



Construction Environmental Management Plan - Stage C Network East

Googong Township Integrated Water Cycle Project

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Acronyms and glossary

Acronym	Meaning
BWPS	Bulk water pumping station
CEMP	Construction Environmental Management Plan
CIC	Canberra Investment Corporation
CoA	Minister for Planning's Condition of Approval
DoE	Department of the Environment (Cth)
DP&E	Department of Planning and Environment (NSW)
EA	Environmental Assessment
EEC	Endangered Ecological Community
EP	Equivalent population
EPA	Environment Protection Authority
EPL	Environment Protection Licence
EP&A Act	Environmental Planning and Assessment Act 1979
EPBC Act	Commonwealth Environmental Protection and Biodiversity Conservation Act 1999
EWMS	Environmental work method statement
GLA	Guideline ACT
GTPL	Googong Township Proprietary Limited
ICON	Icon Water
IWC	Integrated Water Cycle
NH1A	Neighbourhood 1A
NOW	NSW Office of Water
OEH	Office of Environment and Heritage (NSW)
POELA Act	Protection of the Environment Legislation Amendment Act 2011
POEO Act	Protection of the Environment Operations Act 1997
Principal	Icon Water
QPRC	Queanbeyan-Palerang Regional Council
RMS	Roads and Maritime Services
SEE	Statement of Environmental Effects
SoC	Statement of Commitments
SPS	Sewage pumping station
WRP	Water recycling plant

Contents

1.0	INTRODUCTION	8
1.1	Background	8
1.2	Purpose of this document	9
1.3	Consultation	21
1.4	Certification and approval	21
1.5	Environmental management system structure	21
1.5.1	Construction Environmental Management Plan (CEMP)	21
1.5.2	Environmental management plans	21
1.5.3	Environmental Work Method Statement (EWMS)	22
1.5.4	Environmental procedures, forms and checklists	22
1.5.5	Environmental constraints maps	22
1.5.6	Environmental control plans	22
1.5.7	Other project documents	23
1.6	Distribution	25
1.7	Revision	25
2.0	PROJECT DESCRIPTION	26
2.1	General features	26
2.2	Construction activities	28
2.2.1	Works at the Bulk Water Pumping Station	28
2.2.2	Works for the Potable Water Mains	28
2.2.3	Construction compound	28
2.2.4	Construction access points	28
2.2.5	Revegetation and reinstatement	29
2.2.6	Council requirements for any demolition/excavation activities associated with a building	31
2.2.7	Damage to any infrastructure	31
2.3	Defining work areas	32
3.0	PLANNING	33
3.1	Legal and other requirements	33
3.1.1	Approval under Part 3A of the NSW <i>Environmental Planning and Assessment Act 1979</i> (EP&A Act)	33
3.1.2	Approval under Part 4 of the EP&A Act	33
3.1.3	Approval under Commonwealth <i>Environmental Protection and Biodiversity Conservation Act 1999</i> (EPBC Act)	33
3.1.4	Other legal requirements	34
3.2	Approvals, permits and licensing	34
3.3	Environmental aspects and impacts	34
3.4	Environmental policy	34

3.5	Objectives and targets.....	35
3.6	Project alterations.....	35
4.0	IMPLEMENTATION AND OPERATION.....	37
4.1	Roles and responsibilities.....	37
4.1.1	GTPL Assistant Project Director.....	37
4.1.2	Principal (Icon Water).....	37
4.1.3	Site Superintendent (Black Mountain).....	37
4.1.4	Project Manager (Guideline).....	38
4.1.5	Project Engineer (Guideline).....	38
4.1.6	Wider project team (including sub-contractors).....	39
4.2	CEMP availability	39
5.0	COMPETENCE, TRAINING AND AWARENESS	40
5.1	Purpose.....	40
5.2	Site inductions	40
5.3	Toolbox talks, training and awareness.....	40
5.4	Pre-start meetings.....	41
6.0	COMMUNICATION AND CONSULTATION	42
6.1	Internal communication.....	42
6.2	Communication with government agencies.....	42
6.3	Stakeholder and community consultation	43
6.3.1	Community notifications.....	43
6.3.2	Signage.....	43
6.3.3	Complaints Management Procedure	43
7.0	INCIDENTS AND EMERGENCIES.....	44
7.1	Classification of environmental incidents.....	44
7.1.1	Category one	44
7.1.2	Category two.....	44
7.2	Incident management	44
7.2.1	Category one	44
7.2.2	Category two.....	45
7.3	Incident reporting.....	45
7.3.1	Category one pollution incident reporting – notification under the POEO Act.....	45
7.3.2	All other Category one incident reporting	46
7.3.3	Category two incident reporting.....	46
7.4	Incident investigation	48
7.5	Emergency response.....	49
8.0	ENVIRONMENTAL INSPECTIONS, MONITORING AND AUDITING.....	50
8.1	Environmental inspections	50
8.1.1	Weekly inspections	50

8.1.2	Site Superintendent inspections	50
8.2	Environmental monitoring	50
8.2.1	Noise and vibration monitoring	50
8.3	Non-conformity, corrective and preventative actions.....	51
8.4	Auditing.....	52
8.4.1	Internal audits	52
8.4.2	Independent external audits	52
8.5	Reporting	52
8.5.1	Monthly environment report.....	52
9.0	DOCUMENTATION	53
9.1	Environmental records.....	53

Tables

Table 1	Conditions of the Part 3A Concept Approval (approved on: 24 November, 2011)	10
Table 2	DA.2016.027 Project Conditions of Approval (approved by Palerang Shire Council on: 2 May, 2016).....	11
Table 3	Commonwealth Environmental Protection and Biodiversity Conservation Act 1999 Condition of Approvals (approved 19 May 2011)	15
Table 4	Statement of Commitments, Section 6.3 of the Stage C Network East Statement of Environmental Effects (RPS Manidis Roberts Pty Ltd, February 2016).....	16
Table 5	Environmental objectives and targets	35
Table 6	Emergency contacts	48

Figures

Figure 1	Environmental Management System structure	24
Figure 2	Site layout – Stage C Network East and construction boundary	27
Figure 3	Site layout – Stage C Network East Access Points	30
Figure 4	Incident reporting flowchart	47

Appendices

- Appendix 1 Soil and Water Management Plan
- Appendix 2 Work Health and Safety Management Plan (WHSMP)
- Appendix 3 Traffic Management Protocol
- Appendix 4 Noise and Vibration Management Plan
- Appendix 5 Environmental management plan (FFMP, AQMP, HMP, etc.)
- Appendix 6 Waste and Resource Management Plan
- Appendix 7 Environmental constraints map
- Appendix 8 Example Environmental Control Plan
- Appendix 9 Risk register
- Appendix 10 Legal and other requirements
- Appendix 11 Environment policy
- Appendix 12 Monthly environmental report (template)

1.0 Introduction

1.1 Background

Googong Township Proprietary Limited (GTPL) – a partnership between Canberra Investment Corporation (CIC) and Mirvac, is responsible for the development of the new Googong township that will be located in the Canberra region, around seven kilometres south of Queanbeyan in NSW. The new Googong Township will be home to about 16,000 people and developed over the next 25 years. The township is designed around an integrated water cycle (IWC), with a dedicated water recycling plant (WRP) that will reduce the consumption of potable water in the community by around 60 per cent and recycle the township's water for non-potable use.

The Googong Township Water Cycle Project Environmental Assessment (November, 2010) (EA) was prepared under (the now repealed) Part 3A of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) to assess the impacts of construction and operation of infrastructure for the potable water, recycled water and sewage systems required to service the township.

Concept Approval for the ultimate development (Stage 1 and Stage 2) of the Googong IWC Project was granted by the NSW Planning Assessment Commission, under delegation from the Minister for Planning and Infrastructure on 24 November 2011.

The Googong IWC Project is being constructed and operated in stages to ensure the infrastructure is correctly sized to meet the incremental level of demand.

Stage 1 of the IWC Project was approved by the NSW Planning Assessment Commission, under delegation from the Minister for Planning and Infrastructure on 24 November 2011. It is under construction or has commenced operation. It comprises new infrastructure to deliver potable drinking water to the township, treat wastewater and utilise recycled water for re-use in the township and for environmental discharge. Stage 1 includes a new WRP, temporary reservoirs for recycled and potable water, pumping stations and mains pipework (including rising and distribution mains) for sewage, recycled water and potable water.

Stage 2 of the IWC Project is being delivered in two sub stages (Stages C and D) in order to provide the appropriate IWC infrastructure to accommodate the size and growth of the Googong Township. Stage C is currently under development or has commenced construction, with Stage D to be developed as demand requires in the future.

Stage C has been further divided into three components, to facilitate project planning approvals, these being Stage C Network West (within the former Queanbeyan local government area (LGA)), Stage C Network East (within the former Palerang LGA) and Stage C WRP (within the former Queanbeyan LGA). To maintain efficiency and minimise environmental impacts, construction of Stage C and D components for Network East are being undertaken concurrently. This phase of works is referred to as Stage C Network East.

Project Approval for Stage C Network East was granted by Palerang Shire Council on 2nd May 2016 (DA 2016.027). It is noted that from 16 May 2016 when the council amalgamations were enacted Queanbeyan City Council and Palerang Council have merged to form Queanbeyan-Palerang Regional Council (QPRC).

This Construction Environmental Management Plan (CEMP) has been developed for the construction of Stage C Network East (the Project).

1.2 Purpose of this document

The approval of the Project is subject to a number of Conditions of Approval (CoA) issued under the EPBC Approval, Concept Approval (under Part 3 of the EP&A Act) and Project Approval (under Part 4 of the EP&A Act) - refer Tables 1 to 3.

This CEMP has been developed for the construction of Stage C Network East. This CEMP references CoA and SoC relevant to the construction of Stage C Network East.

The purpose of this CEMP is to provide an approach to the management of environmental issues during construction of Stage C Network East, and to ensure that the requirements of the CoA are met. The CEMP is the overarching document in the environmental management system that includes a number of documents and plans (refer Section 1.5).

This CEMP has been prepared in accordance with the *Guideline for the Preparation of Environmental Management Plans* (DIPNR, 2004). It is also generally consistent with AS/NZS ISO 14001.

Guideline ACT, appointed by the Principal (Icon Water) (as future owner/operator) on behalf of GTPL, will carry out the construction of Stage C Network East. Unless otherwise identified, the contractor will be responsible for the ongoing review and implementation of this CEMP and related environmental documents based on detailed construction information.

This CEMP and associated documents will be made available, and are applicable, to all employees and persons involved in construction of Stage C Network East, including relevant sub-contractors.

Table 1 Conditions of the Part 3A Concept Approval (approved on: 24 November, 2011)

CoA	Description	Reference
Terms of the Concept Plan Approval		
1.4	<p>The Proponent shall comply with any reasonable requirements(s) of the Director-General arising from the Department's assessment of:</p> <ul style="list-style-type: none"> (a) any reports, plans or correspondence that are submitted in accordance with this Concept Plan approval or any related project approvals; and (b) the implementation of any actions or measures contained in these reports, plans or correspondence. 	<p>Section 3 Appendix 10</p>
Publicly available information		
3.1	Subject to confidentiality, the Proponent shall make all documents required under this approval available for public inspection on request.	<p>Section 1.6 Section 4.2</p>
Provision of electronic information		
3.2	<p>Prior to the commencement of construction of any projects associated with this Concept Plan approval, the Proponent shall establish a dedicated website or maintain dedicated pages within its existing website for the provision of electronic information associated with the project. The Proponent shall publish and maintain up-to-date information on this website or dedicated pages including, but not necessarily limited to:</p>	Section 1.6
	(c) A copy of each relevant environmental approval, licence or permit required and obtained in relation to the project;	
	(d) A copy of each approval plan, report, or monitoring program required by this approval and associated project approvals;	
	(e) A summary of the monitoring results of the project, which have been reported in accordance with the various plans and programs approved under this approval and associated project approvals;	
	(f) Details of the outcomes of compliance reviews and audits of the project, to the satisfaction of the Director-General.	

Table 2 DA.2016.027 Project Conditions of Approval (approved by Palerang Shire Council on: 2 May, 2016)

CoA	Condition	Reference
Approved development plans		
1.	The development referred to in the application is to be carried out in accordance with the approved plans and documents including the following: <ol style="list-style-type: none"> Statement of Environmental Effects prepared by RPS Manidis Roberts Pty Ltd dated February 2016, pgs. 1-87, and Appendices A-J pgs. 89-111 	Section 1.2
Plans to be kept on site		
2.	Keep a copy of all stamped approved plans, specifications and documents on site while work is being undertaken.	Section 1.6 Section 2.2.3 Section 3.2
Site identification		
4.	The site where building work, subdivision work, or demolition work are proposed to be carried out shall be identified by a sign sited in a visually prominent position containing the following information; <ol style="list-style-type: none"> The development application number, Name, address and telephone number of the principal certifying authority, Name of the principal contractor (if any) and 24 hour contact telephone number, and A statement that "unauthorised entry to the work site is prohibited". 	Section 6.3.2
Aboriginal objects		
5.	The development is to proceed with caution. If any Aboriginal objects are found, works should stop and DECCW notified. If human remains are found work is to stop, the site is to be secured and the NSW Police and DECCW are to be notified.	Appendix 5 – Section 8
Construction activities		
6.	Construction work shall only be undertaken between the hours of 7 am and 6 pm Mondays to Fridays and between the hours of 7.00 am and 5.00 pm Saturdays. No construction work shall take place on Sundays or Public Holidays unless Icon agrees in writing. A written application shall be made to Icon if a variation of hours is required.	Appendix 4 – Table 10 (NV5)
7.	Do not excavate within 500 mm of the boundary.	Section 2.3
8.	All excavations and backfilling associated with the erection or demolition of a building must be executed in accordance with the requirements of WorkCover.	Section 2.2.6
9.	The demolition of the existing building must be carried out in accordance with the: <ol style="list-style-type: none"> Requirements of the WorkCover Authority of New South Wales, NSW Occupational Health and Safety Act 2000, and Australian Standard AS 2601-2001: The Demolition of Structures. 	Section 2.2.6
10.	If any excavation associated with the erection or demolition of a	Section 2.2.6

CoA	Condition	Reference
	<p>building extends below the level of the base of the footings of a building on adjoining land, the person causing the excavation to be made:</p> <ul style="list-style-type: none"> (a) Must preserve and protect the building from damage, and (b) If necessary, must underpin and support the building in an appropriate manner, and (c) Must, at least seven days before excavating, give notice of intention to do so to the owner of the adjoining and furnish particulars of the excavation to the owner of the building being erected or demolished, and (d) Satisfy the requirements of WorkCover. <p>The owner of the adjoining land is not to be liable for any part of the cost of work carried out for the purposes of this clause, whether carried out on the allotment of land being excavated or on the adjoining allotment of land.</p>	
11.	Toilet facilities are to be provided at or in the close vicinity of the work site on which work involved in the erection or demolition of a building is being carried out.	Section 2.2.6
12.	Asbestos material must be removed and disposed of in accordance with the <i>Occupational Health and Safety Act 2000</i> and the New South Wales WorkCover guidelines. Asbestos material must be disposed of to a landfill site approved for that purpose by the Environmental Protection Authority of New South Wales or the equivalent authority in the Australian Capital Territory. Written evidence that the material has been disposed of to the approved landfill site must be submitted to Council.	Appendix 5 – Table 2 (CH2, CH6)
Waste management		
13.	All waste materials generated on-site during construction are to be stored in enclosed containers and deposited in an approved landfill at regular periods.	Appendix 6 – Table 1 (W4)
Engineering conditions		
Pre-construction requirements		
Superintendent of works		
14.	Appoint a Superintendent of Works, prior to commencing construction works. The Superintendent of Works shall be a Civil Engineer or suitably experienced and accredited Registered Surveyor as set out in AusSpec#1. The Superintendent of Works must undertake sufficient day to day inspections, provide supervision of the works and all materials used, to be able to provide a Certification Report to the Principal Certifying Authority (PCA) for all works, following practical completion of works.	Section 4.1.3 CEMP – Table 6
Erosion control		
15.	Erosion and sediment controls are to be in place before the disturbance of any soils on the site, and are to be maintained during the works and for as long as necessary after the completion to prevent sediment and dirty water leaving the site and/or entering the surface water system outside the site. The plan is to cover all measures to control erosion and sediment transport in accordance with the NSW Landcom publication <i>Managing Urban Stormwater -Soils and Construction (4th Edition 2004- "Blue Book")</i> . The ESCP shall include maintenance requirements and inspection schedules for all control measures.	Appendix 1 – Table 3 (SW6)
Construction management		
16.	A Construction Management Plan (CMP) for all site works, including road works and access, is to be approved by the Superintendent of Works prior to work commencing. The plan is	This document Appendix 3 – Table 3 (T3)

CoA	Condition	Reference
	to cover all measures to control construction activities and any temporary traffic management deemed to be necessary for roads external to the worksite, in accordance with Roads and Maritime Services requirements.	
Civil works construction requirements		
Damage to any infrastructure		
17.	Any infrastructure (public or private) that is damaged during construction within public or private road reserves is the responsibility of the applicant to correct and repair or replace as necessary, to bring the damaged infrastructure back to the condition or better, existing prior to any damage. The Applicant/Contractor is to determine the locations of all services, prior to works commencement.	Section 2.2.7
Construction standard and contractors		
18.	Construction work is to be carried out by contractors who are experienced in civil construction, have quality management systems in place and hold business insurance policies covering workers compensation, and public liability.	Section 2.2.7
Site revegetation		
19.	Rehabilitation grass mix or other measures as appropriate, are to be applied to all disturbed surfaces as soon as practicable at the completion of each component of work. The mix is to be applied at the recommended rate of dispersal. Do not use species that are listed under the <i>Noxious Weeds Act 1993</i> .	Appendix 1 – Table 3 (SW29) and Appendix 5 – Table 3 (FF10 and FF11).
Dust suppression		
20.	Undertake measures as appropriate, and/or respond to any Palerang Council or Queanbeyan City Council direction to provide dust suppression on roads leading to, adjacent to and within the worksite in the event that weather conditions and construction traffic are giving rise to abnormal generation of dust.	Appendix 5 – Table 1 (A5, A6)
Traffic control devices		
21.	Install appropriate temporary traffic control devices for all works as required, in accordance with AS1742 and RMS Supplements, as approved by the Superintendent of Works.	Appendix 3 – Table 3 (T3, T8, T9 and T10)
Internal roadways (rural)		
22.	Reconstruct/repair as necessary the internal road and drainage structures between the property access and the worksites along to the end of road to maintain the existing road construction standard.	Appendix 3 – Table 3 (T18)
Inspection and test plans		
23.	<p>The Project Quality Plan shall include inspection and test plans detailing witness points covering at least the following aspects of the works. Witness points (as appropriate), for civil works shall be signed off by the Superintendent of Works or other qualified person nominated to do so in the Project Quality Plan and submitted to the Principal.</p> <p>Typical witness points are:</p> <ol style="list-style-type: none"> 1. Installation of erosion and sediment control devices 2. Preservation measures installed for trees and vegetation 3. Final inspection of completed works. <p>Advice: Additional inspections for any building works requiring a Construction Certificate will be advised on issue of the Construction Certificate by the Principal</p>	<p>Section 4.1.5</p> <p>Section 6.6</p> <p>Refer to Project Management Plan – Section 4 for further details</p>

CoA	Condition	Reference
Certification of completed works		
24.	<p>At the completion of works the Superintendent of Works shall present to the PCA, a Certification Report for civil works and is to include copies of any approvals outlined in this development consent and report on the current status of environmental restoration and revegetation. All project plans, inspection test plans, and results are to be included in the report. The Superintendent of Works shall be a Civil Engineer or suitably experienced and accredited Registered Surveyor as set out in AusSpec#1. Each drawing to be certified by the Superintendent of Works or other authorized person.</p>	<p>Section 6.2 Refer to Project Management Plan – Section 4 for further details</p>
Works as – executed drawings		
25.	<p>Provide one A3 copy, one electronic PDF copy and one electronic copy in AutoCAD format (dwg/dxf (MGA) to GDA94 UTM Zone 55), of all works as-executed drawings to QPRC, clearly recording any variations from the approved designs. The works as-executed drawings are to be prepared in accordance with the requirements set out in Aus-Spec #1 as amended by Council.</p> <p>Utilities are to be shown as colour coded and differing line types:</p> <ol style="list-style-type: none"> 1. Sewer – Red 2. Water – Blue 3. Stormwater – Green 4. Electricity – Magenta 5. Telecommunications – Orange 6. Gas – Yellow <p>Sewerage reticulation Work As Executed (WAE) drawings shall be submitted to Council showing the actual location and alignment of pipelines, manholes, junctions and sewer ties, all pumping station details together with operating and maintenance manuals. Details shall include the size, class, type, relative invert levels, grade of pipelines, manhole location, types and cover details, pump details, switchboard equipment details and station structural details. Provide invert levels on each branch line connected to a manhole, any terminating end of line sewer and the invert level of all sewer ties. The drawings shall be certified by a Civil Engineer or alternatively, a suitably experienced and qualified Registered Surveyor.</p> <p>Water reticulation Work As Executed (WAE) drawings shall be submitted to Council showing the actual location and alignment of mains and all fittings, all pumping station details together with operating and maintenance manuals. Details shall include the size, type and class of pipe, sluice valves, hydrants, tapers, tees, air and scour valves, pump details, switchboard equipment details and station structural details. The drawings shall be certified by a Civil Engineer or alternatively, a suitably experienced and qualified Registered Surveyor.</p>	<p>Refer to Project Management Plan – Quality Management Plan (Section 4) for further details</p>

Table 3 Commonwealth Environmental Protection and Biodiversity Conservation Act 1999 Condition of Approvals (approved 19 May 2011)

CoA	Condition	Reference
4.	To prevent impacts on the Hoary Sunray (<i>Leucochrysum albicans</i> var. <i>Tricolor</i>) during construction, the person taking the action must fence and sign 'no go areas' of Hoary Sunray habitat in the vicinity of the Bulk Water Pumping Station and existing ACTEW Googong Water Treatment Plant.	Appendix 5 – Section 4.1.4 Appendix 5 – Table 3 (FF2)
6.	Within three months of every 12 month anniversary of the commencement of the action, the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any management plans and strategies as specified in the conditions. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the department at the same time as the compliance report is published.	GTPL will comply with this condition, except that the Contractor must: <ul style="list-style-type: none"> • Provide documentation to GTPL, as requested by GTPL, such that this condition can be met.
7.	Upon the direction of the Minister, the person taking the action must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the Minister. The independent auditor must be approved by the Minister prior to the commencement of the audit. Audit criteria must be agreed to by the Minister and the audit report must address the criteria to the satisfaction of the Minister.	GTPL will comply with this condition, except that the Contractor must: <ul style="list-style-type: none"> • Provide documentation to GTPL, as requested by GTPL, such that this condition can be met.
11.	The person taking the action must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement the management plan or strategy required by this approval, and make them available upon request to the department. Such records may be subject to audit by the department or an independent auditor in accordance with section 458 of the <i>Environment Protection and Biodiversity Conservation Act 1999</i> , or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the department's website. The results of audits may also be publicised through the general media.	GTPL will comply with this condition, except that the Contractor must: <ul style="list-style-type: none"> • Provide documentation to GTPL, as requested by GTPL, such that this condition can be met.

Table 4 Statement of Commitments, Section 6.3 of the Stage C Network East Statement of Environmental Effects (RPS Manidis Roberts Pty Ltd, February 2016)

SoC	Management measure / commitment	Reference
Construction		
General		
C1	A Construction Environment Management Plan (CEMP) would be prepared to manage the environmental issues assessed in this SEE and implement the identified mitigation measures where required during construction.	This document
Traffic and access		
C2	A detailed traffic and access management plan would be prepared prior to construction to outline all access routes to, from and within the construction zones, traffic control methods to be utilised and methods to minimise impacts on the local road network.	Appendix 3 – Table 3 (T3)
C3	Access to the BWPS would be maintained as much as feasible. At times when access to the BWPS is required to be closed, an agreement on the time, day and duration of closure would be reached with Icon Water prior to closure of access.	Appendix 3 – Table 3 (T7)
C4	The access road to the BWPS would be fully re-instated at the completion of construction in accordance with Icon Water requirements and re-opened to vehicles.	Appendix 3 – Table 3 (T18)
C5	All employees and contractors would be inducted into the site and would receive appropriate training to fulfil their individual and environmental responsibilities, including requirements and responsibilities under the traffic and access management plan.	Appendix 3 – Table 3 (T1)
C6	Where feasible, construction deliveries would be scheduled outside of peak periods, in particular peak residential access times.	Appendix 3 – Table 3 (T6)
C7	Access to residential properties would be maintained at all times.	Appendix 3 – Table 3 (T8)
C8	Construction staff and delivery vehicles would not park in public parking areas where supply is limited.	Appendix 3 – Table 3 (T16)
C9	Any permits required for oversize vehicles to transport plant or equipment are to be obtained from Roads and Maritime Services.	Appendix 3 – Table 3 (T5)
Biodiversity		
C10	Fencing or flagging would be established around all identified areas of Blakely's Red Gum Woodland within the proposal area to avoid inadvertent impacts.	Appendix 5 – Table 3 (FF2)
C11	Vegetation clearing would be limited to grasses and shrubs along the road side and would be minimised as much as feasible.	Appendix 5 – Table 3 (FF1)
C12	No clearing of any trees (including dead or hollow-bearing trees) would be undertaken as part of the proposal.	Appendix 5 – Table 3 (FF4)
C13	Prior to and following the works, weed control of the proposal area would be undertaken to limit the spread of weeds into adjacent bushland areas.	Appendix 5 – Section 6
Bushfire		
C14	The CEMP would include an emergency evacuation plan for the construction area and compound site, and would include early warning measures such as monitoring fire hazard ratings on a daily basis and monitoring accordingly.	Appendix 5 – Section 7 Appendix 5 – Table 7 (F1)

SoC	Management measure / commitment	Reference
C15	The CEMP would provide for measures to minimise the potential to start a fire from construction activities, e.g. restrictions on the types of activities that can occur during high fire risk ratings and/or the provision for a spotter during such activities.	Appendix 5 – Table 6
C16	Firefighting equipment would be located at the construction site at all times and on appropriate plant.	Appendix 5 – Table 7 (F2)
C17	Smoking would not be permitted on the construction area, the compound site or the adjacent bushland areas during construction.	Appendix 5 – Table 7 (F7)
Soils and hydrology		
C18	Maintaining surface and soil stability at all times during cut-and-fill excavation activities (particularly in relation to trenching) by implementing erosion and sediment controls in accordance with Section 8 of the <i>Soil and Water Impact Assessment</i> (SESL, 2015) and <i>Managing Urban Stormwater: Soils and Construction</i> (Landcom, 2004 – also referred to as ‘The Blue Book’). Site-specific Erosion and Sediment Control Plans (ESCPs) will be prepared progressively to include the management strategies and controls for all activities with the potential to impact on sediment loss and erosion.	Appendix 1 – Table 3 (SW4)
C19	Erosion within the trench would be mitigated by using trench plugs (i.e. trench/sack breakers) at appropriate intervals. These measures are in accordance with the Blue Book.	Appendix 1 – Table 3 (SW5)
C20	Measures to ensure limited tracking of dirt off site will be implemented at access points. Where required the controls may include exit rumble grids at all points of egress onto public (sealed) roads, and/or stabilisation of site roads/tracks with aggregate where appropriate.	Appendix 1 – Table 3 (SW2)
C21	Erosion and sedimentation controls will be inspected prior to and after each rain period and during periods of prolonged rainfall. Any defects will be rectified immediately.	Appendix 1 – Table 3 (SW3)
C22	Erosion and sediment measures to secure the stockpile areas (e.g. diversions, sediment fences) will be installed prior to the commencement of spoil stockpiling activities.	Appendix 1 – Table 3 (SW8)
C23	Stockpiles will be checked for stability weekly and after heavy rainfall.	Appendix 1 – Table 3 (SW9)
C24	Topsoil will be conserved, where reasonable and feasible, for use in site rehabilitation/revegetation.	Appendix 1 – Table 3 (SW11)
C25	During the restoration and clean-up of construction sites, the following measures would be applied to stabilise the soils: <ol style="list-style-type: none"> 1. The site would be re-profiled to achieve soil stability and congruity with the surrounding landscape. 2. Re-seeding would be undertaken, and geotextile materials used as required. 3. Trenches would be backfilled and compacted in layers. 4. Access to the site would be managed (including site restrictions) to assist with site recovery. 5. There will be progressive revegetation, stabilisation and restoration works of earthworks areas in accordance with the Blue Book. 	Appendix 1 – Table 3 (SW26, SW27, SW28)
C26	To prevent the contamination of soils and in the event that contamination is encountered during construction, the following measures would be implemented: <ol style="list-style-type: none"> 1. Works in the vicinity will be stopped 	Appendix 1 – Table 3 (SW13, SW19, SW20, SW21, SW22, SW23, SW24, SW25)

SoC	Management measure / commitment	Reference
	<p>or modified and will not recommence until the material has been analysed, the hazard has been assessed and appropriate action has been taken (including delineating areas of concern as required until earthworks can resume safely).</p> <p>2. Storage areas for fuels, oils and chemicals used during construction will be covered and contained within an impervious bund to retain any spills of more than 110% of the volume of the largest container in the banded area. Any spillage will be immediately contained and absorbed with a suitable absorbent material. The contaminated material will be disposed of according to manufacturers and EPA requirements.</p> <p>3. Where possible, all refuelling would occur at designated fuel distribution points. These distribution points would be underlain by compacted earth to prevent the significant loss of fuel into the ground in the event of a spill. They would also be banded to contain any large spills that may occur as a result of machinery or tank failure.</p> <p>4. Spill response procedures and equipment for containment and recovery would be available on site.</p> <p>5. Workforce training would be conducted on the transport, storage, handling and disposal procedures relating to chemicals.</p>	
Noise and vibration		
C27	A Construction Noise and Vibration Management Plan would be prepared for all construction activities and included in the CEMP. It would outline measures to minimise construction noise and vibration impacts on sensitive receivers. This would also include an action plan to be followed if complaints are received.	Appendix 4 (NVMP)
C28	<p>Works (including delivery of plant and equipment) would be limited to standard working hours of:</p> <p>6. Monday to Friday 7:00am to 6:00pm.</p> <p>7. Saturday 8:00am to 1:00pm.</p> <p>8. No works on Sunday or public holidays.</p>	Appendix 4 – Table 10 (NV5, NV6)
C29	All potentially impacted residents would be notified of the proposed works, including the nature and duration of construction activities, predicted noise levels and contact details should they have any issues with the construction activities.	Appendix 4 – Table 10 (NV2)
C30	Construction plant and equipment would be well maintained (including noise reduction fittings where feasible) and would be turned off when not in use to minimise noisy emissions.	Appendix 4 – Table 10 (NV14, NV15)
C31	Where feasible reversing equipment would use ‘quacker’ alarms or would be minimised to prevent causing a nuisance.	Appendix 4 – Table 10 (NV16, NV17)
C32	Loading and unloading would be undertaken away from sensitive receivers.	Appendix 4 – Table 10 (NV18)
C33	During operation plant and machinery would be well maintained in order to minimise operational noise emissions.	Appendix 4 – Table 10 (NV14, NV15)
C34	Rock breaking activities are not to be undertaken within 50 metres of sensitive receivers.	Appendix 4 – Table 10 (NV19)
Visual amenity		

SoC	Management measure / commitment	Reference
C35	Installation of temporary fencing at the construction site for security and to visually delineate the area of construction.	Section 2.3
C36	The site to be kept tidy and well maintained, including removal of all rubbish at regular intervals. There should be no storage of materials beyond the construction boundaries.	Appendix 6 – Table 1 (W10)
C37	Temporary hoardings, barriers, traffic management and signage would be removed when no longer required.	Appendix 3 – Table 3 (T11)
C38	Locate construction plant, machinery and vehicle parking areas away from public or sensitive viewing areas.	Appendix 3 – Table 3 (T17)
C39	Upon completion, the proposal site would be reinstated and revegetated at the completion of works.	Appendix 5 – Table 3 (FF10)
Aboriginal heritage		
C40	<p>An Aboriginal Heritage Management Sub Plan would be prepared prior to the commencement of works. As a minimum this plan would include:</p> <ol style="list-style-type: none"> 1. Methodology for the actioning of all management measures outlined in section 5.8.5 of the SEE. 2. Inductions procedures on Aboriginal heritage for all staff and sub-contractors working on the proposal. 3. A site constraints map identifying known Aboriginal and the project boundaries and requirements for the display of the constraints map on site. 4. Any ongoing Aboriginal consultation and involvement required. 5. Management plans for the erection, maintenance and de-commissioning of the fencing around the identified Aboriginal sites before, during and at the completion of construction. 6. Procedures for managing any potential unidentified finds during construction, including human skeletal remains. 	Appendix 5 – Section 5 and Section 8
C41	Aboriginal site GWTP5 would be fenced for the duration of construction activities associated with the proposal.	Appendix 5 – Table 4 (H2)
C42	The location of all heritage sites would be clearly marked on all site plans and maps utilised for the proposal.	Appendix 5 – Table 4 (H3, H4)
C43	All construction staff would be inducted on site and advised of the proximity of Aboriginal heritage items within the area and the need to avoid impacts to them.	Appendix 5 – Table 4 (H1, H4)
C44	Construction staff would remain within the designated proposal area throughout construction activities to avoid any potential indirect impacts to adjacent heritage items.	Appendix 5 – Table 4 (H4)
C45	The protocols for the unanticipated discovery of archaeological material and suspected human remains would be implemented for the Googong IWC Stage C Network East project if necessary. A copy of these would be included in the CEMP.	Appendix 5 – Table 4 (H6) Appendix 5 – Table 8
Non-Aboriginal heritage		
C46	If any unknown non-Aboriginal heritage items are discovered during the construction activities, works in the area of the find would cease immediately and the site project engineer contacted for further advice. Works would not resume until after the site project engineer has given approval to proceed. This procedure would be detailed in the CEMP.	Appendix 5 – Section 5.1.4 Appendix 5 – Table 9
Air quality		

SoC	Management measure / commitment	Reference
C47	Speed limits would be reduced during high dust/windy conditions.	Appendix 5 – Table 1 (A15)
C48	Clearing of vegetation and topsoil would be limited to the designated footprint required.	Appendix 5 – Table 1 (A7)
C49	Disturbed areas would be progressively reinstated with suitable stabilising agents or revegetation.	Appendix 5 – Table 1 (A16)
C50	Water trucks would be used to reduce dust in dry, windy conditions.	Appendix 5 – Table 1 (A6)
C51	Working practices would be modified during periods of high winds by limiting the use of some machinery and by reducing travel speeds.	Appendix 5 – Table 1 (A15, A13)
C52	The burning of material on site would be prohibited, except under the instruction of NSW Rural Fire Services.	Appendix 1 – Table 3 (SW12) Appendix 5 – Table 7 (F6) Appendix 6 – Table 1 (W13)
Waste		
C53	Resource management hierarchy principles are to be followed: <ol style="list-style-type: none"> 1. Avoid unnecessary resource consumption as a priority. 2. Avoidance is followed by resource recovery (including reuse of materials, reprocessing, and recycling and energy recovery). 3. Disposal is undertaken as a last resort at a licensed waste facility. (in accordance with the <i>Waste Avoidance and Resource Recovery Act 2011</i>).	Appendix 6 – Section 2.0
C54	Waste materials are not to be left on site once the works are complete.	Appendix 6 – Table 1 (W14)
C55	Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day.	Appendix 6 – Table 1 (W10)
C56	No waste is to be burnt on site.	Appendix 1 – Table 3 (SW12) Appendix 5 – Table 7 (F6) Appendix 6 – Table 1 (W13)
Hazards and risks		
C57	Mitigation measures that would be implemented during construction would be outlined in the CEMP and would include (but not limited to): <ol style="list-style-type: none"> 1. Implementation of appropriate safety and training procedures, such as safe work method statements, safety management plan(s), auditing of contractors' safety management and approval of construction equipment. 2. Risks register and risk minimisation process. 3. Implementation of a traffic management plan (see Section 5.1.4). 4. Liaison with local emergency services, in particular regarding high fire-danger periods. 5. Installing exclusion fencing where appropriate. 	Section 5.2 Appendix 9 Appendix 2 Appendix 5 Section 7 Section 2.3

1.3 Consultation

Consultation is an ongoing and vital component of GTPL's approach to developing the Googong Township. The primary objective of consultation is to keep stakeholders informed and involved with the development of the IWC Project, and to establish effective lines of communication between GTPL and key stakeholders during each stage.

In particular, extensive consultation has been undertaken and is continuing with Icon Water who will be the ultimate operator of Stage C Network East. Icon Water has been involved in the design process for the Stage C Network East, and is also one of the stakeholders and government authorities consulted during the development of this CEMP. Those consulted during the development of this CEMP:

- Icon Water.
- NSW Roads and Maritime Services (RMS) and QPRC, for any works on RMS controlled roads and preparation of traffic control plans.

Consultation with relevant stakeholders and government authorities will continue throughout the construction Stage C Network East, and will include letter box drop notification of construction activities.

The outcome of any future consultation will be documented where relevant in subsequent revisions of this CEMP.

1.4 Certification and approval

This CEMP must be submitted for approval to the superintendent prior to commencement of construction works.

1.5 Environmental management system structure

1.5.1 Construction Environmental Management Plan (CEMP)

This CEMP provides the system to manage and control the environmental aspects of Stage C Network East during construction. It provides the overall framework to ensure environmental impacts are minimised and legislative and other requirements are fulfilled. The contractor will be responsible for implementing this CEMP and developing supportive documents and registers to assist with the implementation, including:

- Site inspection checklists.
- Non-compliance and corrective action reports.
- A complaints report.
- Environment incident reports.
- Environment training registers.
- Monitoring checklists.

1.5.2 Environmental management plans

A number of environmental management plans support the CEMP. These documents have been prepared to identify and manage the specific impacts or aspects of the activities described in Section 2.0. They address requirements of the CoA, SoCs and the environment assessment documentation.

The following management plans have been prepared to support this CEMP:

- Soil and Water Management Plan (Appendix 1).
- Work, Health and Safety Management Plan (Appendix 2).
- Traffic Management Protocol (Appendix 3).
- Noise and Vibration Management Plan (Appendix 4)
- Environmental management plan (Flora and fauna, air quality heritage, etc.)
- Waste and Resources Management Plan (Appendix 6).

1.5.3 Environmental Work Method Statement (EWMS)

Environmental Work Method Statements (EWMS) detail a specific construction methodology and environmental mitigation and management measures for an activity or area, for example, fencing or site-specific rehabilitation measures. EWMS will be prepared, as required by the contractor, prior to the commencement of significant activities. They will be prepared progressively in the lead up to and throughout construction, and approved by the Project Engineer.

1.5.4 Environmental procedures, forms and checklists

Environmental procedures are tools used to document an environmental process (such as flocculating a sedimentation basin, dewatering a trench). Project specific procedures will be developed as required by the Project Engineer.

1.5.5 Environmental constraints maps

Environmental constraints maps detail environmentally sensitive areas, including:

- Flora features, including threatened species and endangered ecological communities.
- Local waterways.
- Recorded threatened fauna habitat, including hollow bearing trees.
- Heritage sites.
- Bushfire prone areas.
- Googong Foreshore Buffer Area.
- Pink-tailed Worm-lizard Conservation Area.
- Noise sensitive receivers.

An environmental constraints map for the Stage C Network East site is provided at Appendix 7. This map will be revised throughout construction, as required, to reflect any revision to sensitive sites. Environmental constraints maps will assist pre-construction planning and on site construction management to help identify areas of environmental sensitivity.

1.5.6 Environmental control plans

An environmental control plan will be prepared to manage the impacts of construction on the environment at the Stage C Network East site. If required, a map will be prepared at a scale that ensures all controls are clearly identified. The environmental control plan will include information such as:

- Environmentally sensitive areas, including no-go areas.
- Erosion and sediment control measures.

- Noise sensitive receivers.
- Designated works areas and access tracks.
- Site compounds, stockpile locations and refuelling areas.
- Rehabilitation measures that would be implemented.

The environmental control plan will be developed by the Project Engineer, and is to be implemented prior to works commencing at the site.

The Project Engineer will maintain a register of environmental control plans. An example environmental control plan is provided in Appendix 8.

1.5.7 Other project documents

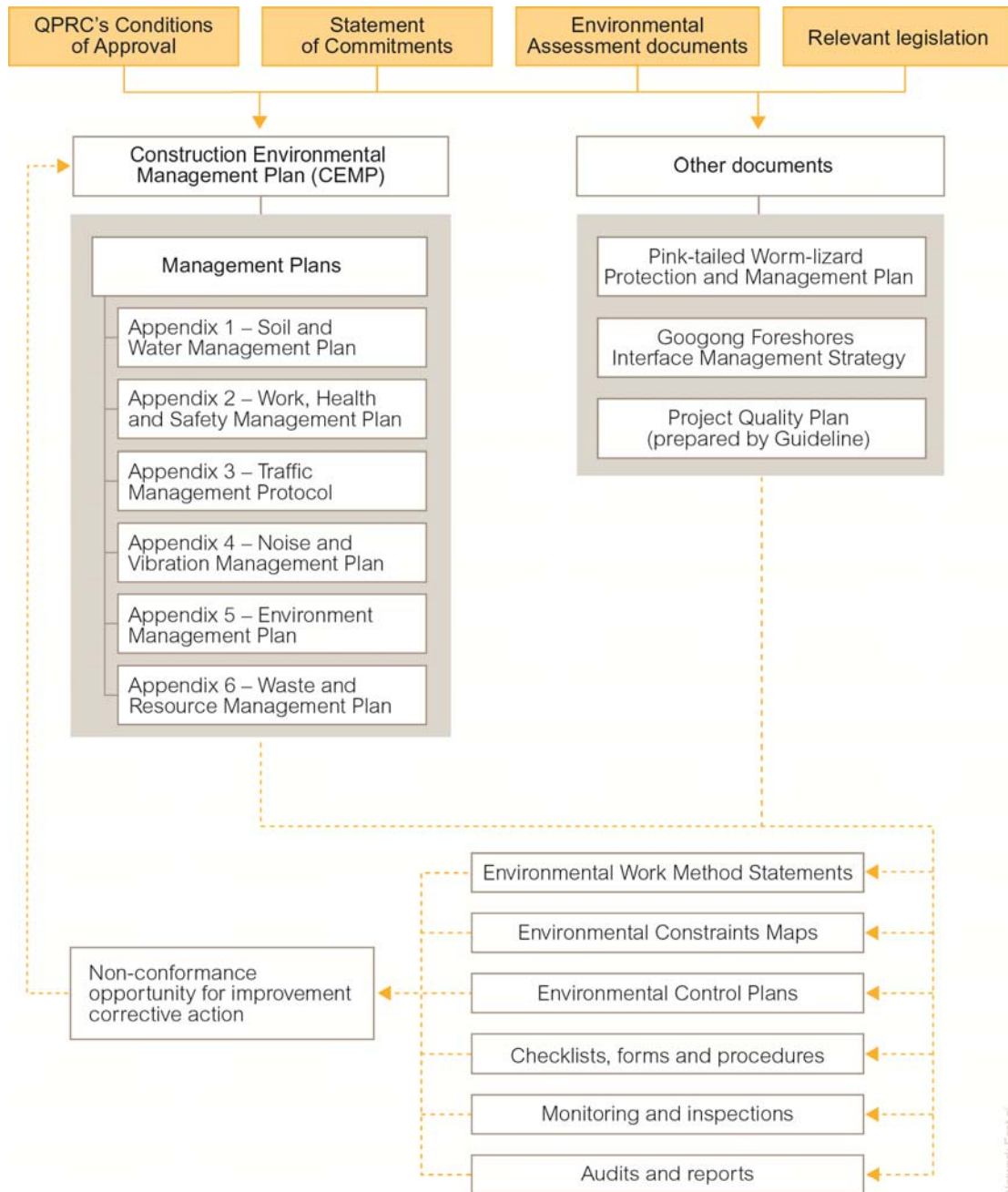
GTPL is responsible for the preparation of other project documents as required by the CoA or SoC. These include:

- Pink-tailed Worm-lizard Protection and Management Plan (EPBC CoA 1).
- Googong Foreshores Interface Management Strategy (EPBC CoA 2)
- Project Quality Plan (Project Approval CoA 23)

The contractor will comply with these project documents, where relevant.

Figure 1 shows the structure of the environmental management system and its relationship to other project documents.

Figure 1 Environmental Management System structure



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1.6 Distribution

This CEMP will be made available to all personnel, the contractor and sub-contractors. An electronic copy will be uploaded to the Googong IWC Project website [www.compliance.googong.net].

The CEMP is uncontrolled when printed. One controlled hard copy of the CEMP and supporting documentation will be maintained at GTPL's and the site office.

Controlled copies will be distributed to:

- GTPL
- Site superintendent (Black Mountain)
- Principal (Icon Water)
- Contractor (Guideline ACT)
- QPRC.

1.7 Revision

A document review process ensures that environmental documentation including this CEMP is updated as appropriate for the specific works that are occurring on site or in response to environmental incidents. This includes following the document review process described in Section 9.1. In addition, the CEMP and environmental management plans will be reviewed by the Project Engineer after every Category One incident. The Project Engineer will ensure that any additional measures arising from the incident investigation are incorporated into the relevant plans

The contractor will coordinate the review and distribution of this CEMP, management plans and other environmental documents during construction of Stage C Network East, in consultation with GTPL.

For any revision of this CEMP, the contractor will ensure that documentation is:

- Developed, reviewed and approved prior to issue.
- Issued for use.
- Controlled and stored for the legally required timeframe.
- Removed from use and archived when superseded or obsolete.

The revised document will then be issued to the Site Superintendent for review. The Site Superintendent will endorse minor changes to the CEMP. Minor changes would typically include those that:

- Are editorial.
- Do not increase the extent of environmental impacts when considered individually or cumulatively.
- Do not restrict the project's ability to meet all CoA and environmental obligations.

Where the Site Superintendent determines that the change is not minor, the revised CEMP will be sent by GTPL to QPRC for update.

A register will identify the current revision of particular documents. Revised documents will be distributed to controlled-copy holders, as identified in Section 1.6.

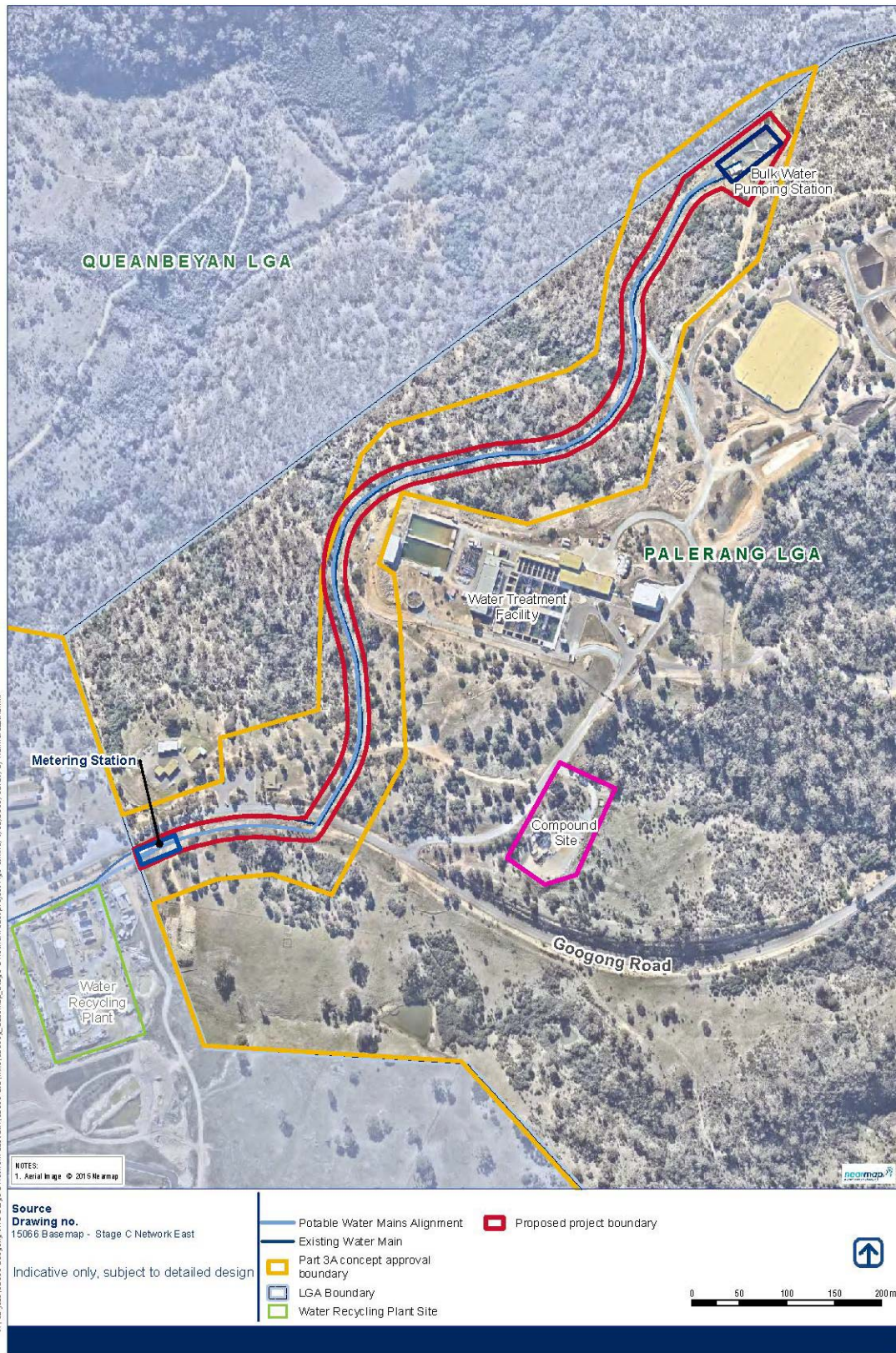
2.0 Project description

2.1 General features

This CEMP applies to works for Stage C Network East that will include construction of the following:

- Installation of a new underground DN375 potable pressure main from the existing bulk water pumping station to the boundary within Queanbeyan LGA (where it will connect to potable pressure main being developed as part of the Stage C Network West works). This main would run parallel to existing DN225 rising main from the bulk water pumping station and the existing access road.
- Installation of an above ground metering station at the boundary between Queanbeyan LGA and Palerang LGA (adjacent to existing metering station).
- Upgrades to the bulk water pumping station (BWPS) would be undertaken within the existing boundary of the BWPS and would include:
 - Installation of a high voltage power conduit from an overhead supply to the bulk water pumping station.
 - Installation of bulk water pumping station block-work building and associated foundations complete with vehicle access and gantry crane
 - Upgrades to the pump station, including installing two new pumps, all interconnecting pipes and valves.
 - Installation of a new transformer to replace the existing 100kva pole mounted transformer
 - Recycled water 'top-up' pumping station discharge pipework and connection to pressure main.
 - Variable Speed Drive and starters for new recycled water top-up pump station, to be located in existing Motor Control Centre building.

Figure 2 Site layout – Stage C Network East and construction boundary



2.2 Construction activities

2.2.1 Works at the Bulk Water Pumping Station

The existing BWPS was built as part of the Googong IWC Stage AB works under the Part 3A Planning Approvals in 2013/14. It is currently operational, supplying potable water to the Googong township and the WRP as required. Upgrades to the existing BWPS are required to increase capacity of the facility to supply potable water to the township. These upgrades to the BWPS would be undertaken within the existing boundary of the BWPS and would include:

- Installation of a high voltage power conduit from an overhead supply to the BWPS.
- Installation of BWPS block-work building and associated foundations complete with vehicle access and gantry crane. This will include a new building (including concrete foundations) about 12 metres by 8 metres connecting to the northern side of the existing building.
- Upgrades to the pump station, including installing two new pumps, all interconnecting pipes and valves.
- Installation of a new transformer to replace the existing 100kva pole mounted transformer.
- Discharge pipework and connection to pressure main.
- Variable Speed Drive and starters for pumps, to be located in existing Motor Control Centre building.

2.2.2 Works for the Potable Water Mains

A new underground DN375 potable pressure main will be installed from the existing BWPS to the boundary with Queanbeyan LGA (where it will connect to a potable pressure main being developed as part of the Googong IWC Stage C Network West works). This main would run parallel to existing DN225 rising main from the bulk water pumping station and the existing access road.

These upgrades will also include the installation of an above ground metering station at the boundary between Queanbeyan LGA and Palerang LGA (adjacent to existing metering station). It would be established on a concrete foundation of about one metre by one metre and would stand about 1.5 metres tall.

2.2.3 Construction compound

A temporary site compound is required to support construction of the Stage C Network East. The primary site compound will accommodate the majority of management, engineering, specialist and administrative personnel. These facilities will include portable buildings, parking facilities, staff amenities and material and chemical storage. Depending on the arrangement, electricity, sewerage, telecommunications and water supplies will be installed. A copy of all stamped approved plans, specifications and documents will be held on site within the construction compound (foreman's shed) while work is being undertaken.

The location for the construction compound is shown in Figure 2.

2.2.4 Construction access points

There are currently two access points into the BWPS as shown in Figure 3. Both access roads are located north off Googong Road. The access roads include:

- The access road to the Googong Water Treatment Plant.

This primarily provides access from Googong Dam Road and the Googong Water Treatment Plant. However, there is secondary access from the Water Treatment Plant up to the BWPS.

- The access road to the BWPS.

This road provides access between Googong Dam Road and the existing BWPS. The proposal would include locating the main within this road and would therefore require the closure of the road for construction activities.

Specific traffic control measures will be implemented during mobilisation and demobilisation of large earth moving equipment, site amenities and other large deliveries that require slow movements to and from the site access roads. Specifically the measures will ensure minimal hindrance on local traffic and residential access. To cater for such circumstances, where possible deliveries will be scheduled outside of peak hour periods thus minimising effects on traffic flow.

Site access shall be restricted by appropriate measures (such as fencing) to prevent unauthorised access and to aid in site recovery and rehabilitation

Further detail is provided in the Traffic Management Protocol (Appendix 3).

2.2.4.1 Access Track Safety and Maintenance

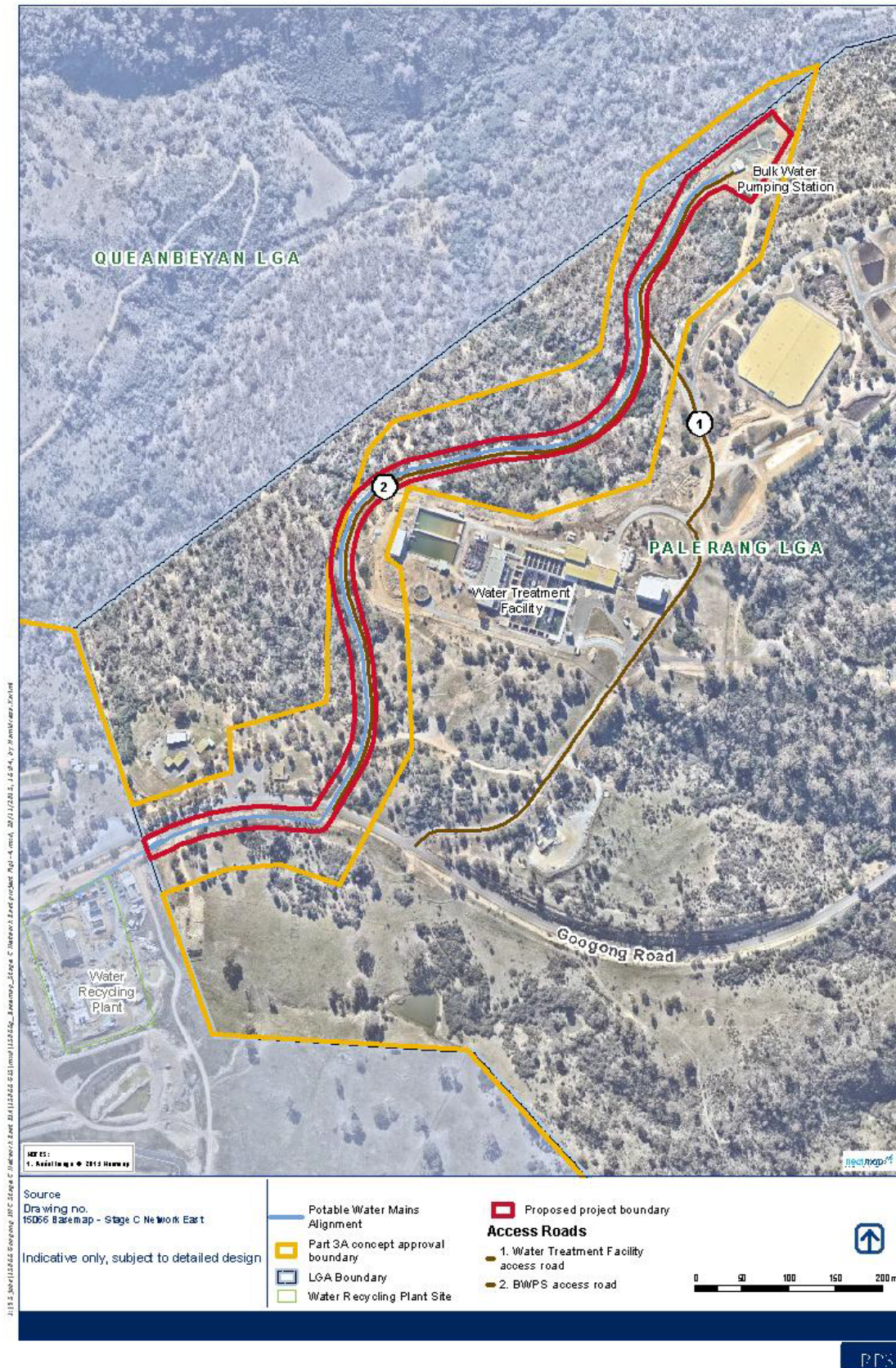
All access roads surrounding infrastructure will be maintained so as to minimise any fire hazard. To achieve this outcome grasses and vegetation adjacent to roads will be monitored and in accordance with Appendix 5 Section 7 fire management plans will be followed at all times. To ensure access to emergency tracks at all times, areas will be designated for parking and storage and all site visitors and workers will be inducted as to the safety parking locations as well as the correct procedures should an emergency occur.

As part of site establishment earthworks all access track entrances and exits will be stabilised so as to limit the tracking of dirt off site. Further, as part of the Guideline weekly environmental site checklist the tracks and adjoining roads will monitored throughout the project duration and any necessary actions recorded.

2.2.5 **Revegetation and reinstatement**

During the life of the project any disturbed areas will be monitored and where practicable, progressive revegetation, stabilisation and restoration works carried out in accordance with *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004). Part of the monitoring process will involve conservation of onsite topsoil for use in site rehabilitation/revegetation.

Figure 3 Site layout – Stage C Network East Access Points



2.2.6 Council requirements for any demolition/excavation activities associated with a building

Demolition or excavation works for any building, if required, are to be carried out on site in accordance with the:

- a) Requirements of the WorkCover Authority of New South Wales,
- b) *NSW Occupational Health and Safety Act 2000*, and
- c) Australian Standard AS 2601-2001: The Demolition of Structures.

With all excavations and backfilling associated with the erection or demolition of a building must be executed in accordance with the requirements of WorkCover. If any excavation associated with the erection or demolition of a building extends below the level of the base of the footings of a building on adjoining land, the person causing the excavation to be made:

- a) Must preserve and protect the building from damage, and
- b) If necessary, must underpin and support the building in an appropriate manner, and
- c) Must, at least seven days before excavating, give notice of intention to do so to the owner of the adjoining and furnish particulars of the excavation to the owner of the building being erected or demolished, and
- d) Satisfy the requirements of WorkCover.

The owner of the adjoining land is not to be liable for any part of the cost of work carried out for the purposes of this clause, whether carried out on the allotment of land being excavated or on the adjoining allotment of land.

Toilet facilities are to be provided at or in the close vicinity of the work site on which work involved in the erection or demolition of a building is being carried out.

2.2.7 Damage to any infrastructure

Prior to commencement of works a Dial Before You Dig request will be issued and an independent service locator will be contracted to identify service locations within the construction footprint. Should any services need further identification pot holing will be undertaken to confirm any unknown services.

Should any existing infrastructure within public or private road reserves be damaged during construction it is the responsibility of the applicant to correct and repair or replace as necessary. The damaged infrastructure must be brought back to the condition or better, existing prior to any damage.

Prior to construction a dilapidation report will be created detailing any nearby structures, roads, etc. and their conditions. As detailed in the NVMP (Appendix 4) mitigation measures will be carried out during construction works and nearby infrastructure will be monitored.

Works carried out for the duration of the project will be undertaken by qualified and experienced personnel only. As part of Guideline ACT's quality assurance systems any contractors involved in the project will be required to provide details of their own quality management systems (SWMS, etc.), documents will be evaluated and monitored during the project.

2.3 Defining work areas

When undertaking any works involving excavation a minimum of 500 mm distance from the construction boundary is to be adhered to at all times so as to mitigate damages to the surrounding environment.

The environmental constraints map will be used in conjunction with the environmental control plan (as required) to help identify key risk areas and to promote ongoing communication to construction personnel during construction (refer Section 1.5).

The environmental constraints map outlines the environmentally sensitive and 'no go' areas for the site and the project boundary. The environmental control plan, to be prepared, will clearly define work areas, including access tracks. Refer to Section 1.5 for further detail.

Areas that are to be protected during construction will be fenced with exclusion fencing and the fencing will remain in place for the duration of construction activities. Fencing type will be determined based on the sensitivity of the area and the potential for unauthorised access, but may include chain wire fencing, para-webb fencing or flagging tape. Temporary security fencing will be erected where agreed between Icon Water and Guideline.

Should night works be undertaken and high powered lighting needed, the environmental constraints map will be used as a guide to protect sensitive and 'no go areas' from unwanted light pollution. Lighting will be strategically placed so as not to disrupt any passing traffic, local fauna or nearby residents.

The procedure for defining the limits to vegetation clearing is outlined in the Flora and Fauna Management Plan (contained in Appendix 5).

3.0 Planning

3.1 Legal and other requirements

A register of legal and other requirements for the construction of Stage C Network East is contained in Appendix 10. This register will be reviewed by the contractor at regular intervals (i.e. at least every six months) and updated to reflect any legislative or approval changes as required. Any changes made to the legal requirements register will be communicated to the wider project team where necessary through toolbox talks, specific training or other methods.

3.1.1 Approval under Part 3A of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act)

The *Googong Township Water Cycle Project Environmental Assessment* (November, 2010) (EA) was prepared under (the now repealed) Part 3A of the EP&A Act to assess the impacts of construction and operation of infrastructure for the potable water, recycled water and sewage system required to service the township including the construction of the WRP.

Concept Approval for the ultimate development (Stage 1 and Stage 2) was granted by the NSW Planning Assessment Commission, under delegation from the Minister for Planning and Infrastructure on 24 November 2011.

This CEMP and environmental management documentation will comply with the conditions of the Concept Approval, where relevant to the construction of Stage C Network East.

Part 3A of the EP&A Act was repealed on 1 October 2011. Under the transitional arrangement, the IWC Project will continue to be legislated by the provisions of Part 3A, as in force immediately before its repeal.

3.1.2 Approval under Part 4 of the EP&A Act

The *Googong Stage C Network East Statement of Environmental Effects* (November, 2015) (SEE) was prepared under Part 4 of the EP&A Act to assess the impacts of construction and operation of Stage C Network East.

Project Approval for Stage C Network East was granted by Palerang Council (now QPRC) on 2nd May, 2016 (DA.2016.027).

This CEMP and environmental management documentation will comply with the conditions of the Stage C Network East Project Approval, where relevant to the construction of Stage C Network East.

3.1.3 Approval under Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act)

The Googong Township Project was referred to the DoE under the EPBC Act due to potential impacts on matters of national environmental significance, including migratory species, threatened species and communities. The Googong Township Project was declared a controlled action under the EPBC Act, and subsequently approved on 19 May 2011, subject to conditions.

This CEMP and environmental management documents will comply with the conditions of the EPBC Act approval, where relevant to Stage C Network East.

3.1.4 Other legal requirements

Refer to Appendix 10 for a register of all legal and other requirements relevant to the construction of Stage C Network East.

Environmental legislation relevant to a particular environmental management plan is referenced in that plan.

3.2 Approvals, permits and licensing

Appendix 10 contains a register of all relevant legal and other requirements, identifying the need for any environmental approvals, permits and licenses for the construction of Stage C Network East. The register will be maintained by the Project Engineer and will be reviewed prior to the commencement of construction, and at regular intervals during construction (i.e. every six months).

All necessary licences, permits and approvals required for the Project will be obtained and maintained as required throughout the life of the Project.

A copy of the Project Approval (including stamped drawings) and all other relevant approvals will be kept on site at all times during construction of Stage C Network East.

3.3 Environmental aspects and impacts

In order to assess the potential environmental impacts of an activity, the construction of Stage C Network East will adopt a risk management approach. This process considers potential regulatory risks and the overarching commitment to protect the environment.

During the development of this CEMP, an environment risk analysis was held to revise and update environmental risks identified in the Statement of Environmental Effects (SEE) for the Project. The outcome of this risk analysis provides the basis of the risk register (Appendix 9). The risk register includes a list of activities associated with the construction of Stage C Network East, related aspects and corresponding risks before mitigation and after implementation of the measures are included in each of the environmental management plans appended to the CEMP.

The Project Engineer will review the risk register during construction of Stage C Network East, as required to ensure it remains current. In particular, the environmental risk assessment will be updated:

- If a significant incident or impact occurs.
- If activities changes.

An assessment of potential risk to the environment will also be undertaken as part of the development of EWMS for specific activities or works in specific areas. This should include both the direct impact of the activity and the impact of any incident that could result from the activity. Outcomes from the ongoing risk assessments will be incorporated into the CEMP and environmental management documents as required.

3.4 Environmental policy

The environmental policy included at Appendix 11 describes GTPL's commitment to continual improvement in environmental performance and compliance with applicable legal requirements. The contractor is also required by contract documentation to have an environmental policy.

Both GTPL's and the contractor's environmental policies will be displayed at the site office, and communicated to staff and other interested parties via inductions and ongoing awareness programs.

3.5 Objectives and targets

Environmental objectives and targets have been established as a way to monitor and evaluate environmental performance during construction of Stage C Network East. These objectives and targets have been developed with consideration of the key issues identified through the environmental assessment and risk assessment process.

The performance of the construction of Stage C Network East against the objectives and targets will be documented in the monthly environmental reports and/or audits.

Environmental objectives and targets for the construction of Stage C Network East are provided in Table 5.

Table 5 Environmental objectives and targets

Objective	Target	Management tool
Comply with all statutory and legal requirements.	Full compliance with statutory approvals. No regulatory infringements (prosecutions, penalty infringement notices). No formal regulatory warnings.	Audits, environmental monthly report
Engage with the effected and broader community and minimise and manage complaints.	Communicate effectively with the community through providing notifications at the start of works, and for any out of hour's works which includes details on where to make a complaint. Record and response to complaints within appropriate timeframes (i.e. within seven days).	Review complaints register, audits, review of monthly environmental reports
Continually improve environmental performance.	Incidents and non-conformances requiring investigation or action are appropriately investigated, and corrective actions assigned. Corrective actions are completed within designated timeframes. A program of ongoing environmental training is developed and maintained. Lessons learned from environmental incidents are implemented to minimise repeat issues.	Audits, environmental monthly report, incident investigation,.

3.6 Project alterations

Alterations to the Project may result from detailed design refinement or changes identified during the construction period.

The GTPL Assistant Project Director is responsible for ensuring that all Project refinements are assessed for consistency against the Concept and Project Approval. During construction of Stage C Network East any design changes or changes in scope of works will be communicated by the contractor to the GTPL Assistant Project Director via the Principal and Environment Manager. GTPL, with support from the Principal and the Environment Manager, will undertake a consistency assessment through a desktop analysis of the environmental issues in the SEE.

GTPL will determine whether the proposed alteration is consistent with the approved Project. Where GTPL determines that the change is generally consistent, this CEMP would be reviewed and revised by Guideline as per the procedures outlined in Section 1.7.

A copy of the consistency assessment will be provided to QPRC for information, prior to the commencement of substantial works associated with the proposed alteration.

Where GTPL determines that the proposed alteration is generally not consistent with the approved Project, a modification to the approved Project is required. GTPL will prepare a modification, to be submitted to QPRC for determination.

GTPL is responsible for documenting minor changes that are consistent with the approved Project, and if required, for seeking approval from QPRC for any substantial project modifications. No work associated with a proposed or pending modification can commence without approval of QPRC.

4.0 Implementation and operation

4.1 Roles and responsibilities

4.1.1 GTPL Assistant Project Director

The environmental responsibilities of the GTPL Assistant Project Director include, but are not limited to:

- Review the CEMP and any environmental management plans and related documents prepared for Stage C Network East.
- Ensure all project alterations are assessed for consistency against the approved Project.
- Oversee the implementation of the CEMP and environmental management plans for Stage C Network East.
- Liaise with government stakeholders and provide notification/information where environmental incidents have occurred.
- Monitor the environmental performance of Stage C Network East in relation to GTPL requirements through audits and review of the monthly environmental reports.

4.1.2 Principal (Icon Water) / Site Superintendent (Black Mountain)

The environmental responsibilities of the Principal include, but are not limited to:

- Supply the GTPL Assistant Project Director with any relevant information required to perform the following responsibilities:
- Review any environmental management plans and related documents prepared for the Project.
- Ensure all Project alterations are assessed for consistency against the approved project.
- Monitor the environmental performance of the Project in relation to GTPL requirements.
- Provide other information as required from time to time, in order to demonstrate to GTPL that Project Approval requirements are being met by the Contractor.

4.1.3 Site Foreman (Guideline)

The environmental responsibilities of the site foreman include, but are not limited to:

- Advise all personnel and sub-contractors of their responsibilities under the CEMP and site-specific environmental issues.
- Coordinate the implementation of the CEMP.
- Identify resources required for implementation of the CEMP.
- Program toolbox talks and daily pre-start meetings to include environmental requirements where required.
- Report any activity that has resulted, or has the potential to result, in an environmental incident immediately to GTPL.
- Coordinate action in emergency situations and allocate required resources.
- Stop activities where there is an actual or immediate risk of harm to the environment and advise the Project Engineer.

4.1.4 Project Manager (Guideline)

The environmental responsibilities of the Project Manager include, but are not limited to:

- Liaise with GTPL and government authorities as required.
- Provide adequate resources (personnel, financial and technological) to ensure effective development, implementation and maintenance of this CEMP and the Project's compliance obligations in relation to all approvals, permits and licences.
- Ensure that complaints are investigated to achieve effective resolution.
- Stop activities where there is an actual or immediate risk of harm to the environment and immediately advise the GTPL Assistant Project Director and Site Superintendent as required.
- Undertake one weekly inspection each month, ensuring all works comply with relevant regulatory and Project requirements.

4.1.5 Project Engineer (Guideline)

Guideline will appoint a Project Engineer who will have overall responsibility for the implementation of environmental management on the construction of Stage C Network East. The environmental responsibilities of the Project Engineer include, but are not limited to:

- Develop, implement, monitor and update the Stage C Network East CEMP and management plans (including a review of the plans after any Category One incident).
- Manage environmental constraints maps, develop environmental control plans (and register).
- Maintain and update the Environment risk register (refer Appendix 9).
- Ensure that all environmental licences, approvals and permits are obtained and updated as required, and ensure that the Legal and other requirements register is maintained (refer Appendix 10).
- Report to Project Manager and GTPL on environmental performance and prepare a Monthly report (refer Appendix 12).
- Ensure all works comply with relevant regulatory and Project requirements.
- Ensure the requirements of this CEMP are fully implemented.
- Ensure that all personnel receive appropriate induction training, including details of the environmental obligations.
- Plan construction works in a manner that avoids or minimises impact to environment.
- Control field works and implement/maintain effective environmental controls.
- Ensure steps are taken to rectify and prevent future incidents from occurring.
- Act on all recommendations made by the Site Superintendent as soon as practicable. If the Project Engineer chooses not to implement recommendations of the Site Superintendent, written justification of the alternate course of action will be provided to QPRC within seven days of receiving the recommendation. QPRC must be satisfied with the alternate course of action.
- Coordinate the implementation of the CEMP.
- Lead liaison with the Site Superintendent.
- Oversee site monitoring, and undertake weekly inspections and audits.
- Develop and facilitate induction, toolbox talks and other training programs relating to environmental

requirements for all site personnel.

- Maintain a register of all project site inductions and environmental training.
- Stop activities where there is an actual or immediate risk of harm to the environment and immediately advise the Project Manager, Site Superintendent and the GTPL Assistant Project Director.
- Ensure steps are taken to rectify and prevent future incidents from occurring.
- Manage an incident register and provide documentation on environmental incidents, non-conformance and corrective actions to Project Manager and the GTPL Assistant Project Director.
- Endorse minor revisions to the CEMP

Before commencement of works a Project Quality Plan (in accordance with CoA 23) will be developed by the Project Engineer comprised of inspection and test plans (ITPs) detailing witness points and hold points. The ITPs will be submitted for approval to the superintendent prior to commencement of works. Throughout the project lifecycle witness and hold points (as appropriate), for civil works shall be signed off by the Superintendent of Works or other qualified person nominated to do so

4.1.6 Wider project team (including sub-contractors)

- Comply with the relevant requirements of the CEMP, or other environmental management guidance as instructed by a member of the Project's management.
- Participate in the compulsory Project/site specific induction program, toolbox talks and daily pre-start meetings.
- Stop activities where there is an actual or immediate risk of harm to the environment and report any activity that has resulted, or has the potential to result, in an environmental incident immediately to the Project Engineer.

4.2 CEMP availability

A copy of this CEMP will be held in the site office.

An electronic copy of the approved CEMP will be available on the IWC Project website [www.compliance.googong.net]. Supporting documents, for example relevant EMWS and environmental control plans will be held on site and on any online document control management systems.

5.0 Competence, training and awareness

5.1 Purpose

To ensure that this CEMP is effectively implemented, each level of management is responsible for ensuring that all personnel reporting to them are aware of the requirements of this CEMP. The Project Engineer will coordinate the environmental training. Several forms of environmental training will be provided, including:

- A project site induction, including environmental roles and responsibilities.
- Toolbox talks.
- Pre-start meetings.
- Environmental awareness training for specific issues.

The Project Engineer will maintain a register of all project site inductions and environmental training carried out. Records of attendees at toolboxes will be kept on file.

5.2 Site inductions

All personnel (including sub-contractors) will attend a site induction prior to commencing any work on site. The site induction will include an environment component and will ensure all personnel are aware of the environmental risks on site, the requirements of the CEMP and their responsibilities around the implementation of environmental management measures.

The environmental component will include, but not be limited to, an overview of:

- Purpose and objectives of the CEMP.
- Conditions of environmental licences, permits and approvals.
- Key environmental issues and responsibilities.
- Working hours.
- Mitigation measures for the control of environmental issues.
- Boundaries for vegetation clearing, location of exclusion zones, and other environmental constraints.
- Responsibilities under the *NSW Heritage Act 1977* and *NSW National Parks and Wildlife Act 1974*, for example if a potential relic/item is uncovered during construction.
- Incident management, response and reporting requirements.

A record of all environment inductions will be maintained by the Project Engineer and kept on site.

5.3 Toolbox talks, training and awareness

Toolbox talks will typically be held weekly and will be used to raise awareness and educate personnel on issues related to all aspects of construction including environmental issues. Toolbox talks will include details relevant to upcoming works and targeted to relevant personnel.

Environmental issues may include (but are not limited to):

- Erosion and sedimentation control.
- Incidents and spill response.

- Managing noise and amenity impacts.
- Threatened species, endangered ecological communities and protection of vegetation.
- Heritage and managing unexpected finds.
- Improvements to existing procedures based on findings of environmental inspections, monitoring and audits (refer Section 8.0).

Toolbox attendance is mandatory and attendees of toolbox talks are required to sign an attendance form. Each attendee is required to sign off on the toolbox talk to register their understanding, and records of attendance will be maintained.

For activities with high environmental risk, targeted environmental awareness training will be provided. The content of targeted training may include the topics outlined above, or as otherwise required, dependant on the nature of construction activities and the type of impact and environmental risk.

The Project Engineer will maintain a register of environmental training. The register will include a record of the topic, content, dates, name(s) and qualifications of trainers, names and signatures of personnel trained.

5.4 Pre-start meetings

The pre-start meeting is a tool for informing the workforce of the day's activities, including information relating to the work schedule, safety, environment or other information that may be relevant to the day's work.

Environmental concerns covered in the pre-start meeting will include any aspect of the day's construction activities that may be impacted by, or may impact on, the environment. Risks and measures to manage those risks will be discussed.

All workers will be required to attend a daily pre-start meeting, prior to commencement of that day's construction and sign on to a pre-start meeting attendance sheet. The Project Engineer will record pre-start topics, dates delivered and a register of attendees.

6.0 Communication and consultation

6.1 Internal communication

A key to ensuring compliance with environmental obligations and continual improvement is the ongoing communication to project personnel. To ensure construction works are undertaken as specified a copy of all stamped approved plans, specifications and documents will be held on site while work is being undertaken.

Throughout the duration of the project as per inspection and test plans various witness and hold points are to be inspected by the superintendent or relevant authority prior to continuation of affected works.

Typical witness points are:

1. Installation of erosion and sediment control devices
2. Preservation measures installed for trees and vegetation
3. Final inspection of completed works.

Further details in regards to Guideline ACT quality assurance systems can be found in the Quality Management Plan (section 4) of the Project Management Plan.

GTPL, the Principal and the contractor will communicate regularly to discuss any issues or concerns with onsite environmental management, any amendments to environmental management documents that might be required or any changes to construction activities.

The contractor will ensure regular communication around the environmental requirements and performance updates is carried out, for example through training and awareness raising as described in Section 5.3.

The Project Engineer is responsible for notifying the Site Superintendent, the Principal (and GTPL) of any environmental incidents as soon as they become aware of the incident.

The Project Engineer has the responsibility to report on the ongoing environmental performance of the construction of Stage C Network East to the Principal, GTPL and the Site Superintendent. The Project Engineer will report on progress and key environmental issues through the preparation of monthly environment reports (refer Appendix 12).

6.2 Communication with government agencies

The Site Superintendent will also liaise with QPRC and provide QPRC with copies of inspections reports and other documentation as necessary.

At the completion of works the Site Superintendent of Works shall present to the PCA, a Certification Report for civil works and is to include copies of any approvals outlined in this development consent and report on the current status of environmental restoration and revegetation. All project plans, inspection test plans, and results are to be included in the report. The Superintendent of Works shall be a Civil Engineer or suitably experienced and accredited Registered Surveyor as set out in AusSpec#1. Each drawing to be certified by the Superintendent of Works or other authorized person.

6.3 Stakeholder and community consultation

6.3.1 Community notifications

The Principal is responsible for providing notification to council, and nearby residents to advise of the commencement of construction (and details for making an enquiry/complaint). The contractor is to provide notification for activities such as noisy works and blasting (as detailed in the environmental management plans) as required. The contractor will provide details of notification to the Principal, Site Superintendent and GTPL.

6.3.2 Signage

The site will be identified by a sign sited in a visually prominent position containing the following information;

1. The development application number,
2. Name, address and telephone number of the principal certifying authority,
3. Name of the principal contractor (if any) and 24 hour contact telephone number, and
4. A statement that “unauthorised entry to the work site is prohibited”.

6.3.3 Complaints Management Procedure

The community can make an enquiry or complaint by telephone, post, email or face to face through the following communication lines:

Information line: 1800 838 438

Project email: iwc@googong.net

The above email address and hotline are managed by GTPL who will provide details of any community inquiries or complaints to the Site Superintendent, the Principal and Contractor.

Details of how to contact the project team will be available on the project website, on site signage and on all communication materials (i.e. notification letters).

All complaints received will undergo an investigation determining cause and effects and the results will be recorded in the Monthly Environmental Report (Appendix 12). The Project Engineer will be required to direct all complaints and enquiries to the Principal, Site Superintendent and GTPL Assistant Project Director for further review.

7.0 Incidents and emergencies

7.1 Classification of environmental incidents

There are two categories of environmental incidents.

7.1.1 Category one

Category one incidents include:

- Unauthorised sediment discharge or fuel, oil or chemical spill leaving site where the pollution incident causes or threatens material harm to the environment or people (as per Part 5.7 of the NSW *Protection of the Environment Operations Act 1997* (POEO Act)).
- Unauthorised impact to threatened species and endangered ecological communities.
- Unauthorised impact to Aboriginal or non-Aboriginal heritage items, sites or relics.
- Carrying out of work without necessary approval/permit/licence.

7.1.2 Category two

Category two incidents include:

- Pollution incidents that can be cleaned up without material harm to the environment or people (as per Part 5.7 of the POEO Act).
- A non-conformance with the environmental management system does not result in a Category one incident.

7.2 Incident management

The incident management response is outlined in the following sections.

7.2.1 Category one

- If necessary, stop work in relevant area and take necessary actions or put in place suitable controls to avoid and reduce impacts of incidents to the environment or community.
- Project personnel to immediately notify the Project Engineer
- Project Engineer or Project Manager to immediately notify the GTPL Assistant Project Director, the Principal and the Site Superintendent (refer to Section 7.3).
- GTPL to immediately notify the EPA and QPRC (and others as required) for pollution incidents causing or threatening material harm (refer to Section 7.3).
- GTPL to immediately notify QPRC (and others as required) for all other category one incidents.
- Project Engineer to complete an incident report and record in the incident register (to be developed and managed by the contractor) and submit report to GTPL within two days.
- GTPL and contractor to investigate incident (root cause analysis) and implement any opportunities for improvement (as soon as practical, but within one week) (refer Section 7.3).
- GTPL to issue copy of incident report and root cause analysis to QPRC (and others as required) for their consideration (within seven days).

7.2.2 Category two

- If necessary, stop work in relevant area and take necessary actions or put in place suitable controls to avoid and reduce impacts of incidents to the environment or community.
- Project personnel to immediately notify the Project Engineer.
- Project Engineer to immediately notify the GTPL Assistant Project Director, the Principal and the Site Superintendent (refer to Section 7.3).
- Project Engineer to complete an incident report and record in the incident register (to be developed and managed by the contractor) and submit report to GTPL within two weeks.
- GTPL and contractor to investigate incident (root cause analysis) and implement any opportunities for improvement (as soon as practical, but within one week) (refer Section 7.3).

7.3 Incident reporting

The Project Engineer and/or Project Manager must immediately notify GTPL, the Principal and the Site Superintendent of any environment incidents immediately and in writing within 24 hours of the incident occurring.

GTPL and/or the Site Superintendent will determine if the incident is a Category one or Category two incidents and then follow the appropriate reporting protocol (see below and refer Figure 4).

In addition to incident reports, all incidents must be recorded in an incident register maintained by the contractor and listed in the monthly environmental report.

7.3.1 Category one pollution incident reporting – notification under the POEO Act

All pollution incidents causing or threatening material harm to the environment must be notified to the EPA via the EPA Environment Line (telephone 131 555) in accordance with Section 148 of the POEO Act.

A 'pollution incident' includes a leak, spill or escape of a substance, or circumstances in which this is likely to occur. Material harm is defined under the POEO Act:

- If the actual or potential harm to the health or safety of human beings or ecosystems is not trivial.
- If actual or potential loss or property damage (including clean-up costs) associated with an environmental incident exceeds \$10,000.

All pollution incidents causing or threatening material harm to the environment must be notified to each relevant authority in accordance with Section 148 of the POEO Act. For Category one pollution incidents, GTPL will immediately (that is promptly and without delay, after they become aware of the incident) notify:

- QPRC.
- EPA.
- Ministry of Health.
- WorkCover.
- Fire and Rescue NSW.

An environment incident report will be prepared by the contractor and provided to GTPL, the Principal and the Site Superintendent within two days of the incident occurring, including learnings from the incident and proposed measures to prevent the occurrence of a similar incident.

Within seven days of the incident occurring, GTPL will provide a detailed incident report and copy of the root cause analysis investigation to the EPA and QPRC.

7.3.2 All other Category one incident reporting

For all other Category one incidents, GTPL will notify QPRC and any relevant agencies as soon as is practicable after GTPL become aware of the incident.

An environment incident report will be prepared by the contractor and provided to GTPL, the Principal and the Site Superintendent within two days of the incident occurring, including learnings from the incident and proposed measures to prevent the occurrence of a similar incident.

Within seven days of the incident occurring, GTPL will provide QPRC, and any relevant agencies, a detailed incident report and copy of the root cause analysis investigation.

7.3.3 Category two incident reporting

An environment incident report will be prepared by the contractor and provided to GTPL, the Principal and the Site Superintendent within two weeks of the incident occurring, including learnings from the incident and proposed measures to prevent the occurrence of a similar incident.

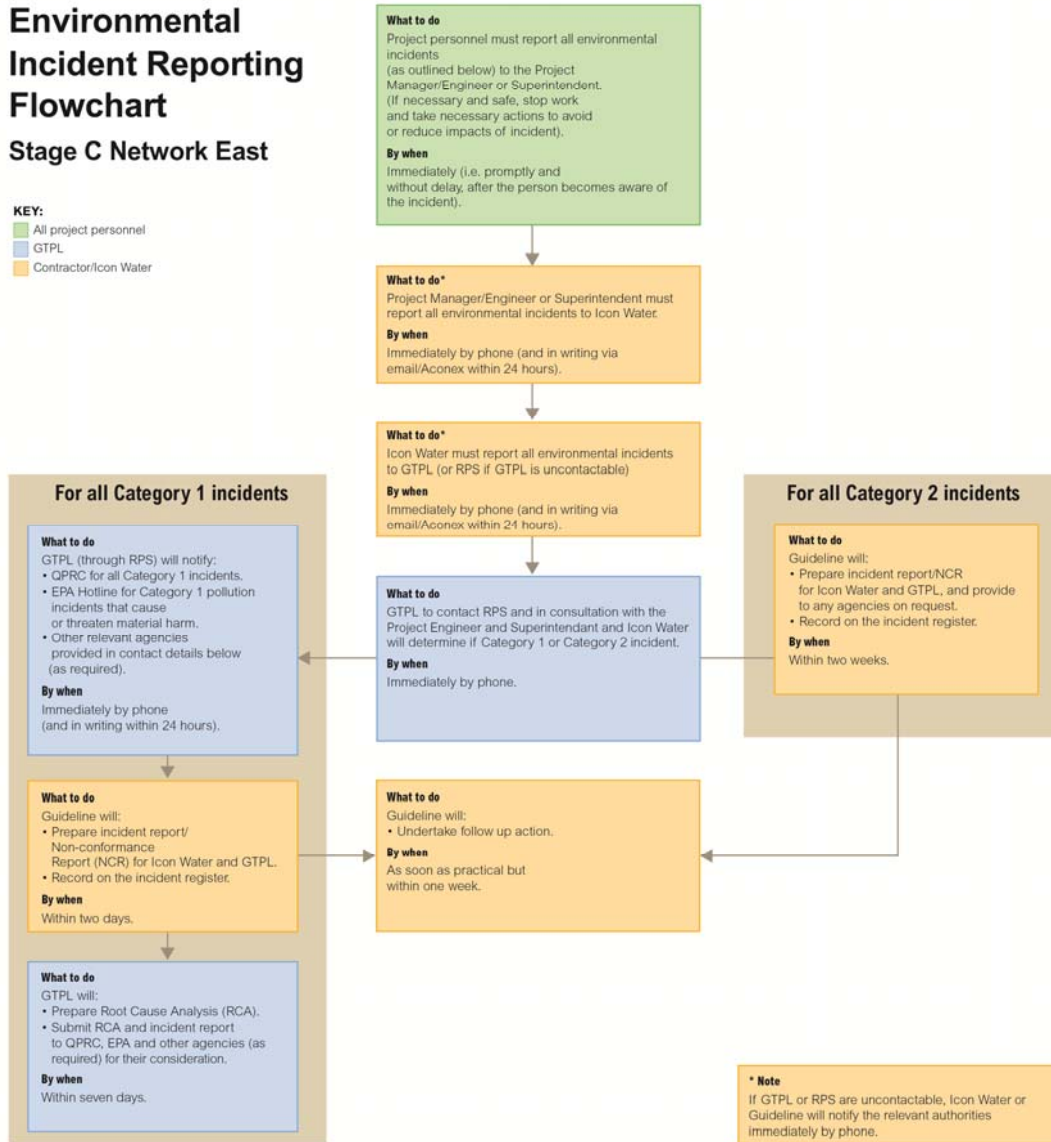
Key contacts for environmental emergencies are provided in Table 6.

Figure 4 Incident reporting flowchart

Environmental Incident Reporting Flowchart

Stage C Network East

KEY:
■ All project personnel
■ GTPL
■ Contractor/Icon Water



WHAT IS AN ENVIRONMENTAL INCIDENT?
What is a Category 1 Incident?
 • A pollution incident which causes or threatens material harm to the environment or people (as per Part 5.7 of the NSW Protection of the Environment Operations Act 1997 (POEO Act)). For example, unauthorised sediment discharge or fuel, oil or chemical spill leaving site.
 - Harm to the environment is material if it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not neutral OR it results in actual or potential loss or property of an amount, or amount in aggregate exceeding \$10,000.
 • Unauthorised impact to threatened species and endangered ecological communities.
 • Unauthorised impact to Aboriginal or non-Aboriginal heritage items, sites or relics.
 • Carrying out of work without necessary approval/permit/licence.
What is a Category 2 Incident?
 • Pollution incidents that can be cleaned up without material harm to the environment or people (as per Part 5.7 of the POEO Act).
 • A non-conformance with the environmental management system that does not result in a Category 1 incident.

CONTACT DETAILS

PROJECT TEAM		
Name	Phone	Email
GUIDELINE/BLACK MOUNTAIN		
John Hite (Project Manager)	0407 008 195	john.hite@guidelineact.com.au
Simon Mula (Project Engineer)	0411 963 203	simon.mula@guidelineact.com.au
Geoff Gardner (Superintendent)	0432 565 123	geoff.gardner@blackmntn.com.au
ICON WATER (Principal)		
Dale Hicks	(02) 6248 3525	dale.hicks@iconwater.com.au
GTPL		
Craig Harris (Assistant Project Director)	0409 999 059	craig.harris@cicaustralia.com.au
RPS		
Rob Salisbury (Environment Advisor to GTPL)	0416 034 054	rob.salisbury@rpsgroup.com.au
AGENCIES		
Queanbeyan-Palerang Regional Council (QPRC)		
Palerang	1300 735 025	(02) 6238 8111
EPA		
Julian Thompson (Unit Head - South East Region)	(02) 6229 7002	julian.thompson@epa.nsw.gov.au
Sharon Peters (Regional Operations Officer)	(02) 6229 7002	sharon.peters@epa.nsw.gov.au
EPA Hotline	131 555	
OTHER AGENCIES		
NSW Rural Fire Service	000	
Southern NSW Local Health District Public Health Unit	(02) 6080 8900	
WorkCover NSW	131 050	

Information as of August 16, 2016

Table 6 Emergency contacts

Emergency contact/organisation	Name	Contact details
GTPL Assistant Project Director	Craig Harris	0409 999 059
Environment advisor to GTPL (RPS)	Rob Salisbury	0416 034 054
Principal (Icon Water)	Dale Hicks	6248 3525
Project Manager (Guideline)	John Hite	0407 008 195
Project Engineer (Guideline)	Simon Mula	0411 963 203
Site Superintendent (Black Mountain)	Geoff Gardner	0432 565 123
NSW EPA	Pollution line	131 555
NSW EPA (South East region)	Julian Thompson	(02) 6229 7002
QPRC	Palerang	1300 735 025 (02) 6238 8111
NSW Health	N/A	(02) 9391 9000
Police	N/A	000 (or 112 from mobiles)
Local police	N/A	131 444
Ambulance	N/A	000 (or 112 from mobiles)
Canberra Hospital	N/A	(02) 6244 2222
Queanbeyan Hospital	N/A	(02) 6298 9211
NSW Rural Fire Service	N/A	000 (or 112 from mobiles)
Gas/electricity	N/A	131 909
WorkCover NSW	N/A	13 10 50
Telstra	N/A	132 999
ACT Territory and Municipal Services	N/A	13 22 81
WIRES	N/A	1300 194 737

7.4 Incident investigation

All environmental incidents will be investigated. A root cause analysis approach will be adopted to identify the origin of the problem in order to:

- Determine what happened.
- Determine why it happened.
- Identify and implement measures to reduce the likelihood that it will happen again.

The CEMP and environmental management plans will be reviewed by the Project Engineer after every Category One incident. The Project Engineer will ensure that any additional measures arising from the incident investigation are incorporated into the relevant plans.

Where QPRC provides recommendations to address the cause or impact of any incident reported to the QPRC, the contractor for Stage C Network East will meet the requirements of QPRC's recommendations, in the timeframe specified, unless otherwise agreed.

Incidents will be closed out as quickly as possible, taking all required action to resolve each environmental incident.

Any recommended actions to improve existing processes or systems will be managed through the Non-Conformance Register (to be developed by the contractor), as outlined in Section 8.3.

7.5 Emergency response

The objectives of the Work Health and Safety Management Plan (WHSMP) Appendix 2 will be communicated to all project team members and persons working on site.

Emergency controllers/fire wardens are to be assigned specific responsibilities and are to be trained, where necessary, in the evacuation procedures and the use of any specialised emergency response equipment (e.g. fire extinguishers, spill kits, etc.). Spill management will be undertaken in accordance with the Work Health and Safety Management Plan (WHSMP) Appendix 2 and the Soil and Water Management Plan (Appendix 1).

8.0 Environmental inspections, monitoring and auditing

8.1 Environmental inspections

8.1.1 Weekly inspections

The Project Engineer (or delegate) will undertake at least weekly inspections of the work sites to monitor and evaluate the effectiveness of environmental management measures. Such measures will include monitoring site tidiness, regular rubbish removal, dust control, tidiness of adjoining roads and ensuring appropriate storage facilities within the construction boundaries. If any environmental controls require maintenance, are ineffective, or require installation to address an actual or potential environmental issue, these observations will be recorded on the environmental inspection checklist (to be developed by the contractor). Any action will also be given a priority.

If an extreme weather event is forecast an inspection will be carried out before and after said event ensuring required controls are in place. If the required controls are found not to be in place measures will be taken immediately to rectify the situation.

If any environmental controls require maintenance, are ineffective, or require installation to address an actual or potential environmental issue, these observations will be recorded on the environmental inspection checklist (Guideline system documents – GLA-SF-2.2-05 and GLA-EF 3.2-01). Any action will also be given a priority.

8.1.2 Site Superintendent inspections

The Site Superintendent will undertake regular inspections of the Stage C Network East construction work site. The frequency of site inspections will be determined by the nature of activities being undertaken and their associated environmental risks.

A member of the project team will participate in all Site Superintendent inspections, and records will be maintained. Required actions will be discussed and prioritised at the completion of the inspection and timeframes for implementation of corrective actions agreed.

The contractor will act on all recommendations made by the Site Superintendent as soon as practicable. If the contractor chooses not to implement recommendations of the Site Superintendent, written justification of the alternate course of action will be provided to the Site Superintendent, Principal and GTPL within seven days of receiving the recommendation the Site Superintendent, Principal and GTPL must be satisfied with the alternate course of action.

8.2 Environmental monitoring

Monitoring will be undertaken to measure the effectiveness of environmental controls and implementation of this CEMP, and to address approval requirements. The monitoring requirements for required aspects are included in the relevant environmental management plans.

8.2.1 Noise and vibration monitoring

Any work generating high noise that has impulsive, intermittent, low frequency or tonal characteristics, including jack hammering, line drilling, pile driving, rock hammering, rock breaking, saw cutting, sheet piling, vibratory rolling but excluding blasting, shall only be undertaken:

- a) between the hours of 8.00 am and 6.00 pm Monday to Friday;

- b) between the hours of 8.00 am and 1.00 pm Saturday; and
- c) in continuous blocks of no more than three hours, with at least one hour respite between each block of work generating high noise impact, where the location of the work is likely to impact the same receivers;

For the purposes of this condition “continuous” includes any period during which there is less than a one hour respite between ceasing and recommencing any of the work the subject of this condition.

Due to the distance of vibration causing activities and sensitive receivers (all identified sensitive receivers are located at least 50 metres from vibratory activities), the level of vibration will be below the level of human perception. Nevertheless activities such as rock breaking, the use of vibratory rollers and unloading must take place a minimum of 50 metres away from any sensitive receivers.

In the event of a complaint being registered, noise and vibration monitoring shall be established to determine whether acceptable limits have been exceeded as described in Appendix 4 NVMP.

8.3 Non-conformity, corrective and preventative actions

A non-conformance is an action or omission that does not conform with the requirements of this CEMP and supporting environmental documentation, or any legal or other requirement as outlined in Appendix 10. Any member of the project team or the Site Superintendent can identify a non-conformance.

An opportunity for improvement may be identified through the review and monitoring processes that will be implemented during the construction of Stage C Network East. Review, monitoring or auditing may identify a variety of improvements that must or should be made to ensure continual improvement. For example, an internal audit of the incident register may identify an opportunity for improvement in areas such as documentation (CEMP, management plans, procedures, checklists etc.) or resourcing (number and experience of environmental or other personnel). Any member of the project team or the Site Superintendent can identify an opportunity for improvement.

8.3.1.1 Identifying non-conformance

Non-conformances may be identified in one of the following ways:

- Environmental incidents.
- Through monitoring and/or reporting.
- CEMP audits/review.
- Project team communication/feedback.

8.3.1.2 Reporting non-conformance

Non-conformances will be investigated and reported. The following details must be included:

- Details of the person reporting the non-conformance.
- Description of the non-conformance including time, date and location.
- Summary of the non-conformance including personnel involved, cause and environmental impact.
- Summary of actions taken to remediate the situation and mitigate further environmental impact.
- Further action required, a timeframe for completion and responsibility to correct or prevent future non-conformances.

8.3.1.3 Recording non-conformance

Following the investigation and reporting, a summary of the non-conformance must be recorded in a non-conformance register to be maintained by the contractor. Improvement opportunities will also be recorded in the non-conformance register, for example to capture any system improvements recommended as the result of an incident investigation.

8.3.1.4 Review of the non-conformance register

The register will be reviewed regularly to ensure actions are closed out in a timely manner or as required.

8.4 Auditing

8.4.1 Internal audits

Internal auditing will be undertaken generally on a six monthly basis throughout the construction of Stage C Network East. The purpose of auditing is to verify compliance with:

- This CEMP and environmental management plan.
- Approval requirements (CoAs, SoCs).
- Any relevant legal and other requirements (e.g. licenses, permits, regulations).

8.4.2 Independent external audits

External auditing will be undertaken by an independent environment auditor in accordance with ISO 19011:2003 – Guidelines for Quality and/or Environmental Management Systems Auditing.

8.5 Reporting

8.5.1 Monthly environment report

The Project Engineer will prepare a monthly environment report to track progress on environmental performance. The monthly report will include relevant details including, but not limited to:

- Environmental inspections.
- Environmental monitoring.
- Environmental incidents.
- Environmental non-conformances.
- Environmental audits.
- Planned and completed construction notifications to the community.
- Complaints and enquiries.
- Training.

This report will be provided to GTPL, the Principal and the Site Superintendent on a monthly basis. A template for monthly reporting is located in Appendix 12.

9.0 Documentation

9.1 Environmental records

The Project Engineer is responsible for maintaining all environmental management records. Types of records include:

- All monitoring, inspection and compliance reports/records.
- Reports on environmental incidents, environmental non-conformances, complaints and close out actions.
- Copy of environmental control plan register, site induction register, environmental training register, incident register and non-conformance register.
- Monthly environmental reporting.
- Induction and training records.
- Correspondence with government agencies and other stakeholders.
- Community engagement and stakeholder management information.

All environmental management documents are subject to ongoing review and continual improvement. This includes changes to legislative or licensing requirements.

Only the Project Manager/Project Engineer has the authority to change any of the environmental management documentation.

Appendix 1

Soil and Water Management Plan



Soil and Water Management Plan

Googong Township IWC Project: Stage C Network East

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Name	Signature	Date
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Contents

1.0	INTRODUCTION	60
1.1	Context	60
1.2	Background	60
1.3	Environmental Management System overview	60
2.0	PURPOSE AND OBJECTIVES	61
2.1	Purpose	61
2.2	Objectives	61
3.0	ENVIRONMENTAL REQUIREMENTS	62
3.1	Relevant legislation and guidelines	62
3.1.1	Relevant guidelines	62
3.1.2	Discharge water quality criteria	62
4.0	ENVIRONMENTAL ASPECTS AND IMPACTS	63
4.1	Soil and ground conditions	63
4.1.1	Landform	63
4.1.2	Geology and soils	63
4.1.3	Contamination	64
4.2	Potential impacts	64
4.2.1	Construction activities and potential impacts	64
4.3	Water quality and hydrology	65
4.3.1	Surface water drainage	65
4.3.2	Groundwater environment	66
4.4	Potential impacts	66
4.4.1	Construction	66
5.0	ENVIRONMENTAL CONTROL MEASURES	67
5.1	Soil and water mitigation and management measures	67
6.0	COMPLIANCE MANAGEMENT	72
6.1	Roles and responsibilities	72
6.2	Training	72
6.3	Inspections	72
6.4	Auditing	72
6.5	Reporting	72
7.0	REVIEW AND IMPROVEMENT	73
7.1	Non-conformity, corrective and preventative actions	73
7.2	Management plan update and amendment	73

Tables

Table 1 Water quality criteria.....	62
Table 2 Potential erosion hazards and excavation constraints	65
Table 3 Soil and water mitigation measures	67

Appendices

Appendix 1	Spill Response Procedure
Appendix 2	Dewatering Procedure

1.0 Introduction

1.1 Context

This Soil and Water Management Plan (SWMP) forms part of the Construction Environmental Management Plan (CEMP) for the Googong Township water cycle project Stage C– Network East.

Refer to Section 1 and Section 2 of the CEMP for additional detail on the scope of Stage C Network to which this SWMP applies.

This SWMP has been prepared to address the requirements of the Council Conditions of Approval (CoA), the Statement of Commitments (SoC), the safeguards listed in the Googong IWC Stage C Network East Statement of Environmental Factors (SEE), and all applicable legislation.

1.2 Background

The Stage C Network East Statement of Environmental Effects (SEE) assessed the impacts of construction and operation of the project on soil and water. The water quality and hydrology, soil and groundwater assessments were addressed in Sections 5.4 and 5.5 of the SEE.

1.3 Environmental Management System overview

The overall Environmental Management System for Stage C Network East and approach to managing environmental impacts during construction is described throughout the CEMP. This SWMP forms part of the environmental management framework for Stage C Network East, as described in Section 1.5.2 of the CEMP.

2.0 Purpose and objectives

2.1 Purpose

The purpose of this Plan is to describe how Googong Township Proprietary Limited (GTPL) and the contractor will manage soil and water issues and protect the environment during construction of Stage C Network East. This Plan encompasses:

- Erosion control.
- Sedimentation.
- Spoil management.
- Groundwater.
- Water quality.
- Contamination.

This Plan also assists in ensuring that the construction of Stage C Network East meets the environmental objectives and targets as defined in Section 3.5 of the CEMP.

2.2 Objectives

The key objective of the SWMP is to ensure that impacts to soil and water are minimised. To realise this objective, the following will be undertaken:

- Ensure appropriate controls and procedures are implemented during construction activities to avoid or minimise potential adverse impacts to soil and water (refer Section 5.1).
- Ensure appropriate measures are implemented to address the relevant CoA and SoC, (refer Sections 5.1).
- Ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in Section 3.1 of this Plan.

3.0 Environmental requirements

3.1 Relevant legislation and guidelines

Section 3.1 of the CEMP identifies the legal and other requirements applicable to the IWC Project and the construction of Stage C Network East. This section identifies the key legislation applicable to managing soil and water.

3.1.1 Relevant guidelines

The following guidelines and documents have been reviewed in the preparation of this Plan:

- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC, 2000).
- *Environmental Best Management Practice guideline for Concreting contractors* (DEC, 2002).
- *Managing Urban Stormwater: Soils and Construction 'The Blue Book'* (Landcom, 2004).
- *Guidelines for Controlled Activities on Waterfront Land* (NOW, 2012).
- *Policy and Guidelines for Fish Friendly Waterway Crossings* (Fishnote, 2003).
- *Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings NSW* (Fisheries, 2003).

3.1.2 Discharge water quality criteria

The following discharge water quality criteria will be applied for any dewatering into the surrounding environment. Refer to Appendix 2 for details on dewatering procedure. Discharge water quality criteria have been developed in accordance with the *Blue Book* (Landcom, 2004) and *Managing urban stormwater: soils and construction, Volume 2A: Installation of Services* (DECC, 2008).

Table 1 Water quality criteria

Parameter	Criteria
pH	6.5 – 8.5
Total suspended solids	<50 mg/L
Conductivity (salinity)	<1,500 μScm^{-1}
Oil and grease	No visible

4.0 Environmental aspects and impacts

The following sections summarise existing soil and water issues identified in the environmental assessment. Identified impacts are then reviewed.

4.1 Soil and ground conditions

4.1.1 Landform

The area that makes up the Googong Township comprises approximately 850 hectares of undulating terrain bordering a series of relatively steep gullies.

Land elevations vary from approximately 600 metres Australian Height Datum (AHD) along the Queanbeyan River to 816 metres at Swan Hill, which forms part of a low series of ridges that run northwest to southeast through the centre of the wider Googong project area.

The natural topography of the proposal area is predominantly steep hillslopes (>20%) with rocky outcrops as tors. The elevation across the site is approximately 677 metres AHD in the south up to 725 metres AHD in the north, with a six degree slope. The landform surrounding the proposal area generally has a steeper slope running perpendicular the proposal area. Surface runoff flows in a northerly direction along the site, in an existing stormwater management system built on the site.

As outlined in Section 3.3 of the SEE, the proposal area is located on land defined as 'Slopes over 18 degrees' which provides for the potential for erosion throughout the proposal area.

4.1.2 Geology and soils

The Soils Landscapes of the Canberra 1:100 000 Sheet Map (Jenkins, 2000) indicates the proposal area is within the Round Hill and Anembo Soil Landscape.

The majority of the proposal area (including the BWPS and northern sections of the main) is located within the Round Hill soil landscape group. Soil within this landscape group is known to have with variable soil depth ranging from 20-80cm deep. The soil profile is generally sandy loams topsoil, whilst subsoils, when they occur, tend to be clay. Clay accumulation in upper slope subsoils occurs behind tors (rock outcrops) and other subsurfaces. These soils are underlain by steep and often isolated hills on granitic material of the Queanbeyan valley, with abundant rock outcrops as tors. These areas are occupied by uncleared open-forest with occasional low woodland on exposed crests.

The proposal area south of the Ranger Station along Googong Road is located within the Anembo soil landscape group. Soils in these areas are similar to Round Hill landscape group, with coarse sandy loam topsoil and underlying medium clay. These soils are underlain by undulating rises and flats on granitic material of the Cullarin Upland and Canberra Lowlands. These areas have been extensively cleared of the original open to tall open-forests with woodland to low woodland in frost hollows.

The general characteristics of both the Round Hill and Anembo landscape groups include:

- Mass movement hazard related to steep slopes.
- Minor to moderate sheet erosion is wide spread, with gully erosion risk and localised wind erosion hazard (Round Hill). Anembo soil landscape group has occasional minor erosion hazard, with >50% of the landscape having no appreciable erosion.
- Shallow soil profile
- Abundant of granite rocks
- Steep rocky slopes
- Low fertility

- Acidic soil
- Low water holding capacity and prone to water logging

Field observations showed minimal variation from the soil mapping classifications. The natural materials in the proposal area consist of brown loamy/clayey sand topsoil, underlain with light brown clayey sand subsoil with weathered granite. Soil profiles were shallow, ranging between 0.25 metres and 0.30 metres prior to encountering large rocks.

Physical test results indicated that the majority of dispersion results were above 10%, classifying the material as dispersible (Landcom 2004, the Bluebook). Laboratory analysis of the Emerson Stability class found that majority of the soil tested are Class 5 and Class 3.1, therefore these soils exhibit an erosion potential risk. Soil salinity levels were found to be low at the sampling locations across the proposal site. Results of the cation analysis indicated that the soil is generally dominated by hydrogen and magnesium salts. These salts balance the cation exchange capacity, resulting in a high exchangeable hydrogen and magnesium percentage. High magnesium increases the risk for dispersion and soil structure collapse.

The site is also identified as having erodibility potential on the Landscape Map under the *Palerang Local Environmental Plan 2014*.

4.1.3 Contamination

Coffey Geosciences undertook an initial contamination investigation (Stage 1 investigation) in 2004 to identify Areas of Environmental Concern (AECs) for the Googong Township Water Cycle Project Environmental Assessment. No AECs were identified in proximity to the Googong IWC Stage C Network East project boundary.

A site survey to confirm the presence of any actual or potential contamination sites was carried out in July 2012. No additional areas of potential or actual contamination were identified within the proposal area.

4.2 Potential impacts

4.2.1 Construction activities and potential impacts

Construction activities that may affect soil include:

- Vegetation clearance, topsoil stripping and soil disturbance.
- Trenching and soil excavation.
- Soil contamination.

Excess spoil from excavation is estimated at 500 cubic metres of primarily virgin for the proposal.

Vegetation clearing, topsoil stripping and soil disturbance

Clearing of vegetation and topsoil stripping may result in the exposure of soil horizons that are susceptible to erosion. This can lead to erosion of exposed areas; deposition of eroded sediment in waterways increasing turbidity and smothering benthic habitat and organisms.

Trenching and soil excavation

The potential for soil erosion is most likely to occur during excavation works, particularly during any trench construction. Erosion can be from water (creating inter-rill erosion, rill and gully erosion and tunnel erosion) and wind. Potential impacts include the erosion of excavation spoil, fill stockpiles, and the disturbance of topsoil due to loss of vegetation cover.

Soil properties for each soil landscape would be affected differently in relation to erosion potential. Table 2 outlines the erosion potential of each respective soil landscape as well as any excavation restraint expected and would be considered further when developing management and mitigation measures.

Table 2 Potential erosion hazards and excavation constraints

Soil landscape	Erosion potential	Excavation constraints
Round Hill	<ul style="list-style-type: none"> Non-concentrated flows – moderate to low erosion potential. Concentrated flows – moderate to high erosion potential. Soils are also subject to moderate to high risk from wind erosion. 	Excavation constraints are likely on steep slopes and crests associated with shallow (less 15 cm) soils over bedrock. Areas with stony soils and/or tors may also be present. The dispersion and shrink–swell properties of subsoils may limit foundation design.
Anembo	<ul style="list-style-type: none"> Non-concentrated flows – moderate erosion potential. Concentrated flows – high to very high erosion potential. 	Limited problems are likely on crests and upper slopes associated with shallow (less than 60 cm) soils. Possible soil moisture issues may be encountered on lower slopes and flat ground. Stony ground and the presence of tors may also present constraints.

The erosion potential and excavation constraints of soil would be considered during construction planning. As noted above, the proposal is situated on the Round Hill or Anembo soil landscapes, which have moderate and very high erosion potential.

Soil contamination

As previously noted, no AECs were identified in proximity to the proposed project boundary, however there is always the potential for trenching and grading activities to disturb unidentified contaminated land and adversely impact existing soil characteristics if not managed appropriately. In addition, there is the potential during construction to contaminate soils through fuel or chemical spills. Risks include contamination of soil profiles, adverse impacts on human health and consequential effects on the groundwater quality.

4.3 Water quality and hydrology

4.3.1 Surface water drainage

Drainage in the proposal area consists of a number of small ephemeral and semi-permanent creeks, farm dams and depressions. The main catchments in the proposal area are:

- Queanbeyan River: All of the proposal area drains to the Queanbeyan River below the Googong Dam. The Queanbeyan River has undergone considerable changes since construction of the Googong Dam, and the base flow has been regulated to about 0.1 cubic metres per second (down from one cubic metre per second prior to damming).
- Googong Creek: This is an unofficial name for the unnamed Creek that runs through Googong Township from the west at Old Cooma Road across the side, under Googong Road and continues to Queanbeyan River. The majority of the proposal area is within the Googong Creek catchment.
- Montgomery Creek: This creek flows through the Googong Township from the south to the east and joins the Queanbeyan River just below Googong Dam. A small part of the proposal area, where the potable water main crosses Googong Dam Road is within the Montgomery Creek catchment.

4.3.2 Groundwater environment

According to SMEC (2015a), groundwater is hosted in a regionally extensive fractured-rock aquifer. Minor alluvial aquifers are located along the alignments of locally significant waterways, but these are expected to have minimal storage and not to be of significance to the assessment of the potential groundwater impacts of the IWC Project. The depth to bedrock across much of the site is expected to be between about one to two metres, with fresh bedrock encountered at shallower depths at higher elevations, and marked changes of slope. Shallow groundwater is expected to migrate along the interface between the soil horizons and relatively fresh bedrock, and to discharge to surface water streams across the site.

4.4 Potential impacts

4.4.1 Construction

The proposal will not cross any major watercourses. Despite this there is still potential for the following to occur during construction:

- Construction activities would require the disturbance and excavation of soils. During rain events this may cause erosion and sedimentation of drainage channels which may impact on water quality downstream.
- There is potential for accidental spills from plant or activities (e.g. hydraulic fluid or cement) during construction, which may enter the natural drainage lines causing pollution of the local waterways. Groundwater may also become contaminated in the event of a spill.
- There is potential for water used during construction activities (such as wash down bays) to run-off the construction site and enters the natural drainage lines causing pollution of the local waterways.
- The compound site would generate waste water that would need to be disposed of offsite, with the potential to spill off site and enter the local drainage lines causing pollution of the waterways.

Excavation also has the potential to result in a slight increase in the localised groundwater recharge, if significant rainfall is experienced when there are a large number of trenches and/or excavations open across the site. However, increases in recharge potential are expected to be minor because:

- Trenches are generally expected to be less than five metres deep across the site.
- The depth of groundwater is expected to be around 10 to 15 metres.
- Low to very low hydraulic gradients and conductivities are expected over much of the site.

5.0 Environmental control measures

5.1 Soil and water mitigation and management measures

A range of environmental requirements and control measures are identified in the various environmental documents, including the CoA, SoC and the SEE. Specific measures and requirements to address impacts on soil and water are outlined in Table 3. Responsibilities have been confirmed by the contractor (Guideline ACT).

Table 3 Soil and water mitigation measures

ID	Measure	When to implement	Reference	Responsibility
Training				
SW1	All personnel will be required to attend the project induction training and will receive ongoing training via toolbox talks, regarding their responsibilities related to soil conservation issues, erosion and sediment control systems and the need to prevent land degradation and water pollution.	Construction		Project Engineer
Erosion and sedimentation				
SW2	Measures to ensure limited tracking of dirt off site will be implemented at access points. Where required the controls may include exit rumble grids at all points of egress onto public (sealed) roads, sweeping of sealed roads to remove deposited material where applicable, and/or stabilisation of site roads/tracks with aggregate where appropriate.	Construction	SoC C20	Project Engineer
SW3	During construction, Erosion and sedimentation controls will be inspected prior to and after each rain period and during periods of prolonged rainfall. Any defects will be rectified immediately. Records will be on the weekly environmental inspection checklist.	Construction	SoC C21	Project Engineer

ID	Measure	When to implement	Reference	Responsibility
SW4	<p>Site-specific Erosion and Sediment Control Plans (ESCPs) will be prepared progressively to include the management strategies and controls for all Project activities with the potential to impact on sediment loss and erosion. They will contain detailed erosion and sedimentation (ERSED) control information and will include drainage systems, location of sediment fences and other ERSED control structures, and sediment basin locations. ESCPs will be prepared in accordance with <i>Managing Urban Stormwater: Soils and Construction</i> (Landcom, 2004) and will include (but not limited to) the following measures:</p> <ul style="list-style-type: none"> ▪ Implement pollution control measures at the site to prevent the egress of material off site. ▪ Undertake regular inspections of controls to ensure they are maintained in a proper and efficient condition prior to any forecast rain events. ▪ Maintain a program of regular audits of the construction site and assessment of the activities on the site to assess existing pollution controls and implement any recommended and necessary additional measures required to minimise the potential for further water pollution events. <p>ESCPs will be submitted to the Superintendent for approval. Record of checks on weekly environmental control checklist</p>	Prior to construction, construction	CoA 15	Project Engineer
SW5	<p>Maintain surface and soil stability during cut and fill excavation and trenching activities by implementing standard sediment and erosion control techniques such as berms and sedimentation fencing.</p> <p>Erosion within the trench would be mitigated by using trench plugs (i.e. trench/sack breakers) at appropriate intervals.</p> <p>These measures are in accordance with Section 8 of the <i>Soil and Water Impact Assessment</i> (SESL, 2015) and <i>Managing Urban Stormwater: Soils and Construction</i> (Landcom, 2004 – also referred to as ‘The Blue Book’).</p>	Construction	SoC C18, SoC C19	Project Engineer
Sediment basins				
SW6	<p>Sediment basins will be designed and constructed in accordance with <i>Managing Urban Stormwater: Soils and Construction</i> (Landcom, 2004) and located as specified in relevant ESCPs.</p>	Prior to construction, construction		Project Engineer
SW7	<p>All runoff from disturbed areas within the work site will be directed to sediment basins (or other appropriate sediment control structures).</p> <p>Sediment basins will only be discharged to receiving waters when confirmed as complying through field tests/laboratory analysis tests with discharge guidelines. Refer to Dewatering Procedure (Appendix 2).</p> <p>Laboratory analysis will be used to validate the field testing methods and results (where required).</p>	Construction		Project Engineer

ID	Measure	When to implement	Reference	Responsibility
Spoil management				
SW8	Erosion and sediment measures to secure the stockpile areas (e.g. diversions, sediment fences) will be installed prior to the commencement of spoil stockpiling activities. Record on Establishment of erosion controls checklist	Construction	SoC C22	Project Engineer
SW9	Stockpiles will be checked for stability weekly and after heavy rainfall. Erosion controls inspected at least weekly and maintained as required.	Construction	SoC C23	Project Engineer
SW10	Clean spoil will be reused or recycled on the Stage C Network East site where possible, in preference to transporting off site, in accordance with the waste minimisation hierarchy principles of avoid, reduce, reuse, recycle or dispose.	Construction	Best practice	Project Engineer
SW11	Topsoil will be conserved, where reasonable and feasible, for use in site rehabilitation/revegetation. The top 50-100 millimetres of topsoil will be stripped, Weed infested topsoil will be reused as fill where possible, and will not be reused for landscaping without implementing weed eradication measures.	Construction	CoA 19, SoC C24	Project Engineer
SW12	No waste to be burnt onsite. Waste shall be classified and disposed of in accordance with waste management plan (refer Appendix 6 of the CEMP)	Construction	SoC C56	Project Engineer
Contaminated material				
SW13	If potentially contaminated land, spoil or fill is encountered works in the vicinity will be stopped or modified and will not recommence until the material has been analysed, the hazard has been assessed and appropriate action has been taken (including delineating areas of concern as required until earthworks can resume safely).	Construction	SoC C26	Project Engineer
Working in or near waterways				
SW14	Stabilise the drainage line banks, where required, by establishing rocks, sandbags/ matting to prevent scouring, ensuring that they are placed to conform as far as possible with existing contours.	Construction		Project Engineer
Working near groundwater monitoring bores				

ID	Measure	When to implement	Reference	Responsibility
Groundwater dewatering				
SW15	Dewatering activities will be undertaken in accordance with the Dewatering Procedure in Appendix 2	Construction		Project Engineer Site Foreman
Water use				
SW16	Where available and of appropriate chemical and biological quality for its proposed purpose, water collected in sediment basins will be used in preference to potable water for construction, including dust control.	Construction		Project Engineer
SW17	Construction water will be tankered to the site or sourced from the water reticulation system within the development. All relevant licenses and permits for access to water will be sought in accordance with the relevant legislation.	Construction		Project Engineer
SW18	The carting of any water to the site must be undertaken in accordance with the <i>NSW Guidelines for Water Carters</i> (NSW Health, 2012).	Construction		Project Engineer
Chemical, fuel, wastewater management and spills				
SW19	Storage areas for fuels, oils and chemicals used during construction will be covered and contained within an impervious bund to retain any spills of more than 110% of the volume of the largest container in the bunded area. Any spillage will be immediately contained and absorbed with a suitable absorbent material. The contaminated material will be disposed of according to manufacturers and OEH requirements.	Construction	SoC C26	Site Foreman
SW20	Potentially hazardous and contaminating activities including major equipment maintenance/servicing, wash down of construction plant and concrete washout to be conducted in bunded areas away from watercourses and other environmentally sensitive areas.	Construction	SoC C26 Best practice	Site Foreman
SW21	Spills will be managed in accordance with the Spill Response Procedure (Appendix 1)	Construction	SoC C26	Site Foreman
SW22	All plant maintenance or refuelling of mobile equipment and vehicles is to occur in locations greater than 150 metres from waterways and other environmentally sensitive areas.	Construction	SoC C26 Best practice	Site Foreman
SW23	Spill kits will be provided at each fuel/chemical storage area and where handling and use of dangerous goods occur. Staff will be provided with appropriate training in spill response. Records through toolbox talks, SDS inductions for hazardous goods.	Construction	SoC C26	Site Foreman
SW24	Where possible, all refuelling would occur at designated fuel distribution points. These distribution points would be underlain by compacted earth to prevent the significant loss of fuel into the ground in the event of a spill. They would also be bunded to contain any large spills that may occur as a result of machinery or tank failure.	Construction	SoC C26	Site Foreman
SW25	In the event of soil contamination, works in the vicinity will be stopped or modified and will not	Construction	SoC C26	Project Engineer

ID	Measure	When to implement	Reference	Responsibility
	recommence until the material has been analysed, the hazard has been assessed and appropriate action has been taken (including delineating areas of concern as required until earthworks can resume safely).			
Rehabilitation				
SW26	There will be progressive revegetation, stabilisation and restoration works of earthworks areas in accordance with <i>Managing Urban Stormwater: Soils and Construction</i> (Landcom, 2004).	Construction	SoC C25	Project Engineer
SW27	The site will be re-profiled to achieve soil stability and congruity with the surrounding landscape. This would be done in consideration of the landscape and open space strategy for the Googong township development. Re-seeding would be undertaken, and geotextile materials used as required.	Construction	SoC C25	Project Engineer
SW28	Trenches will be backfilled and compacted in layers.	Construction	SoC C25	Site Foreman
SW29	Rehabilitation grass mix or other measures as appropriate are to be applied to all disturbed surfaces as soon as practicable at the completion of each component of work. The mix is to be applied at the recommended rate of dispersal. Do not use species that are listed under the <i>Noxious Weeds Act 1993</i> .	Construction	CoA 19	Project Engineer
Commissioning				
SW30	Hydrostatic test water will be dechlorinated and tested for sedimentation and pH prior to onsite reuse.	Construction (commissioning)		Project Engineer
Operational considerations				
SW31	Infrastructure will be constructed in accordance with the approved materials and provisions of water supply code (WSA) 03-2002 to minimise leakage from water cycle infrastructure.	Pre-construction, construction		Project Engineer

6.0 Compliance management

6.1 Roles and responsibilities

The project team's roles and responsibilities are outlined in Section 4.1 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Section 5.0 of this Plan.

6.2 Training

All personnel working on site will undergo site induction training relating to soil and water issues. The induction training will address elements related to soil and water management including:

- Spill response and management.
- Implementation of erosion and sediment control measures.
- Refuelling protocols.
- Appropriate transport, storage and handling and disposal of chemicals.

Further details regarding induction and training are outlined in Section 5 of the CEMP.

6.3 Inspections

Inspections of sensitive areas and activities with the potential to impact soil and water will occur for the duration of construction. Daily visual inspections of the construction site will be undertaken by the Project Engineer or Foreman to identify any potential risks to soil and water quality arising from construction works, and any mitigation measures that need to be implemented to address these.

The Project Engineer or Foreman will undertake weekly environmental inspections, including an inspection of soil and water management measures. This will include auditing of construction activities to ensure all mitigation measures are properly installed and working effectively. These inspections will be documented on the weekly checklist.

Requirements and responsibilities in relation to inspections are documented in Section 8.1 of the CEMP.

6.4 Auditing

Internal audits will be undertaken to assess the effectiveness of environmental controls, compliance with this Plan, CoA and other relevant approvals, licenses and guidelines.

Audit requirements are detailed in Section 8.4 of the CEMP.

6.5 Reporting

Results and outcomes of inspections (namely non-compliances), monitoring and auditing will be reported internally on a monthly basis as part of the monthly environmental report. Reporting requirements and responsibilities are documented in Section 8.5 of the CEMP.

7.0 Review and improvement

7.1 Non-conformity, corrective and preventative actions

A non-conformance is an action or omission that does not conform to the requirements of this Plan or any legal and other requirements. Any member of the project team can identify a non-conformance or opportunity for improvement. Section 8.3 of the CEMP identifies the process for identifying, reporting, recoding and reviewing non-conformances. This will ensure continual improvement.

7.2 Management plan update and amendment

The processes described in Section 7 and Section 8 of the CEMP (relating to incidents, inspections, monitoring and auditing). This will occur as needed.

Appendix 1

Spill Response Procedure

A1 Notification requirements

Recent changes to the POEO Act require occupiers of premises, the employer or any person undertaking an activity which causes a pollution event such as a spill to immediately notify each relevant authority (the appropriate regulatory authority (ARA) is usually the EPA and the local authority is usually a local council). If the event is threatening human health or property an emergency should be raised by immediate notification of the NSW Fire Brigade or the NSW Rural Fire Service and NSW Ambulance by calling 000. There may also be a requirement to notify WorkCover Authority if personnel are injured.

Incident reporting and emergency contact details are provided in Section 7.3 of the CEMP respectively.

A1 Spill containment kit

At any site where there is a significant risk/consequence of a spill, an appropriate spill kit(s) is to be available (different kinds are available for different pollutants). The Project Engineer can provide advice on purchasing the correct spill kit.

A1 Procedure

Spill procedure steps

Step 1 – Assessment of the spill

- Stop all work in the affected area.
- Ensure the safety of all workers, visitors and the public in the vicinity of the spill/leak.
- Immediately notify the Project Engineer and/or Foreman
- Cordon off the area around the spill/leak to stop foot/vehicle passage through the affected area.
- Conduct a short assessment of the affected area and notify the Project Engineer of the results of this assessment. The assessment should include consideration of the:
 - » Quantity of the substance spilt.
 - » Type of substance (i.e. corrosive, poisonous, flammable etc.).
 - » Location and potential impact on the environment, and the health and safety of personnel.
 - » Whether the spill is manageable and the best method of clean up (only after referring to the relevant safety data sheet (SDS)).
 - » Photographs of the location and extent of the spill.
- Refer to the container label or SDS for detailed information on the substance spilled and to determine the appropriate personnel protective equipment (PPE) and clean up/storage and disposal requirements.
- Where the spill is not manageable and presents an immediate danger to people, property or the environment, the following needs to be determined:
 - » Whether sufficient spill control equipment and materials, and personal protective equipment exist on site to deal with the spillage.
 - » Whether attempts to deal with the spill on site would pose any risk to employee safety.
 - » Whether the site's waste management contractor should be contacted for clean up, removal and safe disposal of the spilt substance.

Step 2 – Notification of Emergency Services

Where it is determined that the spill cannot be managed by the resources on site, efforts shall be made (only where safe to do so) to protect stormwater drains and sensitive areas. Notify the NSW Fire Brigade or NSW Rural Fire Service (phone 000).

Step 3 – Spill management

- Personal protective equipment (PPE):
 - » Prior to any clean-up, appropriate personal protective PPE is to be worn as per the SDS. No clean up should occur without the correct PPE.
 - » Control the source.
 - » Stop the source of the spill/leak if it is safe to do so.
- Protect drains, channels or other pathways for environmental reasons:
 - » If there is a possibility that the spill/leak will contaminate a greater area or move off site, protect drains, channels or other pathways for environmental release.
 - » If required, geo-fabric, absorbent materials, booms and sandbags should be placed around drains and grates.
- Contain the spread of the spill:
 - » Stop the spill/leak from spreading by using absorbent materials from spill kit (i.e. booms, pads, pillows, granules etc.) sand bagging, spoil or impermeable silt sausages, any handy physical barrier.
 - » Place booms around outside edges of spilled/leaked substance. Ensure booms are overlapped to prevent leakage.
 - » Ensure there are no gaps between the boom and the affected surface.

Step 4 – Spill clean up

- Deploy booms first to contain spill. Deploy booms first to contain or divert spill from waterway.
- If the booms alone cannot absorb the spill/leak, then use absorbent granules to soak up spilled liquid. Granules are quick and absorbent, good for small spills.
- Lay down pads or pillows. Pillows are best for thickly spread liquids. Pads are best for thinly spread liquids.
- Reduce the size of the spill/leak by gently pushing the booms towards the centre of the spill.

Step 5 – Disposal of material used in clean up

- Booms, pads, pillows, gloves and absorbent granules to be placed in yellow waste bag found within spill kit. These are then to be disposed of to the contaminated waste bin.
- Spilled liquid waste to be placed into a labelled sealed container

Consult with the Project Engineer to determine the appropriate testing and classification of the waste material – implement the Waste Classification procedure where appropriate.

Step 6 – Notification and review (refer also Section 7 of the CEMP)

- After cleaning up the spill/leak, notify the Construction Manager and/or Project Engineer as soon as possible to:
 - » Record the incident and the mitigation measures employed on the incident register.
 - » Ensure that any clean up materials are replaced.
 - » Implement non-conformance and corrective action and record on the non-conformance register.

Appendix 2

Dewatering Procedure

A2 Procedure

The dewatering of water capture points (including excavations, sediment basins and general low points on the alignment) is required to allow for continued work in construction areas.

1. Identifying dewatering points

This procedure relates to all water capture points and includes locations such as sediment basins, below ground excavations where groundwater or stormwater has been captured, or above ground water capture points (e.g. depressions on the alignment).

Water captured at the surface will be tested to determine if it meets onsite water use or environmental discharge requirements. If the water is found to be contaminated then it will be tankered offsite to an appropriate waste facility or approval to discharge will be sought from the EPA.

In the event that the construction works intercept groundwater and the excavation requires dewatering, the water will be tested to determine if it meets onsite water use requirements. If the water is found to be contaminated then it will be tankered offsite to an appropriate waste facility. Groundwater from dewatering will not be discharged into Montgomery Creek.

2. Assessing contamination

Potential contamination could be from numerous sources. The most likely sources will be Total Suspended Solids (TSS), oil and grease and pH.

3. Treating contaminated water

The treatment of contaminated water would be done in accordance with the relevant legislation and guidelines. In summary, pH can be raised or lowered using lime or diluted hydrochloric acid, TSS can be treated using gypsum, and oil and grease can be cleaned up by spill booms.

The timing of water treatment will depend on if, and what treatment is required. Where TSS treatment is required, transfer to a treatment basin shall occur first as solids will be stirred up during transport/pumping.

Where only pH neutralisation is required, treatment can be done at any point.

4. Water treatment

pH

If the pH of sediment pond water is outside the range of 6.5-8.5, it will need to be treated to bring it within the acceptable range.

- If the water pH is above 8.5, hydrochloric acid is used to lower the pH:
 - A 500-millilitre dose of acid lowers 7000 litres of water by a pH of approximately 1.5.
 - To treat water with acid, safety requirements must be followed as outlined in relevant Safety Data Sheets (SDS) and Environmental Work Method Statements (EWMS).
- If the water pH is below 6.5, a base such as agricultural lime, with a pH of about 8.2, will be used to raise the pH.

Suspended Solids (TSS)

If the TSS of water is greater than 50 mg/L a flocculent should be used as follows:

- Treating water with flocculent (e.g. gypsum, liquid alum or flocculent blocks) will make the sediments drop to the bottom. Water retention tanks also have internal baffles installed to further assist with reducing the sediment load. Dosing rates of 30 kilograms per 100m³ will be used and application methods will be applied as per methods recommended in the Blue Book (Landcom, 2004). Note that an even application over the captured water is essential for effective flocculation. Apply evenly in water and wait for the sediment to settle out.
- Only environmentally safe flocculants are to be used based on the Project Engineers' review of SDS information.

Hydrocarbons

- If an oily sheen is found on the surface of the water absorbent material from a spill kit will be used to absorb and skim off the sheen prior to discharge.

5. Dewatering

Where dewatering is required, the quantity and quality of water is to be considered. For large quantities or poor quality, as assessed by the Project Engineer, the water will be preferentially removed by water trucks and used for onsite dust suppression or pumped/carted to sediment basins or points for discharge. The water must be tested by a Project Engineer or approved representative on the day of discharge.

Where the amount of water is considered to be minor and the environmental impact is considered negligible, based on sample results, following approval from the Project Engineer or approved representative, water is to be released through appropriate erosion and sedimentation controls (sediment trap or fence, mulch or grass filters).

Pumps must only be operated by dedicated dewatering crews who have been toolboxed on this procedure. During dewatering pumps must be manned at all times to ensure that sediment is not picked up during discharge and water is discharged through erosion and sedimentation controls.

6. Document results

Any water test results should be stored and included in the Monthly environmental report.

7. Water quality criteria for discharge

Parameter	Criteria
pH	6.5 – 8.5
Total suspended solids	50 mg/L
Conductivity (salinity)	<1,500 μScm^{-1}
Oil and grease	No visible

Appendix 2

Work Health and Safety Management Plan (WHSMP)

Refer to Project Management Plan Section 2 WHS Management Plan

Appendix 3

Traffic Management Protocol



Temporary Traffic Management Protocol

Googong Township IWC Project: Stage C Network East

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Contents

1.0	INTRODUCTION	89
1.1	Context	89
1.2	Background	89
1.3	Environmental Management System overview.....	89
2.0	PURPOSE AND OBJECTIVES	90
2.1	Purpose	90
2.2	Objectives	90
3.0	ENVIRONMENTAL REQUIREMENTS.....	91
3.1	Relevant legislation and guidelines	91
3.1.1	Relevant guidelines	91
4.0	ENVIRONMENTAL ASPECTS AND IMPACTS.....	92
4.1	Existing Environment	92
4.2	Potential Impacts	92
4.2.1	Construction.....	92
4.2.2	Intersections	95
5.0	ENVIRONMENTAL CONTROL MEASURES.....	98
5.1	Traffic and access mitigation and management measures.....	98
6.0	COMPLIANCE MANAGEMENT	101
6.1	Roles and responsibilities.....	101
6.2	Training	101
6.3	Inspections	101
6.4	Auditing.....	101
6.5	Reporting	101
7.0	REVIEW AND IMPROVEMENT.....	102
7.1	Non-conformity, corrective and preventative actions.....	102
7.2	Management plan update and amendment	102

Tables

Table 1 Peak construction vehicle movements estimated per day	93
Table 2 Previous traffic flows in the vicinity of the IWC Project	95
Table 3 Traffic mitigation measures	98

Appendices

Appendix 1	Traffic Control Plans (TCP)
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1.0 Introduction

1.1 Context

This Traffic Management Protocol (TMP or Protocol) forms part of the Construction Environmental Management Plan (CEMP) for the Googong Township IWC Project Stage C Network East.

Refer to Section 1 and Section 2 of the CEMP for additional detail on the scope of Stage C Network East to which this TMP applies.

This TMP has been prepared to address the requirements of the Council Conditions of Approval (CoA), the Statement of Commitments (SoC), the safeguards listed in the Googong IWC Stage C Network East Statement of Environmental Factors (SEE) and all applicable legislation.

1.2 Background

The Stage C Network East Statement of Environmental Effects (SEE) assessed the impacts of construction and operation of the Stage C Network East on traffic.

It was determined that the proposal would result in additional vehicle movements (both light and heavy vehicles) along local roads throughout the construction period. This impact is expected to be minor given the overall construction activities occurring within the Googong Township.

The compound site is an existing cleared hardstand area that has previously been for construction activities. It has two entry points located about 135 metres and 190 metres north of the intersection with the Googong Dam Road. The site is about 2,300 metres square. This is located on Treatment Plant Road off Googong Road (as shown on Figure 1-1).

No vegetation would be cleared for the proposed compound site and the site would be fenced for security purposes prior to the start of construction.

1.3 Environmental Management System overview

The overall Environmental Management System for Stage C Network East and approach to managing environmental impacts during construction is described throughout the SEE.

This TMP forms part of the environmental management framework for Stage C Network East, as described in Section 1.5.2 of the CEMP.

2.0 Purpose and objectives

2.1 Purpose

The purpose of this Protocol is to describe how Googong Township Proprietary Limited (GTPL) and the contractor will manage traffic and access during construction of Stage C Network East.

This TMP is an overarching plan that establishes the procedures for work area or task specific traffic control plans (TCPs) to control and maintain safe and effective road traffic.

This Protocol also assists in ensuring that the construction of Stage C Network East meets the environmental objectives and targets as defined in the CEMP.

2.2 Objectives

The key objective of the TMP is to ensure that impacts to traffic and access are minimised. To realise this objective, the following will be undertaken:

- Ensure appropriate controls and procedures are implemented during construction activities to avoid or minimise potential adverse impacts to traffic and access (refer Section 5.1).
- Ensure appropriate measures are implemented to address the relevant CoA and SoC, (refer Section 5).
- Ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in Section 3.1 of this Protocol.

3.0 Environmental requirements

3.1 Relevant legislation and guidelines

Section 3.1 of the CEMP identifies the legal and other requirements applicable to the IWC Project and the construction of Stage C Network East. This section identifies the key legislation applicable to managing traffic and access.

3.1.1 Relevant guidelines

This Protocol has been prepared in accordance with the following:

- *AS1742.3 Traffic Control for Works on Roads (AS1742.3: 2009)*

4.0 Environmental aspects and impacts

The following sections summarise existing traffic environment and the local road network identified in the environmental assessment. Identified impacts are then reviewed. The key reference documents are located Section 5.1 of the SEE.

4.1 Existing Environment

The proposal area is a predominantly rural and bushland landscape with three primary roads (refer to Figure 4-1):

- Googong Road – is a continuance of Googong Road once the road meets the Googong Foreshore area. Googong Dam Road is a two lane road with a single lane in each direction. It is a bitumen road that does not include kerb and gutters and has dirt shoulders with table drains.
- The BWPS access road – runs north off Googong Road and provides access to the BWPS. It is a single lane unsealed road with dirt shoulders and table drains.
- The Water Treatment Facility access road - runs north off Googong Road and provides access to the Water Treatment Facility. This road also continues north to connect with the BWPS access road and currently provides an alternative access to the BWPS. It is a single lane unsealed road with dirt shoulders with table drains.

The compound site would be located off the Water Treatment Facility access road in an existing cleared area that has previously been used as a construction compound.

4.2 Potential Impacts

4.2.1 Construction

Throughout construction there will be increases in vehicle movements to, from and throughout the proposal area. These will change dependent on the stage and progress of construction activities. Construction vehicle activities would include:

- At initial set up stage – large construction plant and equipment would be delivered to the construction site using flatbed trucks, articulated trucks and low loaders up to 25 metres in length. Where feasible construction plant will
- Throughout construction – peak heavy vehicle traffic movements are likely to occur during excavation and construction of mains and during construction activities at the BWPS. Delivery of equipment and materials would also be required as well as construction staff accessing the site.
- Completion of construction – large construction plant would be removed from the site.

Table 1 outlines the estimated number of vehicle movements per day throughout construction. These vehicle movements would not all be undertaken at the same time as construction would be progressive. In addition, the vehicles would be accessing different areas of the proposal area, reducing the cumulative traffic impacts of construction.

Table 1 Peak construction vehicle movements estimated per day

Construction activity	Peak trips per day	Construction activity
Set up/mobilisation	10	Delivery of plant and amenities to site
Earthworks	20	Excavation, trenching and laying of mains
New pumps at BWPS	5	Delivery and installation of pumps at BWPS
Mechanical/electrical works	5	Various electrical and mechanical works at the BWPS and the metering station
Removal of waste	10	Site clean up
Construction staff	15	Construction staff accessing the site

The construction methodology, as outlined in Section 1.4 of the SEE, provides for the closure of the BWPS access road throughout construction of the new potable water main. Access to the BWPS would be maintained via the Water Treatment Facility access road. Closing the BWPS access road would allow construction activities to proceed unhindered without having to provide for traffic flow through the site, which would extend the construction timeframe and provide a safety risk to workers. The closure of this road would require a minor detour about 100 metres east to the Water Treatment Facility access road. It would also result in additional traffic along the Water Treatment Facility access road. However given the low number of vehicles using both these roads combined, this is expected to be a low impact and would be temporary.

Key aspects of the construction of Stage C Network East that could result in adverse impacts to traffic and access include:

- Increase in vehicular use of the existing road network.
- Access for construction vehicles off Old Cooma Road.

Any oversized and over mass loads will be transported in accordance with RMS guidelines. A permit will be sought from RMS' Special Permits Unit in Glen Innes (phone 1300 656 371) or directly from NHVR, as determined by the contractor.

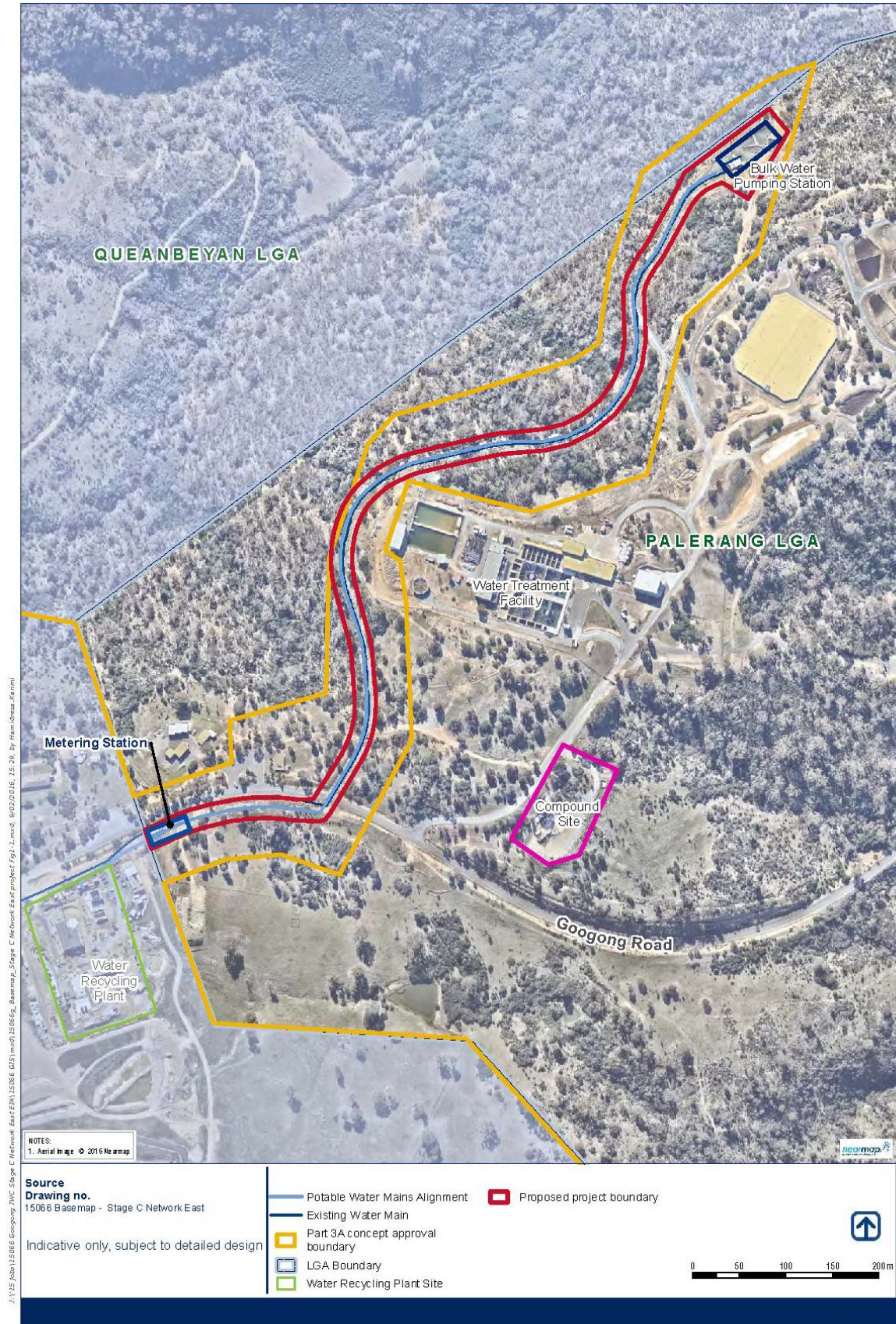


FIGURE 4-1 GOOGONG IWC EAST SCOPE OF WORK

Table 2 Previous traffic flows in the vicinity of the IWC Project

Road	Date	Average weekday traffic (total vehicles)	Peak two-way traffic flow (vehicles/hr)	Percentage of heavy vehicles traffic
Old Cooma Road (south of Googong Road)	May 2005	2,120	244	5.7%
Old Cooma Road (north of Googong Road)	December 2006	2,537	265	5.7%
Googong Road	August 2004	260	29	9.5%

Since the environmental assessment, the traffic in the immediate area has changed. There have been increased vehicle movements associated with the construction of the Part 4 subdivision works and WRP. There will be some vehicle movements associated with the Part 4 subdivision works and/or Stage AB WRP works taking place at the same time as construction of Stage C Network East.

4.2.2 Intersections

The intersection at Old Cooma Road and Googong Road is the only significant intersection in the vicinity and is being upgraded as part of the IWC Project. The traffic volumes at this intersection are low in relation to the capacity of the intersection. Both the morning peak hour and afternoon peak hour flows are classified as level of service (LoS) A and B, respectively.

4.2.2.1 Access routes

There are currently two access points into the BWPS as shown in Figure 1-4. Both access roads are located north off Googong Road. The access roads include:

- The access road to the Googong Water Treatment Plant. This primarily provides access from Googong Dam Road and the Googong Water Treatment Plant. However, there is secondary access from the Water Treatment Plant up to the BWPS.
- The access road to the BWPS.

This road provides access between Googong Dam Road and the existing BWPS. The proposal would include locating the main within this road and would therefore require the closure of the road for construction activities.

It is expected that construction traffic movements generated throughout construction would have a minor impact on the operation of the local road network. This is primarily due to the low number of vehicle movements required, three separate access points and the staging of construction activities.

The temporary access turn lanes established on Old Cooma Road to access the permanent reservoir site would be sufficient to provide for trucks slowing down and turning at 100km/h speed limit. This would minimise impacts on through traffic flow along Old Cooma Road. This access point would remain until a permanent access point is established as part of the adjacent neighbourhood of the Googong township development currently planned in 2018.

No impacts to residential property access or pedestrian access are expected as a result of the proposal.

Construction haul routes and heavy vehicle routes will be developed by the contractor and identified in relevant TCPs. Where possible, routes will be developed to minimise impacts on noise and amenity of nearby residents.

4.2.2.2 Potential impacts on access to properties

Given the unmanned nature of the BWPS, there are no long term expected impacts on local roads or access to properties as a result of operation of the proposal. Access to properties will be maintained during construction of Stage C Network East and it is not anticipated that the property access to private residence would be adversely affected given the remote location of Stage C works from existing properties. However if temporary alterations to access are required, arrangements will be negotiated with relevant landowners (refer Table 3 (T10, T11)). The community will be notified of any traffic alterations prior to commencement of said changes.

4.2.2.3 Construction traffic noise

Construction traffic noise impacts from vehicle movements to and from the construction site are covered in the Noise and Vibration Management Plan (refer Appendix 4 of CEMP).

5.0 Environmental control measures

5.1 Traffic and access mitigation and management measures

A range of environmental requirements and control measures are identified in the various environmental documents, including the CoA, SoC. Specific measures and requirements to address impacts on traffic and access are outlined in Table 3 Responsibilities have been confirmed by the contractor (Guideline ACT).

Table 3 Traffic mitigation measures

ID	Measure	When to implement	Reference	Responsibility
T1	All personnel will be required to attend the project induction and will receive ongoing training via toolbox talks regarding their responsibilities related to traffic management and access.	Prior to Construction	SoC C5	Foreman and Project engineer
T2	A road dilapidation survey will be carried out prior to the commencement of construction. The survey will include as a minimum Googong Road to be used for construction access. Dilapidation surveys will be carried out in consultation with QPRC and RMS (if relevant). Dilapidation surveys will document the current condition of roads through photographic and written reports, or similar.	Prior to construction		Project Engineer
T3	Prior to construction, individual Traffic control plans will be developed for each specific section of works. These plans will show the specifics of the proposed works and individual traffic controls for the site and will be implemented after approval from relevant authorities. Traffic control plans will further describe the implementation of the measures prescribed by this TMP on a site and activity specific basis.	Prior to construction, construction	CoA 16 and 21, SoC C2	Project Engineer
T4	The contractor will obtain a road occupancy licence from the relevant road authority (local council/RMS) as required by Section 138 of the <i>Roads Act 1993</i> .	Construction		Project engineer
T5	Construction haul routes and heavy vehicle routes will be developed by the contractor and identified in relevant Traffic control plans. Where possible, routes will be developed to minimise impacts on noise and amenity of nearby residents. Any oversized and over mass loads will be transported in accordance with RMS guidelines. A permit will be sought from RMS' Special Permits Unit in Glen Innes (phone 1300 656 371) or directly from NHVR, as determined by the contractor.	Construction	SoC C9	Project engineer
T6	Deliveries will be scheduled to occur within approved work hours (7.00am to 6.00pm Monday to Friday and 8.00am to 1.00pm on Saturday) to minimise impact on amenity and peak residential access time.	Construction	SoC C6	Project engineer
T7	Access to the BWPS will be maintained as much as is practical. Should works necessitate obstruction; the contractor will notify councils, property owners and the local community of any potential loss of or disruption to access to properties, roads and/or pathways. Details of notification will be provided to GTPL for inclusion	Construction	SoC C3	Project engineer

ID	Measure	When to implement	Reference	Responsibility
	in the stakeholder database.			
T8	Safe and convenient passage for vehicles, pedestrians and stock to and from side roads and property accesses to the roadway will be maintained or alternative arrangements made following consultation with the affected community. If required, appropriate temporary measures – to either provide alternative access or to reinstate access at the end of each workday – will be negotiated with relevant parties. The details for maintaining access will be provided on individual Traffic controls plans.	Construction	SoC C7	Project engineer
T9	If required, posted speed limits will be reduced on the road network to comply with work safety requirements and enhance road safety through temporary construction zones that impact on traffic flows. QCC and/or Palerang Council will be consulted prior to installation of any speed limit changes on local roads. Consultation with NSW Police Service will be undertaken where required to determine the strategies to enforce these speed restrictions through work sites.	Construction		Project engineer
T10	Traffic control will be in accordance with AS1742.3 and the Specification 201: Control of Traffic Design (QPRC, 2011).	Construction	CoA 21	Project engineer
T11	Directional signposting, driver information signposting and variable message signs to provide advance warning of changes to traffic conditions will be erected to minimise disruption to traffic and removed when no longer required.	Construction	CoA 21, SoC C37	Project engineer
T12	The Stage C Network East site will be fenced, where appropriate, as necessary to provide security and delineate the area of construction at the reservoir site to prevent unauthorised pedestrian access and to enhance pedestrian safety.	Construction		Project engineer
T13	Any damage to local roads (e.g. Old Cooma Road) that poses a potential safety impact and is attributable to the construction of the Stage C Network East will be repaired as soon as possible.	Construction		Project engineer
T14	GTPL will ensure there is effective communications between any other contractors delivering sections of the IWC Project and relevant authorities to allow the identification of potential cumulative impacts from other developments. In the event of cumulative impacts from construction traffic generated by other developments, GTPL will communicate with the relevant developers or authority to identify any possible ways of minimising impacts. This may include coordination of high traffic events, or scheduling to minimise overall impacts.	Construction		GTPL Assistant Project Director Project Engineer
T15	The contractor should identify opportunities to maximise vehicle use efficiency to reduce the number of vehicle trips, e.g. through car pooling. Fuel efficient and low emission vehicles will be utilised where practicable.	Construction		Project engineer
T16	Parking areas will be allocated during Site Establishment ensuring construction staff and delivery vehicles do not park in public parking areas where supply is limited as well as providing ample space for delivery of construction plant and machinery.	Construction	SoC C8	Project engineer

ID	Measure	When to implement	Reference	Responsibility
T17	Location of onsite parking will be strategically located so that construction plant, machinery and vehicle parking is clear from any public or sensitive viewing areas	Construction	SoC C38	Project engineer
T18	At the completion of construction of Stage C of the IWC Project, the condition of roads utilised for the construction works will be reviewed in consultation with Icon Water, QPRC and RMS (if relevant). Road restoration measures and nominated timeframes to repair roads will be developed in consultation with the relevant road authority. The timeframe for repair work will be developed with consideration of potential future impacts. GTPL will ultimately bear the cost of any repair work attributable to construction of Stage C.	Post Construction	CoA 22, SoC C4	GTPL Assistant Project Engineer

6.0 Compliance management

6.1 Roles and responsibilities

The project team's roles and responsibilities are outlined in Section 4.1 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Section 5 of this Protocol.

6.2 Training

All personnel working on site will undergo site induction training relating to traffic and access issues. The induction training will address elements related to traffic and access management including:

- Construction haul routes.
- Approved work hours.
- Maintenance of property access.
- Appropriate driver behaviour.

Further details regarding induction and training are outlined in Section 5 of the CEMP.

6.3 Inspections

The Project Engineer or Foreman will undertake weekly inspections including an evaluation of traffic and access management and mitigation measures. This will include auditing of construction activities to ensure property access and pedestrian/cyclist access is maintained. These inspections will be documented on the weekly checklist.

Requirements and responsibilities in relation to inspections are documented in Section 8.1 of the CEMP.

6.4 Auditing

Internal Audits will be undertaken to assess the effectiveness of environmental controls, compliance with this Plan, CoA and other relevant approvals, licenses and guidelines.

Audit requirements are detailed in Section 8.4 of the CEMP.

6.5 Reporting

Results and outcomes of inspections (namely non-compliances), monitoring and auditing will be reported internally on a monthly basis as part of the monthly environmental report. Reporting requirements and responsibilities are documented in Section 8.5 of the CEMP.

7.0 Review and improvement

7.1 Non-conformity, corrective and preventative actions

A non-conformance is an action or omission that does not conform to the requirements of this TMP or any legal and other requirements. Any member of the project team can identify a non-conformance or opportunity for improvement. Section 8.3 of the CEMP identifies the process for identifying, reporting, recoding and reviewing non-conformances. This will ensure continual improvement.

7.2 Management plan update and amendment

The processes described in Section 7 and Section 8 of the CEMP (relating to incidents, inspections, monitoring and auditing) may result in the need to update this TMP. This will occur as needed.

Appendix 1

Traffic control plans

Refer to PMP Appendix G for Traffic Control Plans

Appendix 4

Noise and Vibration Management Plan



Noise and Vibration Management Plan

Googong Township IWC Project: Stage C Network East

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Contents

1.0	INTRODUCTION	109
1.1	Context	109
1.2	Background	109
1.3	Environmental Management System overview.....	109
2.0	PURPOSE AND OBJECTIVES	110
2.1	Purpose	110
2.2	Objectives	110
3.0	ENVIRONMENTAL REQUIREMENTS	111
3.1	Relevant legislation and guidelines	111
3.1.1	Relevant guidelines	111
4.0	ENVIRONMENTAL ASPECTS AND IMPACTS.....	112
4.1	Environmental aspects.....	112
4.1.1	Existing noise environment.....	112
4.1.2	Construction noise	115
4.1.3	Vibration criteria	117
4.1.4	Blasting criteria	118
4.2	Potential Impacts	119
4.2.1	Construction noise	119
5.0	ENVIRONMENTAL CONTROL MEASURES.....	120
5.1	Noise and vibration mitigation and management measures.....	120
5.1.2	Noise and vibration consultation.....	123
6.0	COMPLIANCE MANAGEMENT	124
6.1	Roles and responsibilities.....	124
6.2	Training	124
6.3	Inspections	124
6.4	Monitoring.....	124
6.4.1	Noise monitoring.....	124
6.4.2	Vibration monitoring.....	124
6.5	Auditing.....	125
6.6	Reporting	125
7.0	REVIEW AND IMPROVEMENT.....	126
7.1	Non-conformity, corrective and preventative actions.....	126
7.2	Management plan update and amendment	126

Tables

Table 1 Unattended continuous noise monitoring	114
Table 2 Background noise levels at identified noise receivers.....	114
Table 3 Interim construction noise guidelines (residences)	115
Table 4 Interim construction noise guidelines for sensitive land uses	116
Table 5 Interim Construction Noise Guidelines for commercial/industrial properties.....	116
Table 6 Project specific construction assessment criteria	117
Table 7 Acceptable vibration dose value for intermittent vibration ($m/s^{1.75}$).....	117
Table 8 Transient vibration guide values for minimal risk of cosmetic damage (BS 7385-2)	118
Table 9 Construction noise prediction results	119
Table 10 Noise and vibration mitigation measures	120

Appendices

Appendix 1	Out of hours works procedure
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1.0 Introduction

1.1 Context

This Noise and Vibration Management Plan (NVMP or Plan) forms part of the Construction Environmental Management Plan (CEMP) for the Googong Township IWC Project Stage C Network East.

Refer to Section 1 and Section 2 of the CEMP for additional detail on the scope of Stage C Network to which this NVMP applies.

This NVMP has been prepared to address the requirements of the Council Conditions of Approval (CoA), the Statement of Commitments (SoC), the safeguards listed in the Googong IWC Stage C Network East Statement of Environmental Factors (SEE) and all applicable legislation.

1.2 Background

The Stage C Network East Statement of Environmental Effects (SEE) assessed the impacts of construction and operation of the Stage C Network East on noise sensitive receivers.

The proposal is located within the Googong Dam foreshores area which is predominantly a natural bushland setting with scattered rural properties. A number of open space picnic areas and walking tracks are also located throughout the area as part of the Googong Dam Foreshores Area.

In addition the neighbouring Googong Township is a predominantly rural landscape characterised by large rural landholding that is gradually developing into a suburban area with the ongoing development of the township. The surrounding area is predominantly characterised by low-intensity grazing, bushland and rural residential land uses; no intensive agricultural activities are known to occur.

1.3 Environmental Management System overview

The overall Environmental Management System for Stage C Network East and approach to managing environmental impacts during construction is described throughout the CEMP.

This NVMP is part of the environmental management framework for Stage C Network East, as described in Section 1.5 of the CEMP.

2.0 Purpose and objectives

2.1 Purpose

The purpose of this Plan is to describe how GTPL and the contractor will manage noise and vibration impacts during construction of Stage C Network East.

This Plan also assists in ensuring that the construction of Stage C Network East meets the environmental objectives and targets as defined in Section 3.5 of the CEMP.

2.2 Objectives

The key objective of the NVMP is to ensure that construction noise and vibration impacts are minimised and that compliance with construction noise and vibration requirements is achieved. To realise these objectives, the following will be undertaken:

- Ensure appropriate controls and procedures are implemented during construction activities to avoid or minimise potential adverse noise and vibration impacts (refer Section 5.1).
- Ensure appropriate measures are implemented to address the relevant CoA and SoC, (refer Section 5).
- Ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in Section 3.1 of this Plan.

3.0 Environmental requirements

3.1 Relevant legislation and guidelines

Section 3.1 of the CEMP identifies the legal and other requirements applicable to the IWC Project and the construction of Stage C Network East. This section identifies the key legislation applicable to managing noise and vibration.

This Protocol also assists in ensuring that the construction of Stage C Network East meets the environmental objectives and targets as defined in the CEMP.

3.1.1 Relevant guidelines

A Noise and Vibration Assessment has been prepared by SLR Consulting (SLR, 2015) for the proposed works. The full report is included as Appendix G of the SEE, this NVMP has been developed based upon the assessment as well as the following documents:

- *Interim Construction Noise Guideline (ICNG)* (DECC, 2009).
- *Assessing vibration: A technical guideline* (DECC, 2006).
- Australian Standard AS 2436 *Guide to noise control on construction, maintenance and demolition sites* (AS 2436, 2010).
- British Standard BS 7385 *Evaluation and measurement for vibration in buildings Part 2* (BS 7385, 1993).
- *NSW Road Noise Policy* (DECCW, 2011)

4.0 Environmental aspects and impacts

The following sections summarise the existing noise environment and identify the sensitive noise and vibration receivers. Identified impacts are then reviewed.

4.1 Environmental aspects

4.1.1 Existing noise environment

The proposal is located within the Googong Dam foreshores area which is predominantly a natural bushland setting with scattered rural properties. A number of open space picnic areas and walking tracks are also located throughout the area as part of the Googong Dam Foreshores Area.

Figure 4-1 indicates a total of 21 receivers that have been identified close to the project area.

There are 15 receivers marked with a prefix “R” and two prefixed with a “C”, which represent Residential and Commercial type receivers respectively. The receiver marked “C1” is the existing Googong Water Treatment Plant while the receiver marked “C2” is a ranger station.

The nearest sensitive receivers were identified in earlier assessments (including for Stage C Network West) conducted by SLR, and were used in this assessment for consistency. It should be noted:

- R12 was an existing dwelling prior to the Googong Township development. Being surrounded by new residential land, this property now forms part of the Googong Township.
- R14 West and R14 East represent the residential receivers within the Googong Township along the western and eastern boundaries respectively. In addition, the Rockley Oval and the Anglican School within the Googong Township have also been identified, which are classified as recreation area and educational establishment respectively.

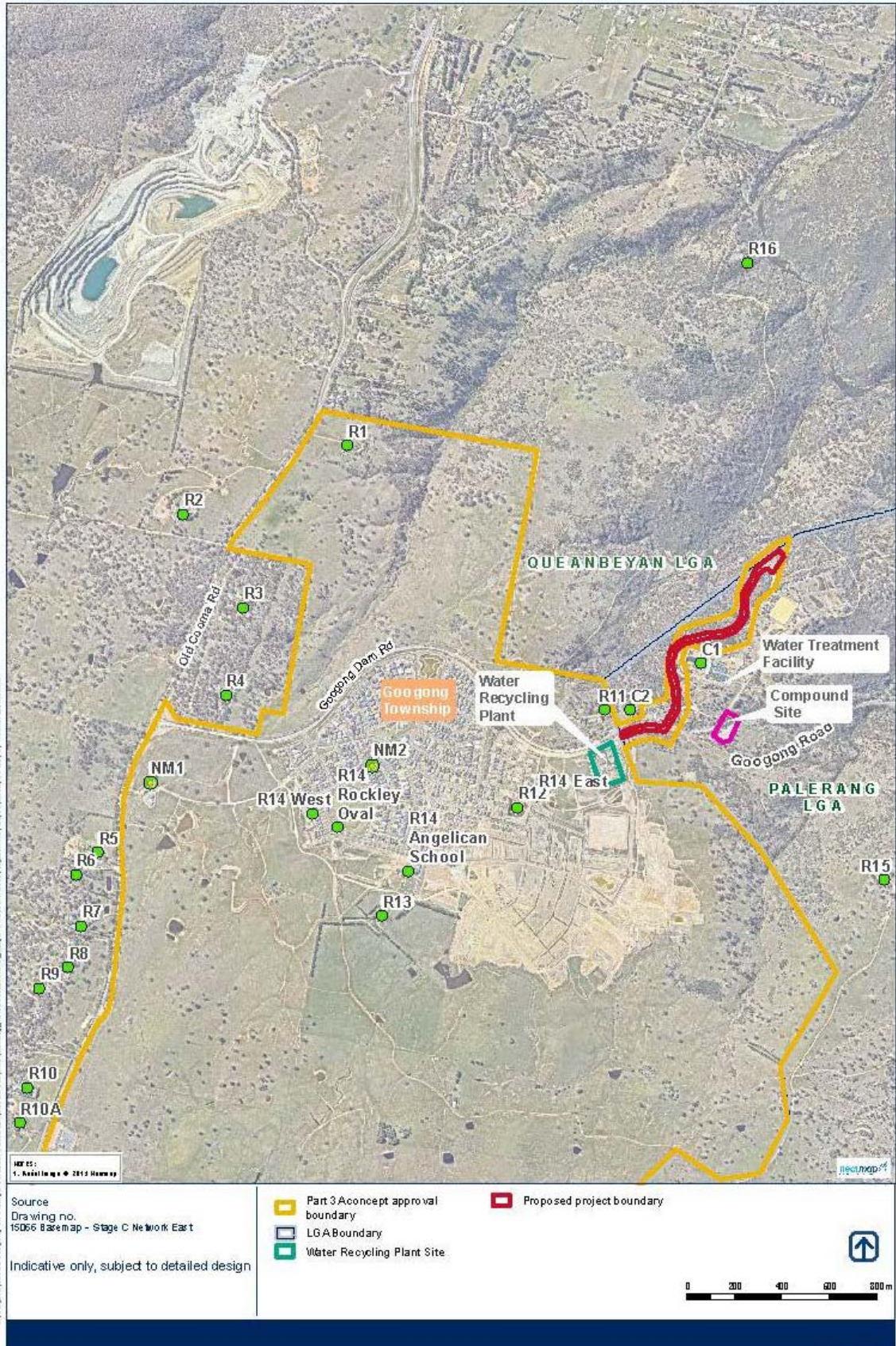


FIGURE 4-1 SENSITIVE RECEIVERS IN VICINITY OF PROPOSED WORKS

Environmental noise loggers were deployed at NM1 and NM2 from 10 June 2015 to 24 June 2015. The loggers were programmed to record statistical noise levels contiguously over 15 minute periods including the L_{A1} , L_{A10} , L_{A90} , and L_{Aeq} indices.

The logger microphones were located in a free-field position and away from extraneous noise sources. A summary of the noise monitoring results is provided in Table 1. Complete daily noise logger results graphs for each location are presented in Appendix G of the noise assessment.

Table 1 Unattended continuous noise monitoring

Location	Description	Noise Level Descriptor dB(A)			
		L_1	L_{10}	L_{90}	L_{eq}
NM1	Day (7am to 6pm)	62	58	38	67
	Evening (6pm to 10pm)	60	54	30	51
	Night (10pm to 7am)	55	41	25	48
NM2	Day (7am to 6pm)	63	52	35	53
	Evening (6pm to 10pm)	49	40	29	44
	Night (10pm to 7am)	38	32	25	40

The Rating Background Levels (RBLs) are the median values of the L_{A90} levels recorded over the duration of the noise monitoring for each assessment time period. Where the RBL is found to be less than 30dBA, then it is set to 30dBA. Therefore, the RBL for assessment purposes are shown in Table 2. Table 2 also notes the estimated contribution the existing industrial noise adds to this background noise level.

Table 2 Background noise levels at identified noise receivers

Location	Description	Background LA90 Noise Level, dB(A)	Estimated existing industrial LAeq contribution, dB(A)
		RBL	
R1 to R9	Day (7am to 6pm)	38	<20
	Evening (6pm to 10pm)	30	<20
	Night (10pm to 7am)	30	<20
R11 to R14	Day (7am to 6pm)	35	<20
	Evening (6pm to 10pm)	30	<20
	Night (10pm to 7am)	30	<20
R15	Day (7am to 6pm)	30	<20
	Evening (6pm to 10pm)	30	<20
	Night (10pm to 7am)	30	<20

4.1.2

4.1.3 Construction noise

The NSW 'Interim Construction Noise Guideline' (ICNG), (DECC, 2009) contains procedures for management of noise in relation to construction activities for residential and other sensitive receivers by defining Noise Management Levels (NMLs) and how they are applied. A summary of the derivation of NMLs from the ICNG is contained in Table 4 for residential receivers, Table 4 for sensitive receivers and Table 5 commercial/industrial premises.

Table 3 ICNG Noise Management Levels (residences)

Time of day	Management (LAeq (15min))	How to apply
<p>Recommended standard hours:</p> <p>Monday to Friday: 7 am to 6 pm</p> <p>Saturday 8 am to 1 pm</p> <p>No work on Sundays or public holidays</p>	<p>Noise affected RBL + 10dB(A)</p>	<p>The noise affected level represents the point above which there may be some community reaction to noise.</p> <p>Where the predicted or measured LAeq (15 min) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level.</p> <p>The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.</p>
	<p>Highly noise affected 75dB(A)</p>	<p>The highly noise affected level represents the point above which there may be strong community reaction to noise.</p> <p>Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.</p>
<p>Outside recommended standard hours</p>	<p>Noise affected RBL + 5dB(A)</p>	<p>A strong justification would typically be required for works outside the recommended standard hours.</p> <p>The proponent should apply all feasible and reasonable work practices to meet the noise affected level.</p> <p>Where all feasible and reasonable practices have been applied and noise is more than 5dB(A) above the noise affected level, the proponent should negotiate with the community.</p>

Note: Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 m above ground level. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 m of the residence. Noise levels may be higher at upper floors of the noise affected residence.

Table 4 ICNG Noise Management Levels (sensitive land uses)

Land use	Management Level, LAeq(15minute) (applies when properties are being used)
Classrooms at schools and other educational institutions	Internal noise level 45dB(A)
Hospital wards and operating theatres	Internal noise level 45dB(A)
Places of worship	Internal noise level 45dB(A)
Active recreation areas ¹	External noise level 65dB(A)
Passive recreation areas ²	External noise level 60dB(A)
Community centres	Depends on the intended use of the centre. Refer to the recommended 'maximum' internal levels in AS2107 for specific uses.

1. Characterised by sporting activities and activities which generate their own noise or focus for participants, making them less sensitive to external noise intrusion.

2. Characterised by contemplative activities that generate little noise and where benefits are compromised by external noise intrusion, for example reading and meditation.

Table 5 ICNG Noise Management Levels for commercial/industrial properties

Land use	Management Level, LAeq(15minute)
Industrial premises	External noise level 75dB(A)
Office, retail outlets	External noise level 70dB(A)

All construction works are proposed to be undertaken within standard operation hours (between 7am to 6pm Monday to Friday and 8am to 1pm on Saturday). Therefore the LA_{eq(15minute)} construction NML for all residential receiver locations will be a minimum of 40dBA for the 'noise affected category, and 75dBA for industrial properties and 70dBA for commercial properties.

The Anglican School Googong is open and operating and is located on Gorman Drive on the southern side of the existing Googong Township. A public Googong township school is currently under construction and may be in operation during the construction timeframe. The noise criteria that would apply if in operation would be 45dBA (internal).

Table 6 Project specific Noise Management Levels

Noise receivers	Description	LAeq 'Noise Affected' noise management level (NML) (RBL plus 10dB)
R1 to R9	Daytime (7am to 6pm)	48
	Evening (6pm to 10pm)	40
	Night time (10pm to 7am)	40
R11 to R14	Daytime (7am to 6pm)	45
	Evening (6pm to 10pm)	40
	Night time (10pm to 7am)	40
R15	Daytime (7am to 6pm)	40
	Evening (6pm to 10pm)	40
	Night time (10pm to 7am)	40
School classrooms	Daytime (during hours of operation)	45
C1	When in use	75
C2	When in use	70

4.1.4 Vibration criteria

The effects of vibration in buildings can be divided into two main categories – those in which the occupants or users of the building are inconvenienced or possibly disturbed and those in which the integrity of the building or structure may be impacted.

Human comfort vibration

The EPA's Assessing Vibration: A Technical Guide (DEC, 2006) provides guideline values for continuous, transient and intermittent events that are based on a Vibration Dose Value (VDV) rather than continuous vibration level. The VDV is dependent upon the level and duration of the short-term vibration event, as well as the number of events occurring during the daytime or night-time period.

The VDV's recommended for vibration of an intermittent nature (i.e. construction works where more than three distinct vibration events occur) are described in Table 7.

Table 7 Acceptable vibration dose value for intermittent vibration (m/s^{1.75})

Location	Daytime (7am to 10pm)		Night time (10pm to 7am)	
	Preferred value	Maximum value	Preferred value	Maximum value
Critical areas ¹	0.10	0.20	0.10	0.20
Residences	0.20	0.40	0.13	0.26
Office, schools, educational institutions and places of worship	0.40	0.80	0.40	0.80
Workshops	0.80	1.60	0.80	1.60

¹ Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring. These criteria are only indicative.

Structural damage vibration

Structural damage vibration limits are based on Australian Standard AS 2187:Prt 2-2006, Explosives – Storage and Use – Part 2: Use of Explosives, and British Standards BS 7385 Part 2-1993 Evaluation and Measurement for Vibration in Buildings Part 2. These standards provide frequency-dependent vibration limits related to cosmetic damage, noting that cosmetic damage is very minor in nature, is readily repairable and does not affect the structural integrity of the building. The recommended vibration limits from BS7385 for transient vibration for minimal risk of cosmetic damage to residential and industrial buildings are described in **Table 8**.

Table 8 Transient vibration guide values for minimal risk of cosmetic damage (BS 7385-2)

Type of Building	Peak component particle velocity in frequency range of predominant pulse	
	4 Hz to 15 Hz	15 Hz and above
Reinforced or framed structures Industrial and heavy commercial buildings	50mm/s at 4Hz and above	
Unreinforced or light framed structures Residential or light commercial type buildings.	15 mm/s at 4Hz increasing to 20mm/s at 15Hz	20mm/s at 15Hz increasing to 50mm/s at 40Hz and above

4.1.5 Blasting criteria

The EPA advocates the use of Australia and New Zealand Environment Conservation Council (ANZECC) 1990 guidelines for assessing potential blast emissions impacts at residential and other noise and vibration sensitive receivers. The ANZECC guidelines are based on human comfort levels and are much more stringent than those based on the potential for damage to structures. The ANZECC guidelines are summarised as follows:

- The recommended maximum level for air blast is 115dB Linear.
- The level of 115dB Linear may exceed on up to 5% of the total number of blasts over a period of 12 months. This level should not exceed 120dB Linear at any time.
- The recommended maximum for ground vibration is 5mm/s, Peak Vector Sum (PVS) vibration velocity.
- The PVS level of 5mm/s may be exceeded on up to 5% of the total number of blasts over a period of 12 months. This level should not exceed 10mm/s at any time.
- Blasting should generally only be permitted during the hours of 9am to 5pm Monday to Saturday. Blasting should not take place on Sundays and public holidays.
- Blasting should generally take place no more than once per day.

Ground borne (regenerated) noise

Ground-borne (or regenerated) construction noise can be present on construction projects where vibration from activities such as rock breaking, road heading, rotary cutting and rock drilling/sawing can be transmitted through the ground and into the habitable areas of nearby buildings. Ground-borne noise occurs when this vibration in the ground and/or building elements is regenerated as audible noise within areas of occupancy inside the buildings.

The EPA ICNG defines internal ground-borne noise goals for residential receivers of 40dB(A) $L_{Aeq}(15 \text{ minute})$ during the evening 6pm to 10pm and 35dB(A) during the night-time (10pm to 7am). The goals are only applicable where ground-borne noise levels are higher than airborne noise levels.

4.2 Potential Impacts

4.2.1 Construction noise

A number of scenarios were modelled to account for different stages of construction associated with both the rising main construction and the BWPS upgrade. These scenarios used typical construction equipment noise levels and construction scenarios to model expected noise levels at each of the sensitive receivers (worst case scenarios were used). As all works would be undertaken during standard operating hours, only this criteria has been considered in accordance with the INP.

Single point noise prediction results derived from the noise model for the proposed works are presented in Table 9. Cells in the table are shaded where the noise levels are predicted to exceed the respective “Noise Affected” NML.

Table 9 Construction noise prediction results

Receiver	Day time ‘noise affected’ NML	Predicted construction noise level dB(A) $L_{Aeq}(15 \text{ minutes})$	
		Works near to town	Works midway along the corridor
R1	48	<30	<30
R2		<30	<30
R3		<30	<30
R4		<30	<30
R5		<30	<30
R6		<30	<30
R7		<30	<30
R8		<30	<30
R9		<30	<30
R10		<30	<30
R11	45	55	40
R12		38	30
R13		<30	<30
R14W		32	<30
R14E		<30	<30
R14 – Rockley Oval	60	<30	<30
R14 – Anglican Church	55 external	<30	<30
R15	40	<30	<30
C1	75	34	45
C2	70	60	43

Based on the results, no receivers were identified as being “Highly Noise Affected” (i.e. construction noise greater than 75 dBA). The construction works have the potential of causing an exceedance of the “Noise Affected” NML at one receiver (R11).

It should be noted that the predicted noise levels are based on typically “worst-case” scenarios assuming multiple plant is operating concurrently, and in this case, the works will progressively move away from the receiver. Therefore the receiver may experience the construction noise for a relatively short period of time.

The proposal is not expected to cause any vibration impacts at any nearby sensitive receivers.

5.0 Environmental control measures

5.1 Noise and vibration mitigation and management measures

A range of environmental requirements and control measures are identified in the various environmental documents, including the CoA, SoC. Specific measures and requirements to address noise and vibration impacts are outlined in Table 10. Responsibilities have been confirmed by the contractor (Guideline ACT).

Table 10 Noise and vibration mitigation measures

ID	Measure	When to implement	Reference	Responsibility
NV1	All project personnel will be provided training on the requirements of this Plan through site inductions, toolbox talks or specific training.	Prior to construction, construction		Project Engineer
NV2	<ul style="list-style-type: none"> ▪ The principal is responsible for consultation with nearby receivers and new incoming residents that may be affected by noise or vibration generating activities during standard construction hours prior to that activity commencing (including noisy construction activities, and other activities that may result in noise and/or vibration complaints). ▪ The notification should take the form of a written letter and must be issued prior to the works occurring. The notification letter provided to the community must include a description of the works, advise if exceedances of ICNG criteria are likely, when the works will occur and for how long. It will also include the community information line (1800 838 438), project email address (iwc@googong.net) for lodging noise complaints. ▪ Icon Water will issue a copy of the notification letter for GTPL to review prior to it being distributed. The contractor will also provide details of all notification to GTPL as well as two points of contact for the works in case complaints are made to the community hotline number. 	Prior to construction, construction	SoC C29	Icon Water
NV3	<p>Noise complaints will be received, recorded and investigated -</p> <p>The Project Engineer will forward any complaints to GTPL who will respond within the timeframes specified in the Complaints Management Procedure.</p> <ul style="list-style-type: none"> ▪ the initial response to complaints should be made within 48 hours of the complaint and need to be recorded in the monthly environmental report ▪ It must also include the community information line (1800 838 438), project email address (iwc@googong.net) for lodging complaints. 	Construction		Project Engineer GTPL Assistant Project Director
NV4	All impacted residents would be notified of the proposed works, including the nature and duration of construction activities, predicted noise levels and contact details should they have any issues with the construction activities.	Construction	SoC C29	Icon Water
NV5	<p>Construction works, other than blasting and high noise activities, will only be undertaken during the following hours (unless otherwise approved by the GTPL Assistant Project Director:</p> <ul style="list-style-type: none"> ▪ 7:00 am to 6:00 pm, Mondays to Fridays. ▪ 8:00 am to 1:00 pm on Saturdays. 	Construction	CoA 6, SoC C28	Project Engineer

ID	Measure	When to implement	Reference	Responsibility
	<ul style="list-style-type: none"> At no time on Sundays or public holidays. 			
NV6	<p>Any work generating high noise that has impulsive, intermittent, low frequency or tonal characteristics, including jack hammering, line drilling, pile driving, rock hammering, rock breaking, saw cutting, sheet piling, vibratory rolling but excluding blasting, will be undertaken (unless otherwise approved by the GTPL Assistant Project Director):</p> <ul style="list-style-type: none"> Between the hours of 8.00 am and 6.00 pm Monday to Friday. Between the hours of 8.00 am and 1.00 pm Saturday. In continuous blocks of no more than three hours, with at least one hour respite between each block of work generating high noise impact, where the location of the work is likely to impact the same receivers. 	Construction	SoC C28	Project Engineer
NV7	<ul style="list-style-type: none"> In accordance with the Out of Hours Works Procedure (Appendix 1) the hours of construction activities specified in NV5 may only be varied with prior written approval from the EPA/QPRC and the GTPL Assistant Project Director Requests for out of hours approval will be considered for construction activities which cannot be undertaken during standard construction hours for technical or other justifiable reasons and will be considered on a case by case or activity-specific basis. Any request to alter the hours of construction will: Be accompanied by details of the nature, need and justification for activities conducted during the varied construction hours. Include any other information necessary to reasonably determine that activities undertaken during the varied construction hours will not adversely impact sensitive receivers. Require that affected residential receivers are informed of the timing and duration of any construction activities approved under this condition at least 48 hours before that work commences. 	Construction		Project Engineer
NV8	<p>Blasting associated with the construction of Stage C Network will only occur during the following hours (unless otherwise approved by the GTPL Assistant Project Director):</p> <ul style="list-style-type: none"> 9.00 am to 5.00 pm, Mondays to Fridays, inclusive. 9.00 am to 1.00 pm on Saturdays. At no time on Sundays or public holidays. 	Construction		Project Engineer
NV9	<p>The contractor will prepare a Blast Management Plan for any blasting activities. The Blast Management Plan will:</p> <ul style="list-style-type: none"> Undertake a vibration assessment in accordance with <i>Assessing Vibration: A Technical Guideline</i> (DECC, 2006) to determine if any additional mitigation measures are required. Stipulate permitted blasting hours Identify the maximum instantaneous charge (MIC) possible to ensure that vibration levels do not exceed the criteria in Table 7 and Table 8. Include procedures for notification. The notification at a minimum should take the form of a written letter and must be issued to council, emergency services and potentially affected landowners <u>two weeks</u> prior to 	Construction		Project Engineer

ID	Measure	When to implement	Reference	Responsibility
	<p>the works occurring. The notification letter must include the time, location and frequency of the blasting. It must also include the community information line (1800 838 438), project email address (iwc@googong.net) for lodging complaints.</p> <ul style="list-style-type: none"> The contractor will issue a copy of the notification letter for GTPL to review prior to it being distributed. The contractor will provide details of all notification to GTPL as well as two points of contact for the works in case complaints are made to the community hotline number. 			
NV10	Noise monitoring at sensitive receivers will be carried out in the event of a noise related complaint. Should monitoring indicate significant exceedances of the construction noise impacts identified in Section 4.2 the contractor will consult with GTPL, and implement additional and feasible mitigation measures as necessary.	Construction		Project Engineer GTPL Assistant Project Director
NV11	Vibration monitoring may be carried out in response to complaints, exceedances, or for the purpose of refining construction methods or techniques to minimise vibrations. Impacts will be avoided by changing work methods / equipment, or by providing some form of building protection where possible.	Construction		Project Engineer GTPL Assistant Project Director
NV12	Where reasonable and feasible: <ul style="list-style-type: none"> Site sheds, materials and stockpiles will be located to provide acoustic shielding. 	Construction		Project Engineer
NV13	Compounds will be designed to promote one way traffic so that the requirement for vehicles to reverse is minimised, and noise from reversing alarms is minimised.	Pre-construction, construction		Project Engineer
NV14	Machines that are used intermittently such as dump trucks, rollers, bulldozers, excavators, bobcats, mulchers etc. will be shut down when not operated for more than 15 minutes.	Construction	CoA C33 SoC C30	Project Engineer
NV15	Construction plant and equipment would be well maintained (including noise reduction fittings where feasible) and would be turned off when not in use to minimise noisy emissions.	Construction	CoA C33 SoC C30	Project Engineer
NV16	Reversing of vehicles and equipment, and use of horns will be minimised to prevent noise emissions to nearby sensitive receivers.	Construction	SoC C31	Project Engineer
NV17	The use of quacker alarms will be considered if sensitive receiver noise levels exceed the highly noise affected noise receiver 75dBA.	Construction	SoC C31	Project Engineer
NV 18	Loading and unloading will be undertaken more than 50m from sensitive receivers.	Construction	SoC C32	Project Engineer
NV 19	Vibratory rollers and rock breaking activities are not to be undertaken within 50m sensitive residential receivers	Construction	SoC C34	Project Engineer

5.1.2 Noise and vibration consultation

Table 10 NV2 identifies the process and tools to liaise with the community to advise them of likely timing and duration of construction activities, including noisy activities.

Any noise or vibration specific complaints will be managed in accordance with this procedure, and with mitigation measures NV3, NV11 and NV12 in Table 100 above.

The Out of Hours Works Procedure included at Appendix 1 of this Plan outlines the process for liaising with relevant agencies to discuss the need to undertake construction activities out of hours. This may include consultation with QPRC, OEH, EPA or GTPL.

6.0 Compliance management

6.1 Roles and responsibilities

The project team's roles and responsibilities are outlined in Section 4.1 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Section 5 of this Plan.

6.2 Training

All personnel working on site will undergo site induction training relating to noise and vibration issues. The induction training will address elements related to noise and vibration management including:

- Normal work hours.
- What activities can and can't take place outside of these working hours.
- The process for seeking approval for out of hours works, including consultation.
- Location of noise sensitive areas.
- The employment of reasonable and feasible noise mitigation measures.
- Roles and responsibilities of the project team related to noise and vibration.

Further details regarding induction and training are outlined in Section 5 of the CEMP.

6.3 Inspections

The Project Engineer will inspect the site regularly and keep the complaints register up to date and report on how noise complaints have been addressed in the monthly report.,

Requirements and responsibilities in relation to inspections are documented in Section 8.1 of the CEMP.

6.4 Monitoring

6.4.1 Noise monitoring

Noise monitoring will be undertaken should noise complaints be received (refer Table 10, NV11). Noise monitoring will be undertaken at sensitive receivers to determine if the actual construction noise generated exceeds the predicted construction noise levels and are below the 'highly noise affect' NML target of 75dBA construction noise management levels identified in this Plan.

Where noise levels are found to exceed the 'highly noise affected' levels, the source of excessive noise will be identified, and any additional feasible and reasonable measures available will be implemented to either reduce noise emissions or reduce the impacts on receivers.

6.4.2 Vibration monitoring

Vibration monitoring may be carried out in response to complaints, exceedances, or for the purpose of refining construction methods or techniques to minimise vibrations (refer to Table 100 NV12).

A Blast Management Plan will be prepared upon completion of geotechnical investigations and detailed design (refer to Table 100, NV9). This Plan will include specific vibration monitoring relating to blasting.

6.5 Auditing

Internal audits will be undertaken to assess the effectiveness of environmental controls, compliance with this Plan, CoA and other relevant approvals, licenses and guidelines.

Audit requirements are detailed in Section 8.4 of the CEMP.

6.6 Reporting

Results and outcomes of inspections (namely non-compliances), monitoring and auditing will be reported internally on a monthly basis as part of the monthly environmental report. Reporting requirements and responsibilities are documented in Section 8.5 of the CEMP.

7.0 Review and improvement

7.1 Non-conformity, corrective and preventative actions

A non-conformance is an action or omission that does not conform with the requirements of this NVMP or any legal and other requirements. Any member of the project team can identify a non-conformance or opportunity for improvement. Section 8.3 of the CEMP identifies the process for identifying, reporting, recording and reviewing non-conformances. This will ensure continual improvement.

7.2 Management plan update and amendment

The processes described in Section 7 and Section 8 of the CEMP (relating to incidents, inspections, monitoring and auditing) may result in the need to update or revise this Plan. This will occur as needed.

Appendix 1

Out of Hours Works Procedure

Scope

This procedure does not apply where:

- The delivery of materials is required by police or other authorities for safety reasons.
- The work is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm.

Procedure for inaudible out of hours work

Subject to approval by QPRC and/or the EPA, work can proceed out of standard construction hours where:

- The works do not cause construction noise to be audible at any sensitive receiver.
- A request to the Project Engineer to conduct inaudible works should be accompanied by:
 - Details of the nature and justification for activities to be conducted during the varied construction hours.
 - A qualitative noise impact assessment of predicted noise impacts at sensitive receivers.
 - Details of any proposed noise monitoring during the out of hours work.
 - Details of notification to sensitive receivers.

Complaints

Any complaints received as a result of the nominated inaudible out of hour's works are to be managed by the contractor. Details of noise complaints will be managed as a Category two incident as per Section 7.2 of the Construction Environmental Management Plan (CEMP).

Procedure for audible out of hours work

Out of hour's noise assessment

Where (audible) out of hours work is proposed, an out of hours work (OOHW) assessment will be prepared by the Project Engineer in consultation with GTPL. As part of the preparation of the OOHW assessment, the Project Engineer and GTPL will consult with the QPRC and/or EPA (refer below for details on consultation requirements).

The OOHW assessment will include:

- Details of the nature and justification for activities to be conducted during the varied construction hours.
- A noise impact assessment of predicted noise levels at each sensitive receiver.
- Details of any additional proposed noise monitoring.
- Evidence that appropriate consultation has been undertaken.
- Evidence that all reasonable and feasible noise mitigation measures have been put in place.

Environment Protection Authority

The Project Engineer and GTPL will consult with EPA on the proposed variation in construction times. Consultation will include but not be limited to details on predicted noise impacts at sensitive receivers and reasonable and feasible noise mitigation measures that the contractor will put in place to limit impacts.

Consideration of community impacts

The contractor will review the proposed work program and where reasonable and feasible prescribe mitigation measures to minimise impacts to the community.

Issue of notification to the community

The Principal will issue a letterbox notification to affected properties at least 48 hours prior to the commencement of the proposed out of hours works, advising of the start date and expected duration of the out of hours activities (in accordance with NV2 in Table 10). The notification must also include details of the community information line (1800 838 438), project email address (iwc@gogong.net) for lodging complaints.

Where the activity is deemed as having a significant effect on sensitive receivers, doorknocking and/or distribution of individual letters to affected properties should also be undertaken at least 48 hours in advance of the proposed works.

Works approval

Following completion of the appropriate community notifications, as confirmed by the Project Engineer and details provided to the Principal and GTPL, the work as described in the OOHW assessment and approved by the Assistant Project Director can proceed out of standard construction hours.

Complaints

Any complaints received as a result of the works are to be managed in accordance with the Complaints Management Procedure in Section 6.3.3 of the CEMP.

Appendix 5

Environmental management plan (Flora & fauna, air quality,
heritage etc.)



Environmental Management Plan

Googong Township IWC Project: Stage C Network East

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Approval for Issue

Name	Signature	Date
John Hite		4/10/2016

Contents

1.0	INTRODUCTION	136
2.0	AIR QUALITY	138
2.1	Construction Impacts	138
2.2	Air quality- Management and Mitigation Measures	139
3.0	CONTAMINATED SITES	140
3.1	Contaminated Site and Hazardous Materials – Management and Mitigation Measures ..	140
4.0	FLORA AND FAUNA	143
4.1	Current Environment	143
4.1.1	Ecological communities	143
4.1.2	Flora.....	143
4.1.3	Fauna.....	144
4.1.4	Habitat	144
4.2	Potential impacts	144
4.3	Flora and Fauna- Management and Mitigation Measures	146
5.0	HERITAGE	147
5.1	Aboriginal heritage	147
5.1.1	Sites within the boundary	147
5.1.2	Sites within the vicinity.....	147
5.1.3	Construction and Operation Impacts.....	148
5.1.4	Non-Aboriginal heritage.....	150
5.2	Heritage – Management and Mitigation Measures	150
6.0	WEED MANAGEMENT PLAN	151
6.1	Weeds – Management and Mitigation Measures	151
7.0	FIRE MANAGEMENT PLAN	153
7.1	Legislative Requirements	153
7.2	Surrounding Environment	153
7.2.1	Hazardous vegetation.....	154
7.2.2	Site geography.....	154
7.3	Potential Construction Impacts	156
7.4	Bush Fire Management Control Plan	157
7.5	Specific Requirements from Statement of Commitments	158
7.6	Emergency evacuation procedures	159
8.0	UNANTICIPATED DISCOVERY PROTOCOLS	160
8.1	Discovery of Historical or Aboriginal Artefacts	160
8.2	Discovery of Suspected Human Remains	161
9.0	ENVIRONMENTAL MONITORING	163
9.1	Inspections and Monitoring	163
9.2	Weekly Environmental Checklist	164

9.3 Auditing.....	164
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Tables

Table 1 Air Quality Mitigation Measures.....	139
Table 2 Contaminated Site and Hazardous Materials Mitigation Measures	140
Table 3 Flora and Fauna Mitigation Measures.....	146
Table 4 Heritage Mitigation Measures.....	150
Table 5 Noxious Weed Mitigation Measures.....	151
Table 6 Bush Fire Control Plan	157
Table 7 Fire Mitigation Measures	158
Table 8 Discovery of Aboriginal Artefact Protocol.....	160
Table 9 Discovery of Suspected Human Remains Protocol	161
Table 10 Monitoring and Inspections	163

1.0 Introduction

This Environmental Management Plan (EMP) has been prepared to cover the construction activities in relation to environmental management that are associated with the development of Stage C Network East not addressed by the other standalone plans and covers aspects like flora and fauna, heritage, air quality and bushfire risk.

This plan has been prepared as part of the CEMP to address the requirements of the Council's Conditions of Approval (CoA), the Statement of Commitments (SoC), and the safeguards listed in the Stage C Network East Statement of Environmental Effects (SEE) and all applicable legislation.

The purpose of this Environmental Management Plan is to facilitate implementation of appropriate environmental protection and impact minimisation techniques throughout the construction phase of the Project. The following document describes the safeguards and controls to be employed to prevent, manage and monitor identified and potential impacts of Guideline ACT activities of the construction, and reflects commitments described in Guideline ACT's Environmental Management Policy (contained in Appendix 11 of the CEMP).

The construction footprint is shown in Figure 1-1.

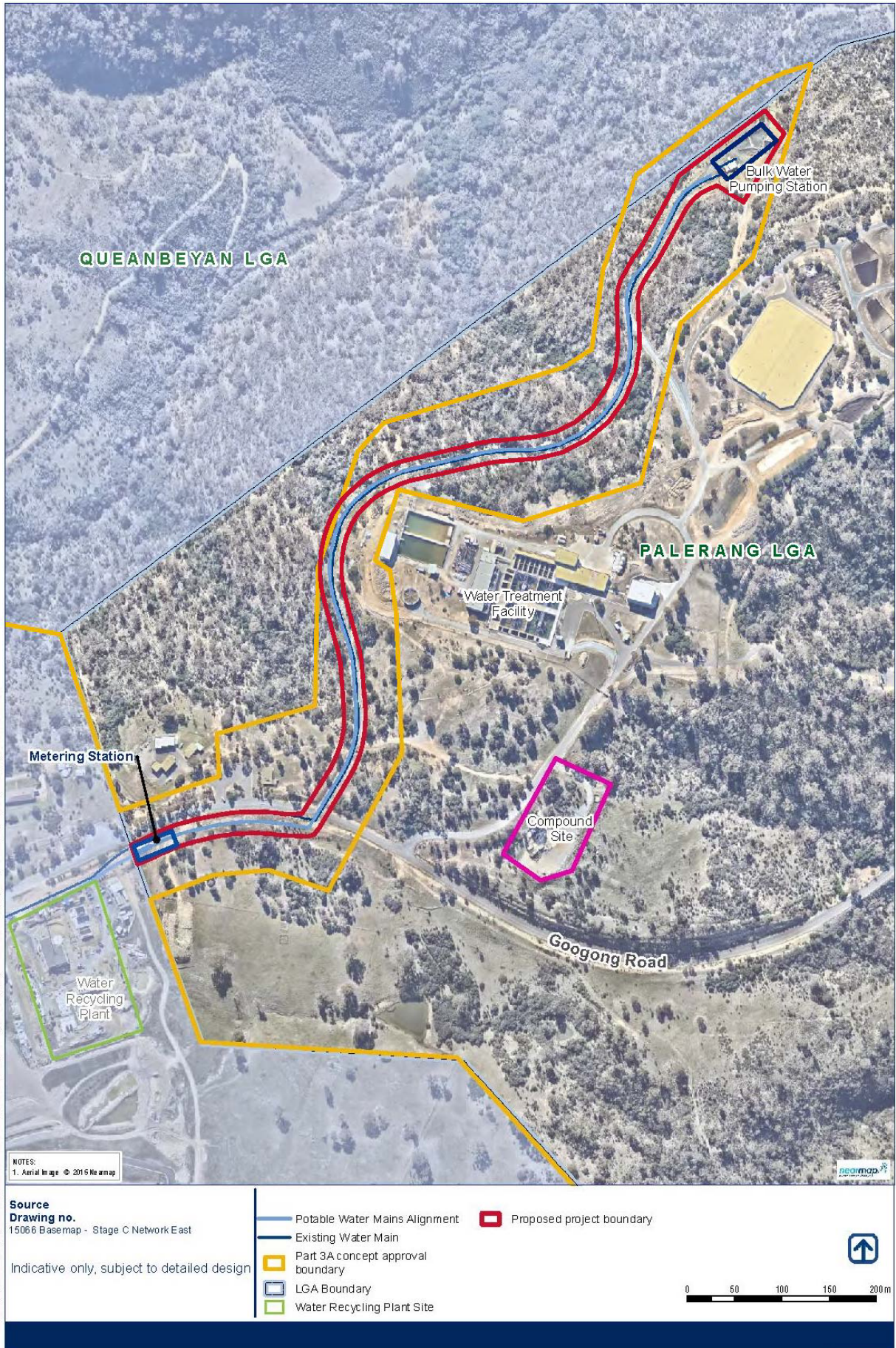


FIGURE 1-1 PROJECT FOOTPRINT

2.0 Air Quality

The proposal is located within the Googong Dam Foreshores Area which is predominantly a natural bushland setting with scattered rural properties. A number of open space picnic areas and walking tracks are also located throughout the area.

In addition the neighbouring Googong Township is located within a predominantly rural landscape characterised by large rural landholdings, which is gradually changing into a suburban area with the ongoing development of the Googong Township. The surrounding area is predominantly characterised by low-intensity grazing, bushland and rural residential land uses; no intensive agricultural activities are known to occur.

Googong is located within a temperate climate, distinctively characterised by dry (and warm) summers and cold winters. Mean temperatures are within the range of 13 to 27°C during summer and 0.5 to 12°C in winter. Uniform rainfall is experienced throughout the year with an average of 615.5 millimetres received per annum.

The ambient air quality of the area is affected by the predominantly agricultural use of the surrounding area, and is considered to be good. (There are minimal odour impacts from the agricultural uses due to the low-intensity farming.) Quantitative analysis of the air quality has not been deemed necessary given the absence of prevailing factors that would alter the air quality from its relatively benign state.

Various external factors would occasionally have impacts on air quality in the area. These include:

- Construction activities related to the ongoing development of the Googong Township.
- Seasonal bushfires, burn-offs and hazard reduction burning, which produce smoke and ash.
- Extreme weather events combined with drought, which can cause dust or particulates from the ongoing construction activities related to the development of the Googong Township.

Note that odour controls installed at the WRP are expected to avoid any offsite odour impacts.

2.1 Construction Impacts

Construction would generate minor dust impacts. Principal dust and particulate matter emissions from construction activities would be associated with bulk earthworks. The extent of the impact would vary depending upon soil type, soil moisture, ground cover and the prevailing wind conditions at a given location.

The following construction activities are potential sources of dust generation:

- Vegetation clearing of roadside vegetation, trenching, backfilling and reinstatement.
- Wind erosion from stockpiling of excavated topsoil and trench spoil.
- Movement of vehicles and construction machinery, both within and in/out of the construction site.
- Excavation (e.g. by drilling) of hard rock areas.

Construction of the pipelines would involve only minimal surface disturbance at any one time as the excavation works and rehabilitation would happen progressively.

During construction, it is unlikely that there would be any odour impacts that would affect air quality, as construction plant and vehicles are the only sources and any odour emissions would be negligible within the context of the open areas surrounding the construction site.

2.2 Air quality- Management and Mitigation Measures

Table 1 Air Quality Mitigation Measures

ID	Prior to construction	Reference	Responsibility
A1	All construction personnel will be made aware of the requirements of this plan during site inductions, toolbox talks or specific training as required.		Foreman and Project Engineer
A2	Ensure all petrol and diesel engine equipment arrives on site in good working condition as per Plant Safety Checklist GLA-SF-2.3-02.		Foreman and Plant Operators
A3	Review service records for hired and subcontract plant.		Foreman and Plant Operators
	During construction	Reference	Responsibility
A4	Ensure that exhaust emissions comply with Environment Protection requirements by maintaining petrol and diesel engine equipment in accordance with the service interval nominated in the relevant SWMS		Foreman and Plant Operators
A5	There will be ongoing visual monitoring of dust levels at the site	CoA 20	Foreman and Project Engineer
A6	Visible dust emissions from earth moving activities will be mitigated through the use of directional sprays from water carts as required	CoA 20 SoC C50	Foreman and Plant Operators
A7	The extent of exposed and unprotected areas will be limited by preserving existing groundcover (specifically limited to the designated footprint required) and progressive reinstatement of vegetation	SoC C48	Foreman and Project Engineer
A8	All haulage vehicles are to have their loads covered while transporting material to or from the construction area to prevent dust generation		Foreman and Plant Operators
A9	Loads on haul vehicles will not exceed the height of the sides and tailboards of the vehicles		Foreman and Plant Operators
A10	Construction traffic will be restricted to designated areas, which will be covered with a gravel surface where practicable, or kept damp		All Employees
A11	Any material spilt by vehicles onto public roads or other sealed pavements will be removed		Foreman and Project Engineer
A12	The use of two-stroke engines in equipment will be minimised where alternatives exist		All Employees
A13	During high wind conditions, activities that have the potential to generate excessive amounts of dust shall be halted	SoC C51	Foreman and Project Engineer
A14	Use of only non-CFC based refrigerants in any on site HVAC systems		Foreman and Project Engineer
A15	Vehicular speeds will be limited to 20km/hr on areas of unconsolidated or un-vegetated soil associated with the Project area and limits reduced during high wind conditions	SoC C47 SoC C51	All Employees
	Post construction	Reference	Responsibility
A16	Revegetate disturbed areas as soon as practicable to minimise dust generation and wind erosion	SoC C49	Foreman and Project Engineer

These dust suppression measures are based on standard construction industry measures based on the 'Blue Book' (Landcom, 2004) – SoC C60

3.0 Contaminated Sites

As noted in Section 5 of the SEE, no AECs were identified in proximity to the proposed project boundary, however there is always the potential for trenching and grading activities to disturb unidentified contaminated land and adversely impact existing soil characteristics if not managed appropriately. In addition, there is the potential during construction to contaminate soils through fuel or chemical spills. Risks include contamination of soil profiles, adverse impacts on human health and consequential effects on the groundwater quality.

The Stage C Network East project does not anticipate encountering contaminated sites, however the following is to be undertaken if found.

On discovering Asbestos, refer to the High Risk Activities Procedure in CEMP Appendix 2 WHSMP.

On discovering any other potential contamination:

- Immediately isolate and cordon off the potential contaminated site, preventing entry into the area;
- Contact the EPA to advise and assist in formulating an action plan. This may include specialist consultants and subcontractors; determine whether the contamination may contain a risk to workers or the general public and liaise to formulate an action plan;
- Contact the Client's Representative and inform them of the discovery and action to date;
- Raise an Incident Report (GLA-SF-2.2-09) and an NCA Report (GLA-QF-4.2-20).

Notifications and internal reporting are to be completed within 24 hours.

3.1 Contaminated Site and Hazardous Materials – Management and Mitigation Measures

Table 2 Contaminated Site and Hazardous Materials Mitigation Measures

ID	Prior to construction	Reference	Responsibility
CH1	All construction personnel will be made aware of the requirements of this plan through site inductions, toolbox talks or specific training. In particular, all construction personnel will be made aware of the High Risk Activities Procedure in the WHSMP		Foreman and Project Engineer
CH2	Complete the Asbestos Checklist (GLA-SF-2.2-11) to determine if any asbestos is likely to be uncovered during the project.	CoA 12	Project Engineer
CH3	Where possible, all refuelling will occur at designated fuel distribution points. These distribution points would be underlain by compacted earth to prevent the significant loss of fuel into the ground in the event of a spill. They would also be bunded to contain any large spills that may occur as a result of machinery or tank failure.		Project Engineer
CH4	Storage areas for fuels, oils and chemicals used during construction will be covered and contained within an impervious bund to retain any spills of more than 110% of the volume of the largest container in the bunded area.		Project Engineer
CH5	Spill response procedures and equipment for containment and recovery would be available on site.		Project Engineer
	During construction		Responsibility
CH6	On discovering Asbestos, refer to the High Risk Activities Procedure in the WHSMP (Appendix 2 of the CEMP).	CoA 12	Project Engineer

CH7	<p>On discovering any other potential contamination:</p> <ul style="list-style-type: none"> • Immediately isolate and cordon off the potential contaminated site, preventing entry into the area; • Contact the EPA to advise and assist in formulating an action plan. This may include specialist consultants and subcontractors; determine whether the contamination may contain a risk to workers or the general public and liaise to formulate an action plan; • Contact the Client's Representative and inform them of the discovery and action to date; • Raise an Incident Report (GLA-SF-2.2-09) and an NCA Report (GLA-QF-4.2-20). • Notifications and internal reporting are to be completed within 24 hours. 		Foreman and Project Engineer
CH8	Isolate and contain identified areas of contaminated land with bunding		Foreman and Project Engineer
CH9	Restrict access to contaminated sites with fencing ;		Foreman and Project Engineer
CH10	Stop work, if any contaminated material, or suspected contaminated material is found during construction, and notify Guideline ACT's General Manager;		Foreman and Project Engineer
CH11	Report any unexpected findings of contaminated material, or suspected contaminated material to the Superintendent's Representative and Environmental Consultant;		Project Engineer
CH12	Record the location, visual appearance, odour, depth, surrounding material, mode of discovering the material and report to the Superintendent's Representative and Environmental Consultant;		Foreman and Project Engineer
CH13	Obtain expert advice in the event suspect material is encountered. There may be a requirement for a Sampling and Analysis Plan and Remedial Action Plan if contaminated material is found;		Project Engineer
CH14	Contact the EPA for their advice and assistance in formulating an action plan in accordance with ACT Regulatory requirements. This may include sampling and laboratory analysis, but could be limited to site inspections;		Project Engineer
CH15	Contact EPA (1800 838 438) to determine whether the contamination may contain a risk to workers or the general public and liaise to formulate an action plan;		Project Engineer
CH16	Obtain the Superintendent's and Environmental Consultant approvals for the proposed action plan;		Project Engineer
CH17	Remedial action is not to commence until appropriate approvals have been received;		Project Engineer
CH18	Any contaminated material from spills will be disposed of according to manufacturers and OEH requirements.		Project Engineer
CH19	Once the APPROVED action plan is implemented, document the findings in accordance with the plan and provide documentation to the relevant parties.		Project Engineer
	Post construction		Responsibility
CH20	Manage the safe removal and disposal of any contaminated material in consultation with the EPA.		Project Engineer

CH21	Obtain receipts from appropriately licensed disposal facilities if material is required to be taken offsite.		Project Engineer
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4.0 Flora and Fauna

A Flora and Fauna Assessment was prepared by Biosis (Biosis, 2015) for the proposed works. A summary of the findings of this assessment are outlined below and the full report is included as Appendix D of the SEE.

The proposal area is generally equivalent to the construction footprint for the Googong IWC Stage A Network East works, which included the construction of the BWPS and associated pipeline and the BWPS access road. The ecological impacts of clearing for Stage A Network East were assessed in the Flora and Fauna Assessment Report (Biosis, 2011). Minor changes were then made to the pipeline and road route to avoid ecological impacts. The extent of the final approved construction footprint is shown in Figure 1-1.

The assessment determined that the works would not have a significant impact upon flora, fauna or ecological communities listed pursuant to the EPBC Act or the TSC Act.

4.1 Current Environment

A survey of the proposal area was undertaken on 25 August 2015 to confirm the vegetation mapping completed by Biosis (2011) and to examine the extent of clearance and disturbance which had been undertaken for the approved Stage A works. This was then used to determine whether the current proposal is likely to result in any impacts to biodiversity.

4.1.1 Ecological communities

Natural vegetation within the proposal area and surrounds consists of a mosaic of Grassy Woodland / Dry Forest (predominantly Dry Forest), varying in both floristic composition and degree of disturbance. Within the study area, some natural vegetation occurs in the form of two discernible vegetation communities:

- Scribbly Gum / Red Box / Bundy Dry Forest.
- Blakely's Red Gum / Red Box / Bundy Grassy Woodland - The small area (approximately 1210m² as recorded in Biosis (2011)) was determined to meet the criteria for the White Box / Yellow Box / Blakely's Red Gum Woodland ecological community, listed as endangered pursuant to the NSW TSC Act and critically endangered pursuant to the EPBC Act.

Modified communities present within the study area include Maintained Woodland Regeneration, Native Pasture with scattered planted native trees and some Acacia Regrowth.

The vegetation communities present within the study area, as mapped in 2011 and confirmed during the recent site visit (25 August 2015), are shown on Figure 5-1. The vegetation communities shown on Figure 5-1 also include areas cleared or otherwise disturbed for installation of the potable water mains pipeline and formation of the gravel road and associated batters for the BWPS works. The extent of clearing/disturbance for this road is considerably wide (at least six metres). The new pipeline will run along the existing potable water mains pipeline under the gravel road.

South of Googong Dam Road, the proposed pipeline will also run through an area previously disturbed for Stage A Network East, although the disturbance corridor is not as wide as that north of Googong Road.

4.1.2 Flora

A total of 81 flora species were recorded within the study area during the survey undertaken by Biosis (2011), comprising 57 native species and 24 exotic species. Targeted surveys for threatened flora with a moderate or higher likelihood of occurrence were completed in 2011 throughout the study area. No plant species listed as threatened pursuant to the EPBC Act and/or the TSC Act were recorded. During the recent survey (25 August 2015) for the current proposal, no threatened flora species were recorded.

4.1.3 Fauna

Fauna surveys recorded by Biosis (2011) found 18 bird species and nine mammals, with two of these species, Speckled Warbler (*Chthonicola sagittata*) and Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*), listed as vulnerable under the TSC Act. Other threatened fauna have since been recorded within or adjacent to the study area, including the TSC Act listed vulnerable Scarlet Robin (*Petroica boodang*).

Review of the NSW Wildlife Online database ('Bionet') and Commonwealth EPBC Protected Matters Search Tool has not identified any additional listed species that may have a moderate or higher likelihood of occurrence within the study area. During the recent survey (25 August 2015) for the current proposal, no threatened fauna species were recorded.

Native wildlife species are protected under the following acts:

- a) *Environmental Planning and Assessment Act 1979* (NSW)
- b) *Local Government Act 1993* (NSW)
- c) *Native Vegetation Act 2003* (NSW)
- d) *Threatened Species Conservation Act 1995* (NSW)
- e) *Fisheries Management Act 1994* (NSW)
- f) *Fisheries Management Amendment Act 1997* (NSW)

It is illegal for an unauthorised person to harm native wildlife. All works on site will be conducted in a manner which avoids disturbance or harm to native wildlife.

4.1.4 Habitat

Several hollow-bearing trees have been recorded within or adjacent to the study area during surveys for the Stage A Network East works (refer Figure 4-1). Some of these trees have been since cleared. No hollow-bearing trees will require removal for construction of the proposal.

As identified and addressed in Table 4-2 of the SEE and its relevant appendices (Biodiversity Impact – Appendix E) any nominated habitats, specifically Hoary Sunray will be fenced and signed as 'no go areas' for the duration of the project.

The scope of works does not identify any known habitats and there is no requirement for removal of additional trees, therefore there is no expected impact on native fauna (Hoary Sunray, etc.).

4.2 Potential impacts

The proposal area is predominantly within the area previously cleared for the construction of the Stage AB works including the construction of the BWPS and the potable water main. As the proposal largely occurs within the previously disturbed area, there would be minimal impacts to local biodiversity as a result of the proposal. The vegetation that would be cleared as a result of the proposal would include planted or re-growth of grasses or shrubs along the road side. This is minimal as the road access has been kept predominantly cleared for access and bushfire management of the site.

The assessment has identified that the proposal would result in the following impacts:

- There would no impacts to endangered ecological communities - White Box / Yellow Box / Blakely's Red Gum Woodland ecological community.
- There are unlikely to be any impacts to any threatened flora species.
- There are unlikely to be any impacts to any threatened fauna species.
- No hollow-bearing trees would be removed.

Following (Figure 4-1) is the biodiversity mapping of the proposal area as seen in the SEE.

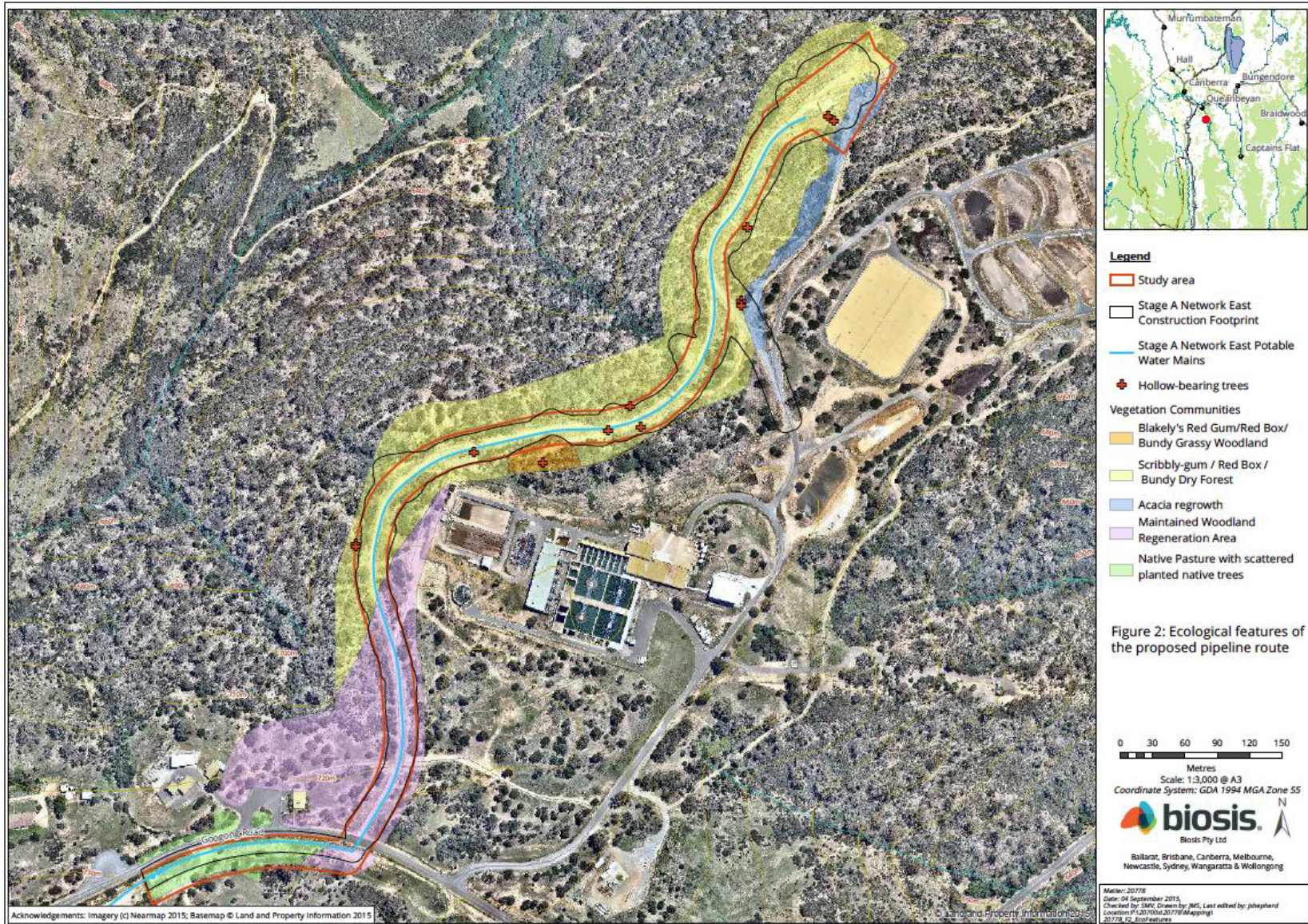


FIGURE 4-1 BIODIVERSITY MAPPING

4.3 Flora and Fauna- Management and Mitigation Measures

Table 3 Flora and Fauna Mitigation Measures

ID	Prior to construction	Reference	Responsibility
FF1	Vegetation clearing would be limited to grasses and shrubs along the road side and would be minimised as much as feasible.	SoC C11	Foreman and Project Engineer
FF2	Areas of protected species habitat within or adjacent to the Project area which are nominated to be protected on the Environmental Constraints Maps (CEMP Appendix 7) are to be fenced/flagged off for the duration of the construction period including (but not limited to) the Hoary Sunray population and the Blakely's Red Gum Woodland.	SoC C10 EPBC CoA 4	Foreman and Project Engineer
FF3	Trees must be protected from damage which: <ul style="list-style-type: none"> • Are shown or specified on construction drawings to be retained; • Are beyond the Project boundary; or • Are not be removed or damaged by construction operations. 		Foreman
FF4	No clearing of any trees (including dead or hollow-bearing trees) would be undertaken as part of the proposal. Should works necessitate the clearing of trees; measures will be taken after receiving written approval from superintendent.	SoC C12	Foreman
	During construction		Responsibility
FF5	No vegetation will be cleared beyond the boundaries marked on construction drawing and as marked on the ground.		Foreman and Project Engineer
FF6	All works and remediation measures are to be conducted in a manner and to a standard consistent with the requirements of appropriate legislature		Foreman and Project Engineer
FF7	Rehabilitation and revegetation of disturbed areas is to be undertaken in accordance with the Revegetation and rehabilitation protocol outlined above.		Foreman and Project Engineer
FF8	Should any threatened flora or fauna species be unexpectedly encountered, the Project Engineer and Project Ecologist will determine the significance, assess impacts and identify management measures, approvals/licences or permits required, in consultation with the Office of Environment and Heritage (OEH), Department of Primary Industries – Fisheries Conservation and Aquaculture and Department of Environment (DoE) as appropriate.		Project Engineer
FF9	Fell habitat trees carefully, allowing trees to be lowered to the ground.		Foreman and Project Engineer
	Post construction		Responsibility
FF10	The project site, compound site and site access track must be fully restored on completion of construction. Restoration will include grading, scarifying, topsoiling, seeding (in accordance with the approved seed and species mixes) and mulching.	CoA 19 SoC C39	Foreman and Project Engineer
FF11	Rehabilitation grass mix or other measures as appropriate are to be applied to all disturbed surfaces as soon as practicable at the completion of each component of work. The mix is to be applied at the recommended rate of dispersal. Do not use species that are listed under the <i>Noxious Weeds Act 1993</i> .	CoA 19	Foreman and Project Engineer

5.0 Heritage

A Due Diligence Archaeological Assessment was prepared by Navin Officer (Navin Officer, 2015) for the proposed works. A summary of the findings of this assessment are outlined below and the full report is included as Appendix H of SEE.

5.1 Aboriginal heritage

A cultural heritage assessment for the proposal has been undertaken according to the NSW Office of Environment and Heritage Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (DECCW, 2010).

A range of archaeological data was reviewed for the proposed project boundary and its surrounds. This literature and data review was used to determine if known Aboriginal sites were located within the proposal and 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, in particular the Aboriginal Heritage Information Management System (AHIMS) search results. One hundred and sixteen Aboriginal recordings are listed on the OEH AHIMS for the area around the Googong township. Sites comprise:
 - 106 artefact scatters
 - Eight Potential Archaeological Deposits (PADs)
 - One modified tree
 - One cultural feature.
- Previous research within the Googong township area which included local histories and archaeological reports.

No field inspections were conducted for this Due Diligence assessment. All areas within the proposed project boundary has been included in previous heritage assessments.

5.1.1 Sites within the boundary

One Aboriginal heritage site has been previously recorded within the proposal area (refer to Figure 5-5). This site is GWTP5 and is a scatter of three artefacts located on a track intersection. Artefacts were found on the edge of the track which is highly disturbed and located on a spur crest. The soils in the area are gravelly decomposing granite sand with bedrock at the surface in close proximity to the site. The track has been laid with gravels. Visibility on the track was 70 per cent with disturbance off the track limited to 20 to 60 per cent visibility.

5.1.2 Sites within the vicinity

Eight Aboriginal sites are recorded within 120 metres of the proposal boundary (figure 5-1). These sites area shown in Figure 5-5 and include:

- GWTP1 – This site comprises four artefacts located on a slight rise above a gully.
- GWTP3 – This site comprises eight artefacts located on a rocky spur crest above dry creek and gully.
- GWTP4 – This site comprises an isolated artefact located on a dirt track which joins onto Googong Dam Road.
- GWTP6 – This site is an isolated find located on a formed access track edge adjacent to a fence line. The site is located adjacent to a heavily disturbed drainage line.
- GWTP7 – This site is an isolated find located on a track edge. The artefact is located on a steep spurline leading to the Queanbeyan River.

-
- G1BAS1 – This site comprises five stone artefacts across approximately 19 m by 12 m on a low gradient ridge crest. The artefacts appear to result from procurement of locally occurring quartz.
 - G1BAS2 – This site comprises an isolated grey volcanic hammerstone with pitting at one end. The artefact measures 90 x 70 x 60 mm. The site is located in a grassy, cleared area within a mid-slope/crest landform.
 - GA23 – 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.

5.1.3 Construction and Operation Impacts

One Aboriginal site, GWTP5, is located within the project area; however the project has been designed to avoid direct impacts to the site.

There is also a risk of inadvertent impacts on known or unknown Aboriginal sites occurring during construction, particularly if activities are undertaken outside of the proposal area.

Management measures outlined in Section 5.8.4 of the SEE and contained herein would aim to avoid any potential indirect impacts to the site and any nearby sites.

Should any relic, artefact or material (including skeletal remains) suspected of being of Aboriginal origin be encountered, Guideline ACT shall cease all construction work that might affect the relic, artefact or material and protect the relic, artefact or material from damage or disturbance. Guideline ACT shall notify the Client's Representative immediately and the unanticipated discovery protocol (Section 8) will be implemented.

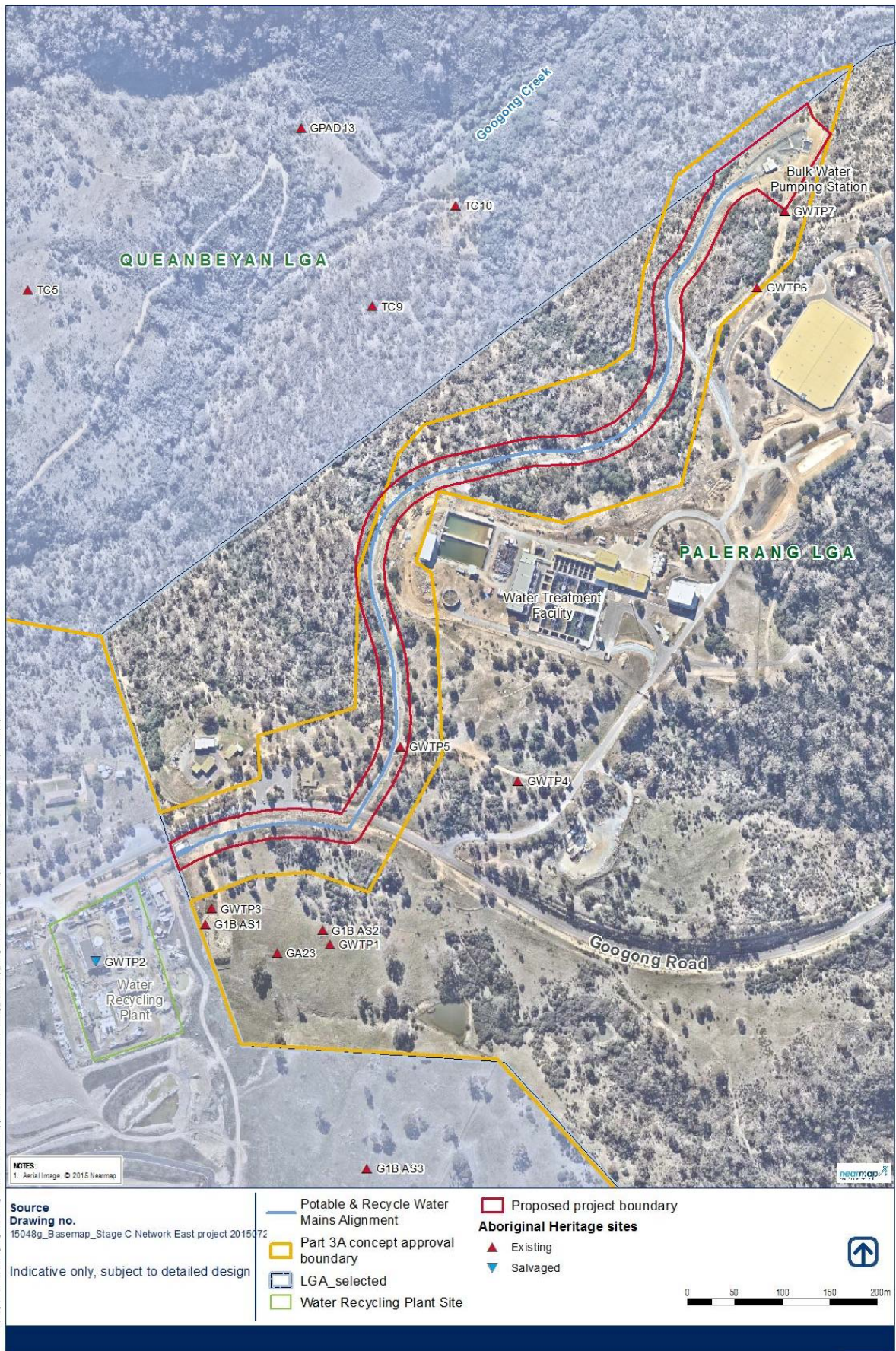


FIGURE 5-1 ABORIGINAL HERITAGE SITE LOCATIONS

5.1.4 Non-Aboriginal heritage

In 2003, Navin Officer conducted a cultural heritage assessment of the proposed Googong Township as part of a Local Environmental Study. The assessment involved a comprehensive surface survey of approximately 1,000 hectares. Seven historical sites (GH1-7) were identified during this survey.

In 2014, Navin Officer conducted a cultural heritage assessment of the remaining areas of the Googong Township not assessed south of Googong Road. Five additional European sites (Grwh1-5) were recorded during this additional survey.

No non-Aboriginal heritage sites have been recorded within the project area.

Should any unknown relic, artefact or material (including skeletal remains) be encountered, Guideline ACT shall cease all construction work that might affect the relic, artefact or material and protect the relic, artefact or material from damage or disturbance. Guideline ACT shall notify the Site Superintendent, Principal and GTPL immediately and the unanticipated discovery protocol (Section 8) will be implemented.

Following is the general heritage management plan to be carried out relating to all known and possibly unknown heritage sites.

5.2 Heritage – Management and Mitigation Measures

Table 4 Heritage Mitigation Measures

ID	Prior to construction	Reference	Responsibility
H1	All construction personnel will be made aware of the requirements of this Heritage Management Plan through site inductions, toolbox talks or specific training. All personnel will be made aware of the requirement to adhere to the UDP (section 8) at all times during construction.	SoC C40 SoC C43	Foreman and Project Engineer
H2	Site GWTP5 will be fenced off for the duration of construction activities associated with the proposal.	SoC C41	Project Engineer
H3	The location of all nearby heritage sites are to identified and marked on the Environmental Constraints Map (Appendix 7 of the CEMP) and displayed in site sheds.	SoC C40 SoC C42	Foreman and Project Engineer
H4	Site staff would be advised of the location through displayed maps in site sheds and presence of Site GWTP5 and the need to avoid impacts to the area. The site should be included on all maps and plans as a no-go zone both on and off site.	SoC C40 SoC C42 SoC C43 SoC C44	Foreman and Project Engineer
	During construction		Responsibility
H5	Heritage sites identified prior to construction (especially high risk sites) will be monitored as part of the weekly site environmental checklist.		Foreman and Project Engineer
H6	If any Unanticipated Aboriginal Heritage discoveries are made (i.e. moderate to high density scatters > 1 artefact /m ² , scarred trees, ochre deposits, hearths, skeletal remains), works which would potentially impact the find would stop immediately. The Unanticipated Discovery Plan (Section 8) would be implemented. Works will not commence until appropriate steps have been followed and clearance has been received.	SoC C45	Foreman and Project Engineer
H7	If any potential European Heritage items are encountered, works which could potentially impact the find would stop immediately. The Superintendent's Representative would be notified immediately. An Archaeologist would be engaged to carry out an assessment of the heritage find in accordance with Unanticipated Discovery Plan (Section 8) . If the items were found to be of heritage significance, the Heritage Council would be notified to review and endorse the find.	SoC C40	Foreman and Project Engineer

6.0 Weed Management Plan

The purpose of this Weed Management Plan (WMP) is to describe how Guideline ACT will undertake construction activities in a manner that appropriately suppresses and inhibits the introduction and spread of weeds within the Project area.

Class 4 noxious weeds for the Queanbeyan LGA and Palerang LGA, including:

- African Love Grass (*Eragrostis curvula*)
- Chilean Needle Grass (*Nassella Neesiana*)
- St John's Wort (*Hypericum Perforatum*)
- Scotch Thistle (*Onopordum Acanthium*)
- Nodding Thistle (*Carduus Nutans*)
- Bathurst Burr (*Xanthium spinosum*)
- Blackberry (*Rubus fruticosus*)
- Paterson's Curse (*Echium plantagineum*)
- Serrated Tussock (*Nassella trichotoma*)
- Sweet Briar (*Rosa rubiginosa*)

Under the *Noxious Weeds Act 1993*, Class 4 'Locally Controlled Weeds' require that the 'growth of the plant must be managed in a manner that reduces its numbers, spread and incidence and continuously inhibits its reproduction'.

6.1 Weeds – Management and Mitigation Measures

Table 5 Noxious Weed Mitigation Measures

ID	Prior to construction	Reference	Responsibility
W1	Prior to arriving to the Project site, all vehicles, machinery, equipment and materials must be free from vegetative materials and propagules.		Foreman and Plant Operators
W2	Notify all relevant authorities, prior to commencement of any weed control activity.		Project Engineer
W3	Weed infested areas within the Project area or directly adjacent to the Project area should be fenced off (or otherwise demarcated) until such time as they are treated to minimise the risk of spreading through vehicle and equipment contamination.		Foreman and Project Engineer
	During construction		Responsibility
W4	Vehicle and machinery movements will be confined to disturbed areas and existing tracks where possible.		Foreman and Plant Operators
W5	Erosion and sediment control materials used on-site should be weed free (e.g. jute, hessian).		Foreman
W6	Rehabilitate and revegetate bare earth with the appropriate specified species as soon as practical following completion of works to minimise weed ingress.		Foreman and Project Engineer

W7	Throughout construction, monitoring for weeds will be undertaken		Foreman and Project Engineer
W8	During construction, undertake noxious weed control procedures to suppress growth and spreading of weeds using appropriate methods outlined in the pesticides Act 1999 and Pesticides Regulation 2009		Foreman and Project Engineer
	Post construction		Responsibility
W9	Weed growth will be monitored by the landscape subcontractor and Guideline ACT throughout the consolidation period.		Project Engineer
W10	Weed treatment (spot spraying, manual removal) is to continue throughout the consolidation period.		Project Engineer
W11	During consolidation, if required undertake noxious weed control procedures to suppress growth and spreading of weeds using appropriate methods outlined in the pesticides Act 1999 and Pesticides Regulation 2009		Project Engineer

7.0 Fire Management Plan

A Bushfire Assessment has been prepared by EcoLogical (EcoLogical, 2015) for the proposed works. A summary of the findings of this assessment are outlined below and the full report is included as Appendix E of the SEE.

7.1 Legislative Requirements

The NSW Rural Fire Service document *Planning for Bush Fire Protection* (PBP) (RFS, 2006) is the guideline controlling development on bushfire prone land. The document focuses on habitable development (such as dwellings) and Special Fire Protection Purpose (SFPP) development such as schools, hospitals and other similar uses. It does not address development associated with infrastructure such as reservoirs and plant.

As stated within Section 4.3.6. of PBP, the Building Code of Australia (BCA) does not provide for any bushfire specific performance requirements for the type of development proposed. As such, the asset protection zone (APZ) and building construction requirements specified within PBP and AS 3959-2009 Construction of buildings in bushfire-prone areas (Standards Australia 2009) do not apply as deemed-to-satisfy provisions for bushfire protection.

Practice notes have been prepared by NSW Rural Fire Service to provide a position or guidance on specific developments that may not be covered by PBP. One such example is telecommunication towers (Practice Note 1/11 Telecommunication Towers in Bush Fire Prone, Version 0.2 February 2012), however a position or requirement has not been prepared for water supply infrastructure or the like. Typically the owner of the asset takes responsibility of the level of bushfire risk management applied.

This assessment compares the requirements of other infrastructure installations imposed by NSW Rural Fire Service and the expectation of PBP for non-habitable development.

The works have been divided into three components based on vulnerability to the impacts of fire and geographical location. The components are:

1. Potable water mains would be located underground and therefore will not be impacted by fire. These components do not require further assessment.
2. Above-ground metering station at the boundary between Queanbeyan and Palerang LGAs, to the north east of the WRP. The station is effectively a small measurement kiosk and does not provide critical operational functionality. The location is surrounded by managed lands and does not require any further assessment.
3. Upgrades to the BWPS located at the north eastern end of the fire trail access road, and north of the Googong Water Treatment Plant. The upgrade includes provision of aboveground power supply and increased capacity of the pumps and associated fittings and connections. The BWPS provides critical infrastructure and is required to be assessed further.

7.2 Surrounding Environment

A bushfire assessment is typically required when a development is proposed within bushfire prone land as mapped by the local council. The development site is identified as bushfire prone land by PSC as shown on Figure 7-1, therefore there is a statutory requirement to provide a bushfire assessment of the proposal. The Concept Approval does not require the preparation of a bushfire assessment; however GTPL has recognised an assessment of bushfire protection to be important for the IWC Project in the same way that it has been identified for the design of the Googong township.

An assessment of the bushfire hazard is necessary to determine the application of bushfire protection measures such as asset protection zone location and dimension. The following sub-sections provide a detailed account of the vegetation communities (bushfire fuels) and the topography (effective slope) that combine to create the bushfire

hazard that may affect bushfire behaviour at the site.

7.2.1 Hazardous vegetation

The predominant vegetation influencing fire behaviour approaching the development site has been assessed in accordance with the methodology specified within Appendix 2 of PBP. PBP requires a structural classification of the vegetation that predominates in area and severity over a distance of at least 140 metres from the asset being assessed. PBP assigns a worst case equilibrium fuel load based on vegetation structure.

Bushfire behaviour is influenced by fuel load and the availability of the fuel which is mostly determined by the arrangement of the fuel and its moisture content. Fuel load and availability affects the rate of spread and intensity of a bushfire.

The land surrounding the BWPS is extensively vegetated with a combination of Low-open Forest and areas of Scrub/Tall Heath. The forest vegetation is situated on moderate to steep slopes to all aspects of the site. The forest-structured vegetation tends to dominate the slopes and ridge tops, while some of the moister riparian areas and slopes with high wind exposures tend to be dominated by heath / open scrub.

The areas surrounding both the BWPS and associated access road have been modified during the construction process for Stage AB works. Subsequently, the vegetation immediately surrounding these areas is disturbed, with the natural topography being regraded to allow for the road construction and to establish a suitable building envelope for the BWPS. Along the north western interface of both the fire trail and BWPS site, the slopes are initially very steep for a short distance, before becoming moderately steep down towards Googong Creek. Steep up-slopes exist beyond the creekline.

Based on the above the predominant vegetation has been assessed as 'forest'.

Cleared / managed land is present to the south and south east associated with the Googong Water Treatment Plant.

7.2.2 Site geography

The effective slope influencing fire behaviour has been assessed in accordance with the methodology specified within Appendix 2 of PBP. This is conducted by measuring the slope that would most influence fire behaviour where the vegetation occurs over a 100 metre transect measured outwards from the asset.

Steeper slopes significantly increase the rate of spread of fires, whereby each 10 degree increase in slope corresponds to doubling in the rate of spread.

The forest vegetation surrounding the BWPS site varies, ranging from the PBP slope class of >10-15° downslope to north west, whilst being level (along contours) to the north east, and upslope to the south east and south. The location of the varying slope classes are identified in Figure 7-2.

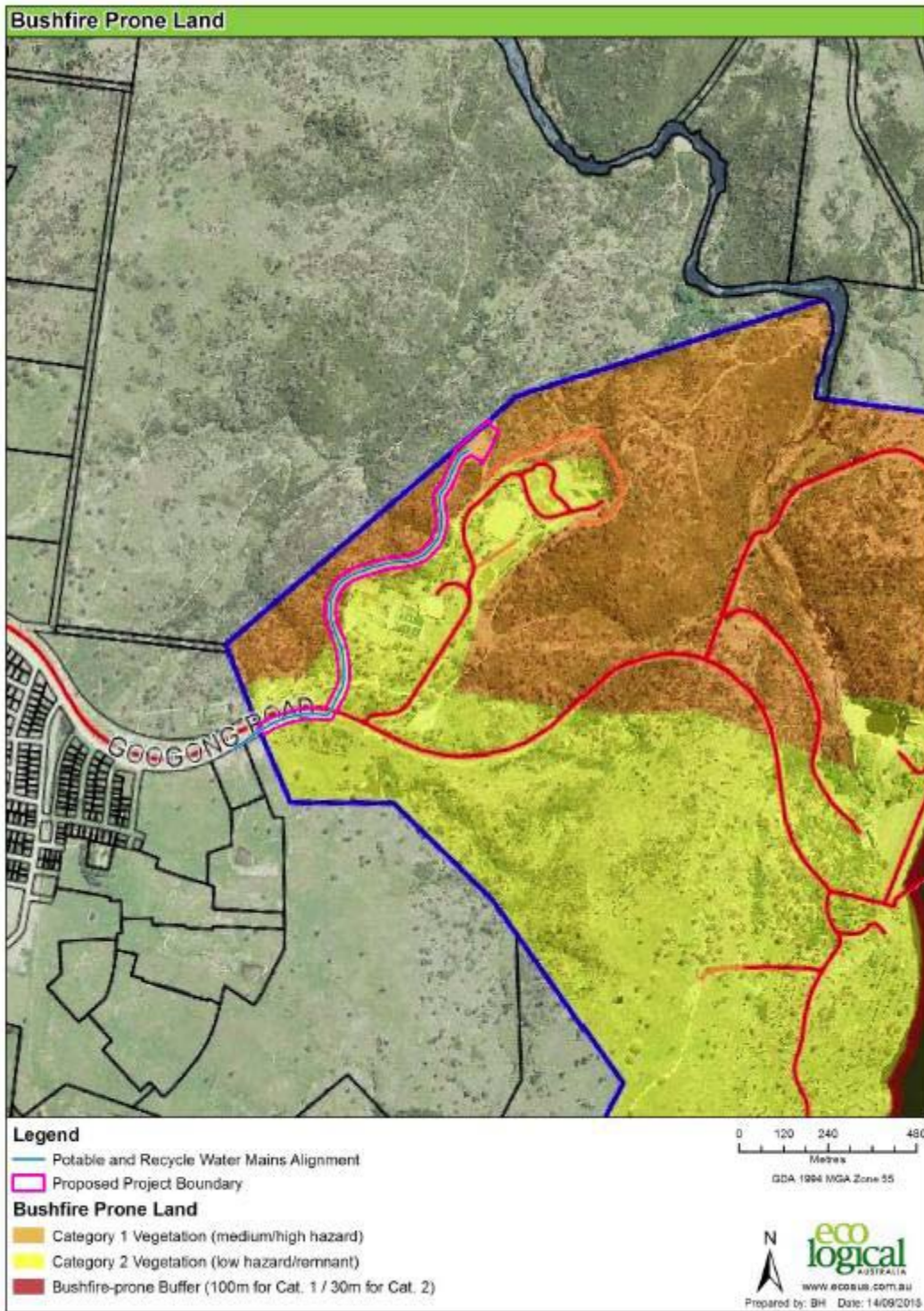


FIGURE 7-1 BUSHFIRE PRONE LAND MAP FOR PROPOSAL AREA



FIGURE 7-2 SLOPES BUSHFIRE ASSESSMENT AT THE BWPS

7.3 Potential Construction Impacts

There is the potential for a low forest / scrub fire to spread towards the BWPS and associated access road. Therefore, a fire in the local bushland may spread towards the construction activities and the BWPS. Given the construction methodology proposes to limit access to the BWPS to one access road (refer to Figure 1-4) this may create an evacuation hazard for construction workers. A fire passing through the construction site would also potentially impact on machinery and resources stored within the construction areas and/or the compound site.

There is potential for construction activities to start a fire in the adjacent vegetation, for example welding or rock breaking which may create sparks. There is also potential for construction workers to start a fire in the vegetation adjacent to the proposal area through the careless disposal of cigarettes. This would be highly dependent on the time of year that construction activities are undertaken and the fire hazard rating at the time.

7.4 Bush Fire Management Control Plan

Due to the high risk outcome of bush fires in the area the following Management and Mitigation Plan is to be followed throughout all stages of the project i.e. Prior to construction, During construction and Post Construction. **THE BURNING OF MATERIAL ON SITE IS STRICTLY PROHIBITED UNLESS INSTRUCTED BY NSW RURAL FIRE SERVICES.**

Bush Fire Management Control Plan General Requirements during construction check (<http://www.bom.gov.au/act/forecasts/act.shtml>) daily for information for the forecast Fire Danger Rating (FDR)

Table 6 Bush Fire Control Plan

On days of High to Very High fire danger where the FDR is HIGH or less	Responsibility
Ensure water cart (chaser vehicle) and pumps are readily available	Foreman
Assign a fire watch person to oversee operations, extinguish any fires and communicate an alarm	Project engineer
Hot Works allowed as per Guideline ACT's procedure GLA-SP-2.2.4. A water cart and a minimum of 1 x 1.8kg powder type fire extinguisher to be present.	Project engineer
On days of Very High fire danger where the FDR is VERY HIGH or greater...	Responsibility
Ensure water cart (chaser vehicle) and pumps are readily available	Foreman
Assign a fire watch person to oversee operations, extinguish any fires and communicate an alarm	Project engineer
Hot Works allowed as per Guideline ACT's procedure GLA-SP-2.2.4. A water cart and a minimum of 1 x 1.8kg powder type fire extinguisher to be present.	Project engineer
Plant and machinery to operate only on areas where the topsoil has been stripped	Foreman
No plant and machinery to operate within 5m of any vegetation.	Foreman and Plant Operators
If instructed by the authorities to suspend operations, park plant in the site compound and turn engines off. Keep watch over plant and site for minimum of 1 hour to ensure no fires ignite.	Foreman and Project Engineer
Toolbox all on-site personnel daily during periods of very high fire danger	Foreman
Total Fire Ban Days (note: a Total Fire Ban may be declared at FDR VERY HIGH under certain conditions)	Responsibility
Plant and equipment use that may cause accidental ignitions must be suspended	Project Engineer
Plant may operate from early morning until 10:00am or until directed to suspend	Project Engineer

operations by the relevant Agency / Authority	
Where plant has operated for part of the day and subsequently been closed down, a spotter must remain on site for at least 30 minutes after closed down to ensure no fires ignite from operations.	Project Engineer
Ensure water cart (chaser vehicle) and pumps are readily available	Foreman
Assign a fire watch person to oversee operations, extinguish any fires and communicate an alarm	Project engineer
No naked flames or Hot works permitted on site	Project engineer
Plant and machinery to operate only on areas where the topsoil has been stripped	Foreman
No plant and machinery to operate within 5m of any vegetation	Foreman and Plant Operators
If instructed by the authorities to suspend operations, park plant in the site compound and turn engines off. Keep watch over plant and site for minimum of 1 hour to ensure no fires ignite.	Foreman and Project Engineer
Toolbox all on-site personnel daily during periods of total fire ban	Foreman

7.5 Specific Requirements from Statement of Commitments

Table 7 Fire Mitigation Measures

ID	Prior to construction	Reference	Responsibility
F1	All site staff are to be inducted as to the emergency procedures and evacuation plans. Fire hazard ratings will be monitored on a daily basis and staff toolboxed accordingly.	SoC C14	Foreman & Project Engineer
F2	Firefighting equipment such as fire extinguishers and/or fire blankets to be stored in site sheds, all mobile plant and company vehicles. Minimum of 1 x 1.8kg powder type fire extinguisher on all plant.	SoC C16	Project Engineer
During Construction			
F3	All fuel to be stored in accordance with AS 1940 in defined locations and structures. All refuelling must occur where the ground is clear of flammable material for at least 1.5m from fuelling point. All fuel and oil spills to be managed as per the Spill Response Procedure.		Project Engineer
F4	All plant and equipment to be well maintained. Plant and equipment must be: <ul style="list-style-type: none"> -to be operated in a manner to minimise risk of a fire starting. -fitted with securely fixed, spark free and good service condition exhaust -free of excessive build-up of combustible materials 		Project Engineer
F5	Landscape areas surrounding works are to be maintained so as to minimise fire hazards.		Foreman and Project Engineer
F6	All access roads surrounding the infrastructure are maintained as a defendable space and grasses and vegetation should be managed adjacent to these roads.		Foreman and Project Engineer

F7	Emergency access to the access roads around the facilities should be maintained at all times.		Foreman and Project Engineer
F8	The burning of material on site would be prohibited, except under the instruction of NSW Rural Fire Services.	SoC C52 SoC C56	All Employees
F9	GLA will aim to reduce the risk of fire by minimising smoking on site and the site compound. No smoking will be allowed anywhere in surrounding bushland. Smoking will be banned on gazetted total fire ban days.	SoC C17	All Employees
F10	In the event that an incident occurs with the use of a fire extinguisher, the plant and equipment involved must not be used until inspected and deemed safe to use by relevant personnel and extinguisher is refilled/replaced.		Project Engineer

7.6 Emergency evacuation procedures

In the case of an emergency on site the protocol outlined in the Project management plan is to be implemented with the following details added for a fire emergency.

When calling Emergency Services:

- State nature of emergency - e.g. Fire, Accident, etc.
- State the Address as follows, located within the Googong Water Treatment Plant, to the edge of the Googong Foreshore Boundary (on Googong Road).
- Ensure someone is present to meet emergency services

Emergency Evacuation Procedures

If an evacuation of the site is necessary, the PE/foreman will ensure that all personnel are verbally notified and accounted for at the assembly point.

Signage will distinguish assembly point location.

Site workmen shall ensure that:

1. Electrical tools and machinery are switched off prior to leaving worksite; and
2. Report to their Foreman at the assembly site;

The PE/foreman shall:

1. co-ordinate with each other to check numbers on site; and
2. ensure a First Aid Kit and vehicle is available at the assembly point.

At an appropriate time but no later than 48 hours after the incident, the PE will provide a written report to the GLA Managing Director. The report will state the causes and impact of the incident and outline procedures to ensure that the incident does not re-occur.

8.0 Unanticipated Discovery Protocols

In correlation to Section 5 of this document (and specifically the controls to implement in case of unanticipated discovery of heritage sites), the following outlines the recommended procedures to follow for all unanticipated discoveries.

8.1 Discovery of Historical or Aboriginal Artefacts

In the event that object(s) which are suspected of being Aboriginal object(s) or relic(s) are encountered during development works relating to the Stage C Network East project, then the following protocol will be followed:

Table 8 Discovery of Aboriginal Artefact Protocol

Upon Discovery of Historical or Aboriginal Artefacts	Responsibility
Cease any further excavation or ground disturbance, in the area of the find(s); a. The discoverer of the find(s) will notify machinery operators in the immediate vicinity of the find(s) so that work can be temporarily halted; and b. The site supervisor, Site Superintendent, Principal and GTPL will be informed of the find(s).	Discoverer, Foreman and Project Engineer
Do not remove any find(s) or unnecessarily disturb the area of the find(s);	Foreman and Project Engineer
Ensure that the area of the find(s) is adequately marked as a no-go area for machinery or further disturbance, and that the potential for accidental impact is avoided.	Foreman and Project Engineer
Note the location and nature of the finds, and report the find to: a. Relevant project personnel responsible for project and construction direction and management, and b. Report the find to the Office of Environment and Heritage (OEH)	Foreman and Project Engineer
Where feasible, ensure that any excavation remains open so that the finds can be recorded and verified by suitably qualified archaeologist. An excavation may be backfilled if this is necessary to comply with work safety requirements, and where this action has been approved by the OEH. An excavation that remains open should only be left unattended if it is safe and adequate protective fencing is installed around it.	Foreman and Project Engineer
Following consultation with the relevant statutory authority (OEH), and, where advised, any other relevant stakeholder groups, the significance of the finds should be assessed by a suitably qualified archaeologist and an appropriate management strategy prepared and followed.	Project Engineer
Development works in the area of the find(s) may re-commence, if and when outlined by the management strategy, developed by a suitably qualified archaeologist and in consultation with Aboriginal stakeholders, and approved by the relevant statutory authority.	Project Engineer

8.2 Discovery of Suspected Human Remains

The following protocol will be actioned if suspected human material is revealed during development activities or excavations relating to the Stage C Network East project:

Table 9 Discovery of Suspected Human Remains Protocol

Upon Discovery of Suspected Human Remains	Responsibility
<p>All works must halt in the immediate area of the find(s) and any further disturbance to the area of the find(s) prevented.</p> <ul style="list-style-type: none"> A. The discoverer of the find(s) will notify machinery operators in the immediate vicinity of the find(s) so that work can be halted; and B. The site supervisor and the Principal/Project manager will be informed of the find(s). 	Discoverer, Foreman and Project Engineer
<p>If there is substantial doubt regarding a human origin for the remains, then consider if it is possible to gain a qualified opinion within a short period of time. If feasible, gain a qualified opinion (this can circumvent proceeding further along the protocol for remains which are not human). If conducted, this opinion must be gained without further disturbance to the find(s) or the immediate area of the find(s). (Be aware that the site may be considered a crime scene that retains forensic evidence). If a quick opinion cannot be gained, or the identification is positive, then proceed to the next step.</p>	Project Engineer
<p>Immediately notify the following of the discovery:</p> <ul style="list-style-type: none"> A. The local Police (this is required by law); B. An OEH archaeologist or Aboriginal Heritage Officer; and C. The Project Archaeologist (if not already notified). 	Project Engineer
<p>Co-operate and be advised by the Police and/or coroner with regard to further actions and requirements concerning the find area. If required, facilitate the definitive identification of the material by a qualified person (if not already completed).</p>	Foreman and Project Engineer
<p>In the event that the Police or coroner instigates an investigation, construction works are not to resume in the designated area until approval in writing is gained from the NSW Police.</p>	Project Engineer
<p>In the event that the Police and/or Coroner advise that they do not have a continuing or statutory role in the management of the finds then proceed with the following steps:</p>	Project Engineer
<p>If the finds are not human in origin but are considered to be archaeological material relating to Aboriginal occupation then proceed with Protocol for the discovery of Aboriginal objects (other than human remains).</p>	Project Engineer
<p>If the finds are Aboriginal or probably Aboriginal in origin:</p> <ul style="list-style-type: none"> A. Ascertain the requirements of OEH, the Heritage Branch, the Project Manager, and the views of the Principal and the Project Engineer. B. Based on the above, determine and conduct an appropriate course of action. Possible strategies could include one or more of the following: <ul style="list-style-type: none"> I. Avoiding further disturbance to the find and conserving the remains in-situ. II. Conducting archaeological salvage of the finds following receipt of any required statutory approvals; 	Project Engineer

<p>III. Scientific description (including excavation where necessary), and possibly also analysis of the remains prior to reburial;</p> <p>IV. Recovering samples for dating and other analyses; and/or</p> <p>V. Subsequent reburial at another place and in an appropriate manner.</p> <p>If the finds are non-Aboriginal in origin:</p> <p>A. Ascertain the requirements of the Heritage Branch, Project Manager, and the views of any relevant community stakeholders.</p> <p>B. Based on the above, determine and conduct an appropriate course of action. Possible strategies could include one or more of the following:</p> <ul style="list-style-type: none"> • Avoiding further disturbance to the find and conserving the remains in situ; • Conducting archaeological salvage of the finds following receipt of any required statutory approvals; • Scientific description (including excavation where necessary), and possibly also analysis of the remains prior to reburial; • Recovering samples for dating and other analyses; and/or • Subsequent reburial at another place and in an appropriate manner determined in consultation with the Heritage Office and other relevant stakeholders. 	
<p>If the finds are non-Aboriginal in origin:</p> <p>A. Ascertain the requirements of the Heritage Branch, Project Manager, and the views of any relevant community stakeholders.</p> <p>B. Based on the above, determine and conduct an appropriate course of action. Possible strategies could include one or more of the following:</p> <ul style="list-style-type: none"> • Avoiding further disturbance to the find and conserving the remains in situ; • Conducting archaeological salvage of the finds following receipt of any required statutory approvals; • Scientific description (including excavation where necessary), and possibly also analysis of the remains prior to reburial; • Recovering samples for dating and other analyses; and/or • Subsequent reburial at another place and in an appropriate manner determined in consultation with the Heritage Office and other relevant stakeholders. 	Project Engineer
<p>Construction related works in the area of the remains (designated area) may not resume until the proponent receives written approval in writing from the relevant statutory authority: from the Police or Coroner in the event of an investigation, from OEH in the case of Aboriginal remains outside of the jurisdiction of the Police or Coroner, and from the Heritage Branch in the case of non-Aboriginal remains outside of the jurisdiction of the Police or Coroner.</p>	Project Engineer

9.0 Environmental Monitoring

The following Environmental Monitoring procedure was extracted from Guideline ACT's Business Management System Procedure GLA-EP-3.2.1.

9.1 Inspections and Monitoring

The following table details the types of monitoring and inspections that are required under this CEMP.

Table 10 Monitoring and Inspections

Monitoring/ Inspection	Objectives	Responsibility	Output	Timing
Establishment of Erosion Controls (see Section 3.6.1)	To ensure that all erosion and sediment controls have been installed correctly and as per the approved ESCP prior to the commencement of construction.	Foreperson Project Engineer	Establishment of Erosion Controls Checklist GLA-EF-3.1-02	Prior to construction
Weekly Environmental Inspections	To monitor general environmental performance and compliance with this CEMP. To monitor the effectiveness of weed control activities. To monitor the effectiveness of erosion and sediment controls.	Foreperson Project Engineer	Site Environment Weekly Checklist GLA-EF-3.2-01	Weekly and following rainfall events.
Daily Plant and Vehicle Inspections	To ensure that plant and vehicles are in good condition prior to use, and to identify any maintenance requirements (e.g. oil leaks).	Plant/vehicle operators	Daily Plant and Vehicle Checklist GLA-SF-2.3-01	Daily, prior to use of vehicles and plant
Waste material monitoring (see Appendix 6 of CEMP)	To track the types and volumes of various wastes leaving the site	Project Engineer	Waste Management Plan GLA-EF-3.2-03	Complete for disposal of wastes

9.2 Weekly Environmental Checklist

A site environment inspection shall be completed at least once per week and after any rain event to monitor all environmental controls and their effectiveness.

The Project Engineer (PE) is responsible for ensuring the check is completed and documented by competent personnel. Any items requiring action shall be recorded using the Site Environment Weekly Checklist.

The Foreperson is to ensure any actions raised are completed before the next inspection. After completion of appropriate action, the checklist is to be forwarded to the PE for review, signing and filing in the project file. The PE shall ensure that any actions raised have been completed.

If the issue is not addressed in a reasonable time, or if a significant breach of the environmental controls occurs, a Non Conformance/Corrective Action (NCA) Report will be issued (GLA-QF-4.2-20).

In the event of an environmental incident (e.g. Client or public complaint or EPA Warning/Fine) a Non Conformance/Corrective Action (NCA) Report will be completed (GLA-QF-4.2-20). All NCA reports are reviewed by Guideline ACT management and subsequent corrective and preventive actions are taken as required.

9.3 Auditing

Environmental management forms part of the following audits:

Project Management Plan (PMP) Audit:

The Environmental Management Plan (EMP), as part of the PMP, shall be subject to an audit at least once for each project to determine whether the provisions of the Environmental Management System are being implemented effectively and in accordance with legislative requirements. Refer to the Quality - Construction Phase - Audit Procedure (GLA QP-4.2.3) for further details.

Guideline ACT Compliance Check:

Significant aspects of the Environmental System will be monitored internally by the Systems Manager (SM) approximately once per month for each project. Refer to the Quality - Construction Phase - Audit Procedure (GLA-QP-4.2.3) for further details.

Non-conformity's or corrective actions identified in the audit will be listed and issued to the site team via GLA form GLA-QF-4.2-23. The Compliance actions list will be itemised and have a responsible person to action within a specified time frame. Closed out items shall be issued back to the Systems Manager for verification and final close out. More information on auditing is also included in Section 8.4 of the CEMP.

Appendix 6

Waste and Resource Management Plan



Waste and Resource Management Plan

Googong Township IWC Project: Stage C Network East

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Name	Signature	Date
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Contents

1.0	PRINCIPLES	ERROR! BOOKMARK NOT DEFINED.
2.0	WASTE MANAGEMENT PLAN	173
3.0	LEGISLATION AND CONTACTS	174
3.1	Protection of the Environment Operations Act 1997 (POEO Act)	174
3.2	Contact	174
4.0	MANAGEMENT AND MITIGATION	172
4.1	Potential impacts	174
4.2	Waste management	174
4.3	Waste – Management and Mitigation Measures	175
	WASTE MANAGEMENT PLAN EXAMPLE	176
	WASTE DISPOSAL REGISTER	177

Tables

Table 1 Management and Mitigation Measures 175

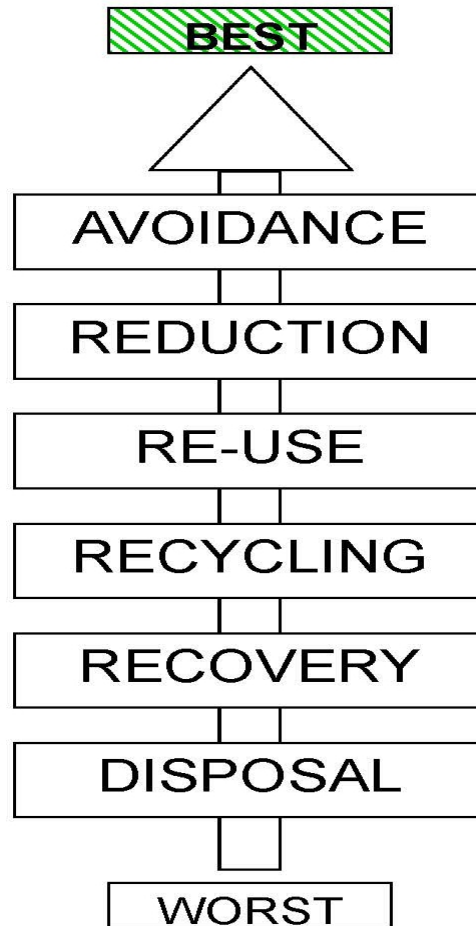
Appendices

Appendix 1 Waste Classification Procedure

1.0 Principles

The construction will use the following waste management principles, in order of priority:

1. avoid the use of excess materials and production of waste,
2. reuse waste materials (such as off cuts) on site where possible,
3. recycle waste, and
4. dispose of waste correctly.



REDUCTION RE-USE RECYCLING RECOVERY DISPOSAL

When deciding how to minimise waste management impacts, consider the following:

- will construction generate surplus material which can be recycled?
- will construction generate waste material which can be disposed on site?
- will construction generate waste material which will have to be disposed off-site?
- will site personnel generate litter or rubbish

2.0 Waste and Resource Management Plan objectives

Waste management would be undertaken in accordance with the *Waste Avoidance and Resource Recovery Act 2001*. The objectives of the Act that are applicable to the proposal and which will be implemented are:

- To encourage the most efficient use of resources and to reduce environmental harm in accordance with the principles of ecologically sustainable development.
- To ensure that resource management options are considered against a hierarchy of the following order:
 - Avoidance of unnecessary resource consumption
 - Resource recovery (including reuse, reprocessing, recycling and energy recovery)
 - Disposal of waste.
- To provide for the continual reduction in waste generation.
- To minimise the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste.
- To assist in the achievement of the objectives of the *Protection of the Environment Operations Act 1997*.

Effluent from the amenities for which Guideline ACT is responsible, will be discharged into the local sewerage system, where available. Otherwise, septic tanks and portable self-contained toilets of suitable capacity may be used subject to acceptable arrangements for disposal of the effluent. Pit toilets are not to be used.

Littering or dumping of unwanted waste or disposal of surplus construction materials or permitting such activities on any land on or around the site, is not permitted.

Set up skip bins or other appropriate receptacles to contain waste materials, litter and spoil. Provide separate bins for recyclable and non-recyclable material, dispose of their contents off-site at a suitable waste disposal location on a regular basis and ensure the site is maintained in clean and safe manner. Chemical, fuel and lubricant containers, solid and liquid wastes must be disposed of in accordance with EPA or local requirements.

Green wastes shall be mulched for re-use (when appropriate) or taken to a composting facility.

3.0 Legislation and Contacts

3.1 Protection of the Environment Operations Act 1997 (POEO Act)

The POEO Act is the key piece of environment protection legislation, and is administered by the Environment Protection Agency (EPA). Construction of Stage C Network East will be undertaken in accordance with the POEO Act, which covers a range of environmental offences including the regulation and enforcement of pollution control in NSW. Specifically Part 5.6 of the POEO Act identifies mechanisms for preventing environmental degradation including pollution prevention, cleaner production, reduction in discharge levels likely to cause harm to the environment, recycling and progressive environmental improvement.

A section 143 notice under the POEO Act enables the disposal of waste to private properties which are not licensed waste facilities, such as Virgin Excavated Natural Material (VENM).

3.2 Contact

- Environment Protection Authority – Pollution hotline: 131 555

4.0 Management and Mitigation

4.1 Potential impacts

Waste streams from construction activities will vary depending on the construction activities being undertaken at any one time. General expected waste streams would include:

- Vegetation waste from clearing and stripping activities, although this is expected to be minimal given the disturbed nature of the proposal area.
- Excess spoil from excavation – an estimated 500 cubic metres of primarily virgin excess spoil.
- Used fuel and chemical containers.
- Packaging waste from delivery of construction materials and plant and equipment.
- General construction waste such as excess concrete, formwork, pipe offcuts, cabling and wiring.
- Contaminated soil material caused by accidental fuel and chemical spills.
- General waste from site amenities including food waste, office waste and waste water.
- Disused environmental controls such as sediment fences, straw bales, gravel socks etc.

Generally waste to be produced would be in minimal quantities and would be disposed of at an appropriately licensed facility. It is not expected that any contaminated waste (except as a result of accidental spills) would be produced as a result of the proposed construction activities.

Resources would be sourced from local suppliers where feasible and volumes required would be minimised where possible. No materials required for the proposal are likely to become in short supply in the near future.

4.2 Waste management

The following Waste Management procedure was extracted from Guideline ACT's Business Management System Procedure GLA-EP-3.2.4.

A site specific Waste Management Plan (GLA-EF-3.2-03) is to be drawn up at the commencement on site of the project between the Project Engineer (PE) and Systems Manager (SM). Refer to for this project's Waste

Management Plan example (Appendix 1).

The Waste Management Plan is to be communicated to staff via toolboxes.

The Waste Management Plan is to be maintained throughout the project construction period and the effectiveness of the Waste Management Plan is to be measured against it through audits.

4.3 Waste – Management and Mitigation Measures

Table 1 Management and Mitigation Measures

ID	Prior to construction	Reference	Responsibility
W1	All construction personnel will be made aware of the requirements of this Waste Management Plan through site inductions and toolbox talks.		Foreman & Project Engineer
W2	Communicate with the staff and discuss with the client's representative on reducing waste and the use of recycled material		Project Engineer
	During construction		Responsibility
W3	A waste register will be maintained throughout the duration of construction to record and monitor all wastes being generated by the works and transported from the site.		Foreman
W4	Enclosed containers for all types of waste are to be located on site and are to be emptied and deposited to an approved landfill on a regular basis.		Foreman & Project Engineer
W5	Separate recyclable materials from non-recyclable materials.		All Employees
W6	Non-recyclable materials are to be disposed of at an appropriate approved disposal centre (e.g. Mugga Lane Landfill).		Foreman
W7	Prior to disposal of waste at an offsite facility, it will be verified that the receiver is licensed to accept the waste.		Project Engineer
W8	Where possible, recycle building material at an appropriate recycling centre (i.e. ACT Concrete Recyclers, local landscape suppliers, and local scrap metal yards).		Foreman
W9	Green waste (excluding weeds or weed contaminated material) is to be mulched and used on site as mulch or recycled to a local landscape supplier.		Foreman
W10	The project site will be maintained in a clean and tidy condition on a daily basis, with all rubbish and litter placed into appropriate receptacles. There will be no storage of materials beyond construction boundaries.	SoC C36 SoC C55	All Employees
W11	Resource management hierarchy principles are to be followed: Avoid unnecessary resource consumption as a priority Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery) Disposal is undertaken as a last resort at a licenced waste facility (In accordance with the Waste Avoidance and Resource Recovery Act 2011).		Foreman and Project Engineer
W12	Prior to disposal, non-recyclable liquid and non-liquid waste will be classified based on the Waste Classification Guidelines: Parts 1 and 2 (DECCW, 2010) and in accordance with the Waste Classification Procedure (refer Appendix 1). This procedure also represents the resource recovery and re-use strategy.		Foreman and Project Engineer
W13	No waste is to be burnt on site	SoC C56 SoC C52	Foreman and Project Engineer
	Post construction		Responsibility
W14	Construction site is to be left clean, uncontaminated and free of stockpiles, litter or waste. Waste materials, other than (re-used) landscaped vegetation and/or tree mulch, is not to be left on site once the works are complete	SoC C54	Foreman & Project Engineer

Appendix 1 WASTE MANAGEMENT PLAN EXAMPLE

Project Name	Project Number
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Waste Materials	Estimated quantity		Destination		
	Vol (m ³)	Mass (t)	On site (specify proposed reuse or recycling methods)	Off site (specify recycler and recycling outlet)	Disposal (specify landfill site)
Plastic, wrapping					
Cardboard packaging					
Bricks					
Timber and green waste					
Fencing materials					
Asphalt and bituminous surfacing					
Concrete, rubble, pipes, etc.					
Non-recyclable mixed waste, for disposal					
Topsoil					
Earthworks spoil					
Effluent					
Hazardous waste e.g. adhesives, lubricants					

Appendix 1

Waste Classification Procedure

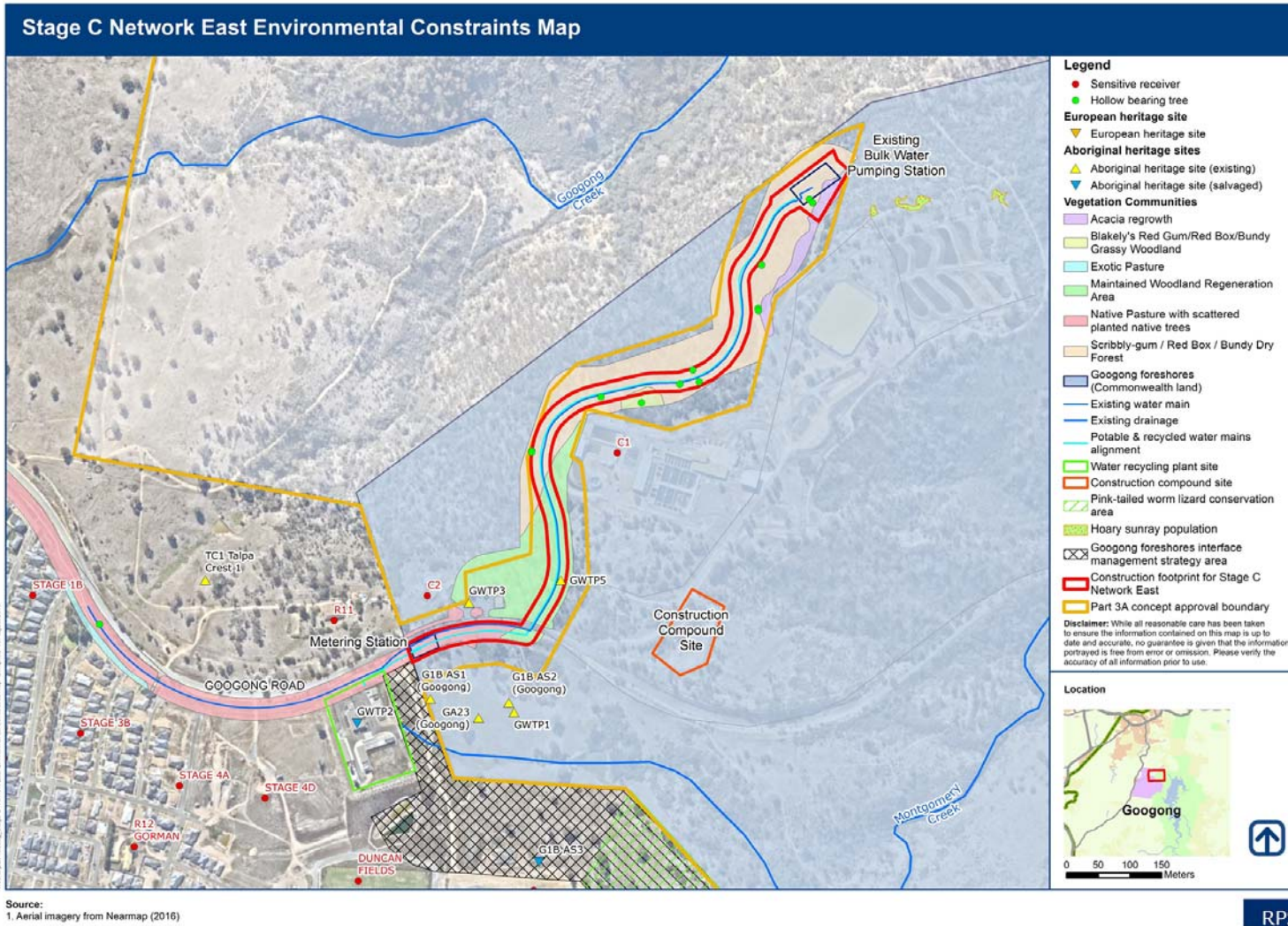
Step 1	
Can the waste be recycled?	Reuse, Recycling, Disposal options
<p>Some waste material can be recycled. This may include:</p> <ul style="list-style-type: none"> ▪ Steel. ▪ Cardboard/paper. ▪ Concrete. ▪ Plastic/glass. 	<p>Recyclable materials: If the material can be recycled, then it is to be segregated and stored separately for disposal in accordance with the relevant legislation and guidelines.</p>
Step 2	
Is the waste special waste?	Reuse, Recycling, Disposal options
<p>Special waste is defined as (1) Clinical and related waste, (2) asbestos waste, (3) waste tyres. Clinical/related waste is typically associated with medical/dental/pharmaceutical practice and is unlikely to be generated on site.</p> <p>NOTE: Asbestos waste means any waste that contains asbestos. Where asbestos is mixed with other waste to form asbestos waste, it is to be assessed in accordance with steps 3 to 7 below. Asbestos waste can only be disposed of at a waste facility that can lawfully receive asbestos and the other class of waste with which it is mixed (if any).</p> <p>If unsure that the waste is/is not special waste then contact the Environment Manager for further advice.</p>	<p>Special waste: If the waste is a special waste category then contact the Environment Manager.</p> <p>Note: Special waste must be disposed of at a facility licenced to take that classification of waste. Special waste must be transported by a licensed transporter. Evidence of appropriate disposal, including quantities, must be provided to the Environment Manager.</p>

Step 3	
If the waste is not special waste (other than asbestos waste), establish whether the waste should be classified as liquid waste.	Reuse, Recycling, Disposal options
<p>According to the waste classification guidelines, liquid waste is any waste that:</p> <ul style="list-style-type: none"> ▪ Becomes free flowing at or below 60°C or when transported ▪ Is not generally able to be picked up by a spade or shovel. <p>Liquid wastes typically include oils, fuels and must be stored correctly prior to disposal or reuse. Refer 'Storing Liquid Waste' fact sheet at: (http://www.environment.nsw.gov.au/resources/waste/storewaste05249.pdf)</p> <p>If liquid waste is mixed with another waste type (i.e. hazardous or solid waste) and retains the characteristics of liquid waste, the waste remains liquid waste.</p> <p>If the waste is not a liquid waste then proceed to step 4.</p>	<p>Liquid Waste: If the waste is a liquid waste then contact the Environment Manager.</p> <p>Note: Liquid waste must be disposed of at a facility licenced to take liquid waste.</p> <p>Liquid waste must be transported by a licenced transporter. Evidence of appropriate disposal, including quantities, must be provided to the Environment Manager.</p>
Step 4	
Is the waste pre-classified by OEH?	Reuse, Recycling, Disposal options
<p>The following wastes have been pre-classified in the OEH guidelines:</p> <ul style="list-style-type: none"> ▪ Hazardous waste (see step 6) ▪ Restricted solid waste ▪ General solid waste (putrescible) ▪ General solid waste (non-putrescible). <p>Definitions of pre-classified wastes are included in the Waste Classification Guidelines (DECCW, 2009).</p> <p>General solid waste (non-putrescible) will typically comprise the waste generated on site. General solid waste (non-putrescible) can be classed into the following sub-classes:</p> <ul style="list-style-type: none"> ▪ Building and demolition waste ▪ Garden waste ▪ Virgin excavated natural material (VENM) and excavated natural material (ENM) ▪ Wood waste. <p>It is important to separate waste into its classifications and sub-classifications to maximise opportunities for reuse and recycling potential.</p>	<p>Hazardous waste: See Step 5.</p> <p>Restricted solid waste: If the waste is restricted solid waste then contact the Environment Manager. Restricted solid waste must be disposed of at a facility licenced to take that waste type.</p> <p>Restricted solid waste must be transported by a licenced transporter. Evidence of appropriate disposal, including quantities, must be provided to the Environment Manager.</p> <p>General solid waste (putrescible) and General solid waste (non-putrescible): General solid waste (putrescible) and General solid waste (non-putrescible) must be transported by a licenced transporter. Evidence of appropriate disposal, including quantities, must be provided to the Environment Manager.</p>
Step 5	
Does the waste possess hazardous characteristics?	Reuse, Recycling, Disposal options
<p>Waste must be classified as 'hazardous waste' if it is a dangerous good under Class 1, Class 2, Divisions 4.1, 4.2 and 4.3, Class 5, Division 6.1 or Class 8 as identified in the Australian Code for the Transport of Dangerous Goods by Road and Rail (National Transport Commission 2008).</p> <p>Refer Waste Classification Guidelines (DECCW, 2009) for further detail on hazardous waste material classes.</p>	<p>Hazardous waste: If the waste is hazardous waste then contact the Environment Manager. Hazardous waste must be disposed of at a facility licenced to take that waste type.</p> <p>Hazardous waste must be transported by a licenced transporter. Evidence of appropriate disposal, including quantities, must be provided to the Environment Manager.</p>

Step 6	
Determining a waste's classification using chemical assessment?	Reuse, Recycling, Disposal options
<p>Where a material cannot be easily classified as:</p> <ul style="list-style-type: none"> ▪ a special, liquid, or pre-classified waste, or ▪ a waste possessing hazardous characteristics, or ▪ the composition of the material is not known, <p>it is to be chemically assessed to determine its classification. A licensed contractor will be engaged do this.</p>	<p>If the material cannot be easily classified, contact the Environment Manager.</p> <p>The Environment Manager will determine if waste classification using chemical assessment is required.</p> <p>The chemical assessment will be undertaken by a specialist consultant who will provide a waste classification for the material as well as Reuse/ Recycling/ Disposal options.</p>
Step 7	
Determining a waste's classification using chemical assessment?	Reuse, Recycling, Disposal options
<p>Where chemical assessment of a waste results in classification of the waste as general solid waste, further assessment may be undertaken to determine whether the waste can be classified as 'general solid waste (putrescible)' or 'general solid waste (non-putrescible)'.</p> <p>The activities identified in Step 4 shall be followed for material classified as 'general solid waste (putrescible)' or 'general solid waste (non-putrescible)'.</p>	<p>Refer Step 4.</p>

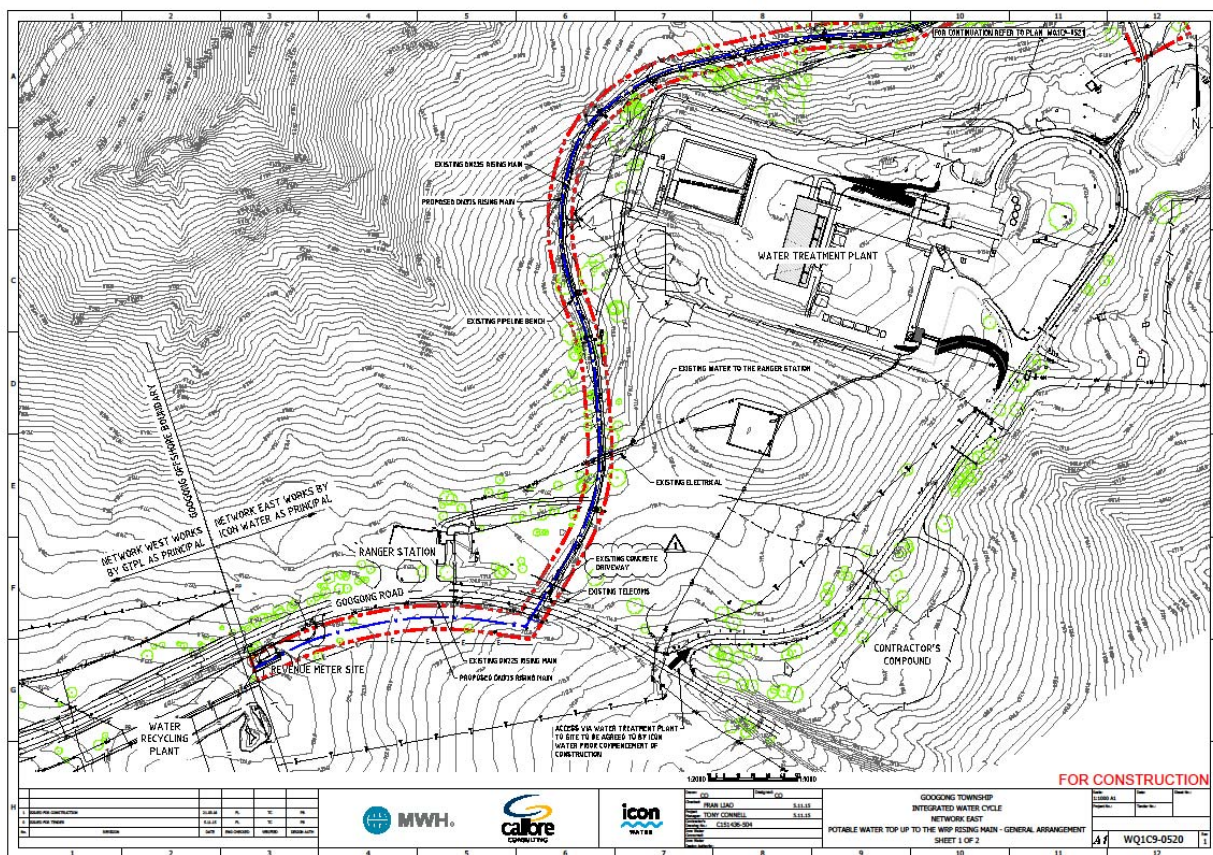
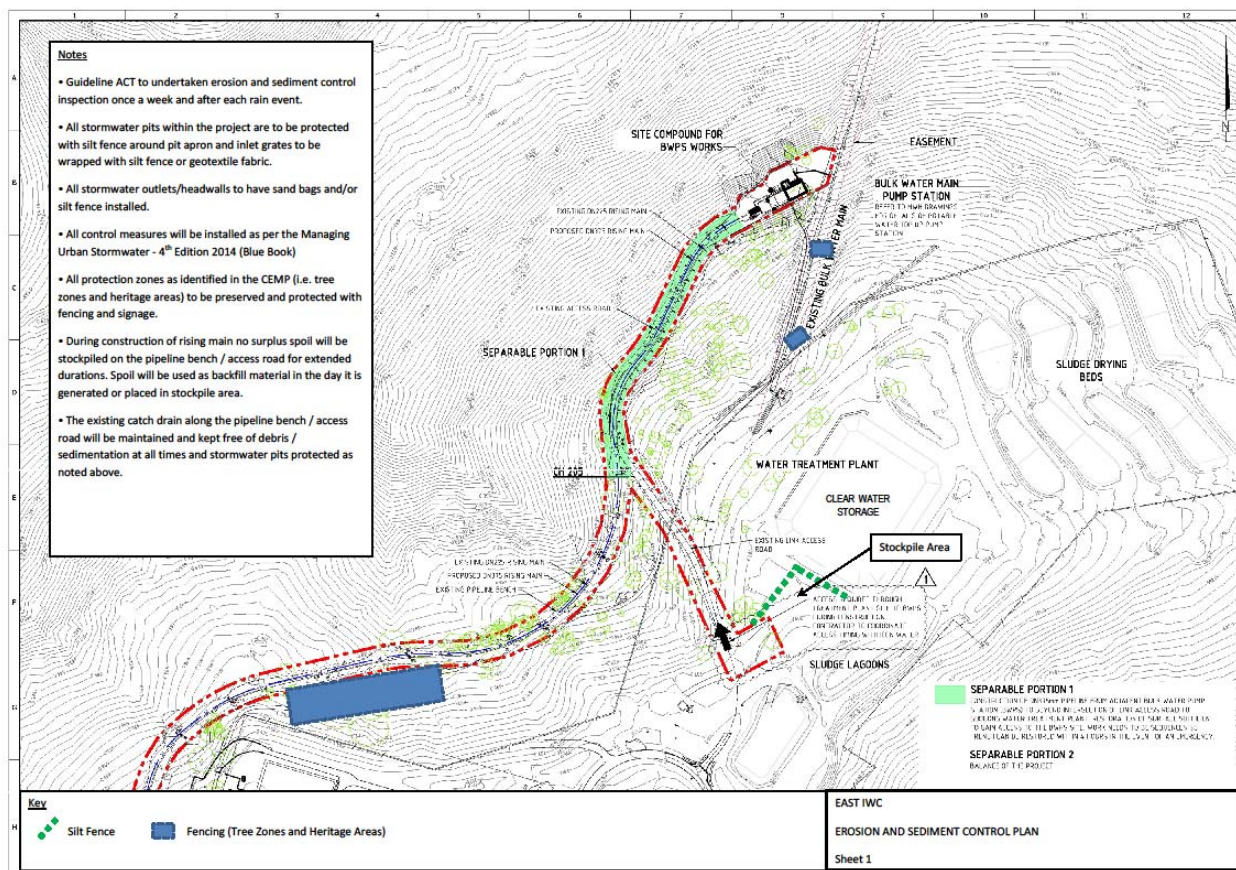
Appendix 7

Environmental constraints map



Appendix 8

Example Environmental Control Plan



Appendix 9

Risk register

Introduction

The environmental risk assessment has been performed in accordance with the principles of AS/NZS 4360:2004. This risk assessment was used to confirm the key issues and identify the scope of environmental impact mitigation and management measures required for construction of Stage C Network East.

The risk assessment focused on the following issues, as identified in the Statement of Environmental Effects (SEE):

- Water quality and hydrology.
- Soils.
- Groundwater.
- Ecology.
- Heritage.
- Traffic and access.
- Waste.
- Air quality
- Noise and vibration.
- Hazards and risk.
- Visual amenity.
- Socio-economic.
- Community.
- Utilities and services.
- Incident management.
- Legislative approvals.

For each issue, associated risks (impacts) have been identified. The relative level of risk was assessed and ranked using the risk analysis matrix presented below. Each environmental risk is categorised based on:

- The environmental aspect.
- Relative scale of the potential impact (refer Table 2).
- Type of potential impact.
- Likelihood of occurrence (refer Table 3).

Table 2 Risk assessment consequence definitions

Consequence level	Definition
Extreme	<ul style="list-style-type: none"> ▪ Would result in a major prosecution under relevant environmental legislation. ▪ Would cause long-term and irreversible impacts.
Major	<ul style="list-style-type: none"> ▪ Would result in a fine or equivalent under relevant environmental legislation. ▪ Would cause medium-long-term, potentially irreversible impacts.
Moderate	<ul style="list-style-type: none"> ▪ Would result in a medium-term, reversible impact.
Minor	<ul style="list-style-type: none"> ▪ Would result in short-term, reversible impact.

Consequence level	Definition
Insignificant	<ul style="list-style-type: none"> Would not result in any perceptible impacts.

Table 3 Risk assessment likelihood definitions

Likelihood level	Definition
Almost certain	The impact is expected to occur in most circumstances.
Likely	The impact will probably occur in most circumstances.
Possible	The impact will probably occur at some time.
Unlikely	The impact could occur at some time.
Rare	The impact may only occur in exceptional circumstances.

Table 4 Risk matrix

Likelihood	Consequences				
	Insignificant	Minor	Moderate	Major	Extreme
Almost certain	Significant	Significant	High	High	High
Likely	Moderate	Significant	Significant	High	High
Possible	Low	Moderate	Significant	Significant	High
Unlikely	Low	Low	Moderate	Moderate	Significant
Rare	Low	Low	Low	Moderate	Moderate

The risk rankings identified are documented in Table 5 and were used to develop the impact mitigation and management strategies for the CEMP and management plans and procedures.

Risk assessment results

Table 5 outlines the results from the environmental risk assessment by including the recognised risks and the associate risk rating before and after the implementation of the mitigation measures include in this CEMP and environmental management plans.

Table 5 Risk assessment results – before and after consideration of mitigation

Risk	Risk rating – before mitigation			Risk rating – after mitigation		
Water quality and hydrology						
Surface water quality impacts due to construction (dewatering, sediment runoff, chemical spills etc.).	Likely	Minor	Significant	Unlikely	Minor	Low
Unforeseen impacts upon water quality in the Googong Dam catchment.	Rare	Moderate	Low	Rare	Moderate	Low
Soils						
Expansive soils that exist in the area may create stability issues during construction.	Unlikely	Minor	Low	Unlikely	Minor	Low
Contamination of land or soils due to chemical spills.	Possible	Minor	Moderate	Unlikely	Minor	Low
Increased soil erosion and potential for soil erosion due to disturbance of topsoil and loss of vegetation.	Possible	Minor	Moderate	Unlikely	Minor	Low
Failure to adequately identify contaminated soils results in impacts on surrounding environment once exposed.	Unlikely	Major	Moderate	Unlikely	Minor	Low
Groundwater						
Interception of groundwater without a license.	Possible	Major	Significant	Unlikely	Major	Moderate
Changes to groundwater flows and quality due to construction activities.	Possible	Minor	Moderate	Unlikely	Minor	Low
Ecology						
Removal of native vegetation including endangered ecological communities in addition to that already approved.	Unlikely	Major	Moderate	Rare	Major	Moderate
Impacts on threatened species (NSW/Commonwealth) in addition to that already approved.	Unlikely	Major	Moderate	Unlikely	Major	Moderate

Risk	Risk rating – before mitigation			Risk rating – after mitigation		
Native flora and fauna habitat loss in addition to that already approved.	Unlikely	Major	Moderate	Unlikely	Major	Moderate
Failure to adequately address environmentally sensitive areas in design and construction.	Unlikely	Major	Moderate	Unlikely	Major	Moderate
Encourage further migration of weeds (noxious and environmental).	Likely	Moderate	Significant	Unlikely	Moderate	Moderate
Wildlife entrapment in trenches.	Likely	Minor	Significant	Unlikely	Minor	Low
Increased vehicle/fauna interactions due to increased traffic.	Possible	Minor	Moderate	Unlikely	Minor	Low
Heritage						
Direct impacts on known items of significance during construction.	Likely	Major	High	Rare	Major	Moderate
Unforeseen impacts, including discovery and impacts on sites that are of cultural heritage or recreational value.	Possible	Major	Significant	Unlikely	Major	Moderate
Traffic and access						
Road diversion and/or temporary closure of roads. Impacts to road users.	Possible	Minor	Moderate	Unlikely	Minor	Low
Road diversion and/or temporary closure of roads. Impacts to private property access.	Unlikely	Minor	Low	Unlikely	Minor	Low
Waste						
Incorrect classification and / or inappropriate disposal of construction waste.	Likely	Moderate	Significant	Unlikely	Moderate	Moderate
Excessive waste from construction and general waste from construction camps.	Possible	Minor	Moderate	Unlikely	Minor	Low
Air quality						
Greenhouse gas emissions during construction (emissions from vehicles, plant and equipment).	Almost certain	Insignificant	Significant	Almost certain	Insignificant	Significant
Plant and equipment emissions affecting local air quality.	Unlikely	Minor	Low	Unlikely	Minor	Low
Dust from earthmoving equipment activities (vegetation clearing, wind erosion from stockpiling of excavated	Almost certain	Minor	Significant	Unlikely	Minor	Low

Risk	Risk rating – before mitigation			Risk rating – after mitigation		
material, etc.).						
Noise and vibration						
Working outside approved hours.	Likely	Minor	Significant	Unlikely	Minor	Low
Noise and vibration impacts.	Almost certain	Minor	Significant	Possible	Minor	Moderate
Hazards and risks						
Safety hazards and risks as a result of construction (bushfire, personal safety and security, chemical storage).	Possible	Extreme	High	Unlikely	Extreme	Significant
Visual amenity						
Inadequate site rehabilitation.	Possible	Minor	Moderate	Unlikely	Minor	Low
Temporary visual impacts (site compounds, works).	Possible	Insignificant	Low	Possible	Insignificant	Low
Socio-economic						
Impacts on recreational use at various nearby sites.	Possible	Minor	Moderate	Unlikely	Minor	Low
Community						
Inadequate / late response to community complaints	Likely	Moderate	Significant	Unlikely	Moderate	Moderate
Utilities and services						
Impacts and interruptions to utilities and services.	Unlikely	Major	Moderate	Unlikely	Minor	Low
Incident management						
Inadequate response to incident, including reporting requirements.	Likely	Major	High	Unlikely	Major	Moderate
Legislative approvals						
Carrying out activities inconsistent with conditions of Project Approval.	Likely	Major	High	Unlikely	Major	Moderate
Non-compliance with legislative requirements.	Likely	Major	High	Unlikely	Major	Moderate
Cumulative impacts						
Cumulative noise, dust, vegetation impacts as a result of Part 4 subdivision occurring concurrently.	Likely	Moderate	Significant	Unlikely	Moderate	Moderate

Appendix 10

Legal and other requirements

Act	Activity/aspect	Requirement	Reference	Applicability to the construction of Stage C Network East
General				
<i>Environmental Planning and Assessment Act 1979 (EP&A Act)</i>	All	Comply with the terms Minister for Planning's approval for the IWC Project.	S75W	The IWC Project has been granted a Concept Approval under Part 3A of the EP&A Act subject to Conditions of Approval (CoA). Stage C Network East has been granted a Project Approval under Part 4 of the EP&A Act subject to Conditions of Approval (CoA). The construction of Stage C Network East must comply with all CoA. Any changes not consistent with the IWC Concept Approval would require additional assessment and approval from the Minister or QPRC.
	BCA and Certification	The Proponent shall ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA. Notes: <ul style="list-style-type: none"> Under Part 4 of the EP&A Act, the Proponent is required to obtain construction and occupation certificates for the proposed building works; and Part 8 of the EP&A Regulation sets out the requirements for the certification of the project. 	Part 4	QPRC will provide the necessary construction/occupation certificates as part of their consent for the Project. The contractor will ensure that all new buildings and structures are constructed in accordance with the relevant requirements of the BCA and construction/occupation certificates.
Water				
<i>Water Management Act 2000 (WM Act)</i>	Water access and use.	Do not take water from a water source (a lake, river or estuary or place where water occurs naturally on or below the surface of the ground, and includes coastal waters) without an access licence. Do not use of water on land (unless supplied by a water utility, irrigation corporation etc. or in accordance with basic landholder rights) without a water use approval.	S56 S60A S89 S91A	The construction of Stage C Network East will be carried out consistent with the aims of the WM Act. It is not expected that groundwater will be intercepted during Stage C Network East construction works therefore it is not anticipated that a Water Access Licence under the WM Act will be required.
	Water management works	Do not construct/use a water supply work, drainage work or flood work without the appropriate approval.	S90 S91B S91C S91D	Consultation with Office of Environment and Heritage (OEH) / NSW Office of Water (NOW) will be undertaken where required, regarding works in and around waterways. No works on waterfront land are proposed as part of the Project.
	Waterfront land.	Do not deposit material, excavate, or remove material within	S91	

Act	Activity/aspect	Requirement	Reference	Applicability to the construction of Stage C Network East
		a watercourse bank, shore or bed, or on land 40 metres inland, or interfere with the likely flow of water to such a body, without a controlled activity approval.		Refer to Soil and Water Management Plan for water management requirements.
<i>Water Act 1912 (Water Act)</i> Note that this Act is being progressively repealed by the <i>Water Management Act 2000</i> .	Surface water	Obtain a licence or permit for construction or use of 'work' for purposes including the taking and using of water.	S21B	The Water Act does not apply, as the Stage C Network East site is located within a Water Sharing Plan area, and so <i>Water Management Act 2000</i> applies.
	Groundwater	Obtain a licence where interference with groundwater is likely to occur.	S112 S121A	The Water Act does not apply, as the Stage C Network East site is located within a Water Sharing Plan area, and so <i>Water Management Act 2000</i> applies.
<i>Protection of the Environment Operations Act 1997 (POEO Act)</i>	Water pollution	Do not cause water pollution (other than to a sewer), except in accordance with the conditions of any EPA licence.	S120	The construction of Stage C Network East will be carried out in accordance with the POEO Act, where relevant. An Environment Protection Licence is not required for construction of Stage C Network East. Refer to Soil and Water Management Plan for water management requirements.
<i>Local Government Act 1993 (LG Act)</i>	Construction and operate water and wastewater facilities	Construction and operate water and wastewater facilities.	S60 (local council)	Not relevant to Stage C Network East.
	Construction and operate water and wastewater facilities	Construction and operate water and wastewater facilities.	S68 (private sector)	Not relevant to Stage C Network East.
<i>Water Industry Competition Act 2006 (WIC Act)</i>	Construction and operate water and wastewater facilities	Obtain a Network operator's licence prior to construction for construction maintenance and operation of water industry infrastructure.		Not relevant to Stage C Network East.
Noise				
<i>Protection of the Environment Operations Act 1997</i>	Plant maintenance and operation	Do not operate plant if it emits noise caused by poor maintenance or operation.	S139	Construction of Stage C Network East will be carried out in accordance with the POEO Act, where relevant. Refer to Noise and Vibration Management Plan

Act	Activity/aspect	Requirement	Reference	Applicability to the construction of Stage C Network East
				for noise management requirements.
	Materials management	Do not cause noise by failing to properly and efficiently deal with materials.	S140	Construction of Stage C Network East will be carried out in accordance with the POEO Act, where relevant. Refer to Noise and Vibration Management Plan for noise management requirements.
Roads				
<i>Roads Act 1993</i>	Works and structures on public roads	Do not erect a structure or carry out a work in, on or over a public road, or dig up or disturb the surface of a public road, or remove or interfere with a structure, work or tree on a public road, or pump water into a public road from any land adjoining the road, or connect a road (whether public or private) to a classified road, otherwise than with the consent of the appropriate roads authority.	S138	Not relevant to Stage C Network East.
Contaminated land				
<i>Protection of the Environment Operations Act 1997</i>	Land pollution	Do not cause or permit land pollution other than under authority of a licence or regulation. It is however not a land pollution offence to place virgin excavated natural material or lawful pesticides and fertilisers on land, or by placing matter on land that has been notified to the EPA as an unlicensed landfill and which is operated in accordance with the regulations.	S142A – S142E	Construction of Stage C Network East will be carried out in accordance with the POEO Act, where relevant. Soil and water management measures are outlined in the Soil and Water Management Plan.
<i>Contaminated Land Management Act 1997 (CLM Act)</i>	Reporting contamination	Notify the EPA if: <ul style="list-style-type: none"> Contaminants exceed thresholds contained in guidelines or the regulations where contamination has entered or will foreseeably enter neighbouring land, the atmosphere, groundwater or surface water. Contaminants in soil are equal to or exceed guideline levels with respect to the current or approved use of the land. Contamination meets other criteria that may be prescribed by the regulations. 	S60	Construction of Stage C Network East will be carried out in accordance with the CLM Act, where relevant. Refer to Soil and Water Management Plan for contamination reporting requirements.
Biodiversity				
<i>Noxious Weeds Act 1993</i>	Weed control	As a private landowner, control noxious weeds on the land as required under the control category or categories	S12	Construction of Stage C Network East will be carried out in accordance with the <i>Noxious</i>

Act	Activity/aspect	Requirement	Reference	Applicability to the construction of Stage C Network East
		<p>specified in relation to the weeds concerned.</p> <p>Notify relevant control authority within 3 days of becoming aware (or ought reasonably to have known) that a notifiable weed (W1 weed) is on land.</p> <p>Must not scatter or cause to scatter notifiable weed material.</p>	<p>S16</p> <p>S30</p>	<p><i>Weeds Act 1993</i>, where relevant.</p> <p>Weed management measures are outlined in the Flora and Fauna Management Plan contained in Appendix 5.</p>
<i>National Parks and Wildlife Act 1974</i> (NPW Act)	Native fauna	Do not harm any animal that is of a threatened species population or ecological community, or its habitat except in accordance with a planning approval.	Part 8A	<p>Construction of Stage C Network East will be carried out in accordance with the NPW Act, where relevant.</p> <p>Fauna protection measures are outlined in the Flora and Fauna Management Plan contained in Appendix 5.</p>
		Do not harm critical habitat except as in accordance with a planning approval.	S98	<p>Construction of Stage C Network East will be carried out in accordance with the NPW Act, where relevant.</p> <p>Habitat protection measures are outlined in the Flora and Fauna Management Plan contained in Appendix 5.</p>
		Do not harm native fauna (other than listed unprotected fauna) except in accordance with a planning approval or licence.	S120	<p>Construction of Stage C Network East will be carried out in accordance with the NPW Act, where relevant.</p> <p>Fauna protection measures are outlined in the Flora and Fauna Management Plan contained in Appendix 5.</p>
	Flora and native vegetation conservation	Do not pick protected native plants without a licence.	S117 S131	<p>Construction of Stage C Network East will be carried out in accordance with the NPW Act, where relevant.</p> <p>Flora protection measures are outlined in the Flora and Fauna Management Plan contained in Appendix 5.</p>
<i>Native Vegetation Act 2003</i>	Flora and native vegetation conservation	Only clear native vegetation in accordance with a planning approval or property vegetation plan.	S12	<p>Construction of Stage C Network East will be carried out consistent with the aims of the Act and will consult with OEH where required, regarding clearing of native vegetation.</p> <p>Habitat protection measures are outlined in the Flora and Fauna Management Plan contained in Appendix 5.</p>

Act	Activity/aspect	Requirement	Reference	Applicability to the construction of Stage C Network East
<i>Fisheries Management Act 1994 (FM Act)</i>	Dredging and reclamation	Do not carry out dredging or reclamation work except under the authority of a permit issued by the Minister.	S201	The IWC Project will be carried out in accordance with the <i>Fisheries Management Act 1994</i> , where relevant. No dredging or reclamation works are required for Stage C Network East works.
	Fish passage	Do not block fish passage without a permit	S219	The IWC Project will be carried out in accordance with the <i>Fisheries Management Act 1994</i> , where relevant. No blockage of fish passage is expected for Stage C Network East works.
<i>Environment Protection Biodiversity Conservation Act 1999 (Commonwealth) (EPBC Act)</i>	Flora and fauna conservation	Do not kill, injure or take a member of a listed threatened species without a permit.	Part 13	Construction of Stage C Network East will be carried out in accordance with the EPBC Act, where relevant. Flora and fauna protection measures are outlined in the Flora and Fauna Management Plan contained in Appendix 5.
		Comply with the terms of any EPBC Act approval for the project.		The IWC Project was approved on 19 May 2011 (EPBC 2011/5829). The approval is subject to conditions. Relevant conditions are addressed in the CEMP and Flora and Fauna Management Plan contained in Appendix 5.
Waste				
<i>Protection of the Environment Operations Act 1997</i>	Littering	Do not litter in a public place or an open private place. Do not litter from a vehicle. Only deposit advertising material in receptacles provided for mail or newspapers or under the door of the premises. Do not deposit advertising material on or in vehicles.	Part 5.6A	Construction of Stage C Network East will be carried out in accordance with the POEO Act, where relevant. Waste management measures are outlined in the Waste and Resource Management Plan.
	Waste and transportation	Do not undertake a scheduled waste activity unless in accordance with an environmental protection licence. A licence must be obtained when construction and demolition wastes are applied to land under certain circumstances. This includes the reincorporation of crushed road base material back into roads and the placing of excess fill material onto properties. A licence is not required if the	Part 3.2 Schedule 1	Due to the relatively small volume of spoil likely to be generated by the construction of Stage C Network East, it is unlikely that a licence to dispose of waste to landfill will be required. Spoil will be reused on site where possible. Construction of Stage C Network East will be carried out in accordance with the POEO Act,

Act	Activity/aspect	Requirement	Reference	Applicability to the construction of Stage C Network East
		material: <ul style="list-style-type: none"> ▪ Is VENM. ▪ Does not exceed 200 tonnes in the Sydney, Newcastle and Wollongong areas, or 20,000 tonnes outside these areas. ▪ Is covered by a 'general exemption'. Current exempted materials are ENM, recycled aggregates and raw mulch. These exemptions are conditional and require some chemical testing of materials before they are placed onto land. A licence must be obtained if more than 2,500 tonnes (or cubic metres) is stored on a stockpile site at any one time, or more than 30,000 tonnes of waste is received per year from off site.		where relevant.
		Only transport waste to a facility that can lawfully accept the waste.	S143	Construction of Stage C Network East will be carried out in accordance with the POEO Act, where relevant. Waste management measures are outlined in the Waste and Resource Management Plan.
		Do not dispose of waste in a manner that harms or is likely to harm the environment.	S115	Construction of Stage C Network East will be carried out in accordance with the POEO Act, where relevant. Waste management measures are outlined in the Waste and Resource Management Plan.
Protection of the Environment Operations (Waste) Regulation 2005	Waste and transportation	Comply with general requirements for the transport of waste. For example, any vehicle used by the person to transport waste must be kept in a clean condition and be maintained so as to prevent spillage of waste. For some wastes only licensed transporters can be used.	Regulation cl.49	Construction of Stage C Network East will be carried out in accordance with the POEO Act, where relevant. Waste management measures are outlined in the Waste and Resource Management Plan.
		Comply with record keeping requirements in relation to the transport of certain types of waste.	Regulation Part 3	Construction of Stage C Network East will be carried out in accordance with the POEO Act, where relevant. Waste management measures are outlined in the Waste and Resource Management Plan.

Act	Activity/aspect	Requirement	Reference	Applicability to the construction of Stage C Network East
Heritage				
<i>Heritage Act 1977 (Heritage Act)</i>	Heritage	Do not undertake an activity that will affect a place, building, work, relic, moveable object or precinct which is subject to an Interim Heritage Order or is listed on the State Heritage Register without approval from the Heritage Council.	S56-57	Construction of Stage C Network East will be carried out in accordance with the aims of the Heritage Act. Heritage management measures are outlined in the Heritage Management Plan contained in Appendix 5.
		Do not disturb or excavate land with knowledge or reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed; or Do not disturb or excavate land on where a relic has been discovered or exposed.	S139	Construction of Stage C Network East will be carried out in accordance with the aims of the Heritage Act. Heritage management measures are outlined in the Heritage Management Plan contained in Appendix 5.
		Notify the heritage Council on discovery of a relic.	S146	Under Section 146 of the Heritage Act the Heritage Council may need to be notified should a 'relic' be found which has not been previously identified in the REF. Reporting requirements are outlined in the Heritage Management Plan contained in Appendix 5.
<i>National Parks and Wildlife Act 1974</i>	Aboriginal places and objects	Do not harm or desecrate an Aboriginal object or Aboriginal place without consent.	S86 S90	Construction of Stage C Network East will be carried out in accordance with the NPW Act, where relevant. Heritage management measures are outlined in the Heritage Management Plan contained in Appendix 5.
		Notify the OEH and DP&E immediately of the location or discovery of all new or unrecorded Aboriginal objects.	S89A	Construction of Stage C Network East will be carried out in accordance with the NPW Act, where relevant. Heritage management measures are outlined in the Heritage Management Plan contained in Appendix 5.
<i>Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Commonwealth)</i>	Protection of areas and objects	Report any discovery of Aboriginal remains to the Federal Minister for the Sustainability, Environment, Water, Population and Communities.	S20	Construction of Stage C Network East will be carried out in accordance with the <i>Aboriginal and Torres Strait Islander Heritage Protection Act 1984</i> , where relevant.

Act	Activity/aspect	Requirement	Reference	Applicability to the construction of Stage C Network East
				Heritage management measures are outlined in the Heritage Management Plan contained in Appendix 5.
		Comply with the provisions of any declaration in relation to a significant Aboriginal area or object.	S22	Construction of Stage C Network East will comply with the provisions of any declaration in relation to a significant Aboriginal area or object. Heritage management measures are outlined in the Heritage Management Plan contained in Appendix 5.
General				
<i>Protection of the Environment Operations Act 1997</i>	Harming the environment	Do not risk harming the environment by wilfully or negligently: <ul style="list-style-type: none"> disposing of waste unlawfully. causing any substance to leak, spill or otherwise escape (whether or not from a container); or emitting an ozone depleting substance 	S115 S116 S117	Construction of Stage C Network East will be carried out in accordance with the POEO Act, where relevant.
	Control equipment	Properly and efficiently maintain and operate any installed pollution control equipment (including monitoring devices).	S167	Construction of Stage C Network East will be carried out in accordance with the POEO Act, where relevant.
	Notification of pollution incidents	Notify the EPA immediately of pollution incidents where material harm to the environment is caused or threatened.	S148	Construction of Stage C Network East will be carried out in accordance with the POEO Act, where relevant.
	Site licensing	Do not carry out or allow an activity listed in Schedule 1, or carry out work to enable such an activity, unless the premises are licensed by the EPA.	S47 S48	Construction of Stage C Network East will be carried out in accordance with the POEO Act, where relevant.
<i>Environmentally Hazardous Chemicals Act 1985</i>	Hazards and risks	Obtain a licence to undertake prescribed activities involving environmentally hazardous chemicals or declared chemical wastes. Codes of practice for the Storage and Handling of Corrosive substances is required.		Construction of Stage C Network East will be carried out in accordance with the <i>Environmentally Hazardous Chemicals Act 1985</i> , where relevant. Measures to manage hazards are outlined in the Work Health and Safety Management Plan.
<i>Dangerous Goods (Road and Rail Transport) Act 2008</i>	Hazards and risks	Ensure that dangerous goods are transported in a safe manner.	S9	Construction of Stage C Network East will be carried out in accordance with the <i>Dangerous Goods (Road and Rail Transport) Act 2008</i> , where relevant.

Act	Activity/aspect	Requirement	Reference	Applicability to the construction of Stage C Network East
				Measures to manage hazards are outlined in the Work Health and Safety Management Plan.
<i>Pesticides Act 1999</i>	Hazards and risks	<p>Use pesticides in an environmentally sensitive manner.</p> <p>Do not use an unregistered pesticide without a permit.</p> <p>Read the label or permit for the pesticide.</p> <p>Use registered pesticides in accordance with instructions on the label.</p> <p>Do not use any restricted pesticide unless authorised by a certificate of competency or a pesticide control order under the Act.</p> <p>Compliance with pesticide codes of practice is required.</p>	<p>S12</p> <p>S13</p> <p>S14</p> <p>S15</p> <p>S17</p>	<p>Construction of Stage C Network East will be carried out in accordance with the <i>Pesticides Act 1999</i>, where relevant.</p> <p>Measures to manage hazards are outlined in the Work Health and Safety Management Plan.</p>
<i>State Emergency and Rescue Management Act 1989</i>	Hazards and risks	Manage risks in emergency and/or maintenance situations at key infrastructure (in this case bush fire, flood or similar natural disaster) (SoC R2)		<p>Construction of Stage C Network East will be carried out in accordance with the <i>State Emergency and Rescue Management Act 1989</i> where relevant in relation to emergency preparedness and response.</p> <p>Measures to manage hazards are outlined in the Work Health and Safety Management Plan</p>
<i>Rural Fires Act 1997 and the Rural Fires Regulation 2002</i>	Hazards and risks	Manage risks in emergency and/or maintenance situations at key infrastructure (in this case bush fire, flood or similar natural disaster)		<p>Construction of Stage C Network East will be carried out in accordance with the <i>Rural Fires Act 1997</i> where relevant – in relation to emergency situation management.</p> <p>Measures to manage hazards are outlined in the Work Health and Safety Management Plan</p>
<i>National Greenhouse and Energy Reporting Act, 2007 and Regulations 2008</i>	Greenhouse gas emissions	Accounting and reporting of greenhouse gases produced and energy consumed during construction. Applicability dependent on thresholds.		<p>The National Greenhouse and Energy Reporting Act 2007 (the NGER Act) is a unified framework for the reporting of greenhouse gas emissions (GHGs) and energy use for significant corporation emitters of greater than 50kt CO₂-e and energy consumption of 200Tj.</p> <p>GTPL is not required to report under the NGERs Act as they do not meet the required threshold.</p>

Appendix 11

Environment policy

GUIDELINE ACT

Environmental Management Policy

Guideline ACT (GLA) is committed to continual improvement of its Environmental Management System.

The objectives which GLA will base its Environmental Management System on are:

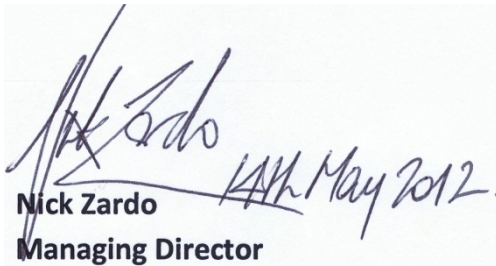
1. Comply with relevant environmental legislation, Environment Protection Authority licences, guidelines and any specific contract requirements,
2. Take all reasonable measures to stop erosion and sediment runoff, minimize dust and noise ensuring construction activities do not adversely affect the environment,
3. Respond promptly to any situation which could cause adverse environmental impacts,
4. Consider the environment in all aspects of operation at all levels including business decisions,
5. Support the principles of Ecologically Sustainable Design and construction practices,
6. Set environmental targets in terms of reportable environmental incidents at each management meeting and review the results.

Environmental compliance of the above objectives will be periodically reviewed. *GLA* aims to prevent problems from occurring and promote continuous improvement towards best practice in environmental management.

Appropriate training and instruction shall be provided to ensure that project staff understands how to implement the Environmental Policy and Management System. Staff members are encouraged to offer suggestions about how environmental protection measures can be improved. Such suggestions will be assessed by GLA management and implemented as appropriate.

GLA is open about its environmental policy and will make this policy statement available to all staff and on request to other relevant interested parties including the general public.

A signed copy of this Environmental Management Policy is displayed at Head Office and in each site office.



Nick Zardo
Managing Director

KAM May 2012.

The following is the CIC Corporate Environmental Policy, as adopted by Googong Township Proprietary Limited (GTPL).

CIC is committed to a high standard of environmental management practice. To achieve this objective any consultants or contractor engaged by CIC shall provide an Environmental Management Plan that covers the following requirements as appropriate;

The Consultant or Contractor must implement an Environment Management Plan that:

- Acknowledges the potential impact of activities, products or services on the environment;
- Includes an environmental policy that has the total support of management involved in the works;
- Has planning processes and procedures in place that have the capacity to identify possible environmental impacts;
- Has planning processes and procedures in place to develop mitigation measures to minimise environmental impacts;
- Establishes responsibilities and procedures for implementing required mitigation measures;
- Establishes systems and procedures to review the implementation process.
- Establishes a process of management review of systems and procedures that support the environmental policy and which will lead to continually improving performance.

Appendix 12

Monthly environmental report (template)

Scope

This monthly report is to be provided to GTPL monthly to track progress on environmental performance. The report is to include relevant details including but not limited to:

- Environmental inspections.
- Environmental monitoring.
- Environmental incidents.
- Environmental non-conformances.
- Environmental audits.
- Environmental reporting against licences, approvals, permits etc.
- Planned and completed notifications to the community regarding construction activities.
- Complaints and enquiries.
- Training.

Project description

Stage 2 of the IWC Project will be delivered in two sub stages in order to provide the appropriate IWC infrastructure to accommodate the size and growth of the Googong township. Therefore, Stage C is under development, with Stage D to be developed as demand requires in the future. Stage C has been further divided into three components, to facilitate project planning approvals, these being Stage C Network West (within Queanbeyan local government area (LGA)), Stage C Network East (within Palerang LGA) and Stage C WRP (within Queanbeyan LGA).

Googong IWC Stage C Network East works are located entirely within the Palerang LGA and include the following scope of work:

- Installation of a new underground DN375 potable water pressure main from the existing bulk water pumping station to the boundary with Queanbeyan LGA (where it will connect to potable water pressure main being developed as part of the Googong IWC Stage C Network West works). This main would run parallel to existing DN225 rising main from the bulk water pumping station and be located within the existing access road.
- Installation of an above ground metering station at the boundary between Queanbeyan LGA and Palerang LGA (adjacent to existing metering station).
- Upgrades to the bulk water pumping station (BWPS) would be undertaken within the existing boundary of the BWPS and would include:
 - Installation of a high voltage power conduit from an overhead supply to the BWPS.
 - Installation of BWPS block-work building and associated foundations complete with vehicle access and gantry crane.
 - Upgrades to the pump station, including installing two new pumps, all interconnecting pipes and valves.
 - Installation of a new transformer to replace the existing 100kva pole mounted transformer.
 - Discharge pipework and connection to pressure main.
 - Variable Speed Drive and starters for new pumps, to be located in existing Motor Control Centre building.

Reporting period

Period starting	Period ending

Scope of construction activities undertaken

Provide details on construction activities undertaken during the reporting period.

Area	Key activities (provide summary)

Environmental inspections

Provide details on environmental inspections undertaken during the reporting period.

Inspection type (e.g. weekly)	Date	Key issues (identify key issues identified and actions taken)	Outstanding issues (identify any outstanding issues)

Environmental monitoring

Provide details on environmental monitoring undertaken during the reporting period.

Monitoring type and location <i>(noise, vibration, water quality etc.)</i>	Date	Outcome <i>(identify any exceedances of criteria and provide explanation)</i>	Action taken <i>(identify any actions taken or further action required)</i>

Discussion of environmental monitoring results

- ... *(provide summary)*

Environmental incidents

Provide details on environmental incidents that occurred during the reporting period.

Incident type and location <i>(category of incident, location and extent)</i>	Date	Response <i>(identify extent of environmental impacts, response, reporting)</i>	Investigation <i>(identify requirements for / results of investigation and further action required)</i>

Environmental non-conformances

Identify non-conformances that occurred during the reporting period and review the non-conformance register to identify outstanding actions. Environmental incidents above are excluded from this section.

Non-conformance <i>(provide summary)</i>	Date	Status <i>(closed or open)</i>	Further action required <i>(provide summary)</i>

Environmental audits

Provide details on internal and external audits undertaken during the reporting period.

Audit type <i>(internal or external, provide details)</i>	Date	Undertaken by	Description	No. of non-conformances <i>(details above)</i>

Environmental reporting against licences, approvals, permits

Provide details on any other reporting undertaken during the reporting period e.g. relating to the Part 4 Project Approval, any other statutory licences or permits.

Licence, approval or permit details	Date	Reported to	Description

Completed construction notifications

Provide details of completed construction notifications undertaken during the reporting period.

Notification type	Date completed	Distributed/sent to	Description
E.g. Letter regarding blasting		Sent to sensitive receivers (list addresses) and QPRC	Letter regarding blasting activities that occurred on [date].

Planned construction notifications

Provide details of planned construction notifications for the upcoming reporting period.

Notification type	Date to be sent by	To be distributed/sent to	Description
E.g. Letter regarding blasting		Sent to sensitive receivers and QPRC	Letter regarding planned blasting activities to occur on [date].

Community complaints/enquiries

This section should provide a summary record of environmental complaints received during the reporting period and outline the response and status (open/closed).

All communication with other stakeholders/community should be recorded and provided to GTPL who will record in the IWC Project consultation manager database.

Complaint made by (list contact details)	Date of complaint	Issue raised (provide summary)	Actions taken (provide summary)	Date closed out

Training

Training type (<i>induction, toolbox talk, other</i>)	Date	Topics covered (<i>provide summary</i>)	No of personnel trained