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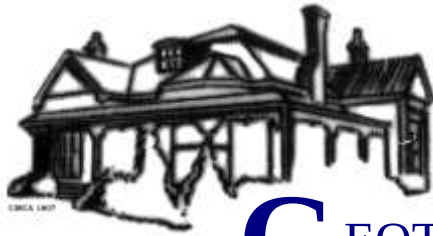


## **PRELIMINARY SITE INVESTIGATION**

**GOOGONG TOWNSHIP RESIDENTIAL DEVELOPMENT  
GOOGONG FORESHORE INTERFACE MANAGEMENT STRATEGY (GFIMS) AREA  
OLD COOMA ROAD, GOOGONG**

**REPORT NO 14328/4-AA      29 SEPTEMBER 2022**

DRAFT



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Job No: 14328/4  
Our Ref: 14328/4-AA  
29 September 2022

Googong Township Pty Ltd (GTPL)  
c/- Eight Mile Planning  
PO Box 1088  
MUDGEE NSW 2850  
Email: [lizdensley@8mileplanning.com.au](mailto:lizdensley@8mileplanning.com.au)

Attention: Ms Liz Densley

Dear Liz

re: **Googong Township Residential Development  
Googong Foreshore Interface Management Strategy (GFIMS) Area  
Old Cooma Road, Googong  
Preliminary Site Investigation**

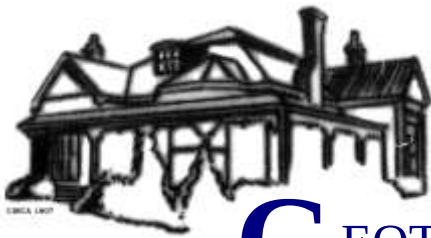
Please find herewith our *Preliminary Site Investigation* (PSI) report for the above site. It is understood that the site is proposed for residential (with garden / accessible soil) land use.

A brief of the outcome of the assessment is summarised in the Executive Summary.

If you have any questions, please do not hesitate to contact the undersigned.

Yours faithfully  
GEOTECHNIQUE PTY LTD

JOHN XU  
Senior Associate  
BE, MEngSc, MEAust



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## EXECUTIVE SUMMARY

A preliminary site investigation (PSI) was carried out at the site known as Googong Foreshore Interface Management Strategy (GFIMS) area, located at Old Cooma Road, Googong, in the Local Government Area (LGA) of Queanbeyan Palerang Regional Council (QPRC).

The report for the PSI was commissioned by Googong Township Pty Ltd (GTPL) (Principal) via Eight Mile Planning (8MP) (Client) and undertaken in accordance with fee proposal (Our Ref: Q14328-3 dated 7 February 2022) prepared by Geotechnique Pty Ltd (Geotechnique). It is understood that the site is proposed for residential (with gardens / accessible soil) land use.

The objectives of the PSI are to assess and comment on the suitability of the site for the proposed development from a contamination prospective, and to provide recommendations with regard to future remediation works. In order to achieve the objectives of this assessment, the scope of work included review of site historical data presented in the relevant report and site inspection.

The findings of this assessment are summarised as follows:

- Contaminated material (livestock carcasses) was identified in Area 3 (refer to Drawing No 14328/4-AA3).
- For landfill disposal purposes, the contaminated material to be removed from Area 3 within the site is classified as **"General Solid Waste (Putrescible)"**.
- Potential off-site impacts of contaminants on groundwater and waterbodies are considered to be low.
- Remediation and validation of the site are required.

Based on this assessment, it is our opinion that the site can be made suitable for the proposed residential (with garden / accessible soil) land use, subject to implementation of the following recommendations, prior to earth works / site preparation:

1. A remedial action plan (RAP) is to be prepared to devise strategies for remediation / management of the contaminated material in Area 3 as indicated on Drawing No 14328/4-AA3.
2. Site validation is to be carried out following the remediation of the contaminated area.

If suspect materials (identified by unusual staining, odour, discolouration or inclusions such as building rubble, asbestos sheets / pieces / pipes, livestock carcasses, ash material, imported fill materials [which are different to those encountered during the previous assessments and this assessment], etc.) are encountered during any stage of future remediation / earthworks / site preparation, we recommend that this office is contacted for assessment and an unexpected finds management protocol in Appendix A of this report be implemented.

Reference should be made to Section 8.0 for details of the recommendations regarding any other materials to be excavated and removed from the site, and any fill to be imported to the site.

Reference should be made to Section 9.0 for the limitations of this report.

## **PROJECT OVERVIEW**

Googong Township is a 25 year project being developed in partnership by Peet and Mirvac, operating as Googong Township Pty Ltd (GTPL). The emerging township is located in Southern NSW, 8 kilometres (km) from Queanbeyan and 15km from Canberra. The Googong master plan is embedded in Queanbeyan-Palerang Regional Council's (QPRC) Googong Development Control Plan and provides the overarching structure for the township. It has been planned and is being developed as a freestanding township with five neighbourhoods, around 6,600 dwellings and a population of over 18,000 people over 25 years.

Googong Township is currently being developed by GTPL and comprises a series of Neighbourhoods.

Neighbourhood's 1 and 2 (also known as Googong North and Googong Central) have completed Structure plans and DAs. Neighbourhood 2 is currently under staged construction.

Neighbourhood's 3, 4 and 5 (NH345) to be developed, the Development Application of which has been submitted, are:

- Neighbourhood 3 (including the Hamson land) – also known as Googong West
- Neighbourhood 4 – also known as Googong South
- Neighbourhood 5 – also known as Googong East

NH345 is bounded by Old Cooma Road to the west, Neighbourhood 2 and Neighbourhood 1B to the north, the Googong Dam foreshore and Pink Tail Worm-Lizard Conservation Area to the east and rural land to the south.

The area around Googong is characterised by rural uses, while NH345 itself is characterised as former agricultural land.

The GFIMS Area lies immediately to the south and east of Googong NH345.

## PROJECT OBJECTIVE

GTPL are seeking to submit a Planning Proposal (PP) application with QPRC to amend the Queanbeyan Local Environmental Plan 2012 (QLEP 2012) to facilitate additional residential development (and associated infrastructure) within the GFIMS Area.

The proposed amendments to QLEP 2012 will facilitate and increase the permissible extent of development within Googong. This extent of realignment will facilitate the development of a total of approximately 191 additional residential lots.

The proposed changes to the QLEP 2012 include changes to the Land Zoning Map and the Minimum Lot Size Map to facilitate the dam catchment realignment and additional residential lots.

The PP will apply to the GFIMS Area shown in red on the following plan.



## PURPOSE OF THIS REPORT

The purpose of this report is for the submission and approval of a PP to QPRC for Googong Foreshore Interface Management Strategy (GFIMS) Area from a contamination prospective.

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## APPENDICES

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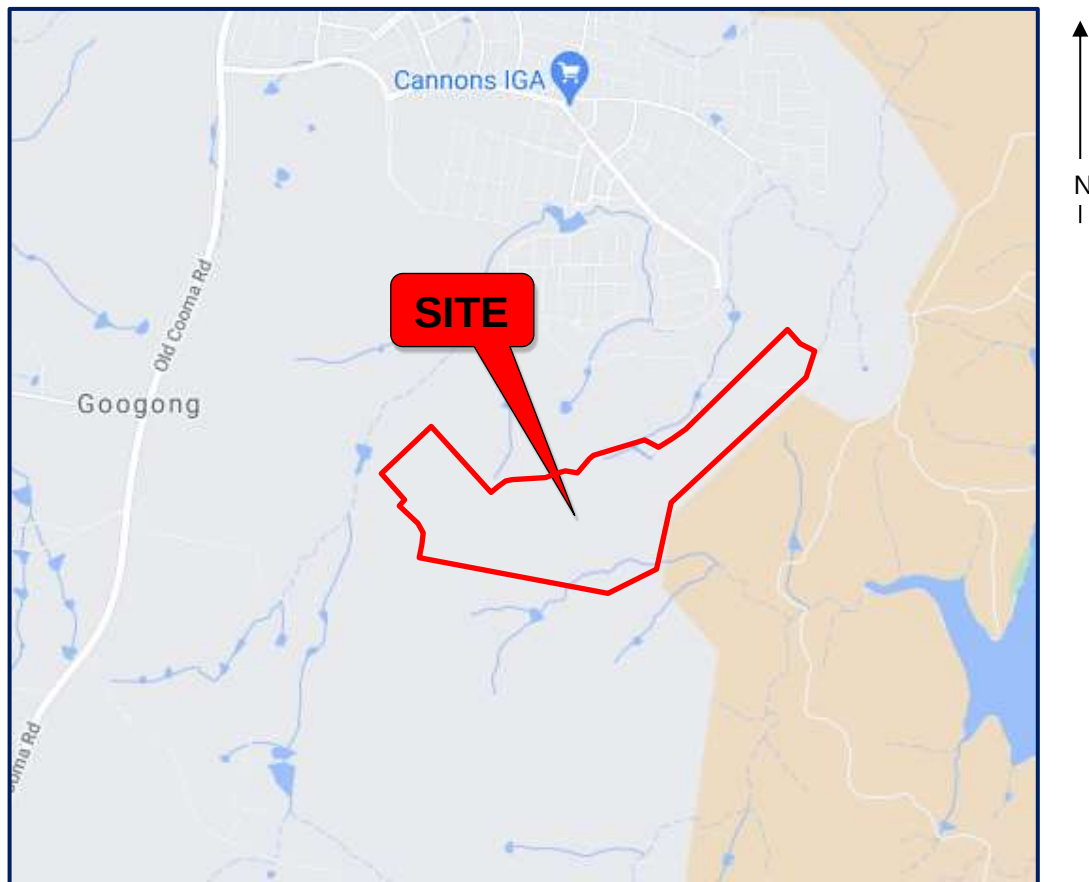
14328/4-AA

Googong Foreshore Interface Management Strategy (GFIMS) Area – Old Cooma Road, Googong

## 1.0 INTRODUCTION

This report, commissioned by Googong Township Pty Ltd (GTPL) (Principal) via Eight Mile Planning (8MP) (Client) and undertaken in accordance with fee proposal (our Ref. Q14328-4 dated 7 February 2022) prepared by Geotechnique Pty Ltd (Geotechnique), presents the results of a preliminary site investigation (PSI) at the site known as Googong Foreshore Interface Management Strategy (GFIMS) Area, located at Old Cooma Road, Googong, as indicated on Figure 1 below.

**FIGURE 1**



Map Data ©2021 Google

It is understood that the site is proposed for standard residential (with garden / accessible soil) land use.

This assessment was based on site historical data presented in the following reports prepared by Geotechnique:

- *Detailed Contamination Assessment* (DCA) Report (Our Ref: 14328/1-AB dated 29 March 2022) for NH3 to NH5; and
- *Site Contamination Assessment* (SCA) (Our Ref. 14328/2-AA dated September 2021) for NH3 to NH5.

The objectives of the PSI are to assess and comment on the suitability of the site for the proposed development from a contamination prospective, and to provide recommendations with regard to future remediation works.

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14328/4-AA

Googong Foreshore Interface Management Strategy (GFIMS) Area – Old Cooma Road, Googong

## **2.0 SCOPE OF WORK**

In order to achieve the objectives of the assessment, the following scope of work was carried out:

- Review of the Reports 14328/1-AB and 14328/2-AA.
- A thorough inspection of the site by our Environmental Scientist from Geotechnique to identify the current site conditions and any visible or olfactory indicators of potential contamination, which are different to those identified during the previous assessments.
- Identification of contamination constraints that may impact the proposed development area, and areas for further detailed investigation and any mitigation strategies, remediation action plan (RAP) or management regime required.

## **3.0 SITE DESCRIPTION**

The site is located to the east of Old Cooma Road, Googong, in the Local Government Area (LGA) of Queanbeyan Palerang Regional Council (QPRC) and within the boundary of the wider Googong Township Development.

The site, as indicated on Drawing No 14328/4-AA1, is irregular in shape and covers an area of approximately 64.1 hectares (ha).

The site comprises part of a parcel of land (2 lots) including:

- Lot 1605 in DP1266000; and
- Lot 2 in DP1231713.

## **4.0 SITE HISTORY & SUMMARY OF PREVIOUS CONTAMINATION ASSESSMENTS**

The site was once part of a larger grazing property that has been operating since the mid to late 1800s, and had typically been used for sheep and cattle grazing.

As shown on Drawing No 14328/4-AA1, contamination assessments had been conducted within the land inclusive of the entire Lot 1605 in DP1266000 and Lot 2 in DP1231713 which covers the subject site in various stages and documented in reports 14328/1-AB and 14328/2-AA.

### **4.1 14328/1-AB Report**

Geotechnique carried out a DCA at the subject land known as NH3, NH4 & NH5 including the subject site (GFIMS Area) boundary (part Lot 1605 in DP1266000 and Lot 2 in DP1231713, refer to Drawing Nos 14328/4-AA1 and 14328/1-AA1) in 2019 and 2021.

The objective of contamination assessment was to provide information on the contamination status of the soil within the subject land to determine the suitability of the land for the proposed residential (with garden / accessible soil), open space, high density residential and commercial land uses including public roads.

In order to achieve the objectives of the assessment, the scope of work included review of site historical data presented in the relevant reports and documents, site inspection, as well as soil sampling and laboratory testing.

14328/4-AA

Googong Foreshore Interface Management Strategy (GFIMS) Area – Old Cooma Road, Googong

The following scope of work was conducted:

- A thorough inspection of the land by our Environmental Scientists from Geotechnique to identify the site conditions and any visible or olfactory indicators of potential contamination.
- Soil sampling was completed in accordance with a pre-determined sampling plan.
- A calibrated Photo-Ionisation Detector (PID) was used to screen the recovered soil samples for the presence of any volatile organic compounds (VOC).
- Soil samples at and in the vicinity of the identified contaminated sample location J2 were recovered for delineation of contamination extents.
- Appropriate quality assurance (QA) and quality control (QC) measures were implemented.
- Chemical analysis of soil samples was carried out by National Association of Testing Authorities (NATA) accredited laboratories, in accordance with Chains of Custody (COC) documentation prepared by Geotechnique.
- Assessment of the laboratory analytical results, as well as field and laboratory QA & QC data.
- Assessment of the contamination status of the NH3 to NH5.

The investigation included the collection of the following samples:

- 101 discrete sample locations collected in a grid pattern across the investigation area;
- 4 samples collected from 3 areas of environmental concern (AEC), namely, fire pit inclusive of waste, metal bath and soil stockpile;
- 14 samples collected at and in the vicinity of the identified contaminated sample location J2.

Of the soil samples collected during the investigation, the following samples were collected from within the site (GFIMS Area) boundary (Part Lot 1605 in DP1266000 and Lot 2 in DP1231713, refer to Drawing No 14328/4-AA1):

- DS17, DS23 to DS25, DS27 to DS29, DS41 to DS46, DS56 to DS62, DS70 to DS76, DS86 to DS89 and DS95.

Reference should be made to Drawing No 14328/1-AA3 for the above sample locations.

The following Table 4.1 summarised the results of the soil samples collected from within the site (GFIMS Area) boundary (Part Lot 1605 in DP1266000 and Lot 2 in DP1231713). The results have been compared with the relevant criteria. No contamination was identified in the samples analysed.

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Googong Foreshore Interface Management Strategy (GFIMS) Area – Old Cooma Road, Googong

**Table 4.1 Summary of Soil Analytical Results for Part Lot 1605 in DP1266000 and Lot 2 in DP1231713**

| Analyte            | Minimum Concentration (mg/kg) | Maximum Concentration (mg/kg) | Criteria for HIL A / HSL A | Criteria for EIL A / ESL A |
|--------------------|-------------------------------|-------------------------------|----------------------------|----------------------------|
| Arsenic            | <1                            | 6                             | 100                        | 100                        |
| Cadmium            | <0.3                          | <0.3                          | 20                         |                            |
| Chromium (Total)   | 2.7                           | 8.1                           | 100                        | 410                        |
| Copper             | 0.6                           | 7.6                           | 6,000                      | 80                         |
| Lead               | 3                             | 15                            | 300                        | 1,200                      |
| Mercury            | <0.05                         | <0.05                         | 10                         |                            |
| Nickel             | 1.0                           | 3.9                           | 400                        | 10                         |
| Zinc               | 4.4                           | 74                            | 7,400                      | 130                        |
| F1                 | <25                           | <25                           | 40                         | 180                        |
| F2                 | <25                           | 160                           | 230                        | 120                        |
| F3                 | <90                           | 930                           |                            | 1,300                      |
| F4                 | <120                          | 520                           |                            | 5,600                      |
| Benzene            | <0.1                          | <0.1                          | 0.6                        | 65                         |
| Toluene            | <0.1                          | <0.1                          | 390                        | 105                        |
| Ethylbenzene       | <0.1                          | <0.1                          | Not Limiting               | 125                        |
| Xylene             | <0.3                          | <0.3                          | 95                         | 45                         |
| BaP                | <0.1                          | <0.1                          |                            | 0.7                        |
| BaP TEQ            | <0.3                          | <0.3                          | 3                          |                            |
| Total PAH          | <0.8                          | <0.8                          | 300                        |                            |
| Naphthalene        | <0.1                          | <0.1                          | 4                          | 170                        |
| PCB                | <1                            | <1                            | 1                          |                            |
| OCP                | <0.1 - <0.6                   | <0.1 - <0.6                   | 6 - 300                    |                            |
| OPP (Chlorpyrifos) | <0.2                          | <0.2                          | 160                        |                            |

Notes:

TRH = Total Recoverable Hydrocarbons

BTEX = Benzene, Toluene, Ethyl Benzene and Xylenes

F1 = TRH (C6-C10) less BTEX

F2 = TRH (>C10-C16) less Naphthalene / TRH (>C10-C16)

F3 = TRH (>C16-C34)

F4 = TRH (>C34-C40)

BaP = Benzo(a)pyrene

PAH = Polycyclic Aromatic Hydrocarbons

OCP = Organochlorine Pesticides

OPP = Organophosphorus Pesticides

PCB = Polychlorinated Biphenyls

The findings of the assessment associated with the site (GFIMS Area) are summarised as follows:

- AEC / potential AEC (PAEC) including surface soil due to grazing activities and a pit with burial livestock carcasses with the associated contaminants of potential concern (CoPC) had been identified.
- Sampling and testing of surface soil samples across the site had been carried out to address the AEC / PAEC and the associated CoPC related to the grazing activities. No contamination was identified in the samples analysed.

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14328/4-AA

Googong Foreshore Interface Management Strategy (GFIMS) Area – Old Cooma Road, Googong

- Contaminated material (livestock carcasses) was identified in the pit / Area 3 (refer to Drawing No 14328/6-AA6), which would present a risk of harm to human health and pose potential risk to terrestrial ecosystems.
- For landfill disposal purposes, the contaminated material to be removed from Area 3 was classified as **“General Solid Waste (Putrescible)”**.
- Potential off-site impacts of contaminants on groundwater and waterbodies were considered to be low.
- Remediation and validation of the site are required.

Based on the assessment, it was our opinion that the subject site (GFIMS Area) could be made suitable for the proposed redevelopment into residential (with garden / accessible soil) land use, subject to implementation of the following recommendations, prior to earth works / site preparation:

1. Preparation of a remedial action plan (RAP) to devise strategies for remediation / management of the contaminated material in Area 3.
2. Site validation following the remediation of the contaminated area.

#### **4.2 14328/2-AA Report**

Geotechnique carried out a site contamination assessment (SCA) at the land known as NH3, NH4 & NH5 including the subject site (refer to Drawing Nos 14328/4-AA1 and 14328/2-AA1) in 2021.

This assessment was based on site historical data presented in the following reports prepared by Geotechnique Pty Ltd (Geotechnique):

- *Supplementary Sampling, Analysis and Quality Plan & Remedial Works Plan* (Our Ref: 12675/2-L1 dated 22 August 2014) for Neighbourhood 1B.
- *Detailed Contamination Assessment* Report (Our Ref: 12675/2-AA dated 12 September 2014) for Neighbourhood 1B.
- *Contamination Assessment / Validation* Report (Our Ref: 12675/3-AAR1 dated 30 November 2015) for NH1B Stage 1 to Stage 8.
- *Groundwater Contamination Assessment* Report (Our Ref: 12675/3-AB dated 2 September 2016) for AEC5 in Neighbourhood 1B.
- *Contamination Assessment* Report (Our Ref: 12675/4-AA dated 31 May 2016) for NH1A Stage 7 and NH2.
- Draft *Detailed Contamination Assessment* Report (Our Ref: 14328/1-AA dated 25 June 2019) for NH3 to NH5 prepared by Geotechnique.

The objectives of the SCA were to assess and comment on the suitability of the land for the proposed development from a contamination prospective, and to provide recommendations with regard to future demolition and remediation works.

In order to achieve the objectives of the SCA, the scope of work included review of site historical data presented in the relevant reports and documents, site inspection, as well as soil sampling and laboratory testing.

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Googong Foreshore Interface Management Strategy (GFIMS) Area – Old Cooma Road, Googong

The following scope of work was carried out:

- Review of the previous reports.
- A thorough inspection of the site by our Environmental Scientists from Geotechnique to identify the current site conditions and any visible or olfactory indicators of potential contamination, which were different to those identified during the previous assessments.
- Recovery of soil samples at and in the vicinity of the previous sample location J2 for laboratory test for delineation of contamination extents.
- Implementation of QA and QC measures.
- Chemical analysis by NATA accredited laboratories, in accordance with COC prepared by Geotechnique.
- Assessment of the laboratory analytical results.
- Assessment of field and laboratory QA and QC.
- Assessment of the contamination status of the site.

The findings of the assessment associated with the site (GFIMS Area) are summarised as follows:

- Contaminated material was identified in the pit / Area 3 (refer to Drawing No 14328/2-AA4).
- For landfill disposal purposes, the contaminated material to be removed from Area 3 was classified as **“General Solid Waste (Putrescible)”**.
- Potential off-site impacts of contaminants on groundwater and waterbodies were considered to be low.
- Remediation and validation of the site are required.

Based on the assessment, it was our opinion that the subject site (GFIMS Area) could be made suitable for the proposed redevelopment into residential (with garden / accessible soil) land use, subject to implementation of the following recommendations, prior to earth works / site preparation:

1. Preparation of an RAP to devise strategies for remediation / management of the contaminated material in Area 3.
2. Site validation following the remediation of the contaminated area.

## **5.0 SITE CONDITION AND SURROUNDING ENVIRONMENT**

### **5.1 Site Condition**

As shown on Drawing No 14328/4-AA1, contamination assessments had been conducted within the subject site in various stages and documented in reports 14328/1-AB and 14328/2-AA.

#### **5.1.1 Site Inspection in 2019**

At the time of inspection by our Environmental Scientists from Geotechnique from 20, 21 & 22 May and 5 June 2019 and as indicated on Drawing No 14328/1-AA2, the land known as NH3 to NH5 including the subject site (GFIMS Area) was grazing land, with rock outcrops and sparsely distributed trees throughout.

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*14328/4-AA**Googong Foreshore Interface Management Strategy (GFIMS) Area – Old Cooma Road, Googong*

The land was divided into two portions based on two separate boundaries, i.e. one smaller portion to the west of the land fronting Old Cooma Road and comprising Lot 42 in DP754881 and one larger portion to the east of the land, which was fronted by a new subdivision area NH1B to the north, and surrounded by Googong Foreshore to the east and by grazing land to the south, and west.

The site features (SF) associated with the subject site (refer to Drawing No 14328/1-AA2) included:

- A small embankment (SF# 2d) on the south eastern portion of the site;
- A small dam (SF# 3i);
- A dried creek line (SF# 8a) in the south eastern portion of the site, running from the south eastern corner of the site to the south of the site
- A large burial pit with livestock carcasses, with soil stockpiles surrounding the pit (SF# 10). The size and appearance of the material appeared to match the pit, and interview with landowner confirmed the origin of the stockpiles was from the pit.
- A bare ground driveway (SF# 16).

#### **5.1.2 Site Inspection in 2021**

A follow up inspection was carried out on 23 and 24 February 2021 within the land (NH3 to NH5) including the subject site (GFIMS Area) to identify any changes to the site condition since the previous inspection.

With the exception of the site features (SF# 2d, 3i, 8a, 10 and 16) associated with the subject site (refer to Drawing No 14328/2-AA2) identified during the previous inspection in 2019 as outlined in Section 5.1.1 of this report, no obvious changes to the appearance of the subject site were noted.

#### **5.1.3 Site Inspection in 2022**

A follow up inspection was carried out on 12 and 13 September 2022 within the subject site (GFIMS Area) to identify any changes to the site condition since the previous inspection.

The following observations related to the subject site (refer to Drawing No 14328/4-AA2) were made:

- Due to recent rainfall events, the ground surface across the whole site had since become saturated. As a result, the previously identified dried creek (SF# 8a) was no longer dry and now appeared as saturated depression area.
- The pit with livestock carcasses (SF# 10) appeared to have been partially backfilled, however carcasses still remained.
- No obvious changes to the remainder of the site.

### **5.2 Surrounding Environment**

At the time of field work, the neighbouring properties were as follows:

|               |                                                                   |
|---------------|-------------------------------------------------------------------|
| To the north: | Googong Township NH4 and NH5                                      |
| To the south: | Rural / Grazing Land                                              |
| To the east:  | Googong Dam Foreshore and Pink Tail Worm-Lizard Conservation Area |
| To the west:  | Googong Township NH3 and NH4; Further West: Old Cooma Road        |

There were no air emissions emanating from the site and the neighbouring properties.

## 6.0 GEOLOGY AND HYDROGEOLOGY

The ground surface of the site was undulating, sloping generally to the east in the western part of the site and to the west or north in the eastern part of the site.

The Geological Map of Canberra (Geological Series Sheet 8727, Scale 1:100,000, 1992), published by the Bureau of Mineral Resources, indicates that the site is underlain by Colinton Volcanics of late Silurian age, comprising dark green dacitic ignimbrite and minor volcaniclastic sediments. In the west of the site there is some tuffaceous shale of the same group. A small area in the centre of the site is underlain by minor granitoid stocks of late Silurian age.

The Soil Landscape Map of Canberra (Soil Landscape Series Sheet 8727, Scale 1:100,000, 2000), published by the NSW Department of Land and Water Conservation, indicates that the majority of the site is located within the Burra Landscape area, which comprises undulating to rolling low hills and alluvial fans on Silurian volcanics. Soils within this landscape are generally shallow to moderately deep. The soils are strongly acid with low fertility and low available waterholding capacity. Subsoils have low permeability. A small area in the centre of the site is located within the Celeys Creek Landscape area, which comprises rolling low hills on granitic rock. Soils within this landscape are generally shallow to moderately deep. The soils are infertile, locally shallow and non-cohesive. Topsoils are acid and highly permeable. Subsoils are hard setting with low available waterholding capacity.

Based on information from all sample locations during the field works for NH3 to NH5 in May and June 2019 (refer to 14238/1-AB report), the sub-surface profile within the subject site is generalised as follows:

|                |                                                                                                                                                                                          |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Topsoil</b> | Clayey Silt, low plasticity, grey or brown, traces of root fibres, some with traces of granite gravel fragments was encountered on the surface across the site at most sample locations. |
| <b>Fill</b>    | Clayey Silt, low plasticity, grey, was encountered at location DS72.                                                                                                                     |

Reference may be made to Drawing No 14328/1-AA3 for the abovementioned sample locations.

Field observations by the Environmental Scientist during sampling indicated that there were no detectable odour and no obvious staining / discolouration of the soil and fibro / asbestos-cement pieces in the sample locations and recovered soil samples that would indicate potential for contamination.

There is no water body such as a creek, river or wetland close to the site. Queanbeyan River is located approximately 580 metres (m) to the east of the site. An obvious local depression area and a farm dam that would capture or divert stormwater run-off were observed within the site. Based on observation and site topography, surface run-off would predominantly flow to the east.

As part of investigation for preparation of Sampling, Analysis and Quality Plan (SAQP) for Neighbourhood 1A, C M Jewell & Associates Pty Ltd (CMJA) undertook a desktop review of records held by the NSW Office of Water (NOW), covering boreholes within a 2 kilometres (km) radius of the centre of land including the site and assessed the hydrogeology of the surrounding area. The search revealed many bores within this radius. However, feature information was only available for three bores with recorded water bearing zones at depths ranging from 0m to 75m below the EGL and standing water levels between 20m and 31m.

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Googong Foreshore Interface Management Strategy (GFIMS) Area – Old Cooma Road, Googong

A search was carried out by Geotechnique on 17 June 2019 through the website of Department of Primary Industries - Office of Water for any registered groundwater bore data within a radius of 500m of the site. The search revealed there was information on six bores available on that date. A summary of the results is presented below:

| Bore     | Completion Date | Authorised / Intended Purpose | AMG coordinates                              | Water Bearing Zone (m)    | Standing Water Level (m) | Salinity (mg/L) |
|----------|-----------------|-------------------------------|----------------------------------------------|---------------------------|--------------------------|-----------------|
| GW063668 | 1.09.1986       | Domestic                      | 700.772 <sub>E</sub> & 6076.579 <sub>N</sub> | 11.90-14.90 & 16.80-18.30 | 4.90                     | No Details      |
| GW064429 | 1.01.1919       | Domestic                      | 700.982 <sub>E</sub> & 6076.944 <sub>N</sub> | 18.30- 27.40              | No Details               | No Details      |
| GW402109 | 2.12.2002       | Stock, Domestic               | 701.108 <sub>E</sub> & 6076.288 <sub>N</sub> | 18.00-23.00               | 11.00                    | 370.00          |
| GW414415 | 10.09.2010      | Stock, Domestic               | 700.849 <sub>E</sub> & 6076.592 <sub>N</sub> | No Details                | No Details               | No Details      |
| GW400206 | 28.04.1997      | Stock, Domestic               | 700.927 <sub>E</sub> & 6076.761 <sub>N</sub> | 22.80- 24.40              | 4.60                     | No Details      |
| GW416391 | 29.08.2013      | Monitoring Bore               | 701.514 <sub>E</sub> & 6076.550 <sub>N</sub> | 12.00-43.00               | 6.80                     | No Details      |

## 7.0 FINDINGS AND DISCUSSION

The findings based on the previous assessments and recent site inspection are summarised as follows:

- The site was once part of a larger grazing property that had been operating since the mid to late 1800s, and had typically been used for sheep and cattle grazing.
- Salient site features as outlined in Section 5.1 and as shown on Drawing No 14328/4-AA2 were identified.
- The site is proposed for residential (with garden / accessible soil) land use.
- The contaminated material (livestock carcasses) was identified in the pit / Area 3 (refer to Drawing No 14328/4-AA3), which would present a risk of harm to human health and pose potential risk to terrestrial ecosystems.
- For landfill disposal purposes, the contaminated material to be removed from Area 3 is classified as **“General Solid Waste (Putrescible)”**.
- Remediation by removal of the contaminated material in Area 3 and disposal at a licensed landfill followed by validation are required.

The contaminated material must be disposed of at an appropriately licensed landfill facility. Removal and disposal of the waste must be carried out in accordance with the requirements of the regulators, such as NSW EPA.

It should be noted that:

- If the waste material is to be disposed at a licensed waste facility in a State other than New South Wales (NSW), such as Australian Capital Territory (ACT), Victoria (VIC) or Queensland (QLD), the proximity principle for disposal might apply and should be considered. If the waste is allowed to be disposed of at a landfill facility in ACT, VIC or QLD, then the classification of the waste will need to comply with the requirements of the regulators in ACT, VIC or QLD. The waste disposal will need to comply with the cross boarder requirements of the National Environmental Protection (Movement of Controlled Waste Between States and Territories) Measure and will require the approval of the EPA in ACT, VIC or QLD.
- Prior to waste material being removed from the site, the Site Auditor is required to review the waste classification for disposal in NSW and all associated documents for disposal in ACT, VIC or QLD.
- All landfill delivery dockets and documents associated with landfill disposal shall be provided to Geotechnique for inclusion in a final validation report.

Due to the relatively impermeable nature of the soils beneath the surface soil and the slope of the land, only minor infiltration of surface waters is likely to occur. As such, the contaminants are likely to be confined primarily to the surface soil, and therefore leaching of contaminants into deeper soils is considered unlikely.

Migration of soil contaminants to the groundwater regime would generally be via leaching of contaminants from the soil, facilitated by infiltration of surface water. It is anticipated that groundwater would be within the underlying shale bedrock. Given that the naturally occurring soils beneath the site are relatively impermeable based on the regional geology information from the previous assessments for the other Neighbourhood development, the potential for recent and ongoing migration of contaminants from the site to the groundwater table below is considered low. Furthermore, the relatively impermeable clay layer and underlying shale bedrock would have minimised the potential for contaminants in the past to migrate to deeper soils or the groundwater regime. It is considered unlikely that the groundwater regime beneath the site has been impacted by contaminants in the soils.

Several tributaries of the Queanbeyan River traversing the site, obvious local depressions and farm dams within the site might capture or divert stormwater run-off. Based on the previous assessments, there were no significant chemical concentrations and widespread contaminants are detected in soil samples; therefore, the potential for off-site impact of the contaminants on the waterbodies due to surface water run-off from the site is considered low. Moreover, the contaminated material identified in Area 3 will be remediated at later stage. It is considered unlikely that the waterbodies within the site would be impacted by contaminants in the soils.

Based on the above, potential off-site impacts of contaminants on groundwater and waterbodies are considered to be low.

## 8.0 CONCLUSION AND RECOMMENDATIONS

The findings of this assessment are summarised as follows:

- Contaminated material (livestock carcasses) was identified in Area 3 (refer to Drawing No 14328/4-AA3).
- For landfill disposal purposes, the contaminated material to be removed from Area 3 within the site is classified as **“General Solid Waste (Putrescible)”**.
- Potential off-site impacts of contaminants on groundwater and waterbodies are considered to be low.
- Remediation and validation of the site are required.

Based on this assessment, it is our opinion that the site can be made suitable for the proposed residential (with garden / accessible soil) land use, subject to implementation of the following recommendations, prior to earth works / site preparation:

1. A remedial action plan (RAP) is to be prepared to devise strategies for remediation / management of the contaminated material in Area 3 as indicated on Drawing No 14328/4-AA3.
2. Site validation is to be carried out following the remediation of the contaminated area.

If suspect materials (identified by unusual staining, odour, discolouration or inclusions such as building rubble, asbestos sheets / pieces / pipes, livestock carcasses, ash material, imported fill materials [which are different to those encountered during the previous assessments and this assessment], etc.) are encountered during any stage of future remediation / earthworks / site preparation, we recommend that this office is contacted for assessment and an unexpected finds management protocol in Appendix A of this report be implemented.

For any other materials to be excavated and removed from the site, it is recommended that waste classification of the materials, in accordance with the "Waste Classification Guidelines Part 1: Classifying Waste" NSW EPA 2014; NSW EPA resource recovery exemptions and orders under the Protection of the Environment Operations (Waste) Regulation 2014; or NSW EPA *Certification: Virgin excavated natural material* is undertaken prior to disposal at a facility that can lawfully accept the materials.

Any imported soil (fill) must be assessed by a qualified environmental consultant, prior to importation, to ensure suitability for the proposed use. In addition, the imported fill must not contain asbestos and ash, be free of unusual odour, not discoloured and not acid sulphate soil or potential acid sulphate soil. The imported fill should either be virgin excavated natural material (VENM) or excavated natural material (ENM).

## 9.0 LIMITATIONS

The services performed by Geotechnique in preparing this report were conducted in a manner consistent with the level of quality and skill generally exercised by members of the profession and consulting practice.

This report has been prepared for the purposes stated within. This report can also be relied upon by Queanbeyan Palerang Regional Council for development and building application assessment processes and by Site Auditor for site auditing purposes. Any reliance on this report by other parties shall be at such parties' sole risk as the report might not contain sufficient information for other purposes.

This report shall only be presented in full and may not be used to support any other objective than those set out in the report, except where written approval is provided by Geotechnique.

The information in this report is considered accurate at the date of issue, in accordance with current site conditions during site inspection for this assessment (12 and 13 September 2022). Any variations to the site form or use beyond those dates could nullify the conclusion stated.

No contamination assessment can eliminate all risk; even a rigorous professional assessment might not detect all contamination within a site. Whilst the assessment conducted at the site was carried out in accordance with current NSW guidelines, the potential always exists for contaminants and contaminated soils to be present between sampled locations and in the grass covered areas.

Presented in Appendix B is a document entitled "Environmental Notes", which should be read in conjunction with this report.

## LIST OF REFERENCES

*Contaminated Land Management Act 1997*

*Contaminated Land Management Regulation 1998*

*Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites – NSW Environment Protection Authority 2020*

*Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (3rd Edition) – NSW Environment Protection Authority 2017*

*Geology of Canberra 1:100,000 Sheet (8727) – Bureau of Mineral Resources, 1992*

*Contaminated Land Management Act 1997*

*National Environment Protection (Assessment of Site Contamination) Measures, 1999 (April 2013) - National Environmental Protection Council*

*National Environmental Protection (Movement of Controlled Waste Between States and Territories) Measure*

*Protection of the Environment Operations Act – 1997*

*Resource Recovery Order / Exemption Under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 – The Excavated Natural Material Order / Exemption 2014 NSW Environment Protection Authority*

*Soil Landscape of Canberra 1:100,000 Sheet (8727) – NSW Department of Land and Water Conservation, 2000*

*State Environmental Planning Policy (Resilience and Hazards) 2021 under the Environmental Planning and Assessment Act 1979*

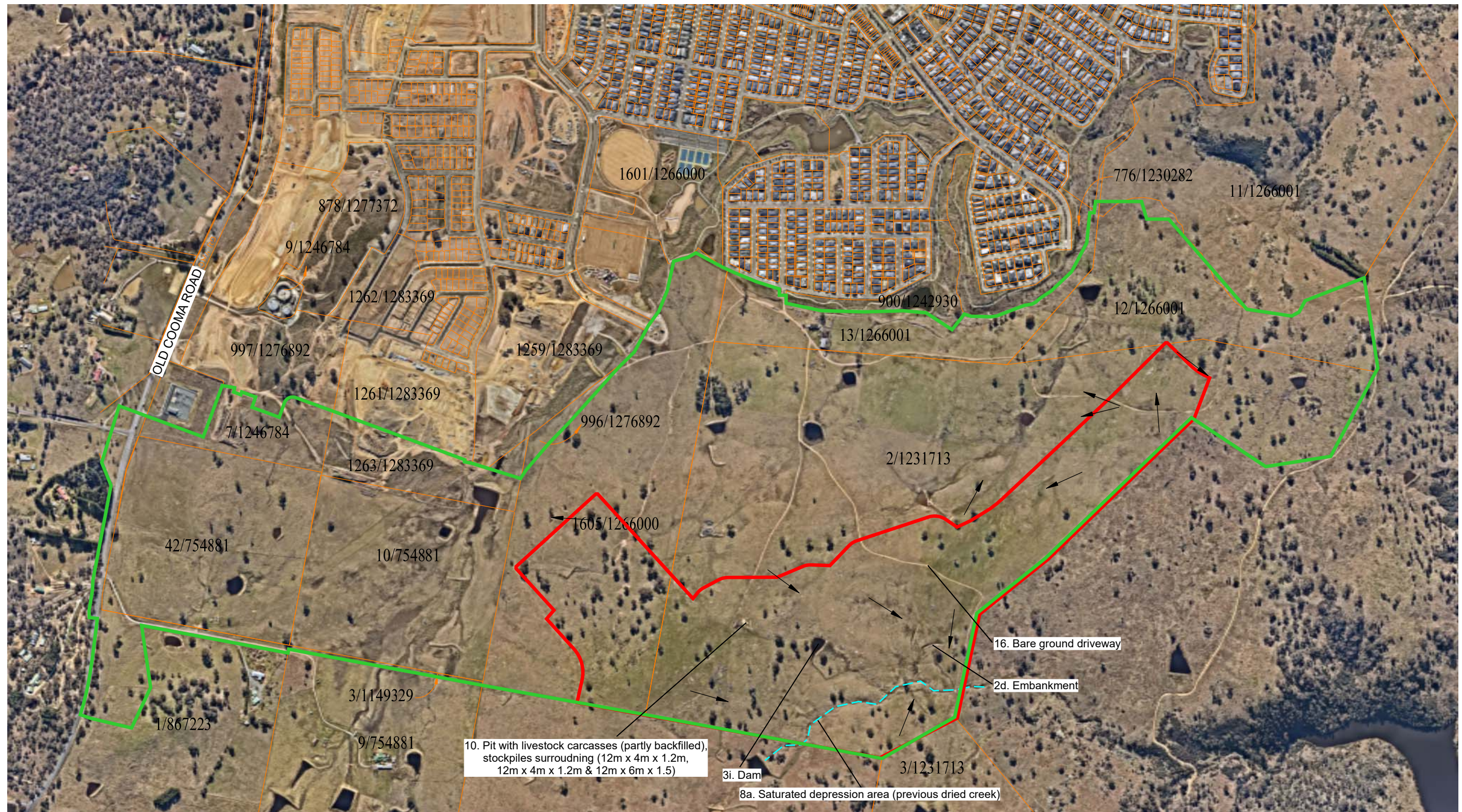
*Waste Classification Guidelines Part 1: Classifying Waste – NSW EPA 2014*

## DRAWINGS

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|             |                                                                 |
|-------------|-----------------------------------------------------------------|
| 14328/4-AA1 | <i>Site &amp; Lot Layout</i>                                    |
| 14328/4-AA2 | <i>Site Features</i>                                            |
| 14328/4-AA3 | <i>Location of Contamination and Area to be Remediated</i>      |
| 14328/1-AA1 | <i>Site &amp; Lot Layout and Areas of Environmental Concern</i> |
| 14328/1-AA2 | <i>Site Features</i>                                            |
| 14328/1-AA3 | <i>Sample Locations</i>                                         |
| 14328/1-AA6 | <i>Locations of Contamination and Areas to be Remediated</i>    |
| 14328/2-AA1 | <i>Site &amp; Lot Layout</i>                                    |
| 14328/2-AA2 | <i>Site Features</i>                                            |
| 14328/2-AA4 | <i>Locations of Contamination and Areas to be Remediated</i>    |





#### LEGEND

- Slope
- Site Boundary of GFIMS Area
- Site Boundary of Contamination Study Area for NH3 to NH5 cover under Report 14328/2-AA dated September 2021

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0 100 200 300 400 500m  
Scale 1:10,000



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#### NOTES

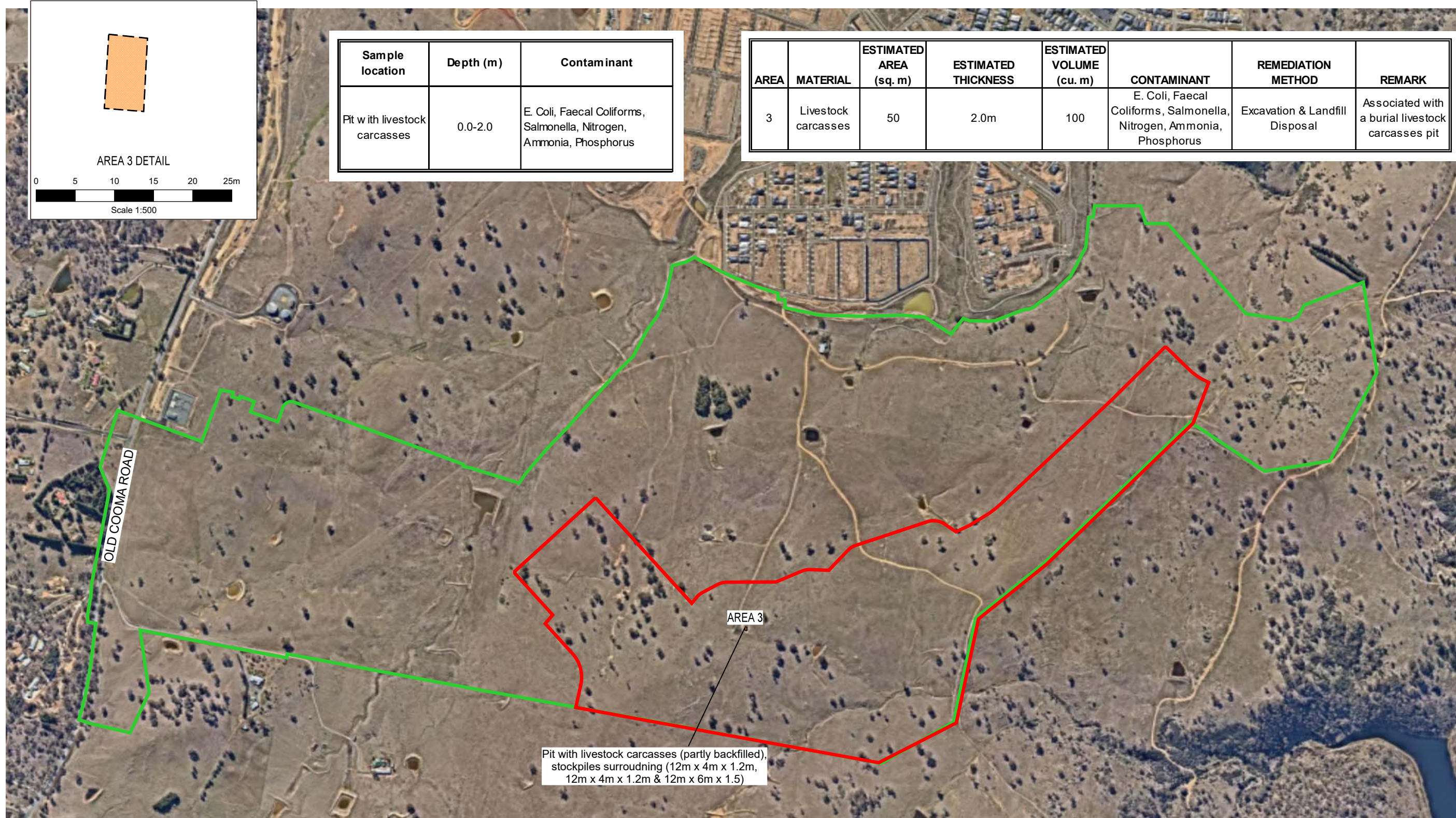
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- Site features are shown at approximate locations and are not to scale.

Googong GFIMS Area  
Old Cooma Road, Googong

Site Features

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Job No: 14328/4  
Drawn By: XZ  
Date: 21 September 2022  
Checked By: JX

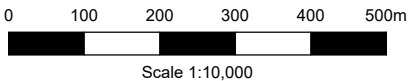
File No: 14328-2  
Layers: 0, 4-AA2



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LEGEND

- Site Boundary of GFIMS Area
- Site Boundary of Contamination Study Area for NH3 to NH5 cover under Report 14328/2-AA dated September 2021
- Area to be Remediated



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Googong GFIMS Area  
Old Cooma Road, Googong

Location of Contamination and Area to be Remediated

Drawing No: 14328/4-AA3  
Job No: 14328/4  
Drawn By: XZ  
Date: 16 September 2021  
Checked By: JX

File No: 14328-2  
Layers: 0, 4-AA3



**LEGEND**

● Area of Environmental Concern (AEC)

— Site Boundary

Imagery ©2018 NearMap.com

0120240360480600m

Scale 1:12,000

| Point ID | Easting    | Northing    |
|----------|------------|-------------|
| 1        | 701225.659 | 6076576.506 |
| 2        | 701223.948 | 6076490.707 |
| 3        | 701177.149 | 6076244.974 |
| 4        | 701163.286 | 6076171.491 |
| 5        | 701162.156 | 6076133.073 |
| 6        | 701641.984 | 6076042.501 |
| 7        | 701724.175 | 6076486.377 |
| 9        | 702225.503 | 6076448.770 |
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| 11       | 702127.117 | 6076230.411 |
| 12       | 702045.391 | 6076080.787 |
| 13       | 701992.754 | 6075976.982 |
| 15       | 702136.159 | 6075950.196 |
| 17       | 702134.322 | 6075940.303 |
| 19       | 703156.359 | 6075753.410 |
| 21       | 703342.651 | 6075858.858 |
| 23       | 703399.171 | 6076124.155 |
| 25       | 703574.316 | 6076264.646 |
| 27       | 703947.510 | 6076624.315 |
| 29       | 704137.203 | 6076499.161 |
| 31       | 704303.398 | 6076525.503 |
| 32       | 702760.737 | 6076998.212 |
| 33       | 704419.167 | 6076741.698 |
| 34       | 703098.396 | 6077691.518 |
| 35       | 704424.115 | 6076750.937 |
| 36       | 702893.977 | 6076948.111 |
| 37       | 704388.870 | 6076981.752 |
| 38       | 702911.477 | 6076937.216 |
| 39       | 704378.932 | 6076978.724 |
| 41       | 704293.883 | 6076944.257 |
| 43       | 704238.157 | 6076922.375 |
| 45       | 704220.810 | 6076893.101 |
| 47       | 704203.794 | 6076886.595 |
| 49       | 704178.986 | 6076886.638 |
| 51       | 704110.214 | 6076895.398 |
| 53       | 704079.320 | 6076905.508 |
| 55       | 704056.388 | 6076922.077 |
| 57       | 704025.032 | 6076961.272 |
| 59       | 704005.293 | 6076976.951 |
| 61       | 703994.205 | 6077010.634 |
| 63       | 703980.322 | 6077022.534 |
| 65       | 703974.371 | 6077043.359 |
| 67       | 703960.488 | 6077053.771 |
| 69       | 703953.216 | 6077065.977 |
| 71       | 703926.997 | 6077084.705 |
| 73       | 703927.050 | 6077101.606 |
| 75       | 703923.255 | 6077115.912 |
| 77       | 703912.015 | 6077125.907 |
| 79       | 703904.523 | 6077144.635 |
| 81       | 703876.692 | 6077161.368 |

| Point ID | Easting    | Northing    |
|----------|------------|-------------|
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| 85       | 703842.321 | 6077185.233 |
| 87       | 703823.125 | 6077187.206 |
| 89       | 703798.253 | 6077185.737 |
| 91       | 703773.664 | 6077178.973 |
| 93       | 703756.728 | 6077170.470 |
| 95       | 703731.201 | 6077148.470 |
| 97       | 703722.014 | 6077138.379 |
| 109      | 702761.667 | 6077003.290 |
| 111      | 702748.977 | 6077009.154 |
| 113      | 702683.796 | 6077060.512 |
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| 132      | 702911.509 | 6076916.849 |
| 310      | 703001.571 | 6076897.807 |
| 311      | 703112.771 | 6076894.926 |
| 312      | 70321.776  | 6076897.688 |
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| 317      | 703709.786 | 6077142.407 |
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| 319      | 703713.497 | 6077264.715 |
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| 335      | 703418.301 | 6076882.676 |
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| 337      | 703384.167 | 6076883.436 |



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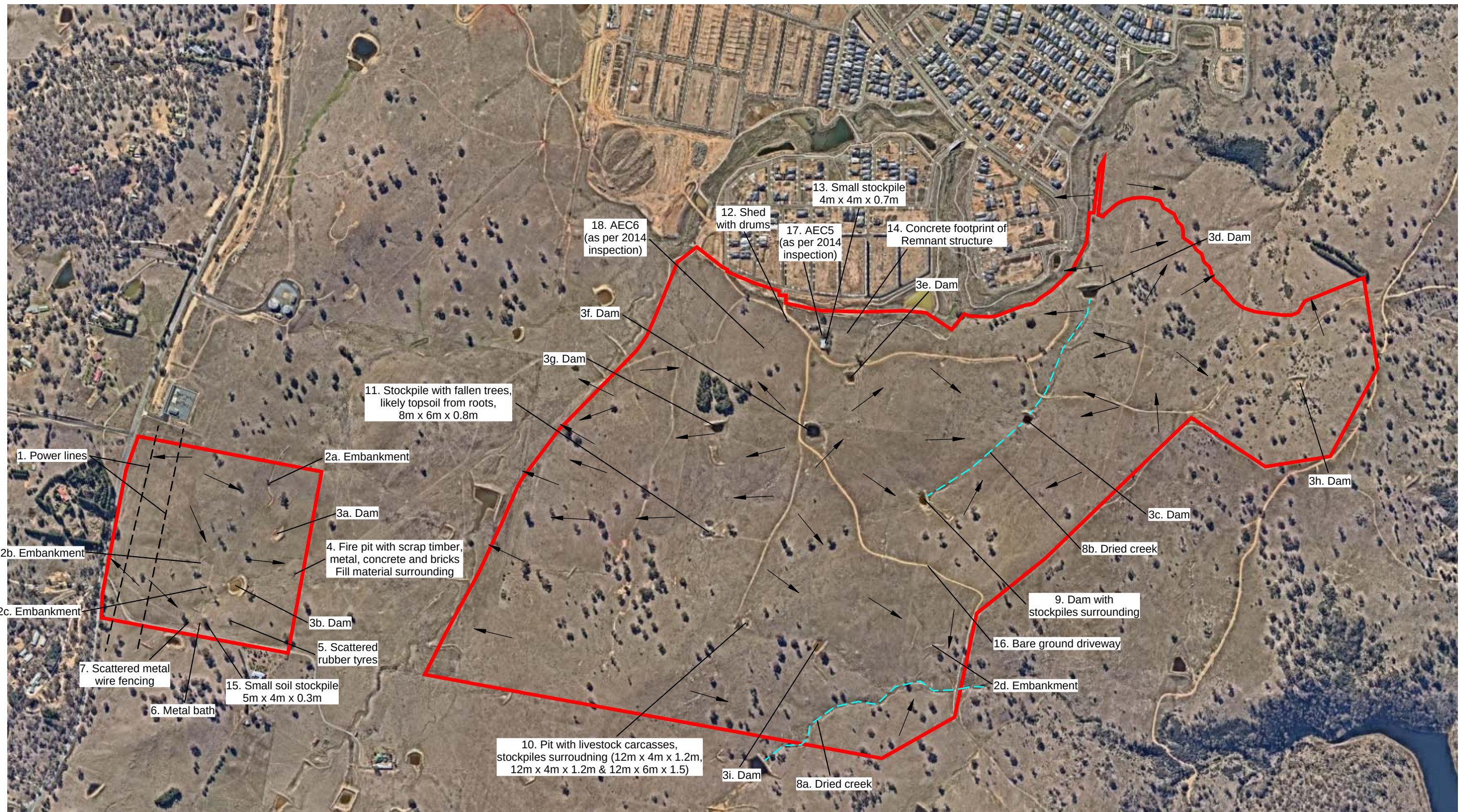
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- Site features are shown at approximate locations and are not to scale.

Googong Neighbourhoods 3, 4 & 5

Site & Lot Layout and Areas of Environmental Concern

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Job No: 14328/1  
Drawn By: MH  
Date: 25 June 2019  
Checked By: JX

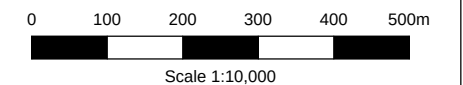
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#### LEGEND

- > Slope
- Site Boundary



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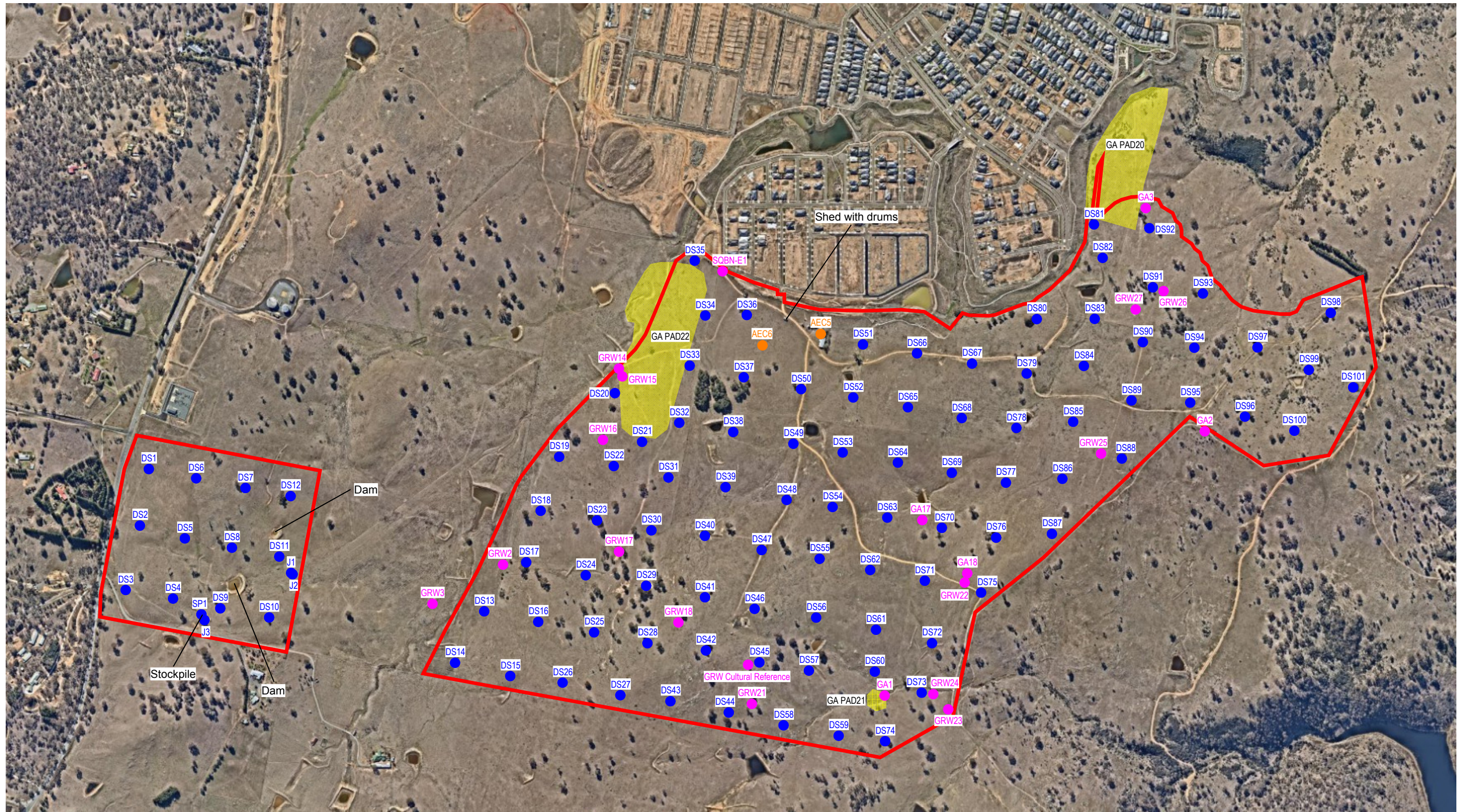
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Googong Neighbourhoods 3, 4 & 5

Site Features

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Job No: 14328/1  
Drawn By: MH  
Date: 11 June 2019  
Checked By: JX

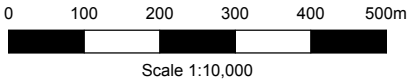
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Layers: 0, AA1



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LEGEND

- Sample
- Area of Environmental Concern (AEC)
- Site Boundary
- Aboriginal Site
- PAD



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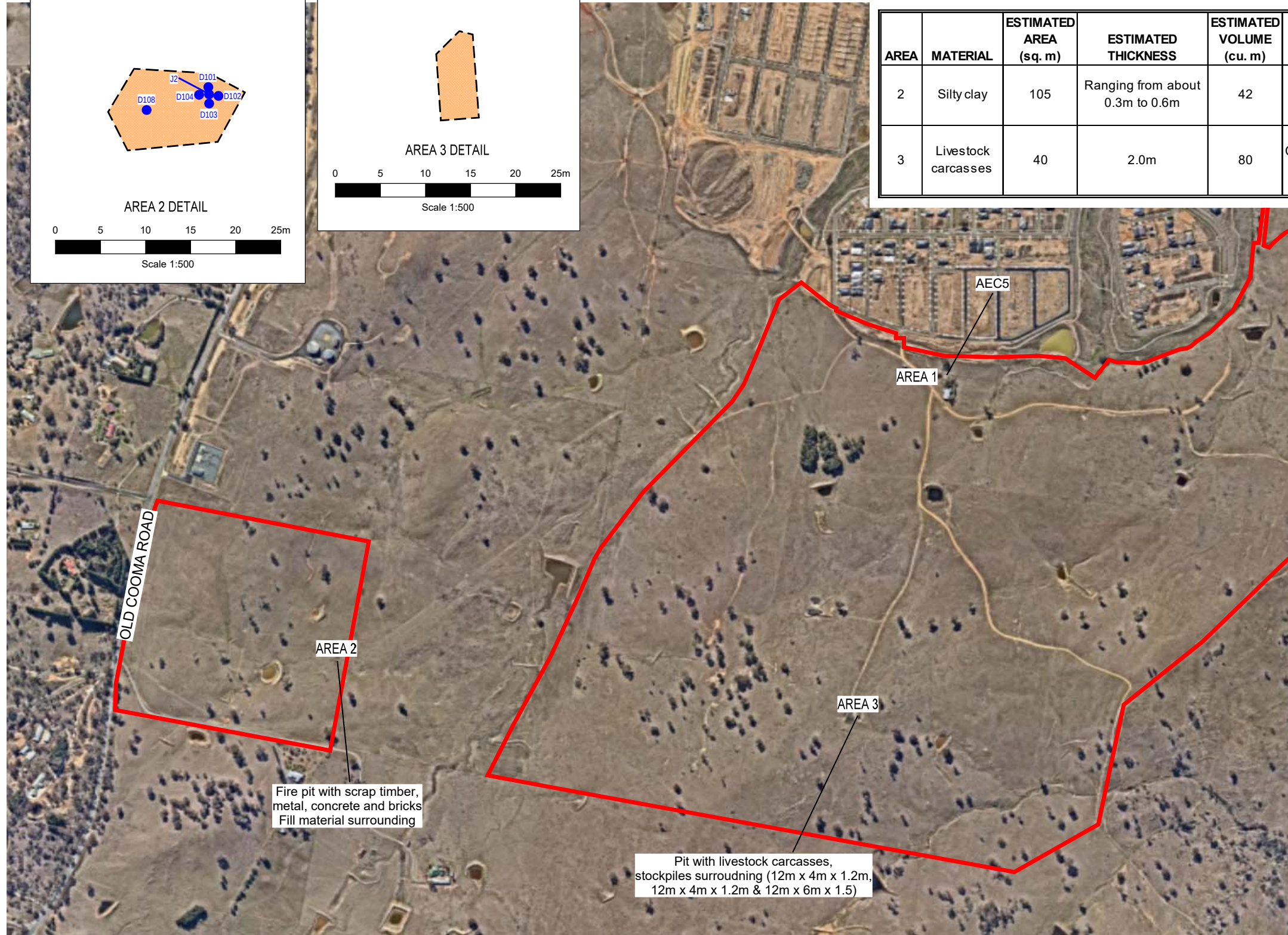
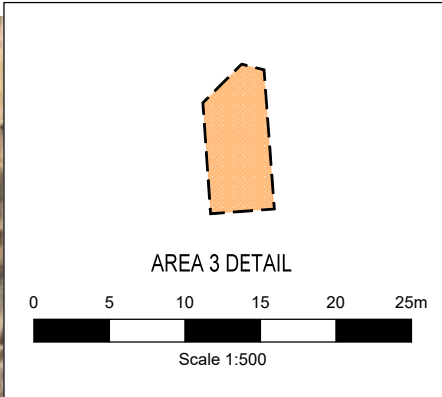
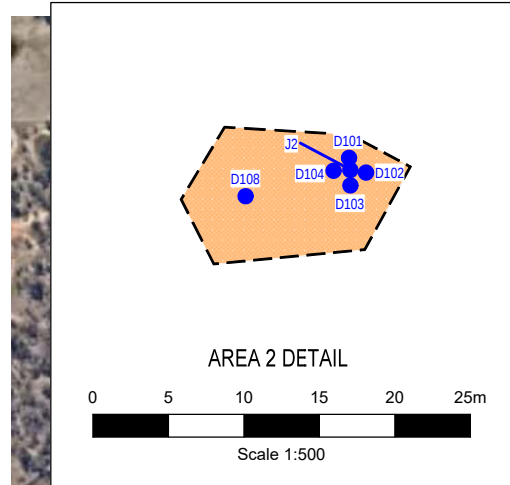
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Googong Neighbourhoods 3, 4 & 5

Sample Locations

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Job No: 14328/1  
Drawn By: MH  
Date: 25 June 2019  
Checked By: JX

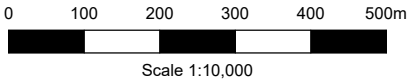
File No: 14328-1  
Layers: 0, AA3



| AREA | MATERIAL            | ESTIMATED AREA (sq. m) | ESTIMATED THICKNESS             | ESTIMATED VOLUME (cu. m) | CONTAMINANT                                                          | REMEDIATION METHOD             | REMARK                                           |
|------|---------------------|------------------------|---------------------------------|--------------------------|----------------------------------------------------------------------|--------------------------------|--------------------------------------------------|
| 2    | Silty clay          | 105                    | Ranging from about 0.3m to 0.6m | 42                       | arsenic, chromium, copper, zinc                                      | Excavation & Landfill Disposal | Associated with a fire pit inclusive of waste    |
| 3    | Livestock carcasses | 40                     | 2.0m                            | 80                       | E. Coli, Faecal Coliforms, Salmonella, Nitrogen, Ammonia, Phosphorus | Excavation & Landfill Disposal | Associated with a burial livestock carcasses pit |

| Sample location              | Depth (m)                                    | Contaminant                                                          | Concentration (mg/kg) |
|------------------------------|----------------------------------------------|----------------------------------------------------------------------|-----------------------|
| J2                           | 0.0-0.1                                      | As, Cr, Cu, Zn                                                       | 1000, 490, 1100, 790  |
| D101                         | 0.0-0.1                                      | As, Cr, Cu                                                           | 520, 170, 430         |
| D102                         | 0.0-0.1                                      | As, Cr, Cu, Zn                                                       | 1800, 620, 1800, 3600 |
| D103                         | 0.0-0.1                                      | As                                                                   | 130                   |
| D103                         | 0.45-0.55                                    | As, Cr, Cu                                                           | 750, 200, 8700        |
| D104                         | 0.0-0.1                                      | As, Cr, Cu                                                           | 1000, 280, 520        |
| D108                         | 0.0-0.1                                      | As, Cr, Cu, Zn                                                       | 630, 150, 360, 3800   |
| Pit with livestock carcasses | 0.0-2.0                                      | E. Coli, Faecal Coliforms, Salmonella, Nitrogen, Ammonia, Phosphorus | -                     |
| Assessment Criteria (mg/kg)  | As = 100 (HIL A) & 100 (EIL)                 |                                                                      |                       |
|                              | Cr (VI) = 100 (HIL A) & Cr (III) = 410 (EIL) |                                                                      |                       |
|                              | Cu = 6000 (HIL A) & 230 (EIL)                |                                                                      |                       |
|                              | Zn = 7400 (HIL A) & 770 (EIL)                |                                                                      |                       |

Notes: As, Cr, Cu, Zn : arsenic, chromium, copper, zinc  
HIL A : Health-based Investigation Level for residential with garden / accessible soil  
EIL: Ecological Investigation Level for urban residential



LEGEND

- Sample    — Site Boundary    ■ Area to be Remediated



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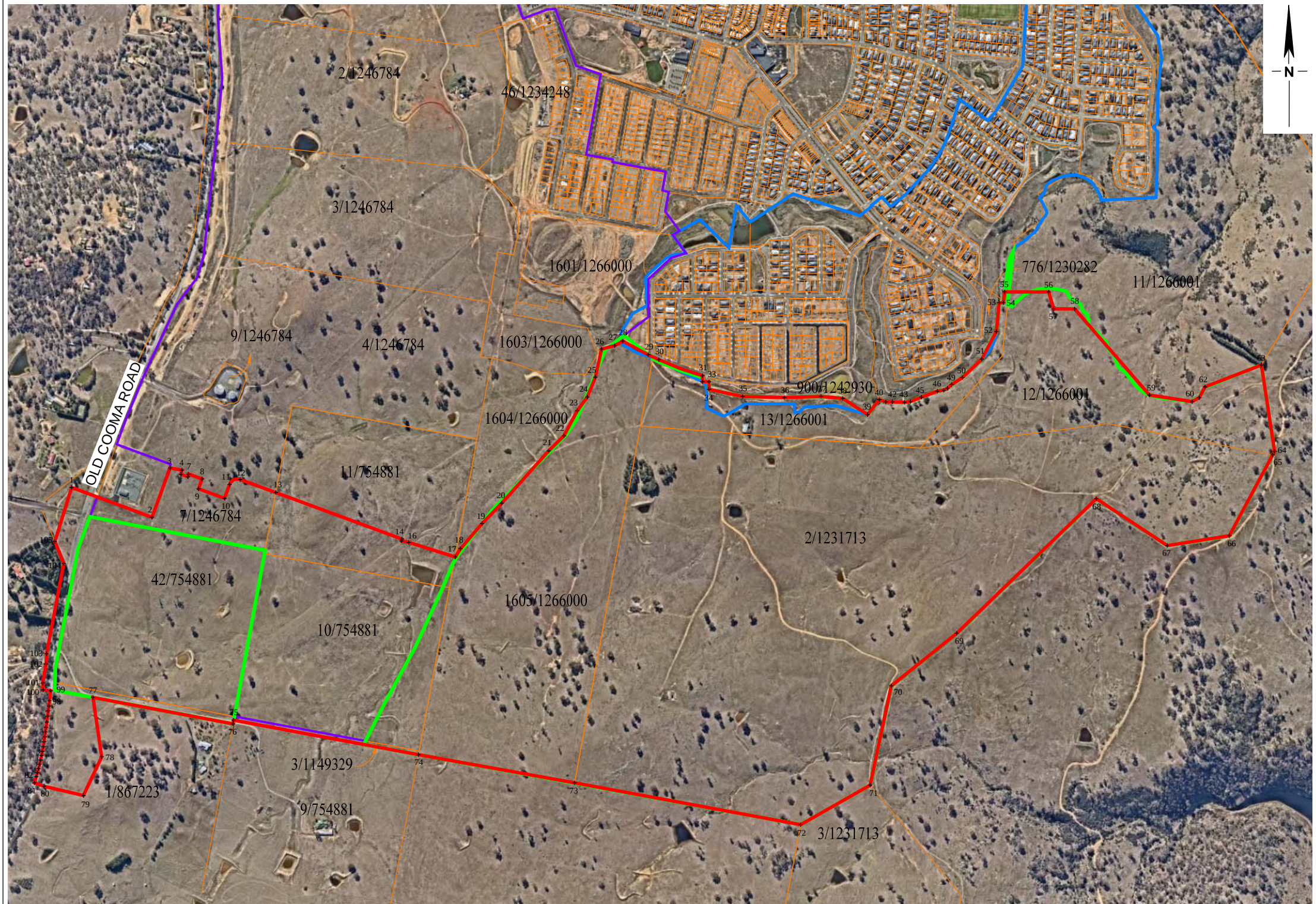
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Googong Neighbourhoods 3, 4 & 5  
Old Cooma Road, Googong

Locations of Contamination and Areas to be Remediated

Drawing No: 14328/1-AA6  
Job No: 14328/2  
Drawn By: XZ  
Date: 29 March 2022  
Checked By: JX

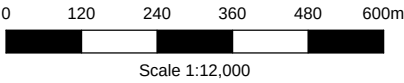
File No: 14328-2  
Layers: 0, 1-AA6



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**LEGEND**

- Site Boundary of Contamination Study Area for NH3 to NH5 (The Site)
- Covered under Report 14328/1-AA dated 25/06/2019 for NH3 to NH5
- Covered under Report 12675/3-AAR1 dated 30/11/2015 for NH1b Stage 1 to 8
- Covered under Report 12675/4-AA dated 31/05/2016 for NH1A Stage 7 and NH2



| Point ID | Easting   | Northing   | Point ID | Easting   | Northing   |
|----------|-----------|------------|----------|-----------|------------|
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| 2        | 701421.44 | 6076575.07 | 55       | 703702.22 | 6077177.19 |
| 3        | 701470.05 | 6076706.59 | 56       | 703819.95 | 6077176.98 |
| 4        | 701501.76 | 6076700.97 | 57       | 703833.12 | 6077131.91 |
| 5        | 701499.05 | 6076689.87 | 58       | 703889.28 | 6077131.84 |
| 6        | 701517.52 | 6076683.04 | 59       | 704089.29 | 6076901.55 |
| 7        | 701519.76 | 6076690.26 | 60       | 704203.49 | 6076884.22 |
| 8        | 701555.46 | 6076677.27 | 61       | 704222.45 | 6076894.41 |
| 9        | 701546.13 | 6076650.87 | 62       | 704238.06 | 6076923.42 |
| 10       | 701615.64 | 6076625.57 | 63       | 704388.73 | 6076981.84 |
| 11       | 701629.15 | 6076662.68 | 64       | 704423.93 | 6076751.02 |
| 12       | 701657.35 | 6076675.83 | 65       | 704418.96 | 6076741.79 |
| 13       | 701752.91 | 6076641.05 | 66       | 704303.16 | 6076525.59 |
| 14       | 702090.12 | 6076516.72 | 67       | 704136.94 | 6076499.29 |
| 15       | 702089.23 | 6076511.48 | 68       | 703947.25 | 6076624.49 |
| 16       | 702108.08 | 6076507.82 | 69       | 703574.05 | 6076264.83 |
| 17       | 702232.44 | 6076468.77 | 70       | 703398.86 | 6076124.33 |
| 18       | 702246.84 | 6076490.86 | 71       | 703342.31 | 6075858.99 |
| 19       | 702304.57 | 6076558.26 | 72       | 703156.47 | 6075753.21 |
| 20       | 702357.21 | 6076612.61 | 73       | 702551.84 | 6075865.12 |
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| 22       | 702523.47 | 6076792.57 | 75       | 701640.00 | 6076032.65 |
| 23       | 702559.03 | 6076859.48 | 76       | 701638.26 | 6076022.74 |
| 24       | 702586.03 | 6076896.28 | 77       | 701263.81 | 6076093.42 |
| 25       | 702607.59 | 6076949.33 | 78       | 701287.03 | 6075934.69 |
| 26       | 702624.03 | 6077024.37 | 79       | 701238.24 | 6075831.15 |
| 27       | 702659.09 | 6077033.64 | 80       | 701133.11 | 6075855.93 |
| 28       | 702680.63 | 6077045.60 | 81       | 701107.28 | 6075865.09 |
| 29       | 702748.98 | 6077009.15 | 82       | 701112.18 | 6075881.83 |
| 30       | 702777.05 | 6076996.18 | 83       | 701115.11 | 6075891.98 |
| 31       | 702893.98 | 6076953.30 | 84       | 701117.99 | 6075903.21 |
| 32       | 702893.98 | 6076937.21 | 85       | 701121.03 | 6075915.14 |
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| 35       | 703001.54 | 6076897.80 | 88       | 701128.44 | 6075949.36 |
| 36       | 703112.75 | 6076894.92 | 89       | 701130.68 | 6075961.34 |
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| 44       | 703450.24 | 6076884.40 | 97       | 701145.79 | 6076070.37 |
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| 46       | 703521.98 | 6076911.88 | 99       | 701150.79 | 6076111.18 |
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| 48       | 703549.34 | 6076919.71 | 101      | 701129.70 | 6076132.00 |
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| 53       | 703687.40 | 6077148.11 |          |           |            |



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**NOTES**

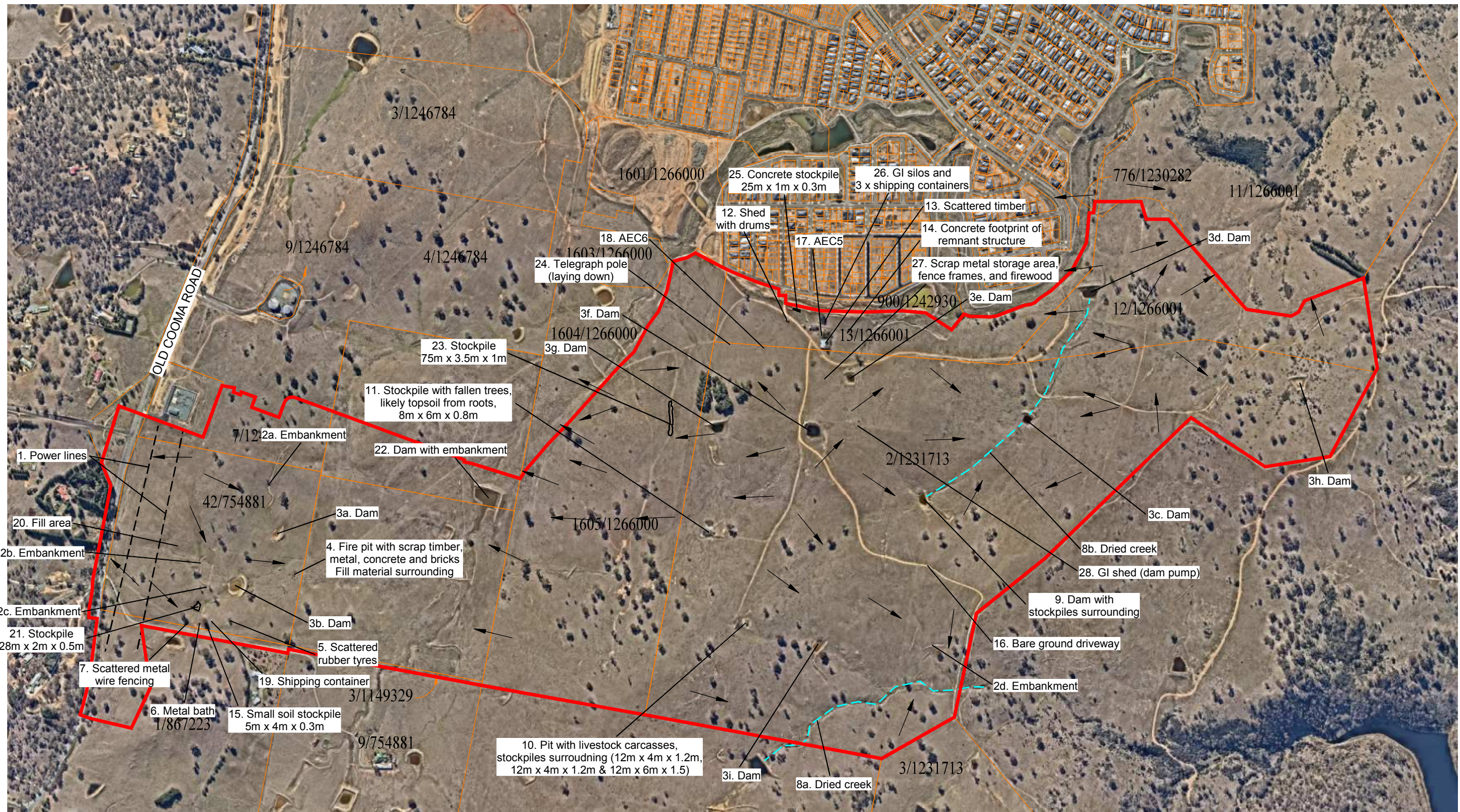
- This drawing has been produced using a base plan provided by others, to which additional information e.g., test pits, borehole locations or notes have been added. Some or all of the information on this plan may not be relevant at the time of producing this drawing.
- Site features are shown at approximate locations and are not to scale.

Googong Neighbourhoods 3, 4 & 5  
Old Cooma Road, Googong

Site & Lot Layout

Drawing No: 14328/2-AA1  
Job No: 14328/2  
Drawn By: MH  
Date: 16 June 2021  
Checked By: JX

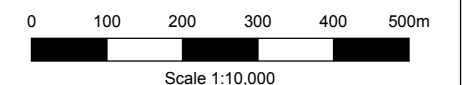
File No: 14328-2  
Layers: 0, AA1



#### LEGEND

- Slope
- Site Boundary

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#### NOTES

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Googong Neighbourhoods 3, 4 & 5  
Old Cooma Road, Googong

Site Features

Drawing No: 14328/2-AA2  
Job No: 14328/2  
Drawn By: MH  
Date: 16 June 2021  
Checked By: JH/XZ/JX

File No: 14328-2  
Layers: 0, AA1

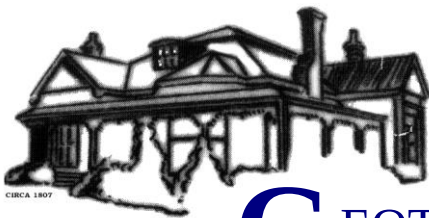
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Layers: 0, AA4

## APPENDIX A

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### UNEXPECTED FINDS MANAGEMENT PROTOCOL

DRAFT



**G EOTECHNIQUE<sup>®</sup>**  
**PTY LTD**

ABN 64 002 841 063



**Unexpected Finds Management Protocol  
Proposed Residential Development  
Googong Foreshore Interface Management Strategy (GFIMS) Area  
Old Cooma Road, Googong**

In the event that unexpected finds and / or suspect materials (identified by unusual staining, odour, discolouration or inclusions such as building rubble, asbestos sheets / pieces / pipes, ash material, imported fill materials (which are different to those encountered during the previous assessments and this assessment), etc.) are encountered during future remediation works / earthworks, the following actions are to be undertaken.

**Management of unexpected finds and / or suspect materials**

If unexpected finds and / or suspect materials are encountered:

- Works are to be ceased.
- An Environmental Consultant is to be engaged to take appropriate action.
- If contamination is identified, the contaminated materials must be disposed of at an EPA licensed landfill facility with an appropriate waste classification.

**Management of bonded asbestos containing material (ACM)**

If bonded ACM is encountered, the following measures are implemented:

- Engage a SafeWork accredited Class B asbestos contractor.
- Removal of the asbestos waste must be carried out in accordance with the requirements of the regulators, such as SafeWork NSW and NSW EPA.
- A SafeWork Licensed Asbestos Assessor should be engaged to provide a clearance certificate.

**Management of friable asbestos within the soil**

It is recommended that the following measures are implemented if friable asbestos is encountered:

- Engage a SafeWork accredited Class A Asbestos contractor.
- Removal of the asbestos waste must be carried out in accordance with the requirements of the regulators, such as SafeWork NSW and NSW EPA
- A SafeWork Licensed Asbestos Assessor must be engaged to provide a clearance certificate.

## APPENDIX B

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### ENVIRONMENTAL NOTES

DRAFT

## **IMPORTANT INFORMATION REGARDING YOUR ENVIRONMENTAL SITE ASSESSMENT**

These notes have been prepared by Geotechnique Pty Ltd, using guidelines prepared by the ASFE (Associated Soil and Foundation Engineers). The notes are offered to assist in the interpretation of your environmental site assessment report.

### **REASONS FOR AN ENVIRONMENTAL ASSESSMENT**

Environmental site assessments are typically, though not exclusively, performed in the following circumstances:

- As a pre-acquisition assessment on behalf of either a purchaser or a vendor, when a property is to be sold
- As a pre-development assessment, when a property or area of land is to be redeveloped, or the land use has changed e.g. from a factory to a residential subdivision
- As a pre-development assessment of greenfield sites, to establish baseline conditions and assess environmental, geological and hydrological constraints to the development of e.g. a landfill
- As an audit of the environmental effects of previous and present site usage

Each circumstance requires a specific approach to the assessment of soil and groundwater contamination. In all cases the objective is to identify and if possible quantify the risks that unrecognised contamination poses to the ongoing proposed activity. Such risks may be both financial (clean-up costs or limitations in site use) and physical (health risks to site users or the public).

### **ENVIRONMENTAL SITE ASSESSMENT LIMITATIONS**

Although information provided by an environmental site assessment can reduce exposure to the risk of the presence of contamination, no environmental site assessment can eliminate the risk. Even a rigorous professional assessment may not detect all contamination within a site. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas which did not show signs of contamination when sampled. Contaminant analysis cannot possibly cover every type of contaminant that may occur; only the most likely contaminants are screened.

### **AN ENVIRONMENTAL SITE ASSESSMENT REPORT IS BASED ON A UNIQUE SET OF PROJECT SPECIFIC FACTORS**

In the following events and in order to avoid cost problems, you should ask your consultant to assess any changes in the conclusion and recommendations made in the assessment:

- When the nature of the proposed development is changed e.g. if a residential development is proposed, rather than a commercial development
- When the size or configuration of the proposed development is altered e.g. if a basement is added
- When the location or orientation of the proposed structure is modified
- When there is a change of land ownership, or
- For application to an adjacent site

### **ENVIRONMENTAL SITE ASSESSMENT FINDINGS ARE PROFESSIONAL ESTIMATES**

Site assessment identifies actual sub-surface conditions only at those points where samples are taken, when they are taken. Data obtained from the sampling and subsequent laboratory analyses are interpreted by geologists, engineers or scientists and opinions are drawn about the overall sub-surface conditions, the nature and extent of contamination, the likely impact on any proposed development and appropriate remediation measures. Actual conditions may differ from those inferred, because no professional, no matter how qualified and no sub-surface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, however, steps can be taken to help minimise the impact. For this reason site owners should retain the services of their consultants throughout the development stages of the project in order to identify variances, conduct additional tests that may be necessary and to recommend solutions to problems encountered on site.

Soil and groundwater contamination is a field in which legislation and interpretation of legislation by government departments is changing rapidly. Whilst every attempt is made by Geotechnique Pty Ltd to be familiar with current policy, our interpretation of the investigation findings should not be taken to be that of the relevant authority. When approval from a statutory authority is required for a project, approval should be directly sought.

**STABILITY OF SUB-SURFACE CONDITIONS**

Sub-surface conditions can change by natural processes and site activities. As an environmental site assessment is based on conditions existing at the time of the investigation, project decisions should not be based on environmental site assessment data that may have been affected by time. The consultant should be requested to advise if additional tests are required.

**ENVIRONMENTAL SITE ASSESSMENTS ARE PERFORMED FOR SPECIFIC PURPOSES AND CLIENTS**

Environmental site assessments are prepared in response to a specific scope of work required to meet the specific needs of specific individuals e.g. an assessment prepared for a consulting civil engineer may not be adequate to a construction contractor or another consulting civil engineer.

An assessment should not be used by other persons for any purpose or by the client for a different purpose. No individual, other than the client, should apply an assessment, even for its intended purpose, without first conferring with the consultant. No person should apply an assessment for any purpose other than that originally contemplated, without first conferring with the consultant.

**MISINTERPRETATION OF ENVIRONMENTAL SITE ASSESSMENTS**

Costly problems can occur when design professionals develop plans based on misinterpretation of an environmental site assessment. In order to minimise problems, the environmental consultant should be retained to work with appropriate design professionals, to explain relevant findings and to review the adequacy of plans and specifications relative to contamination issues.

**LOGS SHOULD NOT BE SEPARATED FROM THE REPORT**

Borehole and test pit logs are prepared by environmental scientists, engineers or geologists, based upon interpretation of field conditions and laboratory evaluation of field samples. Logs are normally provided in our reports and these would not be redrawn for inclusion in site remediation or other design drawings, as subtle but significant drafting errors or omissions may occur in the transfer process. Photographic reproduction can eliminate this problem, however, contractors can still misinterpret the logs during bid preparation if separated from the text of the assessment. Should this occur, delays and disputes, or unanticipated costs may result.

To reduce the likelihood of borehole and test pit log misinterpretation, the complete assessment should be available to persons or organisations involved in the project, such as contractors, for their use. Denial of such access and disclaiming responsibility for the accuracy of sub-surface information does not insulate an owner from the attendant liability. It is critical that the site owner provides all available site information to persons and organisations, such as contractors.

**READ RESPONSIBILITY CLAUSES CLOSELY**

An environmental site assessment is based extensively on judgement and opinion; therefore, it is necessarily less exact than other disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. In order to aid in prevention of this problem, model clauses have been developed for use in written transmittals. These are definitive clauses, designed to indicate consultant responsibility. Their use helps all parties involved recognise individual responsibilities and formulate appropriate action. Some of these definitive clauses are likely to appear in the environmental site assessment and you are encouraged to read them closely. Your consultant will be happy to give full and frank answers to any questions you may have.