements will be using Googong Dam Road, to the existing volumes from Section 7.1 gives the following loading during peak periods at the intersection of Googong Dam Road and Old Cooma Road.

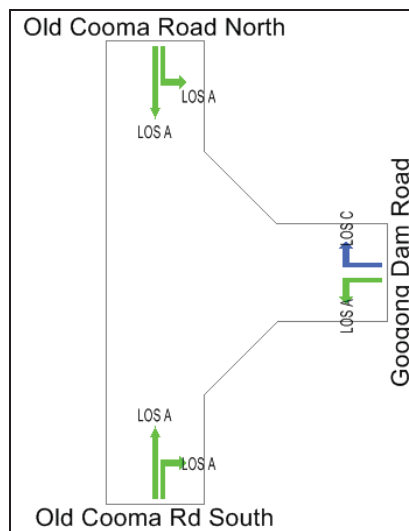


**AM PEAK HOUR**

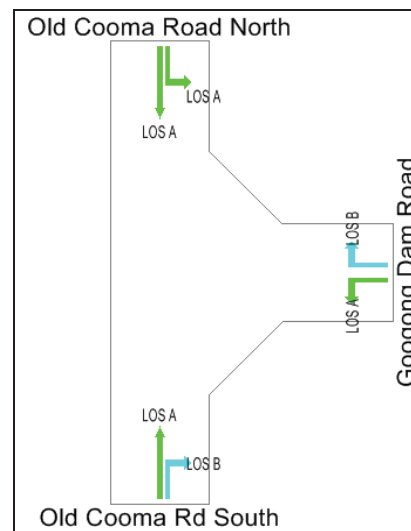


**PM PEAK HOUR**

Sidra analysis provides the following Level of Service assessments.



**AM PEAK HOUR**



**PM PEAK HOUR**

These levels of service are well within acceptable bounds. Further, no significant change to Level of Service will result from the Water Cycle Project traffic.

### **8.3.2 Mid Block Level of Service**

#### **Old Cooma Road North of Googong Dam Road**

Daily traffic is likely to increase by up to 698 vehicle movements, including 294 by heavy vehicles, as a result of the Water Cycle Project in conjunction with Googong Neighbourhood 1A and the Googong Dam Spillway project. This will take volume to 3,235 vehicles per day, including around 17% heavy vehicles.

AustRoads Guide to Traffic Engineering Practice Part 2 indicates Level of Service C for this loading in rolling terrain, with 80/20 directional distribution and no formed shoulders adjacent to 3.4 metres wide lanes, which is the existing form of Old Cooma Road. That is entirely acceptable.

#### **Googong Dam Road**

Level of Service A, calculated per AustRoads, will apply. That is entirely acceptable.

#### **Old Cooma Road South of Googong Dam Road**

Only the traffic associated with reservoir works and some pipe works will use Old Cooma Road south of Googong Dam Road rather than Googong Dam Road. If all of the reservoir work traffic (estimated peak of 52 vehicles per day) and half of the pipe works traffic (estimated peak of 37 vehicles per day) were to use Old Cooma Road South of Googong Dam Road a daily total of 89 additional vehicle movements is estimated on Old Cooma Road south of Googong Dam Road.

That level of additional traffic will have no significant impact on traffic related levels of service, safety or capacity. Level of Service A, calculated per AustRoads, will still be present in Old Cooma Road south of Googong Dam Road.

### **8.4 Traffic Impact During Early Operation**

Prior to full operation the traffic associated with transport of raw sewage will be insignificant in comparison with the traffic during construction of the water cycle project.

### **8.5 Traffic Impact at Full Operation**

The estimated 10 daily vehicle movements is equivalent to the traffic generated by two dwellings, and will be insignificant in the overall context of Googong.

## **9. OTHER CONSIDERATIONS**

We note that spillway project includes a proposal to reduce the speed limit on Old Cooma Road near Googong Dam Road to reduce crash risk. Further, signage warning of trucks is proposed. GHD has demonstrated the capacity of large trucks to make turns at the intersection of Old Cooma Road and Googong Dam Road.

No further recommendations are proposed in respect of the Googong Water Cycle project.

## 10. SUMMARY AND CONCLUSIONS

Both intersection and mid-block levels of service on Old Cooma Road and Googong Dam Road will be well within reasonable bounds during the peak traffic generation periods of the Water Cycle Project in conjunction with Neighborhood 1A and the Googong Dam Spillway project.

The traffic impacts of the Water Cycle Project will be insignificant once the works are complete.

### TTM Consulting (Vic) Pty. Ltd.



**J. D. Higgs**