



Roads and Maritime Services/Sydney Airport Corporation Limited

# Sydney Gateway Road Project

## Environmental Impact Statement/ Preliminary Draft Major Development Plan

Technical Working Paper 7  
Groundwater



November 2019

Roads and Maritime Services

# Sydney Gateway Road Project

## Technical Working Paper 7 – Groundwater



# SYD GATE WAY

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# Contents

Glossary	vii
1. Introduction	1
1.1 Overview	1
1.1.1 Sydney Gateway and the project	1
1.1.2 Overview of approval requirements	1
1.2 Purpose and scope of this report	3
1.3 The project	6
1.3.1 Location	6
1.3.2 Key design features	6
1.3.3 Construction overview	7
1.4 Structure of this report	10
2. Legislative and policy context	11
2.1 Commonwealth legislation	11
2.1.1 Airports Act 1996 and associated regulations	11
2.1.2 Airports (Environment Protection) Regulations 1997	12
2.1.3 Environment Protection and Biodiversity Conservation Act 1999	12
2.2 State legislation	13
2.2.1 Water Management Act 2000	13
2.2.2 NSW Aquifer Interference Policy	15
2.3 Policies and guidelines	16
2.3.1 NSW State Groundwater Policy Framework Document	16
2.3.2 National Water Quality Management Strategy	17
2.3.3 Approved Methods for the Sampling and Analysis of Water Pollutants in New South Wales	19
2.3.4 Risk Assessment Guidelines for Groundwater Dependent Ecosystems	19
2.3.5 Australian Groundwater Modelling Guidelines	19
3. Methodology	21
3.1 General	21
3.2 Desktop assessment	21
3.3 Field investigation	23
3.4 Assessment of impacts	24
3.4.1 Introduction	24
3.4.2 Criteria for undertaking assessment	25
3.4.3 Subsurface infrastructure	25
3.4.4 Groundwater modelling	29
3.4.5 Interpretation of modelling results	32
4. Existing environment	33
4.1 Climate	33
4.2 Topographical setting	34
4.3 Surface water features	35
4.4 Geology	37
4.4.1 Regional geology	37
4.4.2 Site geology	37
4.5 Soil landscape	39
4.6 Soil salinity	39





# Contents (continued)

4.7	Acid sulfate soils	40
4.7.1	Site investigation data	40
4.8	Hydrogeological conditions	42
4.8.1	Introduction	42
4.8.2	Aquifer parameters	42
4.8.3	Groundwater recharge	48
4.9	Groundwater elevations	48
4.9.1	Regional groundwater elevations	48
4.9.2	Temporal changes in groundwater elevations	55
4.10	Groundwater flow velocities	63
4.11	Registered groundwater users	64
4.12	Groundwater management	67
4.13	Water balance	68
4.13.1	Botany Sands	68
4.13.2	The Former Tempe Landfill site	69
4.14	Groundwater dependent ecosystems	69
4.15	Contaminated sites	69
4.16	Existing water quality	72
4.16.1	Historical activities impacting groundwater quality	72
4.16.2	Water quality criteria	72
4.16.3	Groundwater quality	73
4.16.4	Surface water quality	76
5.	Construction impacts	79
5.1	Summary of key findings	79
5.2	Predictions of inflow and radius of influence	80
5.2.1	Inflow rates	80
5.2.2	Radii of influence and capture zones	86
5.3	Groundwater drawdown	90
5.3.1	Water pressure changes	90
5.3.2	Water table changes	90
5.3.3	Settlement of unconsolidated sediments	90
5.4	Groundwater quality	92
5.4.1	Changes in water quality	92
5.5	Construction water balance	99
5.5.1	Changes in rainfall recharge to Botany Sands	99
5.5.2	Construction dewatering	99
5.6	Summary of impacts on Commonwealth land	101
5.7	Significance of impacts on Commonwealth land	101
6.	Operational impacts	103
6.1	Summary of key findings	103
6.2	Groundwater drawdown	103
6.3	Groundwater quality	104
6.3.1	Acid Sulfate Soils	104
6.3.2	Contaminated sites	104
6.3.3	General operational activities	104





# Contents (continued)

6.4	Water balance	105
6.5	Summary of impacts on Commonwealth land	105
6.6	Significance of impacts on Commonwealth land	105
7.	Cumulative impacts	107
7.1	Botany Rail Duplication	107
7.2	New M5 Project	107
7.3	M4-M5 Link	107
	7.3.1 WestConnex Enabling works – Airport East project	109
	7.3.2 WestConnex Enabling works – Airport North project	109
7.4	Summary	110
8.	Recommended mitigation measures	111
8.1	Construction	111
	8.1.1 Mitigating potential impacts from drawdown	111
	8.1.2 Mitigating potential impacts to water quality	112
	8.1.3 Excavation water management	113
8.2	Operation	114
	8.2.1 Former Tempe landfill	114
	8.2.2 Mitigating groundwater drawdown impacts	115
	8.2.3 Mitigating potential impacts to water quality	115
8.3	Proposed monitoring	115
	8.3.1 Baseline monitoring	115
	8.3.2 Construction monitoring	116
	8.3.3 Post construction and operational monitoring	117
9.	Conclusion	119
10.	References	121





## List of tables

Table 1-1	SEARs relevant to this assessment	3
Table 1-2	MDP requirements relevant to this assessment	6
Table 1-3	Construction work phases	7
Table 3-1	Key data sources	22
Table 4-1	Average rainfall (mm)	34
Table 4-2	Temperature (Temp) and evapotranspiration (ET)	34
Table 4-3	Acid sulfate soil classifications	40
Table 4-4	Hydraulic conductivity values derived from other investigations (m/day)	42
Table 4-5	Aquifer characteristics of the Botany Sands (Hatley, 2004)	43
Table 4-6	Summary statistics for wells screened within Botany Sands	44
Table 4-7	Hydraulic conductivity data within the Airport East project (EES, 2018)	44
Table 4-8	Hydraulic conductivity data within Alexandria landfill (AECOM, 2015b)	45
Table 4-9	Hydraulic conductivity data within the former Tempe landfill (Coffey, 2003)	45
Table 4-10	Hydraulic conductivity data for the project	46
Table 4-11	Key groundwater monitoring wells – continuous monitoring	49
Table 4-12	Key groundwater monitoring wells screened within the Botany Sands and alluvium aquifers– spot recording	50
Table 4-13	Sydney Gateway groundwater elevation data loggers	61
Table 4-14	Wells near Alexandra Canal	62
Table 4-15	Estimated groundwater flow velocities	63
Table 4-16	Registered groundwater users within one kilometre of the project site (BOM, 2019)	64
Table 4-17	Existing water balance – Botany Sands	68
Table 4-18	Regulated and notified contaminated sites	69
Table 5-1	Groundwater drawdown modelling results	81
Table 5-2	Damage classification - Typical values for maximum building slope and settlement for damage risk assessment based on AS 2870:2011 and CIRIA (1996)	91
Table 5-3	Preliminary settlement estimate due to groundwater drawdown	92
Table 5-4	Water quality exceedances for excavations intersecting groundwater	95





## List of figures

Figure 1-1	The project	2
Figure 1-2	Construction footprint and facilities	9
Figure 3-1	Key infrastructure intersecting groundwater – Area A, B, C	27
Figure 3-2	Key infrastructure intersecting groundwater – Area D	28
Figure 3-3	Conceptual diagram of excavation for calculation	30
Figure 4-1	Rainfall and cumulative rainfall deviation for weather station Sydney Airport	33
Figure 4-2	Surface water features	36
Figure 4-3	Regional geology	38
Figure 4-4	Acid sulfate soil exceedances	41
Figure 4-5	Hydraulic conductivity – unconsolidated aquifers	47
Figure 4-6	Regional groundwater flow	52
Figure 4-7	Regional groundwater elevations	53
Figure 4-8	Project groundwater elevations	54
Figure 4-9	NSW DoI – continuous monitoring bores (1999 to 2015)	56
Figure 4-10	Monthly groundwater elevations (mAHD) and monthly rainfall (1999-2015) (DoI Water continuous monitoring wells)	57
Figure 4-11	Monthly groundwater elevations (mAHD) and Cumulative rainfall deviation (1999-2015) (DoI Water continuous monitoring wells)	58
Figure 4-12	Historical monitoring wells	59
Figure 4-13	Location of Tempe landfill monitoring wells	60
Figure 4-14	Registered groundwater users within 1 km of Project Site	66
Figure 4-15	Water Restrictions Order areas (NSW Department of Industry, 2018)	67
Figure 4-16	Contaminated sites	71
Figure 4-17	Surface water sampling locations	78
Figure 5-1	Construction idealised conceptual site model	85
Figure 5-2	Area A – radius of drawdown Influence	87
Figure 5-3	Area B and Area C – radius of drawdown Influence	88
Figure 5-4	Area D – radius of drawdown Influence	89
Figure 5-5	Estimated groundwater take for construction dewatering	100
Figure 7-1	Cumulative impact from the M4-M5 Link and New M5 relating to the Sydney Gateway road project (from HydroSimulations 2017)	108

## List of appendices

Appendix A	Field investigation summary
Appendix B	Groundwater quality summary tables
Appendix C	Model calculations
Appendix D	Bore and well installation logs







# Glossary

ADWG	Australian Drinking Water Guidelines
AEPR	Airports (Environment Protection) Regulation 1997
AHD	Australian height datum
AIP	NSW Aquifer Interference Policy
ANZECC	Australian and New Zealand Environment Conservation Council
ANZG	Australian and New Zealand Guidelines
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
ARTC	Australian Rail Track Corporation
ASRIS	Australian Soil Resource Information System
ASS	Acid Sulfate Soils
BOM	Bureau of Meteorology
BSAL	Biophysical Strategic Agricultural Land
BTEX	Benzene, toluene, ethylbenzene and total xylenes
CEMP	Construction Environment Management Plan
CLM Act	<i>NSW Contaminated Land Management Act</i>
CRD	Cumulative rainfall deviation
D&C	Design and Construct
D&SRP	Design and Sustainability Review Panel
DLWC	Department of Land and Water Conservation
DoI	NSW Department of Industry
DPI	Department of Primary Industries
EC	Electrical conductivity
EIS	Environmental impact statement
EMP	Environmental Management Plan
EPA	NSW Environment Protection Authority
EP&A Act	<i>NSW Environmental Planning &amp; Assessment Act 1979</i>
EPBC	Environment Protection and Biodiversity Conservation Act 1999 (Cth)
GDE	Groundwater dependent ecosystem
GMP	Groundwater Management Plan
Groundwater Take	Refers to the 'take' of groundwater from a groundwater resource defined in a relevant water sharing plan. For this assessment, the take of groundwater relates to construction dewatering.
GWL	Groundwater level
ISCA	Infrastructure Sustainability Council of Australia
JOSH	Joint Oil Storage Facility





JUHI	Joint User Hydrant Installation
L/s	Litres per second
LC	Likely case
LEP	Local Environmental Plan
LNAPL	Light non-aqueous phase liquid
LTADEL	Long-term Annual Average Extraction Limit
m/day	Metres per day
m <sup>3</sup> /day	Cubic metres per day
mAHD	Metres Australian Height Datum
mBGL	Metres below ground level
MDP	Major Development Plan
mg/L	Milligrams per litre
mm	millimetres
NEMP	National Environmental Management Plan
NEPM	National Environment Protection Measure
NES	National Environmental Significance
NSW WQO	NSW Water Quality Objectives
NWQMS	National Water Quality Management Strategy
OCP	Organochlorine Pesticides
OEMP	Operational Environment Management Plan
OPP	Organophosphate pesticides
PAH	Polycyclic aromatic hydrocarbons
PASS	Potential Acid Sulfate Soils
PEA	Preliminary Environmental Assessment
PFAS	Per- and poly-fluoroalkyl substances
PFOS + PFHxS	Perfluorooctane sulfonate + perfluorohexane sulfonate
PMP	Project Management Plan
Project (The project)	Sydney Gateway road project
QA	Quality Assurance
QC	Quality Control
QMP	Quality Management Plan
RAMS&E	Reliability, Availability, Maintainability, Safety and Environment
RMS	NSW Roads and Maritime Services
Radius of Influence	Maximum distance at which the groundwater drawdown can be detected
Roads and Maritime	NSW Roads and Maritime Services
RW	Retaining Wall
RWC	Reasonable worst case





Sydney Airport Corporation	Sydney Airport Corporation Limited
SEARs	Secretary's environmental assessment requirements
TDS	Total dissolved solids
TOC	Top of casing
TOPA	Total oxidisable precursor assay
TPH	Total petroleum hydrocarbons
TRH	Total recoverable hydrocarbons
VOC	Volatile organic compounds
VWP	Vibrating wire piezometer
WAL	Water Access Licence
WQOs	Water Quality Objectives
WSP	Water Sharing Plan
WCXAEP	WestConnex Enabling Works Airport East Precinct







# 1. Introduction

## 1.1 Overview

### 1.1.1 Sydney Gateway and the project

Sydney Kingsford Smith Airport (Sydney Airport) and Port Botany are two of Australia's most important infrastructure assets, providing essential domestic and international connectivity for people and goods. Together they form a strategic centre, which is set to grow significantly over the next 20 years. To support this growth, employees, residents, visitors and businesses need reliable access to the airport and port, and efficient connections to Sydney's other strategic centres.

The NSW and Australian governments are making major investments in the transport network to achieve this vision. New road and freight rail options are being investigated to cater for the forecast growth in passengers and freight through Sydney Airport and Port Botany. Part of this solution is Sydney Gateway, which comprises the following road and rail projects:

- Sydney Gateway road project (the subject of this assessment)
- Botany Rail Duplication.

Sydney Gateway will expand and improve the road and freight rail networks to Sydney Airport and Port Botany to keep Sydney moving and growing. The Sydney Gateway road project forms part of the NSW Government's long-term strategy to invest in an integrated transport network and make journeys easier, safer and faster.

Roads and Maritime Services (Roads and Maritime) and Sydney Airport Corporation propose the Sydney Gateway road project (the project). The project comprises new direct high capacity road connections linking the Sydney motorway network at St Peters interchange with Sydney Airport's terminals and beyond. It involves constructing and operating new and upgraded sections of road connecting to the airport terminals, four new bridges over Alexandra Canal, and other operational infrastructure and road connections.

The project and its location is shown below in Figure 1-1.

### 1.1.2 Overview of approval requirements

- The project is subject to approval under NSW and Commonwealth legislation. Parts of the project located on Commonwealth-owned land leased to Sydney Airport (Sydney Airport land) are subject to the Commonwealth *Airports Act 1996* (the Airports Act). In accordance with the Airports Act, these parts of the project are major airport development. A major development plan (MDP), approved by the Australian Minister for Infrastructure, Transport and Regional Development, is required before a major airport development can be undertaken at a leased airport
- Parts of the project located on other land are State significant infrastructure in accordance with the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). As State significant infrastructure, these parts of the project require approval from the NSW Minister for Planning and Public Spaces. An environmental impact statement (EIS) is required to support the application for approval for State significant infrastructure under the EP&A Act
- A combined EIS and preliminary draft MDP is being prepared to:
  - Support the application for approval of the project in accordance with NSW and Commonwealth legislative requirements
  - Address the environmental assessment requirements of the Secretary of the Department of Planning and Environment (the SEARs), issued on 15 February 2019
  - Address the MDP requirements defined by section 91 of the Airports Act.

This report was prepared on behalf of Roads and Maritime and Sydney Airport Corporation to support the combined EIS/preliminary draft MDP.



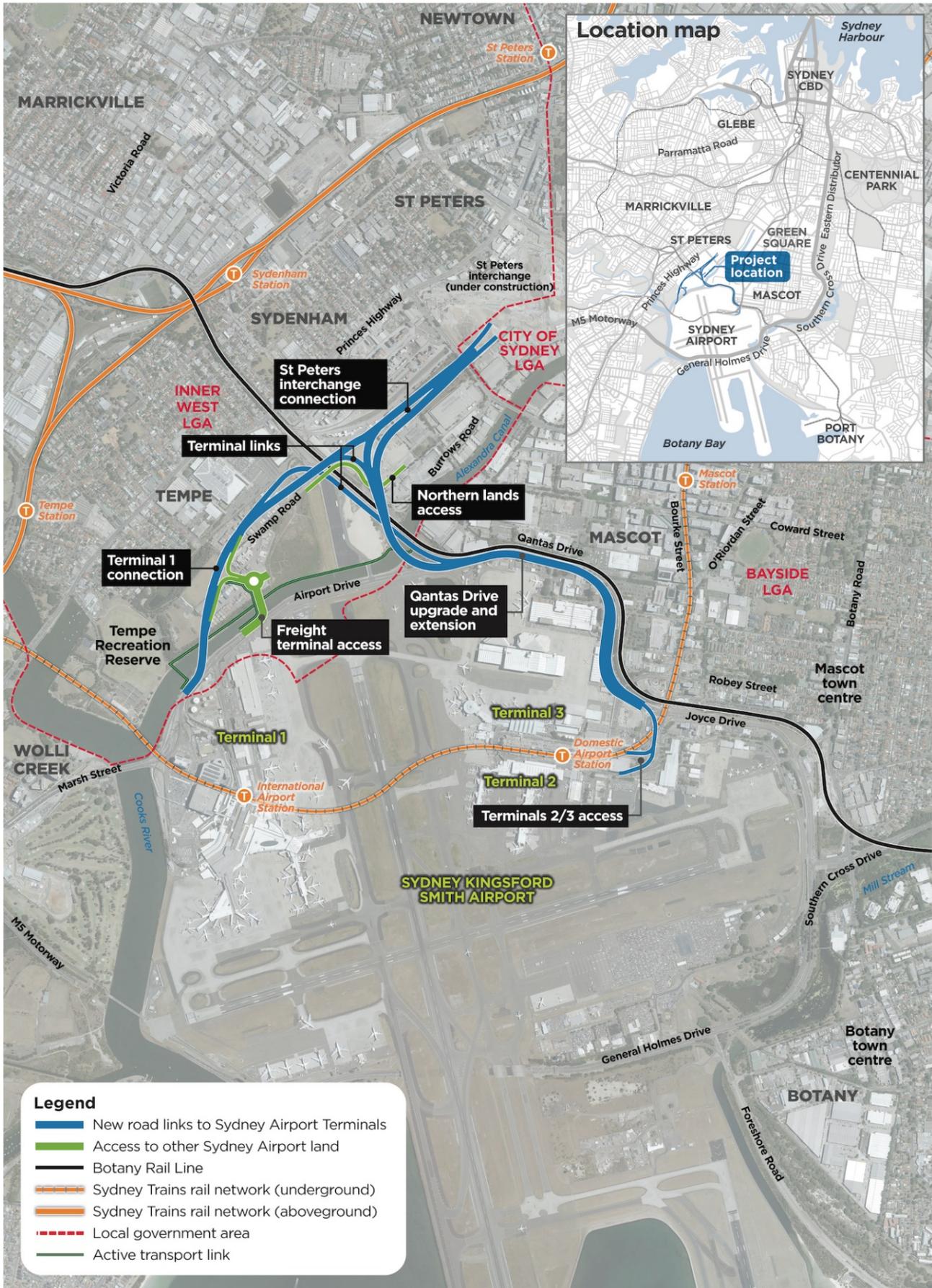


Figure 1-1 The project





## 1.2 Purpose and scope of this report

The purpose of this report is to assess the potential groundwater impacts from constructing and operating the project. This assessment addresses the relevant SEARs, the MDP requirements according to the Airports Act and the requirements of relevant agencies, as outlined in Table 1-1 and Table 1-2. The report:

- Describes the existing regional and local hydrogeological environment
- Assesses the impacts of constructing and operating the project on groundwater
- Recommends measures to mitigate the impacts identified for construction and operation.

Table 1-1 SEARs relevant to this assessment

Requirements	Where addressed in this report
<b>10. Water – Hydrology</b>	
1. The Proponent must describe (and map) the existing hydrological regime for any surface and groundwater resource (including reliance by users and for ecological purposes) likely to be impacted by the project, including rivers, streams, estuaries and wetlands as described in the BAM.	Section 4
2. The Proponent must prepare a detailed water balance for ground and surface water including the proposed intake from all water supply options and discharge locations (including figures showing these locations), volume, frequency, duration and proposed water conservation measures for both the construction and operation of the proposal.	Sections 4.13, 5.5 and 6.4
3. The Proponent must assess (and model if appropriate) the impact of the construction and operation of the project and any ancillary facilities (both built elements and discharges) on surface and groundwater hydrology in accordance with the current guidelines, including: <ul style="list-style-type: none"> <li>a) natural processes within rivers, wetlands, estuaries, marine waters and floodplains that affect the health of the fluvial, riparian, estuarine or marine system and landscape health (such as modified discharge volumes, durations and velocities), aquatic connectivity and access to habitat for spawning and refuge;</li> <li>b) impacts from any permanent and temporary interruption of groundwater flow, including the extent of drawdown, barriers to flows, implications for groundwater dependent surface flows, ecosystems and species, groundwater users and the potential for settlement;</li> <li>c) changes to environmental water availability and flows, both regulated/licensed and unregulated/rules-based sources;</li> <li>d) direct or indirect increases in erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses;</li> <li>e) minimising the effects of proposed stormwater and wastewater management during construction and operation on natural hydrological attributes (such as volumes, flow rates, management methods and re-use options) and on the conveyance capacity of existing stormwater systems where discharges are proposed through such systems; and</li> <li>f) water take (direct or passive) from all surface and groundwater sources with estimates of annual volumes during construction and operation.</li> </ul>	Sections 1 and 5.6  Technical Working Paper 8 - Surface Water  Section 5.3  Sections 5.5 and 6.4  Technical Working Paper 8 – Surface Water and Technical Working Paper 14 – Biodiversity Development Assessment Report Section 8  Sections 5.5, 5.6, 6.2 and 6.4
4. The proponent must identify any requirements for baseline monitoring of hydrological attributes.	Technical Working Paper 8 – Surface Water
5. The assessment must include details of proposed surface and groundwater monitoring.	Section 8  Technical Working Paper 8 – Surface Water





Requirements	Where addressed in this report
<b>11. Water Quality</b>	
<p><b>6. The Proponent must:</b></p> <ul style="list-style-type: none"> <li>a) Describe the background conditions for any surface and groundwater resources likely to be affected by the proposal including leachate from Tempe Tip;</li> <li>b) state the ambient NSW Water Quality Objectives (NSW WQO) and environmental values for the receiving waters relevant to the project, including the indicators and associated trigger values or criteria for the identified environmental values;</li> <li>c) identify and estimate the quality and quantity of all pollutants that may be introduced into the water cycle by source and discharge point and describe the nature and degree of impact that any discharge(s) may have on the receiving environment, including consideration of all pollutants (including contaminated groundwater) that pose a risk of non-trivial harm to human health and the environment;</li> <li>d) assess the impacts of leachate generation from project related activities on the Tempe Tip Site and proposed measures for managing potential impacts during construction and operation;</li> <li>e) describe the proposed measures for treating and disposing of construction and operational wastewater flows;</li> <li>f) identify the rainfall event that the water quality protection measures will be designed to cope with;</li> <li>g) assess the significance of any identified impacts including consideration of the relevant ambient water quality outcomes;</li> <li>h) demonstrate how construction and operation of the project will, to the extent that the project can influence, ensure that:             <ul style="list-style-type: none"> <li>i) where the NSW WQOs for receiving waters are currently being met they will continue to be protected; and</li> <li>ii) where the NSW WQOs are not currently being met, activities will work toward their achievement over time;</li> </ul> </li> <li>i) justify, if required, why the WQOs cannot be maintained or achieved over time;</li> <li>j) demonstrate that all practical measures to avoid or minimise water pollution and protect human health and the environment from harm are investigated and implemented;</li> <li>k) identify sensitive receiving environments (which may include estuarine and marine waters downstream) and develop a strategy to avoid or minimise impacts on these environments; and</li> <li>l) identify proposed monitoring locations, monitoring frequency and indicators of surface and groundwater quality.</li> </ul>	<p>Section 4</p> <p>Section 2.3.2 and Technical Working Paper 8 – Surface Water</p> <p>Sections 4.16, 5.4 and 6.3</p> <p>Sections 5.1, 5.4.1.4, 5.5.1, 7.2, 7.4, 8.1.1.1 and 8.2.1. Technical Working Paper 16 – Landfill Assessment.</p> <p>Section 8</p> <p>Technical Working Paper 6 – Hydrology and Flooding</p> <p>Sections 1 and 5.6</p> <p>Technical Working Paper 8 - Surface Water (also covers item 'i)' below)</p> <p>Section 8</p> <p>Sections 4 and 8</p> <p>Section 8.3</p>
<p><b>7. The assessment should consider the results of any current water quality studies, as available, for the catchment areas traversed by the proposal.</b></p>	<p>Section 4.16</p>





Requirements	Where addressed in this report
<b>12. Contamination</b>	
<p>1. The Proponent must assess the potential for contamination and any impacts associated with the management of contaminated soils and water resources including, but not limited to:</p> <ul style="list-style-type: none"> <li>a) a detailed assessment of the extent and nature of any contamination of the soil, groundwater and soil vapour including from activities on Tempe Tip and PFAS;</li> <li>b) an assessment of potential risks to human health and the environmental receptors in the vicinity of the site;</li> <li>c) a description and appraisal of any mitigation and monitoring measures; and</li> <li>d) consideration of whether the site is suitable for the proposed development.</li> </ul> <p>2. Any assessment of contamination must be in accordance with relevant guidelines produced or approved under the Contaminated Land Management Act 1997.</p> <p>3. All reports prepared for the assessment of contamination must be prepared, or reviewed and approved, by a consultant certified under either the Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil Science Australia Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM) scheme</p>	<p>Sections 4.15, 4.16, 5.4, 6.3 and 8.</p> <p>Technical Working Paper 2 – Contamination and Soils.</p> <p>Technical Working Paper 16 – Landfill Assessment.</p> <p>Section 2.2, 2.3, 4.16.2</p> <p>Technical Working Paper 2 – Contamination and Soils.</p>
<b>13. Soils</b>	
<p>1. The Proponent must assess the potential for contamination and any impacts associated with the management of contaminated soils and water resources including, but not limited to:</p> <ul style="list-style-type: none"> <li>a) a detailed assessment of the extent and nature of any contamination of the soil, groundwater and soil vapour including from activities on Tempe Tip and PFAS;</li> <li>b) an assessment of potential risks to human health and the environmental receptors in the vicinity of the site;</li> <li>c) a description and appraisal of any mitigation and monitoring measures; and</li> <li>d) consideration of whether the site is suitable for the proposed development.</li> </ul> <p>2. Any assessment of contamination must be in accordance with relevant guidelines produced or approved under the Contaminated Land Management Act 1997.</p> <p>3. All reports prepared for the assessment of contamination must be prepared, or reviewed and approved, by a consultant certified under either the Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil Science Australia Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM) scheme.</p> <p>4. The Proponent must assess whether the land is likely to be contaminated and identify if remediation of the land is required, having regard to the ecological and human health risks posed by the contamination in the context of past, existing and future land uses. Where assessment and/or remediation is required, the Proponent must document how the assessment and/or remediation would be undertaken in accordance with current guidelines.</p>	<p>Sections 4.15, 4.16, 5.4, 6.3 and 8.</p> <p>Technical Working Paper 2 – Contamination and Soils.</p> <p>Technical Working Paper 16 – Landfill Assessment.</p> <p>Section 2.2, 2.3, 4.16.2</p> <p>Technical Working Paper 2 – Contamination and Soils.</p> <p>Technical Working Paper 2 – Contamination and Soils.</p>





Table 1-2 MDP requirements relevant to this assessment

MDP key issues	Requirements	Where addressed in this report
Assessment of environmental impacts	(h) the airport-lessee company's assessment of the environmental impacts (groundwater) that might reasonably be expected to be associated with the development.	Sections 1, 5.6 and 7
Plans for dealing with environmental impacts	(j) the airport-lessee company's plans for dealing with the environmental impacts (groundwater) mentioned in paragraph (h) (including plans for ameliorating or preventing environmental impacts).	Section 8

## 1.3 The project

### 1.3.1 Location

The project is located about eight kilometres south of Sydney's central business district and to the north of Sydney Airport on both sides of Alexandra Canal. The northern extent of the project is located at St Peters interchange, which is currently being constructed to the north of Canal Road in St Peters. The western extent of the project is located near the entrance to Sydney Airport Terminal 1 on Airport Drive, to the north of the Giovanni Brunetti Bridge and south-west of Link Road. The eastern extent of the project is located near the intersection of Joyce Drive, Qantas Drive, O'Riordan Street and Sir Reginald Ansett Drive.

The project is located mainly on government-owned land in the suburbs of Tempe, St Peters and Mascot, in the Inner West, City of Sydney and Bayside local government areas.

### 1.3.2 Key design features

The project provides a number of linked road connections to facilitate the movement of traffic between the Sydney motorway network, Sydney Airport Terminal 1 (Terminal 1) and Sydney Airport Terminals 2 and 3 (Terminals 2/3). The project would connect Terminal 1 and Terminals 2/3 with each other and with the Sydney motorway network. The project would also facilitate the movement of traffic towards Port Botany via General Holmes Drive. It would provide three main routes for traffic:

- Between the Sydney motorway network and Terminal 1, and towards M5 motorway and Princes Highway
- Between the Sydney motorway network and Terminals 2/3, and towards General Holmes Drive, Port Botany and Southern Cross Drive
- Between Terminal 1 and Terminals 2/3.

The key features of the project include:

- Road links to provide access between the Sydney motorway network and Sydney Airport's terminals, consisting of the following components:
  - St Peters interchange connection – a new elevated section of road extending from St Peters interchange to the Botany Rail Line, including an overpass over Canal Road
  - Terminal 1 connection – a new section of road connecting Terminal 1 with the St Peters interchange connection, including a bridge over Alexandra Canal and an overpass over the Botany Rail Line
  - Qantas Drive upgrade and extension – widening and upgrading Qantas Drive to connect Terminals 2/3 with the St Peters interchange connection, including a high-level bridge over Alexandra Canal
  - Terminal links – two new sections of road connecting Terminal 1 and Terminals 2/3, including a bridge over Alexandra Canal
  - Terminals 2/3 access – a new elevated viaduct and overpass connecting Terminals 2/3 with the upgraded Qantas Drive





- Road links to provide access to Sydney Airport land:
  - A new section of road and an overpass connecting Sydney Airport’s northern lands either side of the Botany Rail Line (the northern lands)
  - A new section of road, including a signalised intersection with the Terminal 1 connection and a bridge connecting Sydney Airport’s existing and proposed freight facility either side of Alexandra Canal (the freight terminal access)
- An active transport link approximately 1.3 kilometres in length along the western side of Alexandra Canal to maintain connections between Sydney Airport, Mascot and the Sydney central business district
- Intersection upgrades or modifications
- Provision of operational ancillary infrastructure including maintenance bays, new and upgraded drainage infrastructure, signage and lighting, retaining walls, noise barriers, flood mitigation basin, utility works and landscaping.

### 1.3.3 Construction overview

A conceptual construction methodology has been developed based on the preliminary project design to be used as a basis for the environmental assessment process. Detailed construction planning, including programming, work methodologies, staging and work sequencing would be undertaken once construction contractor(s) have been engaged.

#### 1.3.3.1 Timing and work phases

Construction of the project would involve four main phases of work. The indicative construction activities within each phase are outlined below.

Table 1-3 Construction work phases

Phase	Indicative construction activities
Enabling works	<ul style="list-style-type: none"> <li>■ Construction of the temporary active transport link</li> <li>■ Modification of various road intersections to facilitate main construction works.</li> </ul>
Site establishment	<ul style="list-style-type: none"> <li>■ Installing site fencing, hoarding and signage</li> <li>■ Establishing construction compounds, work areas and site access routes.</li> </ul>
Main construction works	<ul style="list-style-type: none"> <li>■ Clearing/trimming of vegetation</li> <li>■ Removal (or partial removal) of a number of buildings and other existing infrastructure e.g. concrete hardstand areas, drainage infrastructure, sheds, advertising structures, containers, etc</li> <li>■ Roadworks, including bridge and viaduct construction and drainage works</li> <li>■ Utility works.</li> </ul>
Finishing works	<ul style="list-style-type: none"> <li>■ Erecting lighting, signage and street furniture, landscaping works and site demobilisation and rehabilitation in all areas.</li> </ul>





Specific construction issues which would require careful planning and management and close co-ordination with relevant stakeholders include:

- Works within the prescribed airspace of Sydney Airport
- Works interfacing with the Botany Rail Line
- Piling in the vicinity of the T8 Airport and South Line underground rail tunnels
- Works within the former Tempe landfill and Alexandra Canal which are subject to remediation orders and specific management plans
- Excavation, storage and handling of contaminated soils generally within the project site and contaminated groundwater from the Botany Sands Groundwater Source.

Construction is planned to start in mid 2020, subject to approval of the project, and is expected to take about three and a half years to complete. Further information on construction is provided in Chapter 8 (Construction) of the EIS.

The project would include work undertaken during recommended standard hours as defined by the *Interim Construction Noise Guideline* (DECC, 2009):

- Monday to Friday: 7am to 6pm
- Saturday: 8am to 1pm
- Sundays and public holidays: no work.

It would also include work outside these hours (out-of-hours work) to minimise the potential for aviation and rail safety hazards.

### 1.3.3.2 Construction footprint

The land required to construct the project (the construction footprint) is shown on Figure 1-2. The construction footprint includes the land needed to construct the proposed roadways, bridges and ancillary infrastructure and land required for the proposed construction compounds. Utility works to support the project would generally occur within the construction footprint; however, some works (such as connections to existing infrastructure) may be required outside the footprint.

### 1.3.3.3 Compounds, access and resources

Construction would be supported by five construction compounds located to support the main construction works (shown on Figure 1-2). Construction compounds would include site offices, staff amenities, storage and laydown areas, workshops and workforce parking areas.

Materials would be transported to and from work areas via construction haul routes, which have been selected to convey vehicles directly to the nearest arterial road.

The construction workforce requirements would vary over the construction period based the activities underway and the number of active work areas. The workforce is expected to peak at about 1,000 workers for a period of about 13 months, indicatively from the fourth quarter of 2021. Either side of this peak, workforce numbers are expected to reduce to about two thirds.



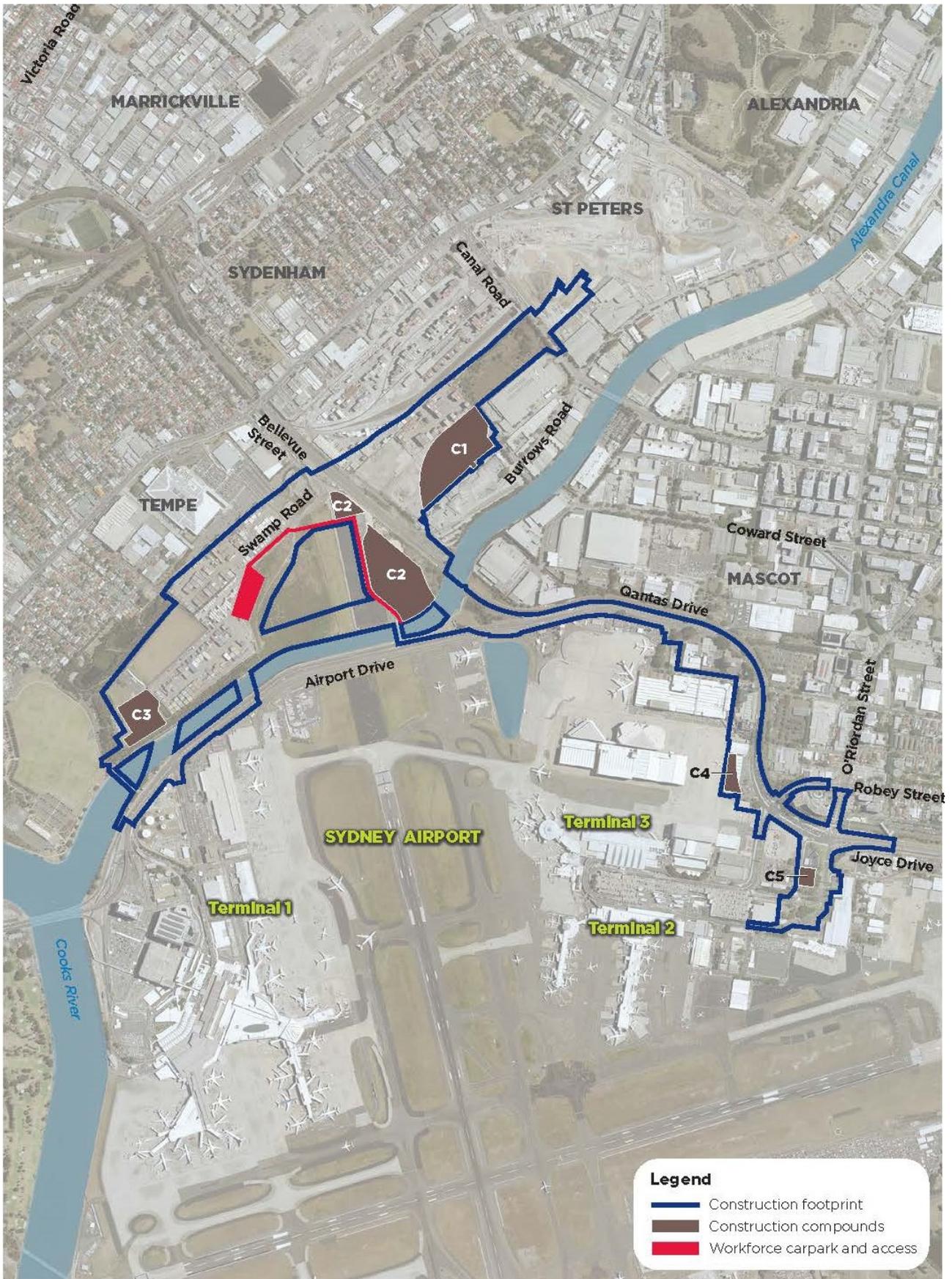


Figure 1-2 Construction footprint and facilities





## 1.4 Structure of this report

To appropriately describe the works undertaken for the groundwater impact assessment this report has been structured as follows:

- **Section 1 – Introduction** – Provides an introduction to the report and details the scope of work undertaken to address the project SEARs, MDP requirements and any potential groundwater impacts
- **Section 2 – Legislative and policy context** – Describes the legislative framework on which groundwater impacts are assessed in NSW and on Commonwealth land in Australia
- **Section 3 – Methodology** – Describes the methodology adopted for this assessment to characterise groundwater impacts
- **Section 4 – Existing environment** – Describes the current understanding of the existing environment
- **Section 5 – Construction impacts** – Interprets the modelling results relative to the receptors identified for construction of the project
- **Section 6 – Operational impacts** – Interprets the modelling results relative to the receptors identified for operation of the project
- **Section 7 – Cumulative impacts** – Details the combined impacts of all the stages of the project as well as other infrastructure projects that are occurring in the surrounding area
- **Section 8 – Recommended mitigation measures** – Details the measures that will be adopted and where possible the effect the mitigation measures have on reducing impacts, including a proposed monitoring program to assess the emergence of impacts
- **Section 9 – Conclusion** – Overview of the key findings of the report.





## 2. Legislative and policy context

### 2.1 Commonwealth legislation

#### 2.1.1 Airports Act 1996 and associated regulations

The project site includes areas of Commonwealth-owned land leased by Sydney Airport. The *Airports Act 1996* (the Airports Act) and associated regulations provide the assessment and approval process for development on Commonwealth-owned land for the operation of Sydney Airport.

Section 89 of the Airports Act specifies types of development that constitute 'major airport development'. A major development plan (MDP) approved by the Australian Minister for Infrastructure, Transport and Regional Development is required before major airport development can be undertaken at a leased airport.

The Airports Act and regulations are the statutory controls for ongoing regulation of development activities on Commonwealth-owned land leased from the Australian Government for the operation of Sydney Airport. Section 70 of the Airports Act requires there to be a final master plan for the airport that has been approved by the Australian Minister for Infrastructure, Transport and Regional Development.

Part 5 of the Act also requires that each airport develop an environment strategy which is included in its master plan. Once approved, Sydney Airport and all persons who carry out activities at the airport are obliged to take all reasonable steps to ensure compliance with the environment strategy.

##### 2.1.1.1 Sydney Airport Master Plan 2039

As part of the planning framework established by the Airports Act, airport operators are required to prepare a master plan for the coordinated development of their airport. Sydney Airport Master Plan 2039 (Master Plan 2039) outlines the strategic direction for Sydney Airport's operations and development over the next 20 years. It acknowledges that the continued growth of Sydney Airport is vital to achieving local, state and national employment, tourism and development objectives. In accordance with the requirements of the Airports Act, Master Plan 2039:

- Establishes the strategic direction for efficient and economic development at Sydney Airport over the planning period
- Provides for the development of additional uses of the Sydney Airport site
- Indicates to the public the intended uses of the Sydney Airport site
- Reduces potential conflicts between uses of the Sydney Airport site, to ensure that uses of the site are compatible with the areas surrounding the airport
- Ensures that operations at Sydney Airport are undertaken in accordance with relevant environmental legislation and standards
- Establishes a framework for assessing compliance with relevant environmental legislation and standards
- Promotes continual improvement of environmental management at Sydney Airport.

##### 2.1.1.2 Sydney Airport Environment Strategy 2019–2024

The Airports Act requires that airport operators provide an assessment of the environmental issues associated with implementing the airport master plan and the plan for dealing with those issues. This is documented in an environment strategy that forms part of the airport's master plan. The Sydney Airport Environment Strategy 2019–2024 (the Environment Strategy), which forms part of the Master Plan 2039, provides strategic direction for the environmental performance and management of Sydney Airport for the five year period between 2019 and 2024. The purpose of the Environment Strategy is to:





- Establish a framework for assessing compliance and ensuring that all operations at Sydney Airport are undertaken in accordance with relevant environmental legislation and standards
- Promote the continual improvement of environmental management and performance at Sydney Airport and build on the achievements and goals of previous strategies
- Realise improvements in environmental sustainability, by minimising Sydney Airport's environmental footprint and working towards a more efficient and resilient airport.

In the absence of relevant aquifer interference criteria in the environment strategy, this impact assessment has relied on the criteria in the NSW Aquifer Interference Policy (discussed in section 2.2.2).

### 2.1.2 Airports (Environment Protection) Regulations 1997

The objective of the Airports (Environment Protection) Regulations 1997 (the AEPR regulations) is to establish a system of regulation for activities at airports that generate or have potential to generate pollution or excessive noise. The regulations impose a general duty to prevent or minimise environmental pollution and have as one of their objects the promotion of improved environmental management practices at Commonwealth-leased airports. The regulations contain detailed provisions setting out:

- Definitions, acceptable limits and objectives for air, water and soil pollution, and offensive noise
- General duties to prevent or minimise pollution, preserve significant habitat and cultural areas, and to prevent offensive noise
- Monitoring and reporting requirements for existing pollution.

Part 2 of the regulations defines pollution in relation to air (including odour), water, soil and offensive noise. Schedules 1 to 4 of the regulations provide the acceptable limits of pollutants and offensive noise, which, in conjunction with other national environment protection measures, provide the system of environmental regulation at airports.

The trigger values for Schedule 2 water pollution acceptable limits for marine waters (AEPR GW) were considered as stormwater from the project would discharge into pipes that connect to Sydney Airport drainage system further downstream. However, since ultimately groundwater would discharge into Alexandra Canal and Botany Bay, not Commonwealth land, these trigger values are not directly applicable to groundwater contamination.

### 2.1.3 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is administered by the Australian Department of the Environment and Energy and provides a legal framework to protect and manage nationally important flora, fauna, ecological communities and heritage places defined as 'matters of national environmental significance'.

Under the EPBC Act, proposed actions (i.e. activities or projects) with the potential to significantly impact matters protected by the EPBC Act must be referred to the Australian Minister for the Environment to determine whether they are controlled actions, requiring approval from the Minister. The following matters are defined as protected matters by Part 3 of the EPBC Act:

- Matters of national environmental significance
- The environment of Commonwealth land
- The environment in general if they are being carried out by an Australian Government agency.

As part of the assessment of the preliminary draft MDP, the Department of Infrastructure, Transport, Cities and Regional Development will, on behalf of the Minister for Infrastructure, Transport and Regional Development, seek advice from the Australian Minister for the Environment under section 160(1) of the EPBC Act.

This report has been prepared in accordance with the EPBC Act guidelines and with respect to potential impacts on Commonwealth-owned land.





## 2.2 State legislation

### 2.2.1 Water Management Act 2000

The *Water Management Act 2000* (WM Act) is administered by the NSW Department of Industry (DoI) Water (NSW Office of Water) and is intended to ensure that water resources are conserved and properly managed for sustainable use benefitting both present and future generations. The WM Act is also intended to provide a formal means for the protection and enhancement of the environmental qualities of waterways and their in-stream uses as well as to provide for protection of catchment conditions. The intent and objectives of the WM Act have been considered as part of this assessment. Specific requirements of the WM Act applicable to this assessment are discussed further below.

#### 2.2.1.1 Water Sharing Plans

The WM Act requires the development of Water Sharing Plans (WSPs) to manage water use and access. WSPs aim to:

- Clarify the rights of the environment, basic landholder user rights, town water suppliers and other licensed users
- Define the long-term average annual extraction limit for water sources
- Set rules to manage impacts of extraction
- Facilitate the trading of water between users.

#### ***WSP for the Greater Metropolitan Region Groundwater Sources***

The project area is located within the Greater Metropolitan Region Unregulated River Water Sources – Southern Sydney Rivers.

The WSP for the Greater Metropolitan Region Groundwater Sources covers 13 groundwater sources on the east coast of NSW within and surrounding Sydney. The Sydney Gateway road project is located within the Botany Sands Groundwater Source.

The WSP provides a legislative basis for specifying available groundwater and sharing of the groundwater between the environment and the consumer. The WSP set rules for approving water access licences and water supply works. These rules generally specify distances between groundwater access licences and water supply works to other groundwater assets to minimise impact.

Generally, water access licences should not be granted:

- For any use other than:
  - Local water utility
  - Major water utility
  - Domestic stock
  - Town water supply
  - Aquifer (aboriginal cultural), up to 10 ML/yr
  - Commercial access licences under a controlled allocation order made in relation to any unassigned water in this water source
- For managing surface water connectivity:
  - For areas adjoining unregulated water sources (i.e. rivers and creeks), existing works within 40 metres of the top of the high bank of a river or creek will have conditions imposed related to flow class after year 7 of the plan.





Generally water supply works approvals should not be granted:

- For water supply works
  - Within 200 metres of an approved water supply work
  - Within 50 metres from a basic landholder rights water supply work
  - Within 50 metres from a property boundary
  - Within 300 metres from an approved water supply work nominated by a local water utility
  - Within 200 metres from a department observation bore
- For bore near contamination
  - Within 250 metres of contamination identified in the plan
  - 250–500 metres distance if there is no drawdown within 250 metres of contamination identified within the plan
  - A greater distance if there are other potential risks associated with contamination migration to the groundwater source
- For high priority groundwater dependent ecosystems identified in the plan
  - Less than 100 metres from bores used for basic landholder right
  - Less than 200 metres from bores used for all other access licenses
  - Less than 40 metres of a river or stream or lagoon (3<sup>rd</sup> order or above)
  - Less than 40 metres of a 1<sup>st</sup> or 2<sup>nd</sup> order stream, unless drilled into underlying parent material and isolated from the shallow aquifer system
- For groundwater dependent culturally significant sites as identified in the plan
  - Less than 100 metres from bores used for basic landholder right
  - Less than 200 metres from bores used for all other access licences.

Generally for the use of water supply works:

- The allocated licence volumes should not be exceeded in any one year for locations within 500 metres of contaminated sites.

As per clauses 21(1), 34 (1) and clause 2 of Schedule 4 of the Water Management Regulation 2018, Roads and Maritime is exempt from the requirement to obtain a water access licence or water supply works approval. As such these rules do not apply. The impacts to assets outlined above, however, have been assessed and managed as part of this groundwater technical paper by assessing impacts in accordance with the NSW Aquifer Interference Policy (Section 2.2.2).

### **Botany Sands Groundwater Source**

The project is located within the Botany Sands Groundwater Source. The NSW government has been managing the extraction of groundwater from this source, via a Temporary Water Restrictions Order, due to contamination issues (see section 1.1). In August 2003, an embargo was put in place on the northern part of the aquifer under section 113A of the *Water Act 1912* to prevent extraction. Then in June 2007, an embargo was placed on the rest of the aquifer to prevent additional commercial extraction. The groundwater source is now split into two management zones; Botany Management Zone 1 (covers the embargo area of 2003) and Botany Management Zone 2 (covers the embargo area of 2007). The project is mainly located in the Botany Management – Zone 2.

The Botany Sands Groundwater Source has a total estimated rainfall recharge of 30,424 ML/yr. Once planned water to sustain the environment is removed, the Botany Sands Groundwater Source has a long-term average annual extraction limit of 14,684 ML/year (groundwater available for allocation to groundwater access licences). Of this volume, 11,156 ML/yr is allocated to approximately 80 groundwater access licences (groundwater take), and only 3,528 ML/yr (9,665 m<sup>3</sup>/day) is unallocated. The groundwater extraction associated with construction and operation of the Sydney Gateway road project would potentially take additional groundwater from this source and need to be considered in the context of the available water and the impact on the environment.





### 2.2.1.2 Water licences and approvals

Roads and Maritime as a road authority is exempt from the requirement to hold a water access licence or water use approval for on-going take of groundwater as per clauses 21(1), 34 (1) and clause 2 of Schedule 4 of the Water Management Regulation 2018.

For this assessment the 'take' of groundwater primarily refers to extraction of groundwater from the groundwater resource defined in a relevant WSP as the Botany Sands Groundwater Source. For this assessment the take of groundwater from the Botany Sands primarily relates to construction dewatering, but also relates to groundwater recharge reduction.

Further to this, any monitoring bores, installed in accordance with the minimum bore construction requirements for water bores in Australia, for the purposes of monitoring water levels or water quality are exempt from the requirement to obtain a water supply works approval if:

- It is completed as part of a condition of an approval under division 5.2 Part 5, of the EP&A Act (State significant infrastructure)
- Well installation details and bore log information is provided to Water NSW within 60 days of completion of the water supply works.

Although a licence is not required for the project, Roads and Maritime inherently consider the requirements of licensing set out in the Greater Metropolitan Region Water Sharing Plan (see section 2.2.1.1) by addressing the approval requirements of the NSW Aquifer Interference Policy (see section 2.2.2) in this assessment.

Ongoing consultation with DoI Water is required to confirm extraction monitoring requirements.

### 2.2.2 NSW Aquifer Interference Policy

The NSW Aquifer Interference Policy (AIP) (NOW, 2012) was finalised in September 2012 and clarifies the water licensing and approval requirements for aquifer interference activities in NSW. Many aspects of this policy will be given legal effect in the future through the Water Management (General) Amendment (Aquifer Interference) Regulation 2011. This regulation is under the WM Act. The policy adopts the definition of aquifer interference from the WM Act which includes:

- The penetration of an aquifer
- The interference with water in an aquifer
- The obstruction of flow of water in an aquifer
- The taking of water from an aquifer in the course of carrying out mining or any other activity prescribed by the regulations
- The disposal of water taken from an aquifer in the course of carrying out mining or any other activity prescribed by the regulations.

The policy also indicates that an activity with the potential to contaminate groundwater is considered to be an aquifer interference activity.

The AIP states that aquifer interference approval will not be granted unless the "Minister is satisfied that adequate arrangements are in force to ensure that no more than minimal harm will be done to any water source, or its dependent ecosystems, as a consequence of being interfered with" by the activities the approval relates to.

The minimal impact criteria for the groundwater source are summarised below:

- With regard to the water table, impact is considered to be minimal where the water table change is less than 10 per cent of the cumulative variation in the water table 40 metres from any high priority groundwater dependent ecosystem (GDE) or high priority culturally significant site listed in the WSP. A high priority GDE has a high conservation value and is listed in the WSP. If an impact is greater than this, it must be demonstrated to the Minister administering the WM Act's satisfaction, that the variation will not prevent the long-term viability of a GDE of cultural significance. The WSP states there are three high priority GDEs within the Botany Sands Groundwater Source. This includes the Botany Wetlands, the Lachlan Swamps and Towra Point Estuarine Wetlands. The Botany Wetlands and the Lachlan Swamps are located two kilometres to the south-east of the project boundary. Towra Point is located on the southern side of Botany Bay





- With regard to the water table, impact is considered to be minimal where there is less than a cumulative two metre decline at any water supply work. If the impact is greater, make good provisions apply
- With regard to water pressure, impact is considered to be minimal where the cumulative decline in head is less than two metres at any water supply work. If the impact is greater, then further studies are required to satisfy the Minister that long-term viability of the affected water supply works will not be affected. Otherwise make good provisions will apply
- With regard to water quality, impact is considered to be minimal where the change in groundwater quality is within the current beneficial use category of the groundwater source beyond 40 metres from the activity. If this cannot be achieved, studies are required to demonstrate that the change would not prevent the long-term viability of the dependent ecosystem, or affected water supply works.

The assessment considers the potential impacts identified against the criteria outlined above.

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## 2.3 Policies and guidelines

### 2.3.1 NSW State Groundwater Policy Framework Document

The objective of the NSW State Groundwater Policy Framework Document (Department of Land and Water Conservation (DLWC), 1997) is to manage the State's groundwater resources so that they can sustain environmental, social and economic uses for the people of NSW. The NSW groundwater policy has three component parts:

- NSW Groundwater Quantity Protection Policy (DLWC, 1997a)
- NSW Groundwater Quality Protection Policy (DLWC, 1998)
- NSW Groundwater Dependent Ecosystems Policy (DLWC, 2002).

#### 2.3.1.1 NSW Groundwater Quantity Protection Policy

The principles of this policy include:

- Maintain total groundwater use within the sustainable yield of the aquifer from which it is withdrawn
- Groundwater extraction shall be managed to prevent unacceptable local impacts
- All groundwater extraction for water supply is to be licensed. Transfers of licensed entitlements may be allowed depending on the physical constraints of the groundwater system.

These principles are implemented under the WM Act and the AIP, which have been discussed above.

#### 2.3.1.2 NSW Groundwater Quality Protection Policy

The objective of this policy is the ecologically sustainable management of the State's groundwater resources so as to:

- Slow and halt, or reverse any degradation in groundwater resources
- Direct potentially polluting activities to the most appropriate local geological setting so as to minimise the risk to groundwater
- Establish a methodology for reviewing new developments with respect to their potential impact on water resources that will provide protection to the resource commensurate with both the threat that the development poses and the value of the resource
- Establish triggers for the use of more advanced groundwater protection tools such as groundwater vulnerability maps or groundwater protection zones.

These objectives of the policy are considered by assessing the project against the requirements outlined in the relevant WSP and the AIP. This includes incorporating the environmental values (beneficial use category) and trigger values outlined in National Water Quality Management Strategy (NWQMS), presented below, into the impact assessment criteria outlined into the AIP.





### 2.3.1.3 NSW Groundwater Dependent Ecosystems Policy

This policy was designed to protect ecosystems which rely on groundwater for survival so that, wherever possible, the ecological processes and biodiversity of these dependent ecosystems are maintained or restored for the benefit of present and future generations.

The objectives of this policy are considered by assessing the project against the requirements outlined in the WSP and the AIP. This includes criteria to be protective of groundwater dependent ecosystems.

### 2.3.2 National Water Quality Management Strategy

The NWQMS provides a national framework for improving water quality in Australia's waterways. The main policy objective of the NWQMS is to achieve sustainable use of the nation's water resources; protecting and enhancing their quality, while maintaining economic and social development. The NWQMS process involves community and government interaction, and implementation of a management plan for each catchment, aquifer, estuary, coastal water or other water body. This includes the use of national guidelines for local implementation.

The NWQMS policy and principles document (ARMCANZ/ANZECC, April 1994) provides an overview of the principles for water quality management in Australia. The primary objective of the guideline/policy is:

*“to achieve sustainable use of the nation's water resources by protecting and enhancing their quality while maintaining economic and social development”.*

The policy and principles document states that:

*“the generally accepted mechanism for establishing in-stream or aquifer water quality requirements is a two-step process which involves:*

- *establishing a set of environmental values, and*
- *establishing scientifically based water quality criteria corresponding to each environmental value”.*

Environmental values are often interchanged with the term beneficial use (which is referred to in regard to minimum impact criteria set in the AIP in section 2.2.2) and are identified in the guidance to include:

- Ecosystem protection
- Recreation and aesthetics
- Drinking water
- Agricultural water (irrigation and stock water)
- Industrial water.

Ecosystem protection, in this context, refers to aquatic ecosystems which depend at least in part on groundwater to maintain ecosystem health (groundwater dependent ecosystems). Depending on the site setting, this may include surface water bodies such as wetlands, streams and rivers reliant on groundwater base flow, some estuarine and near-shore marine systems, as well as aquifer and cave ecosystems.

Criteria have been developed to characterise water quality relative to these environmental criteria and are discussed further below.

The criteria presented below have been considered as the basis for assessing:

- The current environmental values (beneficial use category in the AIP) of groundwater and receiving water bodies on which impacts can be assessed
- Management requirements for discharge to receiving water environments, which could include:
  - Discharge to surface water along current pathways or by direct discharge
  - Discharge to groundwater
  - Discharge to land.





### 2.3.2.1 Australian and New Zealand Guidelines for Fresh and Marine Water Quality

For this project, the national guidelines on water quality benchmarks within the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2018) are applicable and provide default trigger values of various analytes for comparison with sampled values. These guidelines were previously known as the ANZECC (2000) guidelines. The guideline is available online (<http://www.waterquality.gov.au/anz-guidelines>). The default guideline values for toxicants are the same as ANZECC (2000) guidelines. ANZECC (2000) guidelines are recommended under current guidelines in the SEARs. This study will adopt the ANZECC (2000) guidelines default guideline values when presenting information from previous investigations completed under ANZECC (2000), but the new guidance (ANZG, 2018) for assessment of field data against water quality criteria.

Water criteria are presented in the guidelines for:

- Aquatic Ecosystems
- Primary Industries (which includes agricultural and industrial water criteria).

The environmental values and water quality criteria adopted for the project are provided in Technical Working Paper 8 – Surface Water (Section 4). The target water quality criteria outlined in Technical Working Paper 8 – Surface Water are based on the environmental values of the receiving water bodies and include:

- The values for the protection of 80% of species in marine water ecosystems for Mill Stream
- The values for the protection of 80% of species marine water ecosystems for Alexandra Canal.

The ANZG (2018) guidelines for protection of 95% of species in marine and fresh water ecosystems have been considered as a conservative trigger value for groundwater.

### 2.3.2.2 Australian Drinking Water Guidelines

The Australian Drinking Water Guidelines (ADWG) (NHMRC, 2013) provide a framework for the appropriate management of drinking water supplies to achieve a safe and appropriate point of supply. The guidelines provide a base standard for aesthetic and health water quality levels.

Groundwater is not expected to be used for potable purposes across the project and as such the ADWG do not apply to this investigation. They do, however, provide the basis for recreational water quality, which is discussed further below.

### 2.3.2.3 Recreational Water Quality

Guidelines for Managing Risks in Recreational Water (NHMRC, 2008) provides a framework to protect the health of humans from threats posed by the recreational use of coastal, estuarine and fresh waters.

These values are protective of human activities such as boating and fishing and have also been adopted as conservative screening criteria for assessing risks to construction workers encountering groundwater in excavations, recreational users coming into contact with irrigated groundwater and industrial water users.

The guidelines also provide a basis for using recently updated ADWG values for establishing revised criteria. This assumes that, during secondary contact activities, recreational users ingest ten times less water than they would ingest potable water per day and hence the recreational criteria are equivalent to ten times the ADWG criteria.

### 2.3.2.4 PFAS National Environmental Management Plan

The PFAS National Environmental Management Plan (HEPA, 2018) (NEMP), provides guidance about per- and poly-fluoroalkyl substances (PFAS). The PFAS NEMP provides a national approach to the environmental regulation of PFAS. The plan provides screening criteria applicable to this project for certain analytes for aquatic ecosystems for freshwater and marine water (interim). The plan also provides human health recreational criteria to consider activities such as boating, fishing, irrigation and industrial contact. The recreational criteria can also be used as initial screening criteria for construction workers coming into contact with groundwater in excavations.





### 2.3.2.5 NSW Water Quality and River Flow Objectives

The NSW Water Quality and River Flow Objectives are the agreed environmental values and long-term goals for NSW's surface waters. The water quality objectives align with the ANZECC (2000) guidelines. The objectives:

- Outline the community's values and uses for our rivers, creeks, estuaries and lakes
- Provide a range of water quality indicators to help assess whether the current conditions of our waterways support those values and uses.

Technical Working Paper 8 – Surface Water has considered these in the development of site specific discharge criteria for the project, which have been used in this investigation to characterise suitability of groundwater for discharge to surface water.

### 2.3.3 Approved Methods for the Sampling and Analysis of Water Pollutants in New South Wales

The document *Approved Methods for the Sampling and Analysis of Water Pollutants in New South Wales* (DEC, 2004) lists the sampling and analysis methods to be used when acquiring water samples for compliance with environmental protection legislation, a relevant licence or relevant notice.

The report has relied on field data collected by others. It is assumed that the data has been collected in accordance with this guidance.

### 2.3.4 Risk Assessment Guidelines for Groundwater Dependent Ecosystems

*Risk Assessment Guidelines for Groundwater Dependent Ecosystems* (NOW, 2012) comprises four volumes and provides a conceptual framework for identifying and assessing GDEs along with worked examples of assessments. The guidelines discuss the identification of high priority GDEs and also discuss the ecological value of GDEs. Where impacts remain to GDEs after this assessment, they will be considered further by ecological specialists to further characterise the impacts.

### 2.3.5 Australian Groundwater Modelling Guidelines

The Australian groundwater modelling guidelines (Barnett et al., 2012) provide a framework for numerical modelling of groundwater systems in Australia. The guidelines state that:

*“These guidelines are a point of reference for best practice for all those involved in the development, application and review of groundwater models, and those who use the outputs from models. It is anticipated that the guidelines will be adopted by regulatory bodies, modellers, reviewers and proponents of groundwater models as a nationally consistent guide to groundwater modelling.”*

The guidelines also state that:

*“These guidelines are not regulation or law, as they have not received endorsement from any jurisdiction. They should not be considered as de facto standards, as they are likely to evolve with modelling requirements and the sophistication of modelling approaches”.*

These guidelines have been considered in the development of the modelling approach adopted for this assessment. It is noted that the guidelines have been designed to guide the development of numerical groundwater models to assess complex groundwater systems, which is not applicable to the analytical approach adopted for this assessment. The rationale for adopting an analytical modelling approach is detailed in section 3.4.4.







## 3. Methodology

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### 3.1 General

The assessment of potential groundwater related impacts arising from the project has been undertaken as follows:

- Review of background documents including relevant documents from adjacent projects, recent project approvals for major infrastructure in the study area and other similar assessments in the Sydney region
- Characterisation of the current conceptual hydrogeological and groundwater conditions in the study area
- Field investigations including drilling, permeability testing, monitoring well installation, and water level and quality monitoring
- Development of an analytical groundwater modelling approach
- Completion of analytical groundwater calculations to predict groundwater inflows and drawdown propagation
- Assessment of potential groundwater related impacts to satisfy the minimal impact considerations of the AIP and to address groundwater related matters raised in the SEARs/Airports Act
- Recommendations for monitoring and management of identified impacts, including mitigation measures as appropriate.

The specific methodologies used for these components are described in the following sections.

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### 3.2 Desktop assessment

The desktop assessment included a review of available documents relevant to the project. Table 3-1 provides a summary of the key documents informing this assessment and the key information collated from each document.

A preliminary design and document review was completed to identify potential groundwater impacts for further characterisation.

Specific information considered in the assessment included:

- Groundwater management zones imposed by the DoI (refer to section 4.12). Zone 2 has been split into three areas to include Area 1 (Tempe, Sydenham, St Peters) and Area 2 (Botany) and Area 3 (Matrville and Phillip Bay). Groundwater extraction for domestic purposes is banned throughout Zone 2. An extraction exclusion also applies in Zone 1 (Botany, Banksmeadow). The project is mainly located in Zone 2 management zone (Area 1)
- The Secretary's environmental assessment requirements (SEARs) and the Airports Act requirements for major development plans (MDPs) – as outlined in section 1.3
- The Commonwealth and NSW legislative framework for groundwater quality and availability, paying particular attention to the AIP, relevant WSPs, the NSW Groundwater Dependent Ecosystems Policy, and NSW and Australian groundwater quality guidance
- The concept design drawings and construction methodology
- Previous studies prepared for the project and surrounding/connecting projects
- Existing hydrology/flooding, surface water quality, leachate monitoring (former Tempe landfill only) and groundwater monitoring data provided by Roads and Maritime, Sydney Airport Corporation and publicly available data
- Publicly available databases detailing the existing groundwater, soil, geological and hydrogeological environments.





Table 3-1 Key data sources

Report reference	Report description	Project data collated
Hydrogeology of the Botany Basin (Hatley, 2004)	A review of the geology, hydrogeology, and geotechnical characteristics of the Botany Basin	Geology and hydrogeology of the Botany Sands Groundwater Source
Bureau of Meteorology (BoM) online database, accessed July 2018	Database of water, climate, and environmental data	Historical rainfall data
Silo Climate Data, The State of Queensland Department of Environment and Science	Database of climate and evaporation data	Historical rainfall and evaporation data
WaterNSW online database, accessed July 2018	Surface and groundwater monitoring data	Monitoring well construction details Drillers logs Groundwater monitoring data
New M5 – Groundwater Monitoring Report (AECOM, 2016)	Developed to provide groundwater data along the M5 Motorway corridor	Groundwater and surface water quality results Groundwater monitoring data
M5 East – Groundwater Baseline Report (Golder, 2018)	Developed to establish pre-construction groundwater conditions across the New M5 project	Groundwater monitoring data Groundwater quality test results
Dewatering Feasibility Study – WestConnex Enabling Works Botany Road Rail Underpass (WCXAEP) (EES, 2018)	Developed to assess drawdown associated with services installation on the Airport East Precinct	Groundwater elevations Geological logs for alluvial aquifer Groundwater and surface water quality results
M4-M5 Link Environmental Impact Assessment (AECOM, 2015a)	EIS for the proposed tolled, multi-lane road link between M4 East at Haberfield and the New M5 at St Peters	Groundwater and surface water quality results
New M5 Environmental Impact Assessment (AECOM, 2017)	EIS for the new multi-lane twin motorway tunnels between the M5 East Motorway and St Peters, a new road interchange, and upgrade of local roads at St Peters to Mascot	Groundwater and surface water quality results Groundwater monitoring data
Sydney Gateway – Monthly Baseline Surface Water Monitoring (AECOM, multiple dates)	Monthly surface water monitoring data	Surface water monitoring data
Sydney Gateway, State Significant Infrastructure Scoping Report (RMS, 2018)	Detailing the project and key environmental issues associated with the project	Key environmental issues
PSH Recovery Program (2017), Taxi Parking Area, Sydney Domestic Airport, NSW (WSP, 2018)	Groundwater monitoring data from the taxi parking area at Sydney Airport	Groundwater quality results
Stage 3, Northern lands Precinct Investigation, Sydney Airport, Mascot, NSW (JBS&G, 2017)	Contamination and remediation data and information at the northern lands area	Groundwater quality results and capping layer information





Report reference	Report description	Project data collated
Groundwater Monitoring at the Former Tempe Lands (Uminex, 2018)	Recent groundwater monitoring event undertaken at the former Tempe landfill	Groundwater quality results and groundwater levels at the former Tempe landfill
Geotechnical long sections – based on concept designs	Drawings of the concept design in relation to geology and groundwater levels	Geology and groundwater levels

### 3.3 Field investigation

Field investigations were undertaken in parallel with the preparation of the combined EIS/preliminary draft MDP. The hydrogeological investigation program was undertaken in conjunction with the geotechnical and contamination investigation program.

The groundwater investigation program developed was based on an initial review of existing wells in the area with subsequent recommendations for additional wells to achieve the following key objectives:

- Characterisation of groundwater elevations along the entire project to inform the groundwater impact assessment
- Characterisation of groundwater flow directions across the project to understand potential dewatering capture zones, the migration of plumes from contaminated sites and the identification of down-gradient receiving environments/receptors
- Characterisation of all lithological conditions and associated hydraulic properties encountered across the project to inform representative modelling of groundwater impacts
- Characterisation of temporal changes in groundwater elevations to inform the assessment of reasonable worst case conditions that may be encountered across the project
- Characterisation of baseline groundwater quality to inform existing environmental values for the groundwater and inform groundwater quality management requirements for discharge to receiving environments. This included a requirement of up-gradient wells.

The groundwater monitoring program implemented is summarised below and has met these objectives.

Monitoring wells were sampled for groundwater level, groundwater quality and hydraulic testing. The data has been collated and reported in Sydney Gateway Project – Interim Groundwater and Landfill Gas Data Report (AECOM, 2019). This data has been used, in addition to historical data sources outlined above, as the baseline monitoring data for the project. It has also been used to inform groundwater management measures for construction.

A summary of the data collected is provided in Appendix A and includes:

- Twenty seven wells screened within or around the former Tempe landfill, 47 wells in the Botany Sands Groundwater Source and eight wells in bedrock aquifers (primarily Hawkesbury Sandstone). The location of the monitoring wells and a summary of the sampling completed are presented in Appendix A. Available bore logs for the wells are presented in Appendix D with the bore logs from other monitoring wells discussed in this report
- Seventy four monitored for groundwater levels, and 73 wells monitored for water quality. The general analytical suite consisted of:
  - Dissolved heavy metals
  - Total recoverable hydrocarbons (TRH) and Total petroleum hydrocarbons (TPH)
  - Polycyclic aromatic hydrocarbons (PAH)
  - Volatile organic compounds (VOC)
  - Organochlorine and organophosphate pesticides (OCP and OPP)
  - Major anion and cations
  - Nutrients





- Physio-chemical parameters such as pH and total dissolved solids (TDS)
- Per and poly-fluoroalkyl substances (PFAS) and Total Oxidisable Precursor Assay (TOPA) PFAS
- Aggressivity suite (AS2159), AS3600 (pH, sulfate, chloride, magnesium, resistivity) and ammonia

The individual analysis completed for each well during each sampling event completed is summarised in the results tables in Appendix B

- 14 wells had groundwater level data loggers installed within them with monitoring periods ranging between 14 and 62 days between February and April 2019
- 16 wells had hydraulic testing completed.

The results from the field investigation are summarised in section 4.

---

## 3.4 Assessment of impacts

### 3.4.1 Introduction

The impact assessment characterised the potential changes to groundwater conditions due to the project and the potential impacts to the range of beneficial uses or values of the receiving environments identified in section 4. For the following reasons, a qualitative and analytical approach was adopted for the assessment:

- The magnitude of impacts is expected to be localised and temporary (construction focused)
- A more detailed quantitative approach would not measurably improve project outcomes given a single aquifer hydrogeological environment with the project primarily interacting with the shallow unconsolidated water table aquifers.

This assessment would be refined with more detailed assessment at construction phase when specific dewatering requirements are better understood and as more field data becomes available.

The following groundwater conditions were the focus of the impact assessment:

- Groundwater recharge
- Groundwater drawdown
- Groundwater quality – beneficial use potential.

**Groundwater recharge** – An overall comparison of the change in sealed areas relative to unsealed areas has been undertaken pre-project, during development (construction) and post-project development to assess the overall impacts on groundwater recharge. It is noted that due to the highly industrialised nature of this area and the presence of existing sealed infrastructure, the project is not expected to induce a measurable change in the existing recharge conditions. As such, this assessment is qualitative only. It is noted that the former Tempe landfill has a separate issue in that changes in recharge may result in changes in leachate generation which would require management. This has been dealt with separately in Technical Working Paper 16 –Landfill Assessment.

**Groundwater drawdown** – Engagement with the project design team has been undertaken to identify the depths of key infrastructure that could require dewatering works for installation. This infrastructure has then been compared against:

- Groundwater elevations interpreted from existing monitoring well spot elevations. These conditions are expected to be representative of most likely case (LC) groundwater elevations that would be encountered during construction
- Reasonable worst case (RWC) groundwater elevations, which have also been established to account for groundwater level response to long term climatic conditions and response to rainfall.

The groundwater conditions on which the LC and RWC conditions are based are provided in sections 3.4.4.1 and 4.9.





Analytical groundwater modelling has then been undertaken to establish the radius of groundwater drawdown influence around infrastructure identified to require dewatering during construction. The radius of influence contours are presented on figures that show the location of sensitive receptors. Further detail on the modelling completed is provided in section 3.4.4.1.

Any sensitive receptors (identified in section 4) within the zones of drawdown have been considered to be adversely impacted and have been characterised further qualitatively or have been carried through for consideration as part of the recommended mitigation and management measures.

**Groundwater quality beneficial use potential** – Section 4.16 presents the criteria that have been established to be protective of the environmental values potentially impacted by the project. These criteria have been used as the design and construction requirements for groundwater discharging from the project. Acute and diffuse groundwater quality impacts associated with project construction and operation are difficult to predict as they depend on the nature of the incident that occurs at the time. As such, impacts have been assumed to have potential to occur during construction and operation and management and monitoring measures have been considered.

### 3.4.2 Criteria for undertaking assessment

The AIP requires that potential impacts on groundwater sources, including their users and high priority GDEs, are assessed against minimal impact considerations, outlined in Table 1 of the policy. If the predicted impacts are less than the Level 1 minimal impact considerations, then these impacts will be considered as acceptable. The predicted groundwater impacts have been assessed with reference to the minimal impact considerations for highly productive groundwater sources for coastal sand water sources. A highly productive (high yields and total dissolved solids less than 1,500 mg/L) system was selected based on the conceptual understanding of the hydrogeological conditions (outlined in section 4). These criteria are as follows:

- Water table – less than or equal to ten per cent cumulative variation in the water table, allowing for typical climatic ‘post-water sharing plan’ variations, at a distance of 40 metres from any high priority GDE or high priority culturally significant site listed in the schedule of the relevant WSP. Section 4.9 considers groundwater variation associated with rainfall and tidal impacts and indicates groundwater elevations fluctuations are likely to be greater than 0.5 metres along the Sydney Gateway road project. Ten per cent of 0.5 metres is 0.05 metres which has been set as the criteria for protection of GDEs
- Water table – a maximum two metres water table decline cumulatively at any water supply work
- Water pressure – a cumulative pressure head decline of not more than a two metre decline at any water supply work
- Water quality – any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond a distance of 40 metres from the activity.

These criteria have been adopted to identify potentially adverse impacts, on which further investigations or mitigation measures are proposed in section 8. These criteria need to be considerate of the changing conditions temporally and spatially in order to provide a comprehensive assessment of impacts.

It is noted that the NSW AIP does not apply within Sydney Airport land owned by the Commonwealth. However, there currently no specific commonwealth groundwater impact assessment criteria and as such the AIP has been adopted for Commonwealth areas.

### 3.4.3 Subsurface infrastructure

The project would require the installation of subsurface infrastructure that has the potential to interact with groundwater. These include:

- **Utilities/services (excluding stormwater drainage) installation, augmentation or protection.** This may involve excavation of trenches for utilities/services installation, including dewatering and associated water management requirements. It is expected that utility installation works would not extend more than 1.5 metres below ground surface. It is expected that construction would use shoring techniques that do not prevent ingress of groundwater





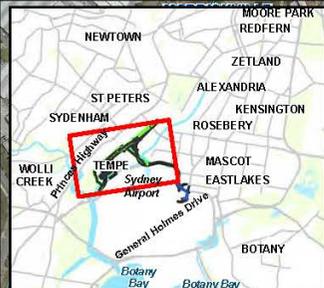
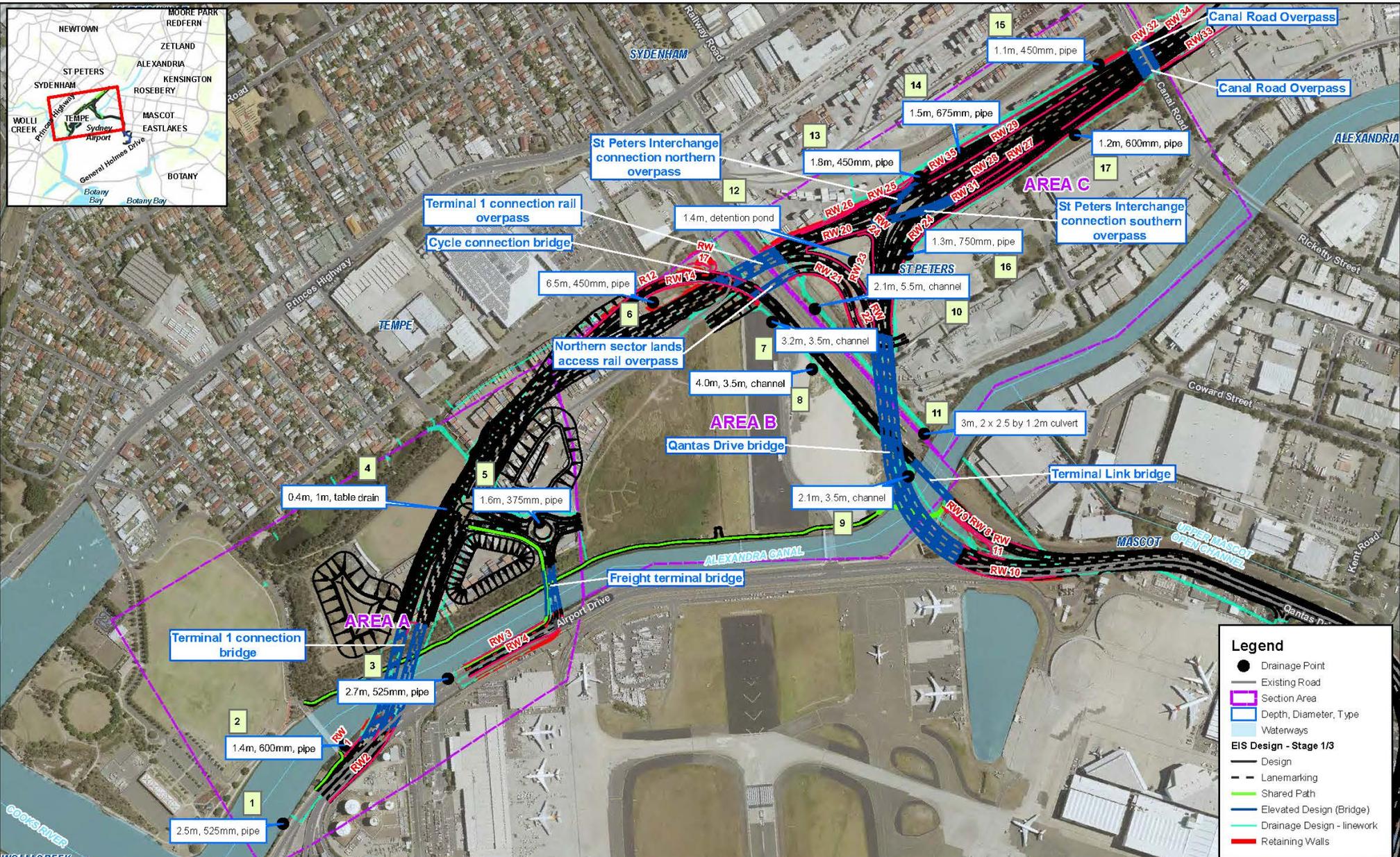
In areas where groundwater is encountered during excavation, dewatering would be required. The excavations would be temporary in nature with excavation and backfilling at any one location typically occurring on a daily basis, however, there may be instances where the excavations remain open for up to two days. Individual excavations for utility works are not expected to exceed 10 metres by 1 metre (length by width) with a maximum depth of 1.5 metres at any one time

- **Stormwater drainage.** The locations and expected excavation depth of key drainage infrastructure are presented on Figure 3-1 and Figure 3-2. These have been used to estimate potential interactions with groundwater. It is expected that construction would use shoring techniques that do not prevent ingress of groundwater. In areas where groundwater is encountered during excavation, dewatering would be required. There are two main types of drainage infrastructure: subsurface stormwater lines and stormwater channels. The concept design includes two large stormwater channels. The proposed locations are shown on Figure 3-1 (Item numbers 7, 8, 9, 10 and 11). The excavation area for these channels are not expected to exceed 10 metres by 5.5 metres for the southern channel and 10 metres by 7.5 metres for the northern channel. These excavations would remain open during construction

The excavations for the stormwater lines would be temporary in nature with excavation and backfilling on a daily basis. There may, however, be instances where the excavations remain open for up to two days. Individual excavations areas are not expected to exceed 10 metres by 3 metres at any one time

- **Flood mitigation basin.** The location and expected excavation depth below ground surface of the flood mitigation basin is presented on Figure 3-1 as item location Item 12. The basin is expected to be triangular with side lengths of 110 metres by 125 metres by 150 metres with a depth of approximately 1.4 metres below ground surface. The basin construction method is currently under design so for the purposes of this assessment, it has been assumed that construction would take over three months. Other sedimentation basins may be developed within construction site compounds as required but these have not been finalised and would be assessed at a later date if needed. The basin is expected to be lined and have limited contact with the surrounding groundwater system once in operation
- **Bridges, bridge ramps and over passes.** There are two bridges spanning Canal Road, three spanning the Port Botany rail corridor and four spanning Alexandra Canal. The primary subsurface structures would be piles installed for bridge footings. The piles would be installed using cast in-situ or boring methods that would prevent the ingress of groundwater into the excavation. These methods are not expected to require significant dewatering. There would be incidental discharge from the top of bore holes of displaced groundwater that collects in the excavation when concrete is poured into the bored holes. This would require management to contain and prevent impacts to the surrounding environment
- **Retaining walls.** The locations of retaining wall infrastructure are presented on Figure 3-1 and Figure 3-2. Excavations for installation of retaining wall infrastructure are expected to be for the purposes of installing levelling supports only and would be shallow. The excavation depths are expected to be a maximum of 1 metre below ground surface. In some areas where groundwater is shallow, it is expected groundwater would be intersected and may require dewatering. Dewatering would be temporary and limited to the installation of retaining walls only. It is expected that the construction excavations for each retaining wall could be up to 24 metres long by 1 metre wide at any one time
- **Road cuttings.** The project alignment is not expected to extend significantly below ground surface at any location along the project alignment other than at the underpass location marked on Figure 3-1. In this area, the project and associated construction excavation is expected to be up to 1.3 metres below ground surface. This excavation may intersect groundwater and require dewatering. This section of the project would be lined preventing any ongoing dewatering during operation.





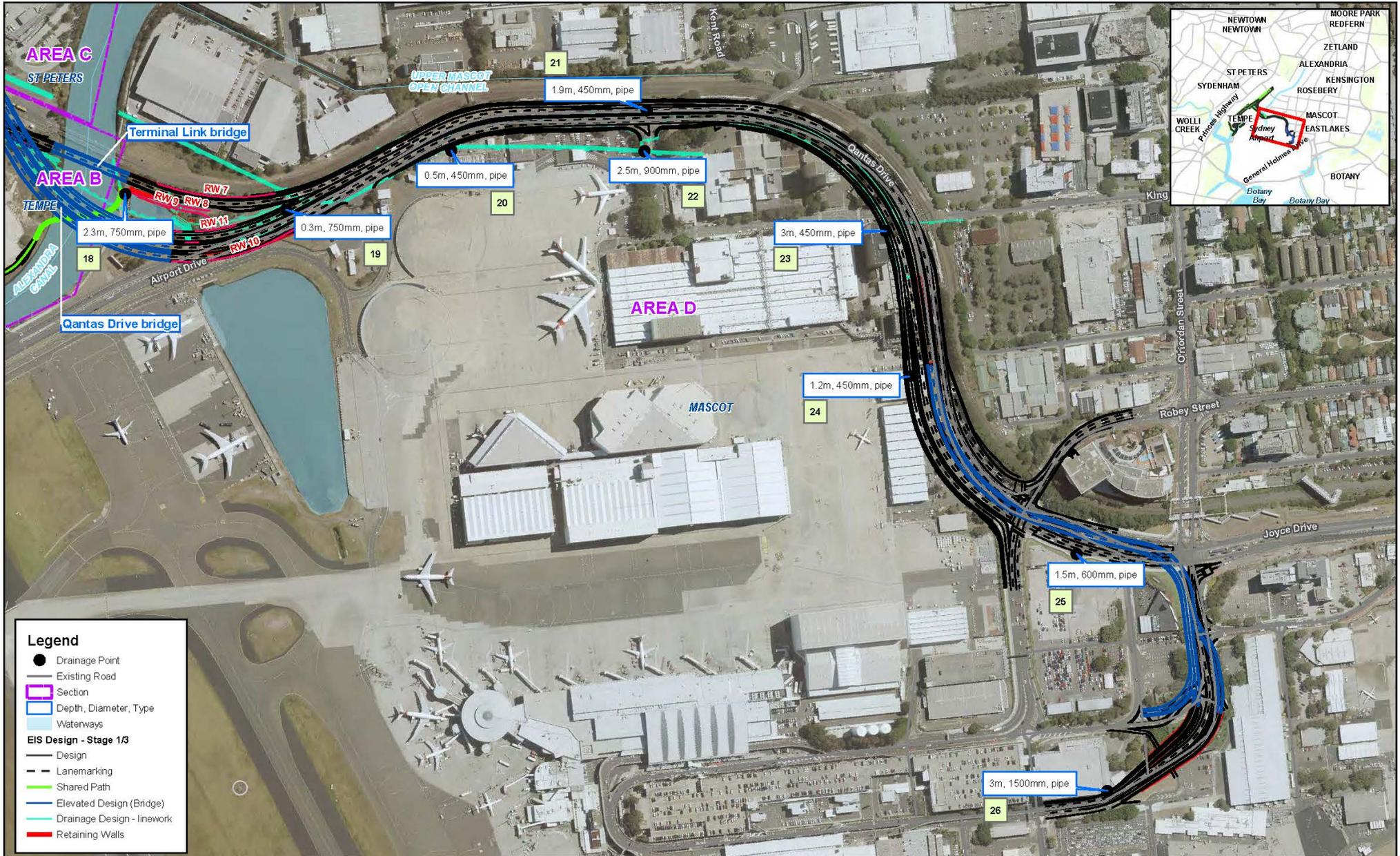
### Legend

- Drainage Point
- Existing Road
- Section Area
- Depth, Diameter, Type
- Waterways

### EIS Design - Stage 1/3

- Design
- - Lanemarking
- Shared Path
- Elevated Design (Bridge)
- Drainage Design - linework
- Retaining Walls

DATA SOURCE: Aerial Imagery @ AUSIMAGG - Jacobs Group (Australia) Pty Ltd 2018, © Department of Finance, Services & Innovation 2018		DESIGN/LOT CODE	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING - REV 3 (20180114)	PLOT DATE / TIME 16/07/2019 9:37:23 AM	PLOT BY DN	CLIENT <b>NSW</b> Transport Roads & Maritime Services	SYDNEY GATEWAY	A3	
REV	DATE	AMENDMENT / REVISION DESCRIPTION	MWR No.	APPROVAL	SCALES ON A1 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY	TITLE	NAME	DATE
A2	21/02/2019	Key Infrastructure Intersecting Groundwater - Area A, B, C			0 50 100 1:5,000	wsp   GHD	GROUNDWATER IMPACT ASSESSMENT		16/07/2019
A3	21/03/2019	Key Infrastructure Intersecting Groundwater - Area A, B, C					Figure 3-1		
A4	01/04/2019	Key Infrastructure Intersecting Groundwater - Area A, B, C					Key infrastructure intersecting groundwater - Area A, B, C		
A5	11/06/2019	Key Infrastructure Intersecting Groundwater - Area A, B, C							
A6	19/06/2019	Key Infrastructure Intersecting Groundwater - Area A, B, C							
A7	16/07/2019	Key Infrastructure Intersecting Groundwater - Area A, B, C							



**Legend**

- Drainage Point
- Existing Road
- ▭ Section
- ▭ Depth, Diameter, Type
- ▭ Waterways

**EIS Design - Stage 1/3**

- Design
- - - Lanemarking
- Shared Path
- Elevated Design (Bridge)
- Drainage Design - linework
- Retaining Walls

DATA SOURCE: AerialImagery@AUSIMAG - Jacobs Group (Australia) Pty Ltd 2010, © Department of Finance, Services & Innovation 2010		DESIGN/LOT CODE	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING - REV 3 (2019/01/14)		PLOT DATE / TIME 18/07/2019 4:30 AM	PLOT BY DN	CLIENT	SYDNEY GATEWAY		A3	
REV	DATE	AMENDMENT / PERMISSION DESCRIPTION	WVR No.	APPROVAL	SCALES ON A1 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY		TITLE	ANME	DATE	
A2	21/02/2019	Key Infrastructure Intersecting Groundwater - Area D						DRAWN	D HARKEN	16/07/2019	
A3	21/03/2019	Key Infrastructure Intersecting Groundwater - Area D						DRS CHECK	S CHARTERS	16/07/2019	
A4	01/04/2019	Key Infrastructure Intersecting Groundwater - Area D									
A5	11/06/2019	Key Infrastructure Intersecting Groundwater - Area D									
A6	19/06/2019	Key Infrastructure Intersecting Groundwater - Area D									
A7	20/07/2019	Key Infrastructure Intersecting Groundwater - Area D									
APPROVED FOR AND ON BEHALF OF WSP Australia Pty Ltd.					CO-ORDINATE SYSTEM MGA ZONE 56	HEIGHT DATUM AHD	DRG No.	PREPARED FOR			
								<b>Groundwater Impact Assessment</b> <b>Figure 3-2</b> <b>Key infrastructure intersecting groundwater - Area D</b>			
RMS REGISTRATION No.								ISSUE STATUS FOR INFORMATION		EDMS No.	SHEET No.
										ISSUE	



### 3.4.4 Groundwater modelling

#### 3.4.4.1 Model development

An analytical approach to the groundwater modelling was adopted. This approach was considered to be suitable given the following conditions:

- A single aquifer hydrogeological conceptual environment with the project primarily interacting with the shallow unconsolidated water table aquifers only outside of the former Tempe landfill. It is noted that on the western side of Alexandra Canal, the fill material on top of the Quaternary sediments is thicker and there is more silt and clay within the soil profile. However, the fill is predominantly sand and has subsequently been conservatively treated as sand in the analytical modelling
- Groundwater drawdown impacts are temporary and localised and associated with construction activities.

To inform groundwater dewatering management and to understand the impacts to surrounding receptors, the analytical method adopted was used to calculate inflow rate and radius of influence for individual construction excavations.

Radius of influence calculations have been completed to assess the impacts of infrastructure related groundwater drawdown against the AIP criteria. The radius of drawdown influence has been set as the 0.05 metre drawdown contour around each excavation which is in accordance with the most conservative AIP criteria (Section 3.4.2). For this assessment, any receptors inside the radius of influence are considered to be potentially impacted and discussed further.

It has been assumed that each excavation is completed separately and that there are no additional effects associated with drawdown cones around overlapping excavations. This is considered to be a non-conservative approach, although it is expected that any interference between excavations would primarily result in a reduction in excavation inflows rather than a mirrored increase in drawdown, particularly perpendicular to the line between excavations. To manage this, excavations have been simulated to be larger and open for longer than expected.

#### **Method**

Groundwater inflow and dewatering volumes have been estimated using the analytical equations and approach outlined in Cooper and Jacob (1946). The equation presented by Cooper and Jacob (1946) provides a simple means of estimating long-term radius of influence from a pumping well varying with time (represents an excavation that is being dewatered). This approach is used for confined aquifers but by using an appropriate storativity value, it can be adapted for unconfined aquifers, which are intersected by the project.

$$s = \frac{2.3Q}{4\pi kD} \log \frac{2.25kDt}{r^2S}$$

Where:

- $s$  – Drawdown at distance  $r$  from the edge of the excavation (m)
- $Q$  – Discharge ( $\text{m}^3/\text{day}$ )
- $k$  – Hydraulic conductivity (m/day)
- $D$  – Saturated thickness of aquifer before pumping (m)
- $t$  – Time (days)
- $r$  – Distance from centre of excavation (m)
- $S$  – Storativity (dimensionless).

A limitation of this approach is that it assumes flow from a single well, while in reality excavations would be much larger than this and of variable size. To account for this, an effective excavation radius has been calculated, as shown below. Subsequently, discharge was increased in the analytical calculations until drawdown at the effective radius (or edge) of each excavation equalled the estimated depth to which the excavation penetrated the groundwater table (the dewatering depth).

A conceptual diagram showing this is presented below in Figure 3-3.



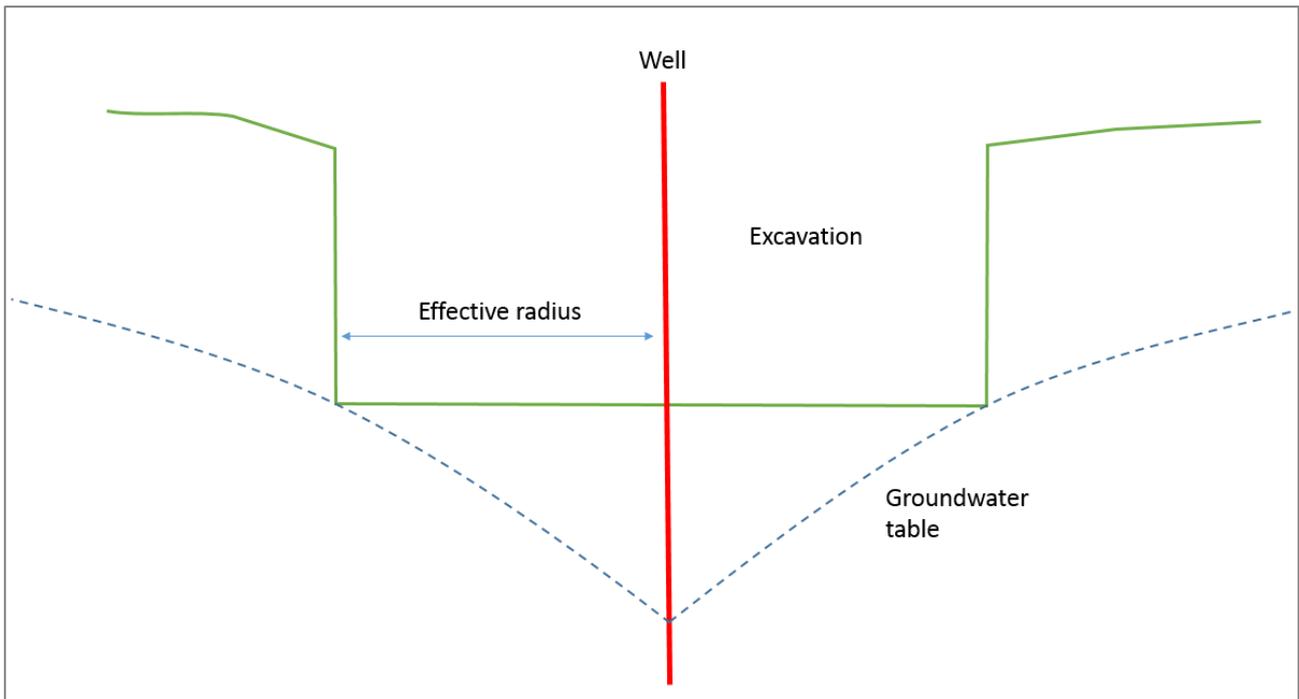


Figure 3-3 Conceptual diagram of excavation for calculation

The effective radius has been calculated using the following equation:

$$Re = \sqrt{lw/\pi}$$

Where:

- $Re$  = Effective radius of the excavation
- $lw$  = the length of the excavation
- $\pi$  = pi.

Once the dewatering depth of the excavation was established using the equation, the following information was documented:

- Discharge rate ( $m^3/day$ )
- Distance to the 0.05 metres drawdown contour, which was considered to be conservative. It is significantly lower than the AIP criteria and therefore, is protective of groundwater supply wells, groundwater dependent ecosystems, migration of contamination plumes and exposure of acid sulfate soils.

It is noted that the modelling conservatively assumed that there was no barrier to groundwater flowing into the excavations.

To inform migration distances from contaminated sites toward excavations, an estimate of the distance to origin of a groundwater particle flowing into an excavation was made. This was completed by incorporating the groundwater drawdown curve (groundwater gradient) predicted at each excavation into the groundwater velocity equation presented in section 4.10. The groundwater gradient was established at a number of increments along the drawdown curve and the travel velocity of a groundwater particle within each increment was calculated. The increment distance was then divided by the travel velocity within each increment to calculate the amount of time it took for a groundwater particle to travel within each increment. These travel times were then added to obtain a travel time at a given distance from the excavation. This is summarised in the following equation.



$$T_{r_i} = \frac{x_1}{v_1} + \frac{x_2}{v_2} + \frac{x_3}{v_3} \dots \dots + \frac{x_i}{v_i}$$

where:

- $v$  = groundwater velocity from section 4.10 (m/day)
- $x$  = increment distance along the groundwater drawdown curve moving away from the excavation (m)
- $T_{r_i}$  = travel time to  $r_i$  (days) from the edge of the excavation
- $r_i = x_1 + x_2 + x_3 \dots \dots x_i$  (m).

The travel time was then plotted against the distance from the excavation edge and compared against the dewatering time (estimated excavation duration) for each piece of infrastructure to understand the distance over which particles would travel to enter each excavation. This is often referred to as the ‘capture zone’ of the excavations and is referred to as such in the following discussion of impacts.

### **Input data**

Data sources and assumptions used to derive input values for each of the parameters required for the equations developed by Cooper and Jacob (1946) are presented below.

#### *Excavation depth (groundwater intersection depths)*

The excavation depths for key infrastructure were established in consultation with the design team. The information provided for each type of infrastructure is presented in section 3.4.3. The locations are presented in Figure 3-1.

The infrastructure depths were then compared with available ground surface and groundwater elevation data in the area (including interpolated information from the geotechnical long sections), to estimate the depth of groundwater intersection.

Two groundwater elevation scenarios were adopted for the assessment, one based on the existing groundwater elevations (likely case – LC) interpreted from existing data and the second being a high-end estimate (reasonable worst case – RWC) to account for wet climate conditions. These two scenarios are presented as existing groundwater levels and worse case groundwater levels. The high-end RWC scenario estimate was estimated to be 0.87 metres higher than the LC levels and was based on an assessment of the response to rainfall and long term variations in groundwater elevation data within project monitoring wells and within the Dol Water monitoring bores (as discussed in section 4.9.2).

#### *Hydraulic conductivity*

Average hydraulic conductivity (10 m/day) from hydraulic testing along the project alignment of the Botany Sands was adopted for the likely case (LC) scenario and the 95<sup>th</sup> percentile confidence value (26.3 m/day) of the average hydraulic conductivity of the Botany Sands was adopted for the RWC scenario. The values are presented within section 4.8.2.

#### *Initial (pre-construction) saturated thickness of aquifer*

The saturation thickness of an aquifer represents the height of groundwater above the base of the aquifer (which in this instance is the top of bedrock). Figure 4-3 presents the depth to bedrock along the project alignment and indicates the depth ranges between approximately -5 metres Australian height datum (AHD) and -15 metres AHD. Given that ground generally lies between 0 metres AHD and 5 metres AHD, it can be expected that the initial saturated thickness of the unconsolidated aquifers along the project alignment will range between 5 metres and 20 metres. For this assessment, a conservative end saturated thickness of 17 metres has been adopted.

#### *Time*

The expected duration of excavation dewatering activities for each different type of infrastructure is discussed in section 3.4.3. The locations of the infrastructure are presented in Figure 3-1.





### Storativity

The storage capacity of the Botany Sands Groundwater Source is large due to the aquifer being unconfined and the thickness of the geological unit of the Quaternary Sediments. In an unconfined aquifer, storativity is generally equivalent to the specific yield. As discussed in section 4.8.2, Hatley (2004) described specific yield values ranging from 0.11 to 0.26 for the Botany Sands. Specific yields generally have a positive correlation with hydraulic conductivity as indicated by the positive correlation between specific yield and grain size for sands and finer grained material (Weight and Sonderegger, 2001). As such, a value of 0.11 was adopted for the LC scenario and a value of 0.2 was adopted for the RWC scenario.

### 3.4.5 Interpretation of modelling results

The radius of influence results have been interpreted as follows:

- Acid sulfate soil exposure impacts have been assessed against the LC conditions as they generally would only occur when groundwater elevations fall below the minimum groundwater elevation associated with normal climatic fluctuations. On this basis the radius of drawdown influence associated with the LC is considered to be reasonably conservative as groundwater elevations adopted for the LC scenario are above minimum elevations as highlighted in section 4.9.2
- Settlement impacts have been assessed against the LC conditions as they generally would only occur when groundwater elevations fall below the minimum groundwater elevation associated with normal climatic fluctuations. On this basis the radius of drawdown influence associated with the LC is considered to be reasonably conservative as groundwater elevations adopted for the LC scenario are above minimum elevations as highlighted in section 4.9.2
- Impacts to groundwater wells and GDEs have been assessed against RWC conditions as normal use/reliance on groundwater at these receptors may change depending on the climatic conditions present
- Expected dewatering rates have assessed using both LC and RWC groundwater elevation conditions to provide an understanding of the range of expected dewatering that would take if construction occurs within the current or under wet climatic conditions.





## 4. Existing environment

### 4.1 Climate

Rainfall data have been obtained from the closest Bureau of Meteorology (BOM) weather station site at Sydney Airport (BOM site number 066037). Sydney Airport has a complete rainfall record with complete data from 1898. This data was obtained from scientific information for land owners available from the Queensland Government website (<https://data.qld.gov.au/dataset/silo-patched-point-datasets-for-queensland>).

Most rainfall occurs in the Autumn season and the highest average rainfall occurs in June. The lowest rainfall occurs in Spring. The average annual rainfall is 1083.4 millimetres.

Figure 4-1 presents the long-term monthly rainfall record for Sydney Airport along with the cumulative rainfall deviation (CRD).

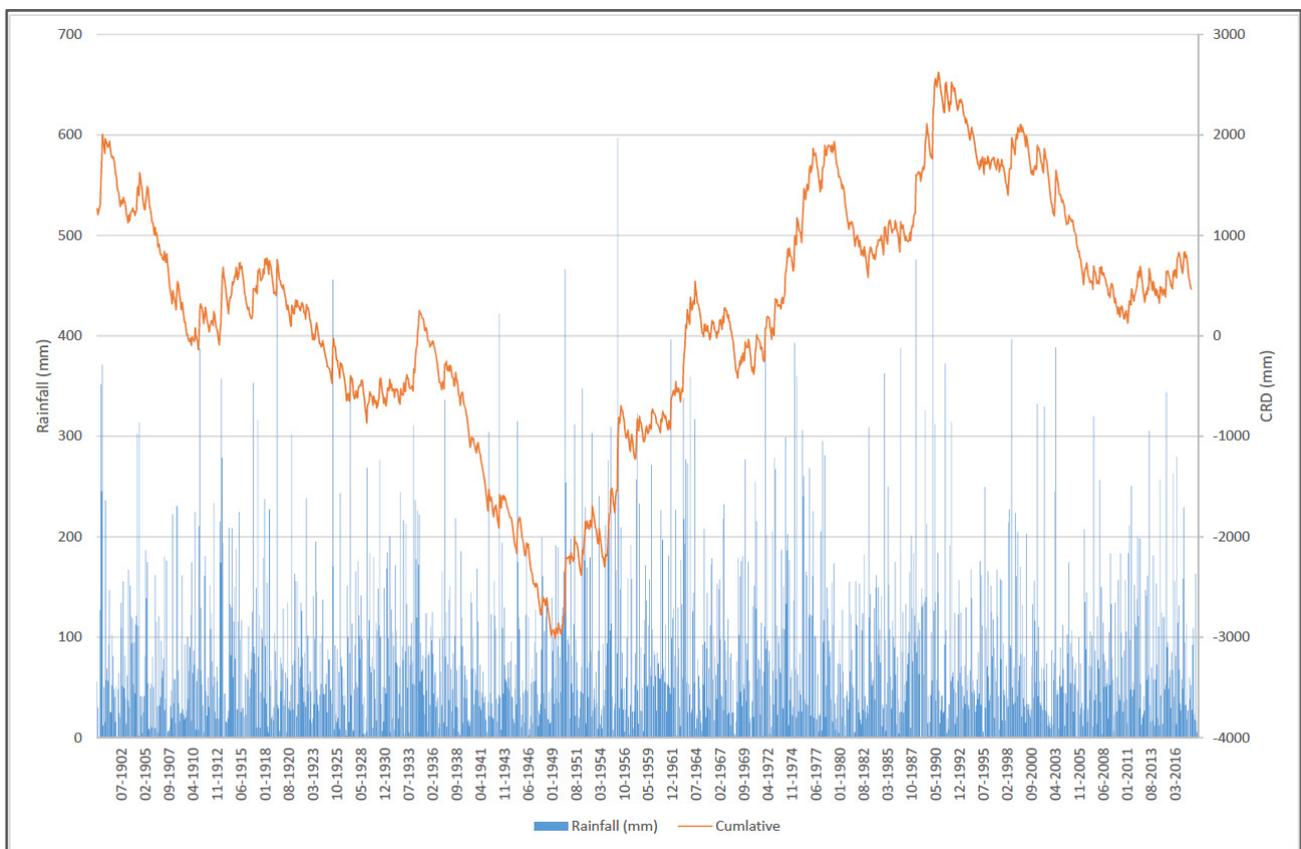


Figure 4-1 Rainfall and cumulative rainfall deviation for weather station Sydney Airport

The cumulative deviation plot shows three distinct and large scale climatic trends over the 118 years of observation.

Three periods of below average rainfall occur; the first from 1900 to 1910, the second from 1934 to 1949 and the third from 1999 to 2011. There is a prolonged period of above average rainfall between 1949 and 1990. These large-scale trends include numerous small and intermediate scale fluctuations.

Different types of aquifers have different responses to climatic variation, generally referred to as the groundwater response time. Shallow unconfined aquifers often respond to a small-scale fluctuation including individual rainfall events, whereas deeper regional scale and semi confined aquifers such as the Hawkesbury Sandstone often show trends that are more aligned with larger scale variations.





The average annual rainfall for Sydney Airport over the available 79 years is provided in Table 4-1. This data was obtained from the BOM website (<http://www.bom.gov.au/>).

Table 4-1 Average rainfall (mm)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
066037	94.6	111.4	117.0	107.8	96.0	124.6	69.0	76.0	59.7	69.7	80.4	73.6	1083.4

Temperature and evapotranspiration (ET) data for Sydney Airport are provided in Table 4-2. Temperature is available for 79 years (1939 to present), while evapotranspiration data is available from 1889.

Mean daily evapotranspiration ranged from a minimum of 0.4 millimetres on 23/06/1974 to 9.4 millimetres on 01/01/2006 respectively. Average annual evapotranspiration for the monitoring period is 1,200.7 millimetres per annum.

Table 4-2 Temperature (Temp) and evapotranspiration (ET)

Record	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean Max Temp (°C)	26.6	26.5	25.4	23.0	20.1	17.6	17.1	18.4	20.7	22.7	24.1	25.9	22.3
Mean Min Temp (°C)	18.9	19.1	17.6	14.3	11.0	8.7	7.3	8.2	10.5	13.3	15.5	17.6	13.5
ET (mm)	146.5	120.5	110.7	82.2	62.4	47.7	55.0	74.0	96.9	122.2	134.9	150.0	1200.7

## 4.2 Topographical setting

The project is located within the local government areas of Inner West Council, Bayside Council and City of Sydney. It includes Commonwealth land leased to Sydney Airport Corporation, NSW Crown land, local council land and private property. The project area is in a highly modified landscape that features industrial, commercial and transport related uses. The topography is generally flat and at elevations less than ten metres AHD.

The topography generally slopes gently upwards from 0 metres AHD at Botany Bay in the south and Cooks River/Alexandra Canal to the west and north-west to elevations of 30 to 40 metres AHD to the north-east, east, and south-east of the project site. Higher elevations are present east of the Sydney Central Business District, with a maximum of 110 metres AHD at Waverly Park in Bondi, before dropping to sea level at the coast. The project alignment is relatively flat to the east of Alexandra Canal and rises towards the west of Alexandra Canal towards Princes Highway. Areas of higher elevations are also present across the former Tempe landfill.





## 4.3 Surface water features

The project area is located within the 'Cooks River' sub-catchment of the larger Botany Bay catchment (Sydney Metropolitan Catchment Management Authority, 2011). The Botany Bay catchment covers about 1,165 km<sup>2</sup> (Figure 4-2). The Botany Bay catchment encompasses surface water features near and within the project site including Alexandra Canal, the Botany Wetlands (including Lachlan Swamps and Mill Stream, also known as Sydney freshwater wetlands) and Botany Bay to the south-east. The mouth of the Cooks River is located to the south of the project. The project is located at the lower portion of the Cooks River catchment. There is a small wetland located to the west of Alexandra Canal and adjacent to South Street known as Tempe Wetlands. These wetlands are man-made and approximately 2.8 hectares in size.

The Cooks River catchment covers around 100 km<sup>2</sup> in Southern Sydney and discharges to Botany Bay. This catchment is fed by nine tributaries including Alexandra Canal, which intersects the project. Alexandra Canal is a four kilometre long artificial waterway (formerly Sheas Creek), and is characterised by its channelled route, defined edges, and sandstone embankment walls. It drains to the west into Cooks River at Tempe, and into Botany Bay. Both Cooks River and Alexandra Canal are tidally-influenced waterways.

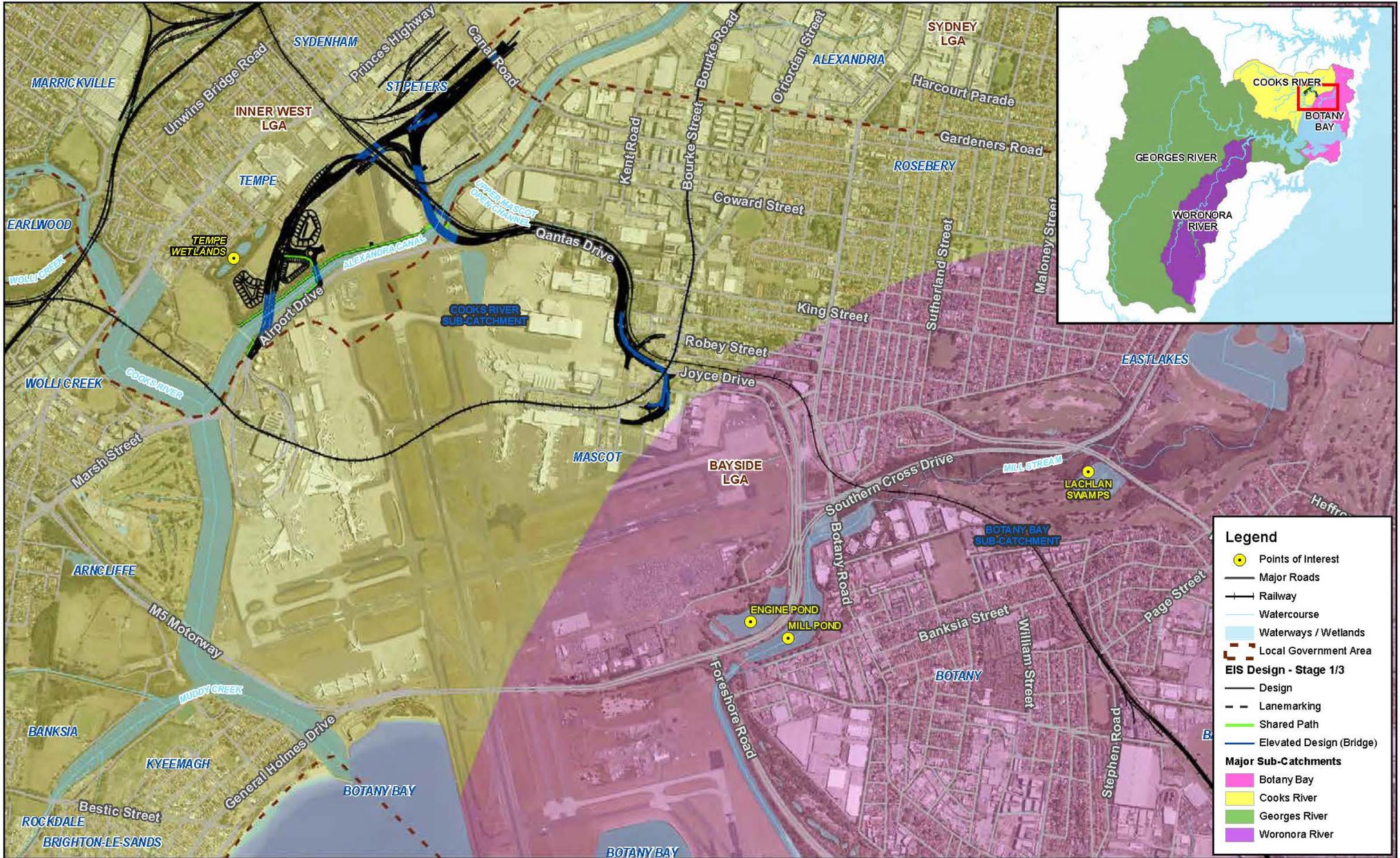
Other waterways near the project site are Wolli Creek and Muddy Creek, both located about one kilometre to the north-west and west and drain into Cooks River.

To the east and south-east of the project is Engine Pond. Thick reeds and aquatic vegetation border the majority of the pond. Engine Pond acts as a sink for surface water runoff from the surrounding local area. While a locally and regionally significant surface water feature, it is disturbed by the industrial and urban environment in which it is located. Engine Pond and Mill Stream are designated as Environmentally Significant Areas under a range of registers, including the Sydney Airport Master Plan 2039 and the National Wetlands Program. Furthermore, the WSP for the Greater Metropolitan Region Groundwater Sources 2011 lists Engine Pond, Mill Stream and Mill Pond as high priority groundwater dependent ecosystems. This is based on these features being part of Botany Wetlands, which are listed as an endangered ecological community in the *Biodiversity Conservation Act 2016*. It is noted that Engine Pond is on Commonwealth land. Consequently, it is not subject to environmental assessment or approvals under NSW environmental planning and assessment legislation. However, the EPBC Act requires protection of the environment from actions involving Commonwealth land, and it is therefore appropriate to consider threatened biota that are listed under NSW legislation and other aspects of the biodiversity in this area. In addition, the Botany Bay area provides summer habitat for a number of migratory wading birds that are listed under the EPBC Act, and the ponds may also be used on occasion by these species.

Botany Bay, while disturbed by industrial and urban activities, is used for a range of beneficial purposes such as recreation and fishing (despite the NSW Department of Primary Industries prohibition of commercial fishing in Botany Bay and Cooks River under the Fisheries Management (General) Regulation, 2010). Recreational fishing is prohibited in the area between the runways extending into Botany Bay but is not prohibited in and around Mill Stream and the broader Botany Bay area. There is a Botany Bay Water Quality Improvement Plan (2011) developed by the Sydney Metropolitan Catchment Management Authority with the main objective to improve pollutant load reduction and suspended sediment through direction and on-ground implementation.

NSW Department of Primary Industries released a recreational fishing guide in December 2013 that states no fishing is to be undertaken in Alexandra Canal. In regards to the Cooks River and its tributaries, the guide states that only rod and reel can be used and all fish and shellfish caught in this area should be released, not eaten.





**Legend**

- Points of Interest
- Major Roads
- Railway
- Watercourse
- Waterways / Wetlands
- Local Government Area
- EIS Design - Stage 1/3**
- Design
- - - Lanemarking
- Shared Path
- Elevated Design (Bridge)
- Major Sub-Catchments**
- Botany Bay
- Cooks River
- Georges River
- Woronora River

REFERENCE SOURCE: © Botany Bay & Catchment Water Quality Improvement Plan, Sydney Botany Bay Water Quality Improvement Program, Sydney Metropolitan Catchment Management Authority 2011.		DESIGN/LOT CODE	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING - REV 3 (20180114)	PLOT DATE / TIME 10/07/2019 10:40:56 AM	PLOT BY DN	CLIENT Transport Roads & Maritime Services	SYDNEY GATEWAY	A3	
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APPROVED FOR AND ON BEHALF OF WSP Australia Pty Ltd.		CO-ORDINATE SYSTEM MGA ZONE 56	HEIGHT DATUM AHD	DRG No.	FOR INFORMATION	ISSUE STATUS FOR INFORMATION	EBN No. SHEET No. ISSUE No.	PART A3	



## 4.4 Geology

### 4.4.1 Regional geology

The Permo-Triassic Sydney Basin is a convergent margin foreland sedimentary basin located along Australia's central eastern coast. It covers 64,000 km<sup>2</sup>, with the onshore basin centred in Sydney, while the offshore basin extends eastward with 5,000 km<sup>2</sup> between the coast and the outer edge of the continental shelf (Stewart and Alder, 1995). It is characterised by a lower sequence of interbedded marine-deposited strata, followed by local Permian coal-bearing sequences, which are then finally overlain by additional marine and terrestrial strata. The Permo-Triassic sedimentary succession is intruded by igneous bodies of Jurassic to Tertiary in age, and overlain by unconsolidated Quaternary alluvium. The basement of the Sydney Basin includes the Lachlan Fold Belt and Late Carboniferous volcanoclastic sediments. The project location with regard to the regional geology is presented in Figure 4-3.

### 4.4.2 Site geology

The 1:100,000 Sydney Region Geological Map (Department of Mineral Resources and Energy 1991) states that the regional geology consists of Triassic Hawkesbury Sandstone and Ashfield Shale overlain by Quaternary sediments (unconsolidated sands with minor peat, silts and clays and hard iron-cemented layers known as Waterloo rock). The Quaternary sediments infilled drowned river valleys that were incised into the bedrock. These sediments are composed of predominantly unconsolidated to semi-unconsolidated permeable sands. These are interspersed with lenses and layers of peat, peaty sands, silts and clays (low permeability), which become more common at greater depths. The stratigraphic units encountered in the project site are discussed below and presented in Figure 4-3.

#### 4.4.2.1 Fill

A thin layer of fill is commonly encountered in urban areas and is associated with infrastructure and roadworks. The fill thicknesses across the project site vary between 1.5 metres and 4.5 metres, typically comprising sand, clay, clayey sand and gravelly sand. Areas of thicker filling are present in the former Tempe landfill and Alexandria landfill.

These man-made fill areas comprise dredged estuarine sand and mud, demolition gravels, and industrial and household waste. Sydney Airport, located directly south of Alexandra Canal, features large areas of reclaimed land consisting of dredged Botany Sands. It is possible the project overlies these dredged Botany Sands, but currently available borehole information suggests soils encountered are natural.

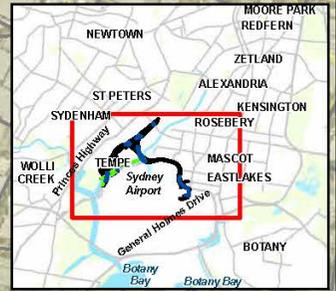
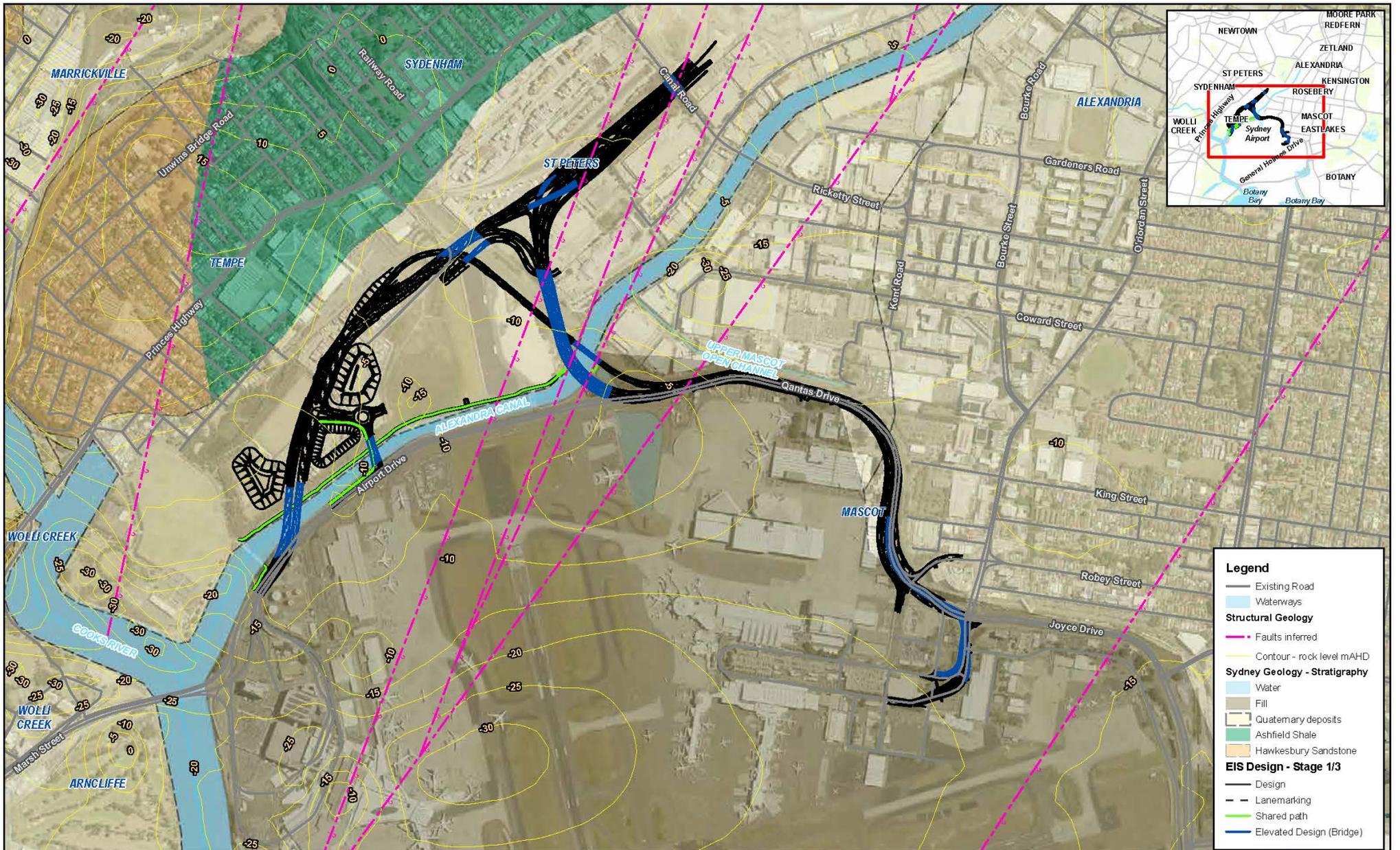
Additional detail on the extent and contents of the former Tempe landfill is provided in Technical Working Paper 16 – Landfill Assessment.

#### 4.4.2.2 Quaternary sediments

The sediments from the erosion of the underlying bedrock are transported by waterways to form the Quaternary sediments. The project area located north to north-west as well as immediately surrounding Alexandra Canal is underlain by peat, sandy peat, and mud. This unit is deposited through fluvial processes in freshwater swamps and extends south of the canal, east of Qantas Drive.

Botany Sands are aeolian deposits comprising well-sorted, poorly cemented, and fine to medium-grained quartz sands. Lenses and bands of inter-dunal peat and organic clay are also present within the unit. The average thickness of the Botany Sands is 15 to 20 metres (Hatley, 2004). The marine, alluvial deposits and residual soils underlying the uncontrolled fill have varying thicknesses between 15 and 30 metres, typically comprising sands, clays and clayey sands of a very loose to very dense density; and very soft to hard consistency. Contours of the interface of unconsolidated sediments with the underlying bedrock (including the Quaternary sediments) are presented on Figure 4-3.





**Legend**

- Existing Road
- Waterways
- Structural Geology**
- Faults inferred
- Contour - rock level mAHD
- Sydney Geology - Stratigraphy**
- Water
- Fill
- Quaternary deposits
- Ashfield Shale
- Hawkesbury Sandstone
- EIS Design - Stage 1/3**
- Design
- Lanemarking
- Shared path
- Elevated Design (Bridge)

DATA SOURCE: Aerial Imagery @ AUSIM/GE - Jacobs Group (Australia) Pty Ltd 2018, © Department of Finance, Services & Innovation 2018		DESIGN/LOT CODE	DESIGN MODEL FILE(S) USED: FORD DOCUMENTATION OF THIS DRAWING - REV 3 (20190114)	PLOT DATE / TIME: 30/07/2019 5:29:26 PM	PLOT BY: DN	CLIENT: <b>SYDNEY GATEWAY</b>	<b>A3</b>
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A1	10/12/2018	Regional Geology					GROUNDWATER IMPACT ASSESSMENT
A2	16/01/2019	Regional Geology					FIGURE 4-3
A3	19/07/2019	Regional Geology					Regional geology
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#### 4.4.2.3 Bedrock

The alluvium, marine deposits and residual soils overlie Ashfield Shale and Hawkesbury Sandstone. The Ashfield Shale of the Wianamatta Group is composed of black to dark grey shale and laminates, and overlies the Hawkesbury Sandstone. The nearest exposure is located about 70 metres north-west of the project site. The shale decreases in thickness from west to east across the project site. The Hawkesbury Sandstone is composed of medium to coarse-grained quartz sandstone, with very minor shale and laminate lenses.

There are a number of north-east to south-west faults cutting across the project area (WSP, 2019). The Woolloomooloo fault zone, consisting of a number of north-east trending unnamed faults, cuts across the Northern Lands. These fault lines are shown on Figure 4-3.

The project also crosses a NNE-SSW striking normal fault under the proposed viaduct at Sir Reginald Ansett Drive. Hawkesbury Sandstone lies on the upthrown, eastern side of the fault, next to shale downthrown on the western side.

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## 4.5 Soil landscape

Based on the Soil Landscapes of Sydney (WSP, 2019), the project is within two types of soil landscapes: Tuggerah (9130tg) to the east, and Disturbed Terrain (9130xx) extending across the airport land, the lower reaches of the Cooks River and the Alexandra Canal to the north.

---

## 4.6 Soil salinity

Saline soils are typically present in areas along tidal waterways, such as Alexandra Canal. Tidal influence was observed in five monitoring holes located up to 40 metres away from the canal (Coffey, 2003). A soil salinity assessment performed by Golder (2016) for the New M5 classified the northern portion of the project site, located south of St Peters, as a low salinity potential area. This may be attributed to the high permeability soils in the area that allow for rapid drainage and flushing of salts.





## 4.7 Acid sulfate soils

Acid sulfate soils (ASS) are naturally occurring soils containing iron sulfides. When exposed to air, these oxidise and produce sulfuric acid. These soils are common along coastal areas and inland waterways, wetlands, and drainage channels. Based on the Botany Bay Acid Sulfate Soil Risk map (DLWC 1997), the project is classified as being located within disturbed terrain at 2 to 4 metres AHD and is shown in Figure 4-4.

There is the potential for ASS to present beneath the disturbed terrain and Table 4-3 presents the acid sulfate classification of locations within the project site (DLWC, 1997b).

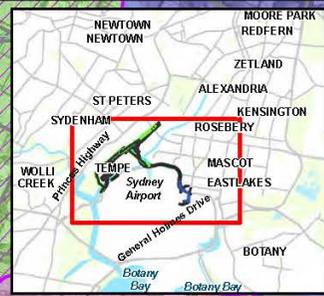
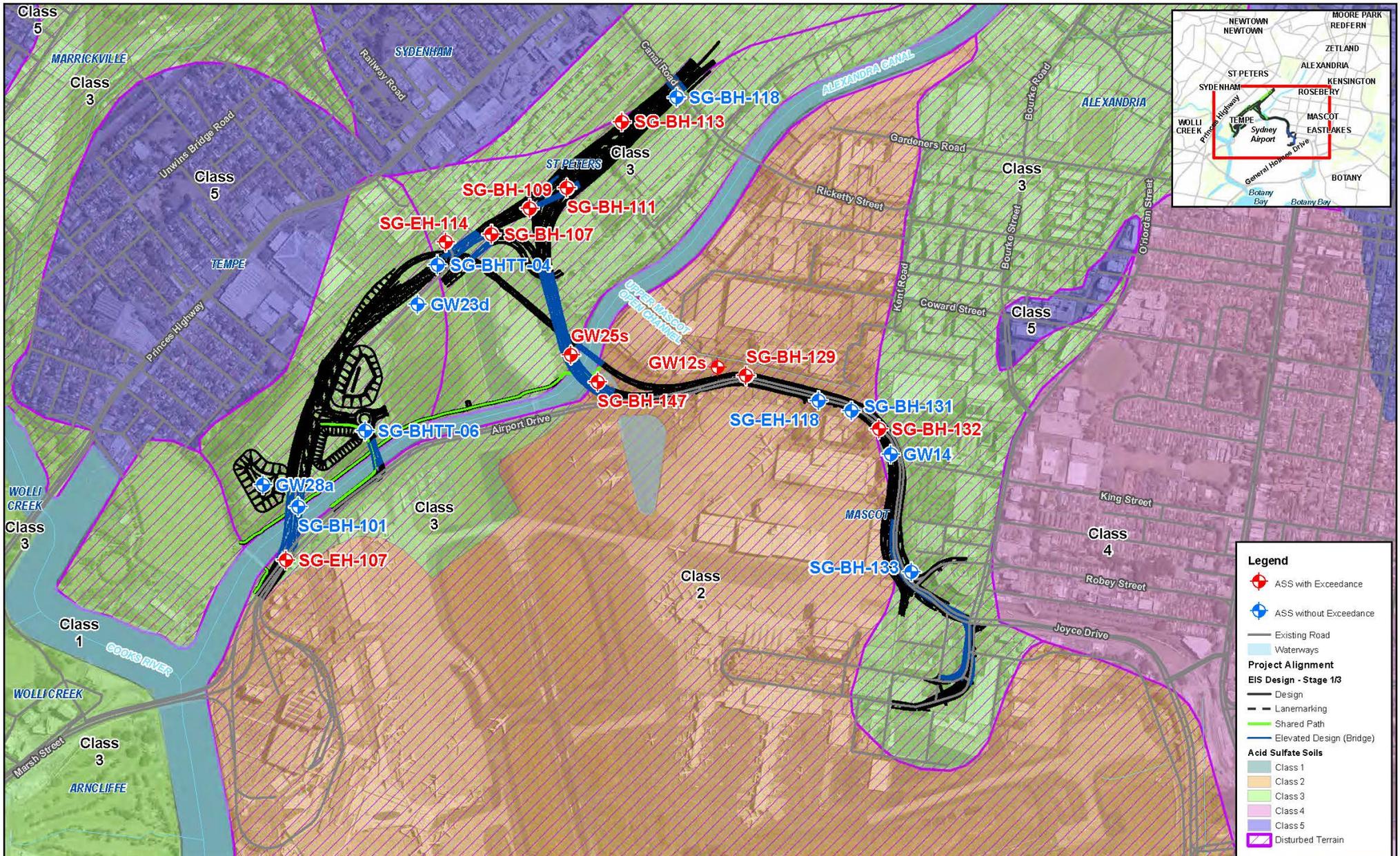
Table 4-3 Acid sulfate soil classifications

Location	Class	Work which would potentially expose acid sulfate soil
Alexandra Canal	1	Any works
Qantas Drive – Alexandra Canal to Kent Road	2	Works below natural ground surface and works by which the water table is likely to be lowered
Qantas Drive – Kent Road to O’Riordan Street	2/3	Works beyond 1 metre below the natural ground surface and works by which the water table is likely to be lowered beyond 1 metre below natural ground surface
Airport Drive and Link Road near Terminal 1	2/3	
Canal Road to Alexandra Canal	3	

### 4.7.1 Site investigation data

Acid sulfate soil data collected from field investigations is presented in Table 4-3 and Figure 4-4. Potential of acid sulfate soils has been identified at depths of less than four metres across the project. This is in general agreement with the Botany Bay Acid Sulfate Soil risk map (DLWC 1997b).





**Legend**

- Red diamond with cross: ASS with Exceedance
- Blue diamond with cross: ASS without Exceedance
- Grey line: Existing Road
- Blue line: Waterways
- Project Alignment - EIS Design - Stage 1/3**
  - Black line: Design
  - Black dashed line: Lanemarking
  - Green line: Shared Path
  - Blue line: Elevated Design (Bridge)
- Acid Sulfate Soils**
  - Light blue: Class 1
  - Light green: Class 2
  - Light orange: Class 3
  - Light purple: Class 4
  - Light pink: Class 5
  - Purple hatched: Disturbed Terrain

DATA SOURCE: AerialImagery@ALUSIMAGE - Jacobs Group (Australia) Pty Ltd 2018, © Department of Finance, Services & Innovation 2018		DESIGN/LOT CODE	DESIGN/MODEL FILE(S) USED: FORD DOCUMENTATION OF THIS DRAWING - REV 3 (20190114)	PLOT DATE / TIME 16/07/2019 10:34:45 AM	PLOT BY DN	CLIENT NSW Transport Roads & Maritime Services	SYDNEY GATEWAY		A3
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A2	21/03/2019	Acid Sulfate Soil Exceedances					DRG CHECK	S CHARTERS	16/07/2019
A3	01/04/2019	Acid Sulfate Soil Exceedances							
A4	17/06/2019	Acid Sulfate Soil Exceedances							
A5	18/06/2019	Acid Sulfate Soil Exceedances							
A6	16/07/2019	Acid Sulfate Soil Exceedances							
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PART						ISSUE No.			



## 4.8 Hydrogeological conditions

### 4.8.1 Introduction

The following sections describe the hydrogeological conditions of all underlying strata. However, based on the concept design (Section 3.4.3) it is expected that the project construction and operation would primarily intersect the shallow unconsolidated Botany Sands Groundwater Source.

### 4.8.2 Aquifer parameters

#### 4.8.2.1 Historical investigations

##### **Hawkesbury Sandstone**

The Hawkesbury Sandstone is defined as a semi-confined dual porosity (fractured and secondary porosity) regional aquifer extending across the Sydney Basin. Groundwater flow is predominantly through the open and connected fractures and bedding plane of the rock mass. Reduced water quality within the upper portion of the sandstone unit may be due to the natural leakage of saline groundwater from the Wianamatta Group (Ashfield Shales) (Golder, 2017).

##### **Ashfield Shale**

Ashfield Shale is considered to be a low-yielding aquifer. Like the Hawkesbury Sandstone, its permeability is controlled by fracture intensity, persistence, and joint aperture. Groundwater within this unit is of high salinity, ranging from 5000-50000 mg/L (McNally, 2004). The Mittagong Formation (located intermittently between the Ashfield Shale and the Hawkesbury Sandstone) is also considered to have the same hydraulic properties as the Ashfield Shale. Based on the New M5 hydrogeological design by Golder (2017), *“The Mittagong Formation has been conceptualised within the Ashfield Shale unit as they exhibit similar hydraulic properties and are both not understood to contain significant amounts of groundwater except in fracture networks”*.

The hydraulic conductivities of the bedrock are presented in Table 4-4. From this it is apparent that despite the Ashfield Shale being considered an aquitard relative to the Hawkesbury Sandstone, the range of horizontal hydraulic conductivity values derived from testing is very similar between the two formations, and, as shown from the New M5 and M4 East investigations, the Ashfield Shale and Hawkesbury Sandstone displayed identical median hydraulic conductivity values. From the M4-M5 Link, the maximum and arithmetic mean hydraulic conductivity values of the Hawkesbury Sandstone was found to be an order of magnitude greater than those of the Ashfield Shale, while harmonic mean results had similar values.

Table 4-4 Hydraulic conductivity values derived from other investigations (m/day)

Source	Ashfield Shale (m/day)	Hawkesbury Sandstone (m/day)	Method
New M5 (AECOM, 2015)	<0.0001 to 0.07 Median = 0.003 n = 6	<0.0001 to 4.3 Median = 0.003 n = 205	Packer tests (n = 221) Depth range 10 to 80 m
Sydney Metro EIS (Jacobs, 2016)	<0.0086 to 0.05 n = 3 Depth range 12 to 29 m	<0.0086 to >0.86 n = 53 Depth range 12 to 46 m	Packer tests (n = 72)
North West Rail Link (ECRL) EIS (Hewitt, 2005)	No data	Mean (near surface) = 0.1 Mean (50 m depth) = 0.002	Packer tests (n = 363)





Source	Ashfield Shale (m/day)	Hawkesbury Sandstone (m/day)	Method
M4 East (GHD, 2015)	0.00022 to 0.73 Median = 0.011 n = 75 Depth range 10 to 40 m	0.00043 to 1.7 Median = 0.011 n = 83 Depth range 10 to 50 m	Packer tests (n = 158)
M4 – M5 Link (AECOM, 2017)	0.0086 to 0.12 Arithmetic Mean = 0.017 Geometric mean = 0.010 n = 24	0.0086 to 1.17 Arithmetic Mean = 0.1 Geometric mean = 0.012 n = 181	Packer tests (n = 205)

Notes: n = number of tests

### Geologic structures

Groundwater flow in the bedrock units within the project site is strongly influenced by geologic structures. Faults and intrusions generally provide secondary permeability as the fractures serve as conduits for groundwater flow.

### Botany Sands

The Botany Sands is considered to be an unconfined, high permeability aquifer. Groundwater is contained in the pore spaces in the unconsolidated sediments and there is a strong hydraulic connection between surface water and groundwater. The estimated travel time between rainfall recharge and surface water features such as Alexandra Canal and Cooks River is expected to be days to months.

Published data from 1937 to 1997 for the Botany Sands was compiled by Bish et al. (2000), and further summarised by Hatley (2004). The aquifer characteristics of the Botany Sands are presented below in Table 4-5.

Table 4-5 Aquifer characteristics of the Botany Sands (Hatley, 2004)

Parameter	Range
Average thickness	15 to 20 m, up to 53 m in deeper paleochannels
Recharge (by rainfall infiltration)	6% (over estuarine sediments) to 37% (over sandy sediments)
Hydraulic gradient	0.003 to 0.01
Porosity	0.33 to 0.40
Variable storage coefficients	0.0004 to 0.26
Hydraulic conductivity (m/day)	1.4 to 85
Transmissivity (m <sup>3</sup> /day/m)	230 to 630
Specific yields	0.11 to 0.26





**Fill**

There are two primary types of man-made fill materials associated with the project. One is the landfill material at the former Tempe landfill and Alexandria landfill while the other type is the man-made fill associated with land reclamation for Sydney Airport. The reclaimed material is generally reworked local estuarine deposits and is similar in composition to the underlying natural materials. There are also intermittent areas of fill across the project site associated with development/infrastructure in the area.

Hydraulic conductivity data from previous and the current site investigations for bores screened within the Botany Sands and unconsolidated man-made fill are summarised in Table 4-6 and discussed below:

Table 4-6 Summary statistics for wells screened within Botany Sands

Summary statistics	Value
Number of test points (n)	31
Average hydraulic conductivity (m/day)	10.03
Minimum hydraulic conductivity (m/day)	0.087
Maximum hydraulic conductivity (m/day)	52
Median hydraulic conductivity (m/day)	1.86

*Westconnex Enabling Works Botany Road Rail Underpass – Airport East Project (EES, 2018)*

Hydraulic conductivity data for wells located south-east of the project, and screened within the Botany Sands are shown in Table 4-7. Data considered in this assessment are a combination of falling head and rising head slug tests analysed using Hvorslev slug test analysis method. The Hvorslev method is an industry standard method for estimating hydraulic conductivities from slug tests. Estimated hydraulic conductivities have an average of 27 m/day.

Table 4-7 Hydraulic conductivity data within the Airport East project (EES, 2018)

Bore location	Screen depth (mBGL)	Screen lithology	Hydraulic conductivity (m/day)	Method
MW1_6	3.3-6.3	Sand	38.12	Hvorslev method (rising head slug test)
MW1_9	6.0-9.0	Sand	20.46	Hvorslev method (rising head slug test)
MW1_12	9.0-12.0	Sand	13.45	Hvorslev method (rising head slug test)
MW4	3.0-6.0	Sand	20.29	Hvorslev method (falling head slug test)
MW5	3.0-6.0	Sand	23.29	Hvorslev method (rising head slug test)
MW6	3.0-6.0	Sand	47.96	Hvorslev method (rising head slug test)





*New M5 – Alexandria Landfill Closure – Hydrogeological Assessment (AECOM, 2015b)*

Hydraulic conductivity tests were performed as part of the hydrogeological assessment for the Alexandria landfill closure (AECOM, 2015b). Falling head tests were conducted in three bores screened within fill and Botany Sands. Results shown in Table 4-8 may reflect the presence of low permeability clay along the screened sections. There was a failed slug test in MW131 (screened within the fill from 6.5–9.5 m) as the water dissipated quickly, indicating that this location could have a higher hydraulic conductivity than the other wells tested.

Table 4-8 Hydraulic conductivity data within Alexandria landfill (AECOM, 2015b)

Bore location	Screen depth (mBGL)	Screen lithology	Hydraulic conductivity (m/day)	Method
MW308	30.5-33.5	Fill (silty sand)	0.505	Hvorslev method (falling head slug test)
MW309	6.3-6.9	Clayey sand, sandy clay, sand	0.783	Hvorslev method (falling head slug test)
MW312	11.2-14.2	Sand, clay, siltstone	0.904	Hvorslev method (falling head slug test)

*Tempe Lands Remediation and Development – Groundwater Report (Coffey, 2003)*

Hydraulic conductivity tests were conducted in the former Tempe landfill, both in landfill material and alluvium from the Botany Sands. Hydraulic conductivity for the landfill material ranges from 0.4 m/day to 6.7 m/day, with an average of 2.65 m/day.

The former Tempe landfill features a soil bentonite cut-off wall (of very low hydraulic conductivity) and leachate extraction system that would affect the hydraulic conditions and therefore groundwater flow conditions. This is expected to include lowered groundwater levels and artificial groundwater flow patterns associated with sumps for collection by the leachate system. Previous studies also conclude that the two landfill sites surrounding the project site have had an impact on groundwater quality in the area.

Hydraulic conductivity values for bores screened within alluvium/Botany Sands have an average of 0.9 m/day, and are listed in Table 4-9. Generally, the landfill material consisting of rubbish in a sandy clay matrix has a higher conductivity than the alluvium. Cohesive alluvium composed of clayey material also has a lower hydraulic conductivity to the granular alluvium.

Table 4-9 Hydraulic conductivity data within the former Tempe landfill (Coffey, 2003)

Bore location	Screen lithology	Hydraulic conductivity (m/day)	Method
TL1	Alluvium (cohesive), residual	0.80	Falling head slug test
TL3	Alluvium (granular)	0.90	Falling head slug test
TL4	Alluvium (granular), residual	1.10	Falling head slug test
TL5	Alluvium (granular/cohesive)	0.80	Falling head slug test
TL6	Alluvium (granular)	0.90	Falling head slug test





*Sydney Gateway road project field investigations (AECOM, 2019)*

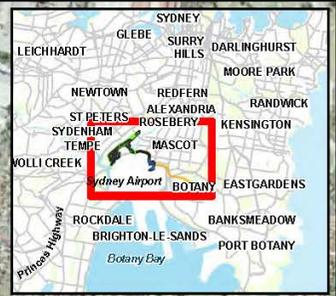
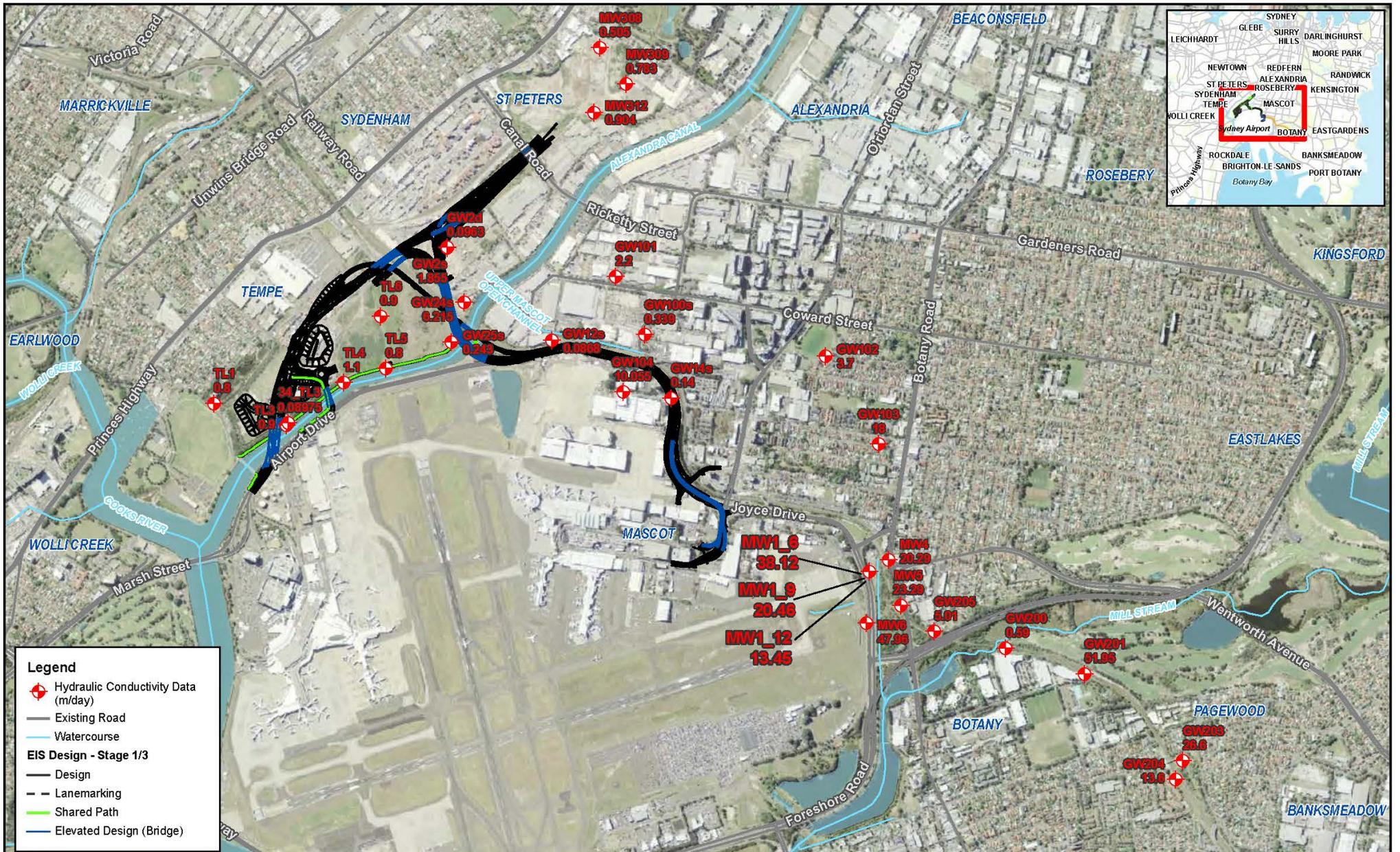
Hydraulic conductivity testing was completed as part of the ongoing groundwater investigation for the Sydney Gateway road project. A combination of falling head and rising head slug tests were conducted in 17 monitoring bores screened within Botany Sands from January to April 2019. Results are shown in Table 4-10. Bores screened within sand have the highest hydraulic conductivity values averaging 14 m/day, followed by bores screened along silty sands, and bores screened along lithologies with low permeability clay and peat.

Table 4-10 Hydraulic conductivity data for the project

Bore location	Screen lithology	Hydraulic conductivity (m/day)	Method
GW2s	Sandy clay	1.855	Hvorslev method (one rising head, and one falling head slug test)
GW2d	Sand/Sandy clay/clay	0.0963	Hvorslev method (one rising head, and one falling head slug test)
GW12s	Peat/Clay/Sandy clay/Clayey sand	0.0868	Hvorslev method (one falling head slug test)
GW14s	Sand/Clay/Sandy Clay	0.14	Hvorslev method (two rising head slug tests)
34_TL3	–	0.08975	Hvorslev method (one rising head, and one falling head slug test)
GW24s	Sand	6.215	Hvorslev method (one rising head, and one falling head slug test)
GW25s	Silty Sand/Sand	0.243	Hvorslev method (one rising head, and one falling head slug test)
GW100s	Sand	0.339	Hvorslev method (one rising head, and one falling head slug test)
GW101	Clayey sand/Sand	2.2	Hvorslev method (one rising head, and one falling head slug test)
GW102	Silty sand/Sand	3.7	Hvorslev method (one rising head, and one falling head slug test)
GW103	Silty sand	18	Hvorslev method (one rising head, and one falling head slug test)
GW104	Sand	10.055	Hvorslev method (one rising head, and one falling head slug test)
GW200	–	0.59	Hvorslev method (one rising head slug test)
GW201	Sand	51.95	Hvorslev method (one rising head, and one falling head slug test)
GW203	Sand	26.60	Hvorslev method (one rising head, and one falling head slug test)
GW204	Sand	13.60	Hvorslev method (one rising head, and one falling head slug test)
GW205	Sand	5.01	Hvorslev method (one rising head, and one falling head slug test)

Note: – Data was not available





Legend	
	Hydraulic Conductivity Data (m/day)
	Existing Road
	Watercourse
EIS Design - Stage 1/3	
	Design
	Lanemarking
	Shared Path
	Elevated Design (Bridge)

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A1	24/06/2019	Hydraulic Conductivity - unconsolidated Aquifers					GROUNDWATER IMPACT ASSESSMENT
A2	16/07/2019	Hydraulic Conductivity - unconsolidated Aquifers					Figure 4-5
							Hydraulic conductivity - unconsolidated aquifers
							RMS REGISTRATION No.
							ISSUE STATUS
							FOR INFORMATION
							EDM No.
							SHEET No.
							ISSUE A2



### 4.8.3 Groundwater recharge

Recharge to the Botany Sands Groundwater Source is primarily through direct rainfall infiltration (Hatley, 2004) and ranges between six per cent over estuarine sediments to 37 per cent over sands (Bish et al, 2000). The main recharge for the Botany Sands Groundwater Source is located to the north-east of the project at the Centennial Parklands. Other green areas like golf courses and the Botany Wetlands are also main recharge areas. The project area is mapped as an impervious surface (SMCMA, 2011), as urban developments such as roads and other man-made structures result in reduced surface infiltration. Therefore, it is expected that the project site would already have lower groundwater recharge from rainfall infiltration compared with open spaces overlying the same aquifer. However, leakage from supply and drainage networks generally compensate for decreased direct recharge in urban areas (Lerner, 2002).

## 4.9 Groundwater elevations

### 4.9.1 Regional groundwater elevations

Interpolated regional groundwater flow directions for the Botany Bay catchment are presented in Figure 4-6 (Hatley 2004).

The flow directions within Botany Sands are generally controlled by topography. From the recharge areas located at higher elevations north-east of the Botany Basin, groundwater flows south and south-west towards rivers and other tributaries and into Botany Bay. Based on available well monitoring data, groundwater is about 35 metres AHD (mAHD) near Centennial Park, with elevations gently declining south to Botany Bay. Flow gradients range from 0.003 to 0.01 (Hatley, 2004).

Interpreted regional groundwater elevations within the surficial (water table) aquifers (primarily the Botany Sand aquifer) across the project site are presented in Figure 4-7 and have been interpolated using the following data:

- Long term Dol Water monitoring wells, with average elevation from records commencing between 1999 and 2005 and ending in 2015 (WaterNSW, 2015). Table 4-11 summarises the well details and groundwater elevations
- Short term groundwater elevation monitoring (average groundwater elevations) for WCXAEP (EES, 2018) – wells MW2 to MW5. Table 4-12 summarises the well details and groundwater elevations
- Spot height elevations from:
  - Coffey (2003) – wells TL9, TL17, TL21 and screened within landfill material. Table 4-12 summarises the well details and groundwater elevations
  - AECOM (2016) – wells BH042, BH115, BH122, BH152s, MW300, MW302, and MW311. Of these wells only MW300, MW302 and MW311 are screened in Botany Sands. Table 4-12 summarises the well details and groundwater elevations
- AECOM (2019) – wells from current field investigations. Data from the latest groundwater monitoring event undertaken in April 2019 was used. This included all wells along the bentonite cut-off wall of the former Tempe landfill (prefixed with 'MPE' for external to the bentonite cut-off wall and 'MPI' for internal to the bentonite cut-off wall), all 'GW' wells that were not Dol Water wells and a number of 'WCX' wells located across the project site. The screen details for these wells are presented in Appendix A
- Water strike information from bore logs (mainly located east of the project along the Botany rail alignment and along Airport Drive at the western end of the project) where groundwater elevation monitoring data was scarce.

Groundwater elevations approximate 27 metres AHD in the north-east near Centennial Park flow and gradually fall to less than four metres AHD across the project site and to discharge points at Botany Bay, Cooks River and Alexandra Canal.





Interpreted groundwater elevations across the project site are presented in Figure 4-8. Groundwater contours in the figure suggest that groundwater passing beneath the project site primarily discharges to Alexandra Canal or the Cooks River from the east and to Alexandra Canal from the north-west.

In regards to the depth to groundwater Table 4-11 also highlights how close groundwater gets to ground surface in wells close to the project site with minimum depths to groundwater ranging between 0.21 m below top of casing (TOC) at GW075023 and 0.55 m below TOC at GW075024.

Table 4-11 Key groundwater monitoring wells – continuous monitoring

Source	Well ID	Monitoring Period	Screen depth m below ground (from – to)	Screen lithology	Average depth to groundwater (m TOC) (min – max)	Average groundwater elevation (mAHD)
Dol Water	GW075024	01/03/1999 to 14/09/2015	12.0–15.0	Sand	1.48 (0.55–3.2)	5.4
	GW075023	01/05/2005 to 14/09/2015	15.5–18.5	Clayey sand	0.54 (0.21–0.996)	6.9
	GW075022	11/03/1999 to 05/02/2014	11.25–14.25	Sand, peat	1.5 (0.03–1.83)	5.0
	GW042161	15/03/2000 to 14/09/2015	n/a	n/a	11.8 (9.9–12.9)	10.1
	GW075020	05/03/1999 to 05/03/2014	24.5–27.5	Sand	10.3 (0.12–13.9)	9.8
	GW075019	05/03/1999 to 25/05/2015	16.50–19.50	Silty sand	8.4 (7.8–8.8)	5.7
	GW075025	05/03/1999 to 14/09/2015	21.20–24.20	Sand	8.9 (5.7–11.8)	20.5
	GW075021	05/03/1999 to 14/09/2015	39.00–43.00	Silty sand, sandy clay	3.7 (3.1–4.6)	19.1
	GW075017	04/03/1999 to 14/09/2015	24.50–27.50	Silty sand, sandy clay	2.5 (1.87–3.4)	20.7
	GW075018	04/03/1999 to 25/05/2015	40.00–43.00	Silt	1.24 (0.4–1.95)	24.6

Notes:

The screen lithology of GW042161 was unable to be identified from the available information. GW075025 is screened across the interface with the bedrock aquifer.

m TOC = metres below the top of the well casing.





Table 4-12 Key groundwater monitoring wells screened within the Botany Sands and alluvium aquifers– spot recording

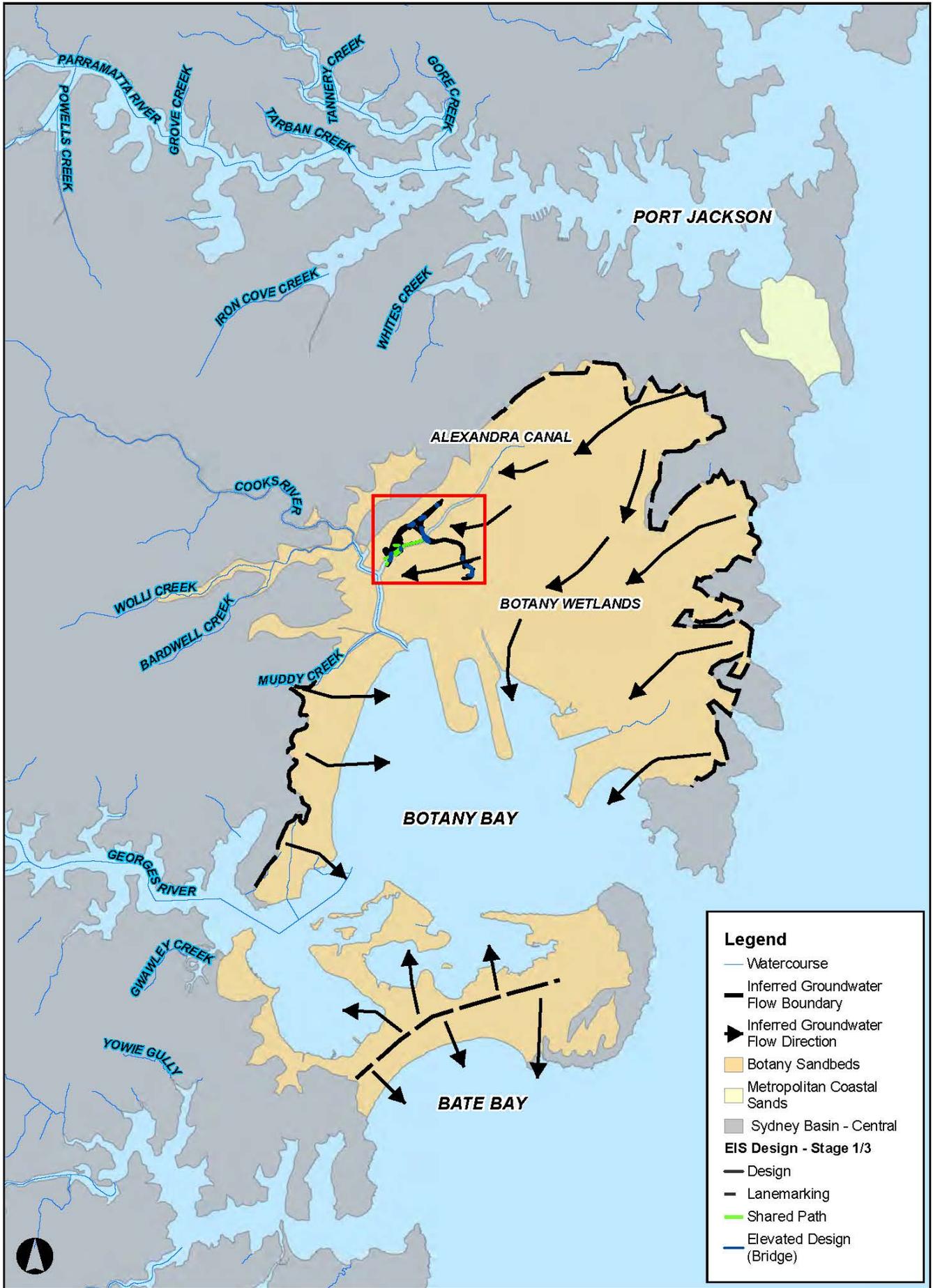
Source	Well ID	Monitoring Period	Screen depth m below ground (from – to)	Screen lithology	Average depth to groundwater (m TOC)	Average groundwater elevation (mAHD)
EES, 2018	MW1-6	02/2017 to 08/2017	3.00–6.00	Sand	4.41	2.66
	MW1-9	02/2017 to 08/2017	6.00–9.00	Sand	4.31	2.71
	MW1-12	02/2017 to 08/2017	9.00–12.00	Sand	4.33	2.81
	MW1-18	02/2017 to 08/2017	15.00–18.00	Sand	4.01	3.12
	MW1-25	02/2017 to 08/2017	22.00–25.00	Clay	4.26	2.88
	MW2	02/2017 to 08/2017	3.00–6.00	Sand	1.80	3.22
	MW3	02/2017 to 08/2017	3.00–6.00	Sand	4.53	2.52
	MW4	02/2017 to 08/2017	3.00–6.00	Sand	3.76	3.35
	MW5	02/2017 to 08/2017	3.00–6.00	Sand	3.13	3.34
	MW6	02/2017 to 08/2017	3.00–6.00	Sand	4.49	2.48
	EX1	02/2017 to 08/2017	--	n/a	3.43	3.38
	EX2	02/2017 to 08/2017	--	n/a	3.73	3.19
AECOM, 2016	MW300	24/02/2015	1.90–6.00	Fill (Clayey sand, gravelly sand, slag ash)	3.61	0.91
	MW302	24/02/2015	5.45–7.45	Sand	1.73	0.53
	MW303	24/02/2015	1.50–3.50	No recovery (sand?)	1.25	1.00
	BH042	16/11/2015	45.0–48.0	Sandstone, siltstone	0.91	1.00
	BH115	16/11/2015	29.5–32.5	Siltstone	14.36	5.97
	BH122	16/11/2015	14.9–17.9	Laminite	1.82	2.09
	BH152S	1/04/2015	17.9–20.9	Clayey sand	2.3	0.63
Coffey, 2003	TL17	29/04/2003	0.50–4.20	Landfill	0.72	1
	TL21	29/04/2003	10.10–15.20	Landfill	9.94	2.83
	TL9	29/04/2013	13.40–16.40	Landfill	11.81	1.58
AECOM, 2019	GW100s	11/04/2019	2.2–6.10	Sand	2.07	1.374
	GW101	15/04/2019	1.9–6.20	Clayey sand, sand	1.13	1.056
	GW102	17/04/2019	3.0–7.5	Sand, silty sand	3.853	5.317
	GW103	17/04/2019	1.2–6.0	Silty sand	1.334	6.804





Source	Well ID	Monitoring Period	Screen depth m below ground (from – to)	Screen lithology	Average depth to groundwater (m TOC)	Average groundwater elevation (mAHD)
	GW104	10/04/2019	3.0–6.0	Sand	1.63	0.933
	GW10s	9/04/2019	1.7–6.1	Clayey sand, clay	0.36	1.537
	GW11s	16/04/2019	6.7–8.7	Clayey sand, sandy clay	5.58	1.078
	GW13s	11/04/2019	3.0–5.9	Sand, clay	1.865	0.639
	GW14s	10/04/2019	3.0–6.0	Sand, clay, clayey sand, sandy clay	2.192	1.908
	GW15s	10/04/2019	3.1–6.1	Silty sand	1.356	1.889
	GW203	17/04/2019	4.0–6.3	Sand	2.825	7.753
	GW25s	17/04/2019	3.5–6.5	Silty sand, sand	1.505	0.05
	GW27s	16/04/2019	3.5–6.5	Clay	2.867	0.232
	GW2s	9/04/2019	2.0–6.0	Sandy clay	0.91	1.128
	GW4s	15/04/2019	–	Log unavailable	3.857	2.69
	GW5s	16/04/2019	1.0–3.0	Cobbles, gravelly sandy clay	2.4	1.249
	MPE_2	12/03/2019	3.0–15.0	Sandy clay, silty clay	2.44	0.239
	MPE_3	12/03/2019	3.0–9.0	Sandy clay, clay, extremely weathered sandstone	2.875	0.091
	MPE_4	12/03/2019	0.5–3.05	Sandy clay, sand, gravel	3.91	-1.128
	MPE_5A	12/03/2019			3.033	-0.266
	MPI_2	12/03/2019	3.0–13.9	Clay, sandy clay, sand	1.36	0.955
	MPI_3A	12/03/2019	–	Log unavailable	1.17	0.89
	MPI_4	12/03/2019	–	Log unavailable	1.96	0.29
	MPI_4A	12/03/2019	–	Log unavailable	0.96	1.334
	MPI_6A	12/03/2019	–	Log unavailable	1.2	1.01
	WCX_GTY_BH_002	19/12/2018	1.0–4.0	Sand	No data	3.03
	WCX_GTY_BH_009s	11/04/2019	3.0–3.5	Sand, silty sand	No data	0.15
	WCX_GTY_BH_027	16/04/2019	1.0–4.0	Sand	No data	0.687





Data Source: © Department of Finance, Services & Innovation 2018 and WaterNSW

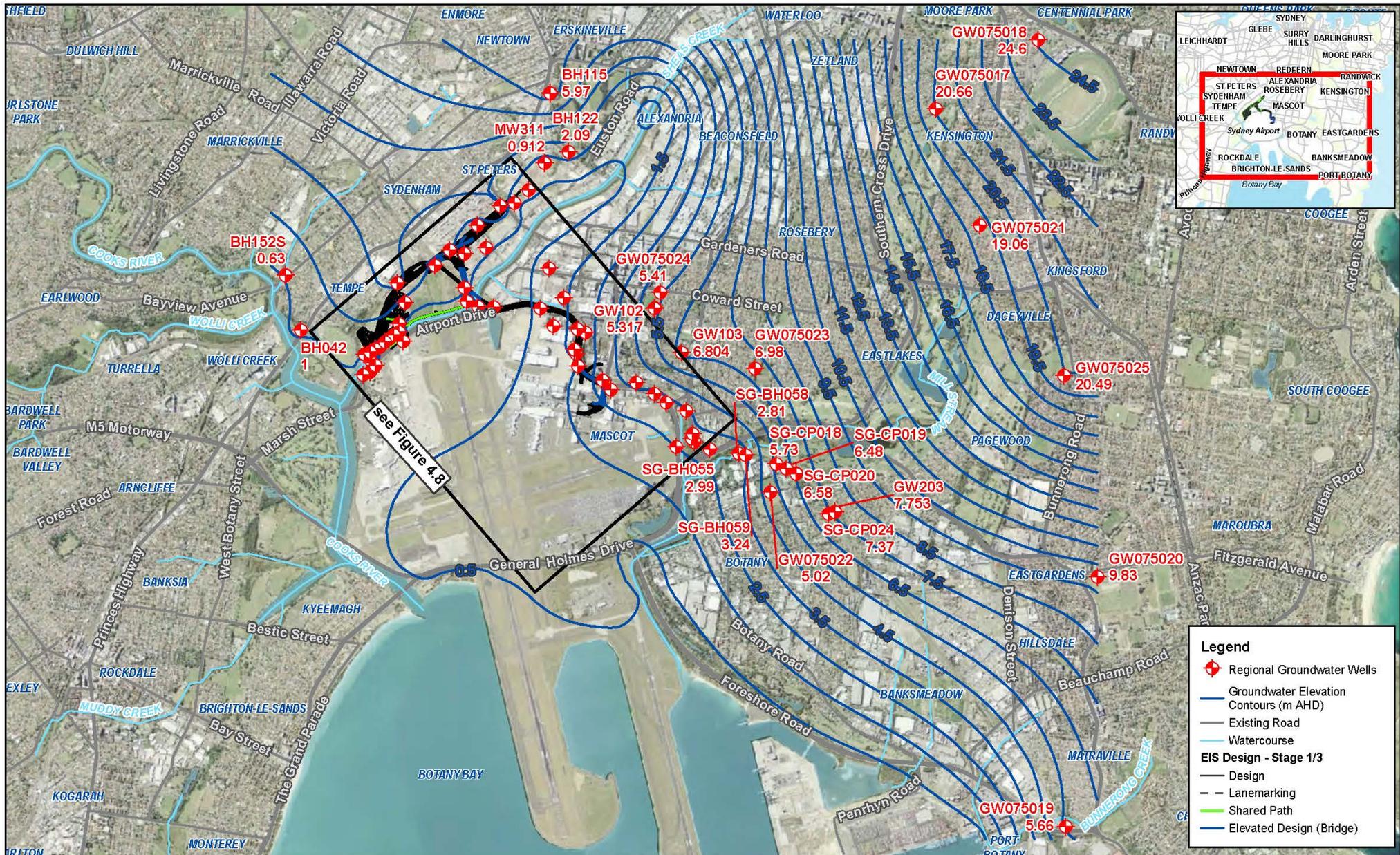
**SYDNEY GATEWAY**  
Groundwater Impact Assessment

**Figure 4-6**  
Regional groundwater flow

0 1.5 3 km  
Scale 1:120,000



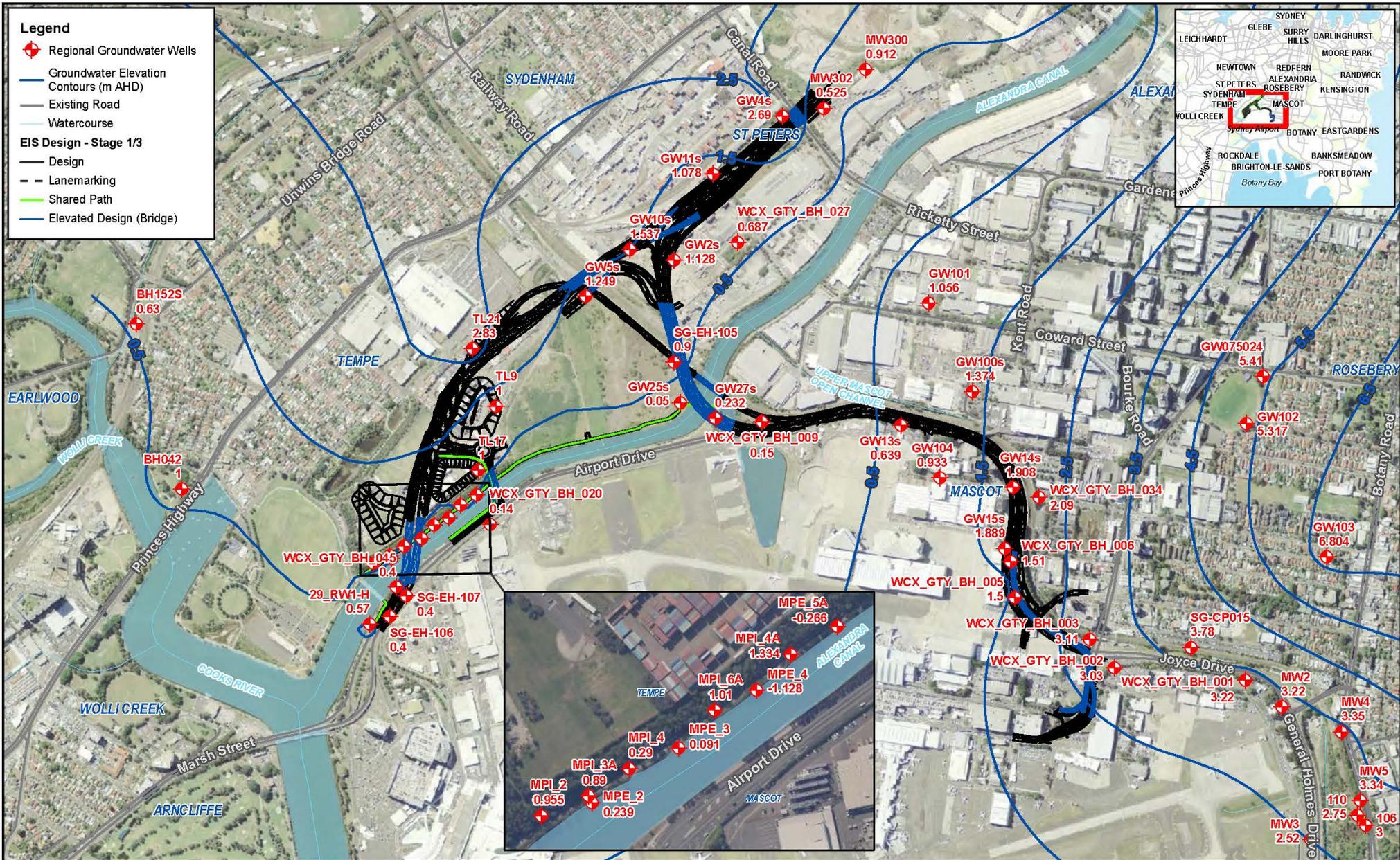
Author: David Naiken  
Date: 1/08/2019  
Map no: PS109315\_GIS\_162\_A5



**Legend**

- ◆ Regional Groundwater Wells
- Groundwater Elevation Contours (m AHD)
- Existing Road
- Watercourse
- EIS Design - Stage 1/3
- Design
- - - Lanemarking
- Shared Path
- Elevated Design (Bridge)

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A3	07/06/2019	Regional Groundwater Elevations							
A4	08/06/2019	Regional Groundwater Elevations							
A5	02/07/2019	Regional Groundwater Elevations							
A6	18/07/2019	Regional Groundwater Elevations							
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A2	02/07/2019	Regional Groundwater Elevations					DRS CHECK	S CHARTERS	16/07/2019
A3	16/07/2019	Regional Groundwater Elevations							
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ISSUE STATUS FOR INFORMATION		ED16 No.		SHEET No.		ISSUE A3		PART	



## 4.9.2 Temporal changes in groundwater elevations

### 4.9.2.1 Historical data

Ongoing monitoring was undertaken by Dol Water from March 1999 through to September 2015 at ten wells primarily screened within the Botany Sands Groundwater Source. All of these are located north-east of the project as shown in Figure 4-9. The data was obtained from the WaterNSW real time data website (<https://realtimedata.waternsw.com.au/>). Table 4-11 summarises the well details and groundwater elevations. The locations of these wells are shown on Figure 4-9 and Figure 4-12.

Plots of the groundwater elevations compared with rainfall data are shown in Figure 4-10, and groundwater elevations compared with the cumulative rainfall departure curve (CRD) are shown in Figure 4-11.

Monthly rainfall records for Sydney Airport AMO Bureau of Meteorology weather station were plotted against groundwater levels. The wells with elevations between five and eight metres AHD are in a similar location along the groundwater flow path (including GW075022, GW075023, GW075024 and GW075019). These wells tend to be relatively stable over the monitoring period with no apparent increase or decrease associated with climatic variability. Any variation in these wells appears to be primarily associated with rainfall events, although there are some temporary dips in the GW075024 in 2006 and 2014 that are indicative of other effects which could be associated with groundwater extraction. The closest wells to the project site are GW075023 and GW075024. GW075023 is located about 1.3 kilometres to the east and GW075024 is located about 800 metres to the north-east of the project alignment. The overall fluctuations in these wells over the monitoring period approximate 1.2 metres in GW075023 and 3.5 metres in GW075024 (which appears to also be affected by groundwater extraction). This is expected to be a similar variation to that which would occur across the site noting that they are up gradient of the site and would therefore have a slightly high variation and that GW075024 appears to be affected by intermittent groundwater extraction resulting in a larger variation.

The CRD provides an understanding of the long term climatic conditions with a declining curve representing below average rainfall and an increasing curve representing above average rainfall. The CRD curve indicates that the data range (1999 to 2015) is a period with lower than average rainfall. There is a decline until around 2011 where it slightly increases and stabilises. The groundwater elevations in wells near to the project site (GW075023 and GW075024) do not respond to this decrease in rainfall. This suggests that the Botany Sands in the vicinity of the project site does not respond to long term climatic conditions and is likely to be in a steady state condition.





**Legend**

- Continuous Monitoring Bores
- Existing Road
- Watercourse
- EIS Design - Stage 1/3**
- Design
- Lanemarking
- Shared Path
- Elevated Design (Bridge)

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A3	18/07/2019	NSW DPI Continuous Monitoring Bores (1999 to 2015)					NSW DoI - Continuous monitoring bores (1999 to 2015)
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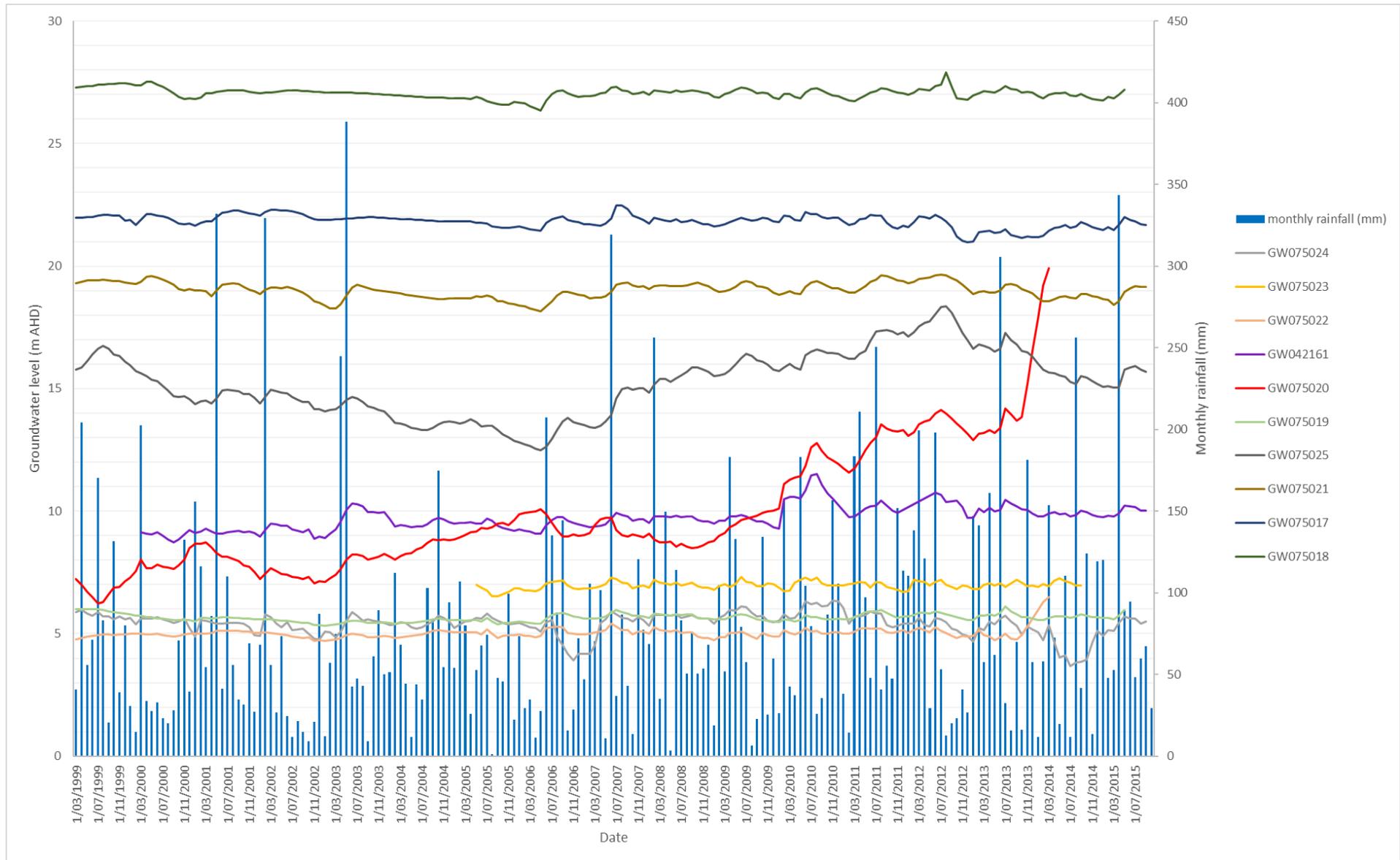


Figure 4-10 Monthly groundwater elevations (m AHD) and monthly rainfall (1999-2015) (DoI Water continuous monitoring wells)



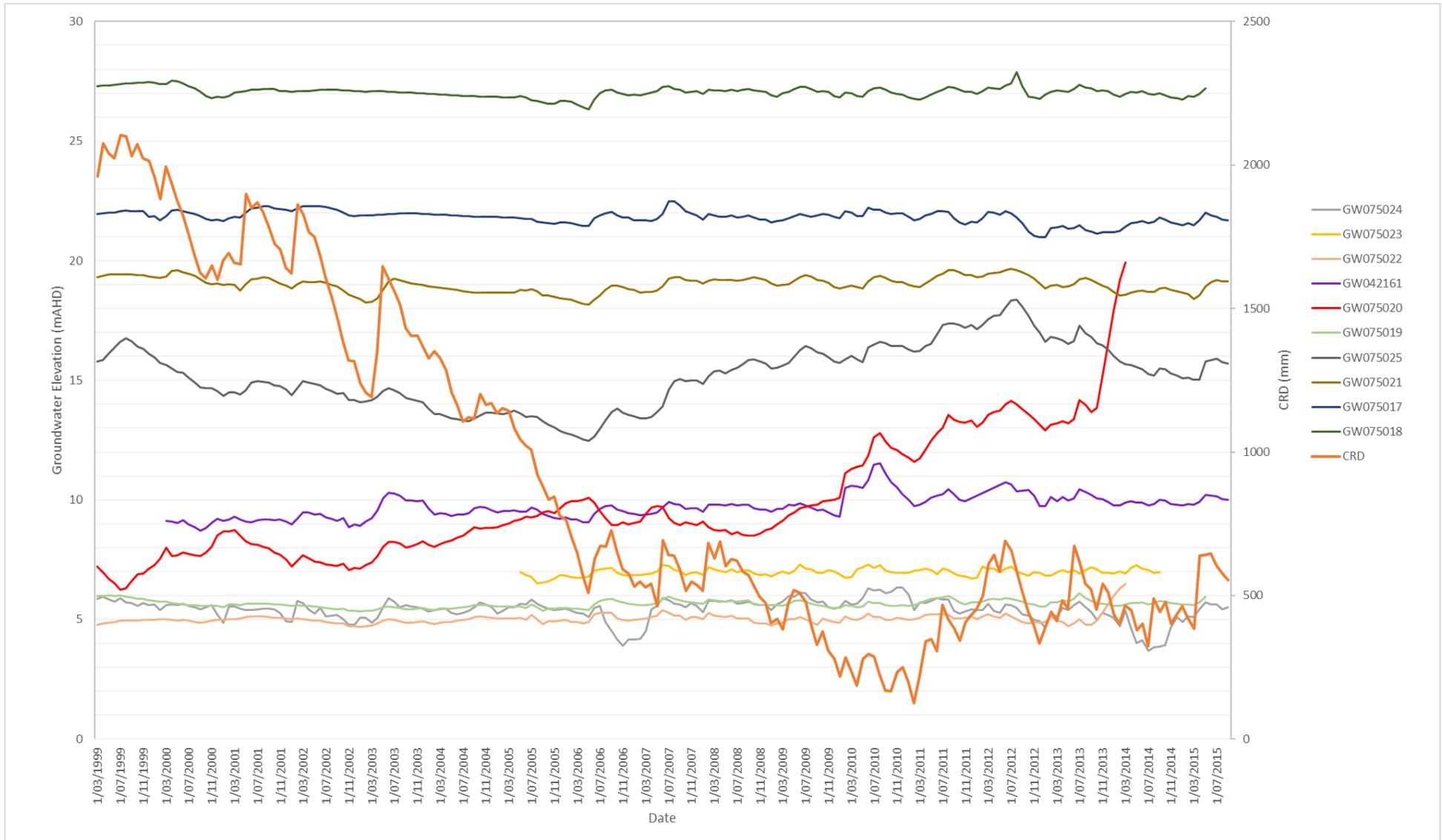
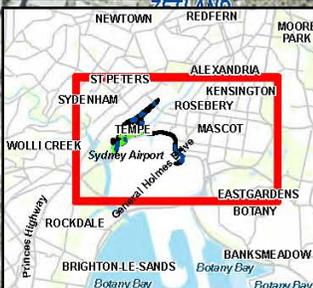
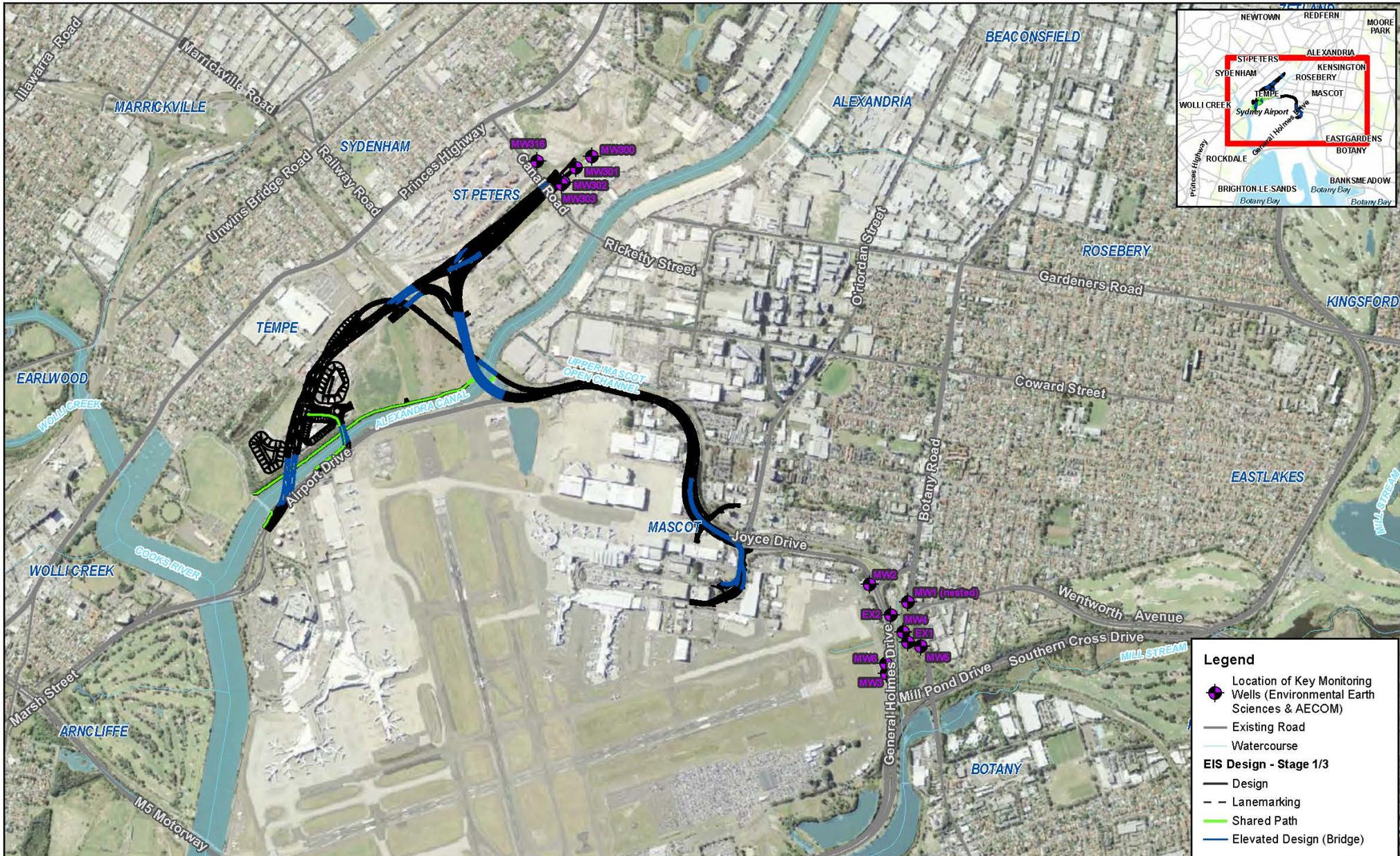


Figure 4-11 Monthly groundwater elevations (mAHd) and Cumulative rainfall deviation (1999-2015) (DoI Water continuous monitoring wells)





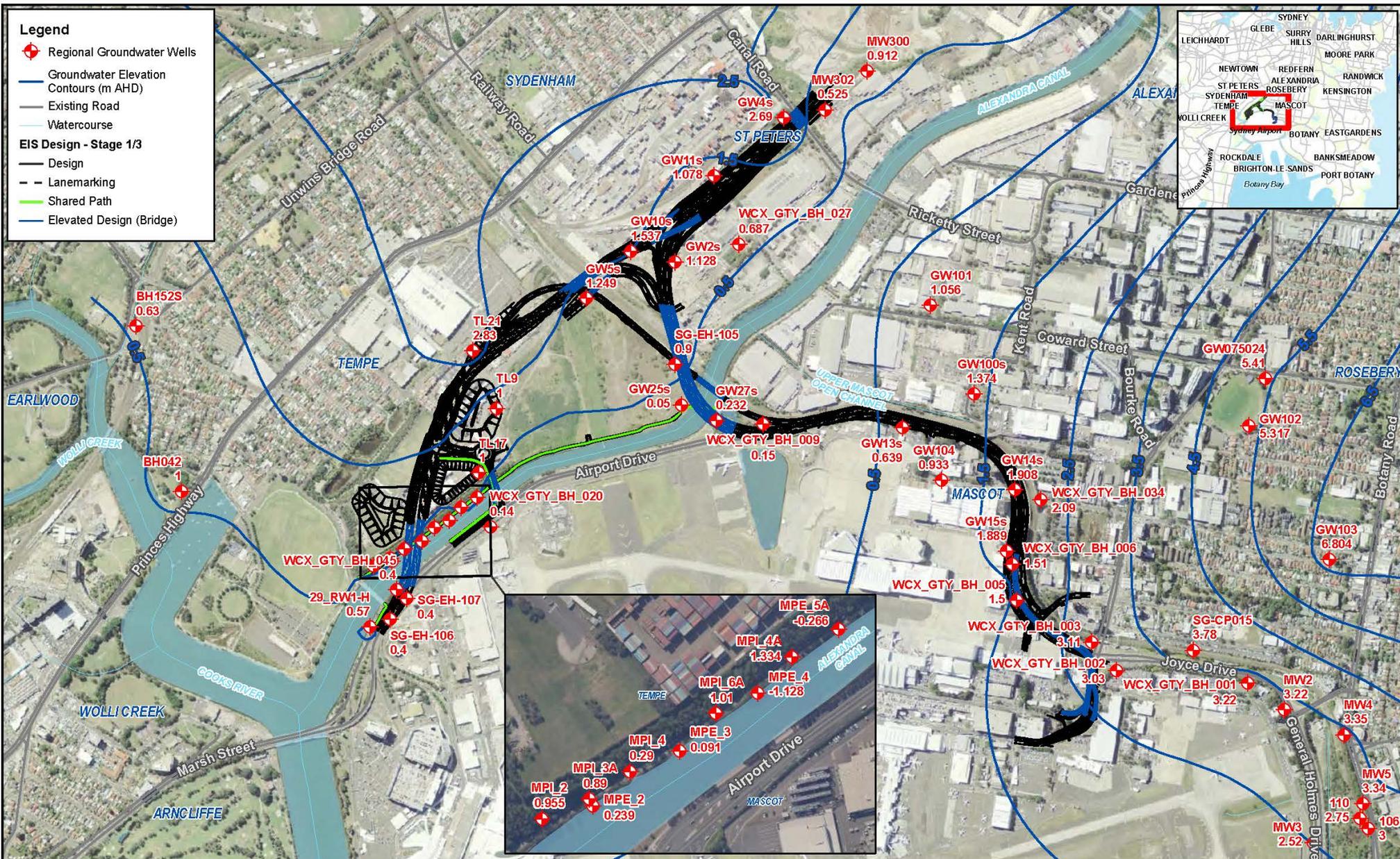
**Legend**

- Location of Key Monitoring Wells (Environmental Earth Sciences & AECOM)
- Existing Road
- Watercourse

**EIS Design - Stage 1/3**

- Design
- Lanemarking
- Shared Path
- Elevated Design (Bridge)

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									ISSUE A2



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#### 4.9.2.2 Site data

##### Temporal response

Data obtained from Interim Groundwater and Landfill Gas Data Report (AECOM, 2019) included hydrographs of 12 monitoring wells, which are summarised in Table 4-13. All wells are screened within the Botany Sands, except for GW5s which is screened within man-made fill and alluvium. It should be noted that in lieu of the raw data, groundwater elevations were estimated using the hydrographs in the interim report. This data provides an understanding of the climatic variations in groundwater elevations across the project, which can be used to further inform groundwater elevation conditions that may be encountered if wetter conditions were present during construction and operation.

Key points in regard to the data are outlined below:

- GW8 is beneath landfill and GW11s is near to landfill and is expected to be impacted by the leachate treatment system in this area
- GW25s is located in close proximity to Alexandra Canal and appears to have a tidal response. Groundwater elevations fluctuate between -0.33 mAHD to 0.24 mAHD with a total variation of 0.57 m, which is primarily associated with tidal fluctuations. This provides an example of the expected fluctuations in groundwater in tidally impacted areas next to Alexandra Canal
- The monitoring data for 34\_TL3 is for a shorter period and did not adequately capture any response to a significant rainfall event. As such, the range in groundwater elevations in this well was small
- The remaining eight wells were subject to a 70 millimetre rainfall event with subsequent stabilisation of groundwater elevations after the event. The groundwater elevation range for each well over the monitoring period, including the 70 millimetre rainfall event, was between 0.29 m at GW2s and 0.7 m at GW103. The majority of wells had ranges approximating 0.4 to 0.5 m. There was also a slight trend of increasing range with increasing average groundwater elevation at each well.

Table 4-13 Sydney Gateway groundwater elevation data loggers

Well ID	Location	Screen depth (mBGL)	Lithology	Monitoring dates/period	Min elevation (mAHD)	Max elevation (mAHD)	Range (m)
GW2s	Sydney Airport Northern Land, St Peters	2.0–6.0	Sandy clay	13/02/2019-16/04/2019	0.94	1.23	0.29
GW4s	No data	No data	No data	13/02/2019-10/04/2019	2.4	2.8	0.4
GW5s	Northern Lands car park, Tempe	1.0–3.0	Fill - mixture of cobbles and soil; Gravelly sandy clay	13/02/2019-09/04/2019	0.8	1.3	0.5
GW8	Tempe Golf Range & Academy, Tempe	9.8–15.8	Gravelly sand, clay	03/04/2019-16/04/2019	2.33	2.45	0.12
GW10s	Maritime Container Services, St Peters	1.7–6.1	Clayey sand, Clay	13/02/2019-16/04/2019	1.23	1.71	0.48
GW11s	Sydney Airport Northern Lands, St Peters	6.7–8.7	Clayey sand, Sandy clay	13/03/2019-10/04/2019	0.95	1.1	0.15





Well ID	Location	Screen depth (mBGL)	Lithology	Monitoring dates/period	Min elevation (mAHD)	Max elevation (mAHD)	Range (m)
GW25s	Sydney Airport Northern Land, St Peters	3.5–6.5	Silty Sand, Sand	13/02/2019-16/04/2019	-0.33	0.24	0.57
GW101	288 Coward St, Mascot	1.9–6.2	Clayey and, Sand	13/02/2019-10/04/2019	0.68	1.16	0.48
GW102	Mascot Oval, Mascot	3.0–7.5	Sand	13/02/2019-17/04/2019	4.78	5.43	0.5
GW103	258-322 King St, Mascot	1.2–6.0	Silty sand	14/02/2019-10/04/2019	6.25	6.95	0.7
GW203	Galarine Gardens, Pagewood	4.0–6.3	Sand	14/02/2019-10/04/2019	7.36	7.9	0.54
34_TL3	No data	No data	No data	02/04/2019-16/04/2019	0.9	1.05	0.15

### Groundwater elevations near tidally influenced surface water features

To better understand the potential tidal effects on groundwater elevations around construction works along Alexandra Canal, groundwater measurements collected from February to April 2019 from wells screening unconsolidated sediments near Alexandra Canal were reviewed (AECOM, 2019). These wells and the potential tide variations are summarised in Table 4-14 (refer to Figure 4-7 and Figure 4-8). While only a few readings have been taken at most wells (preventing resolution of the response to tidal events) that range would as a minimum be reflective of the response to tides and other climatic stressors (such as rainfall) combined. The groundwater elevation ranges vary from 0.15 metres in 34\_TL3, which is not associated with tides, to 1.9 metre in MPE\_4.

GW25s and 34\_TL3 have available data logger results. GW25s is located 20 metres north of Alexandra Canal and is the only well that shows an apparent tidal influence of these two wells.

Table 4-14 Wells near Alexandra Canal

Well ID	Depth (m)	Lithology	Number of observations	Min elevation (mAHD)	Max elevation (mAHD)	Range (m)
MPE_2	3.0–15.0	Sandy clay, silty clay	6	-0.031	0.797	0.828
MPE_3	3.0–9.0	Sandy clay, clay, extremely weathered sandstone	6	-0.294	0.921	1.215
MPE_4	0.5–3.05	Sandy clay, sand, gravel	5	-1.128	0.772	1.9
MPE_5	3.0–5.4	Sandy clay	6	-0.346	0.584	0.93
MPE_5A			6	-0.266	0.827	1.093
MPE_6	3.0–9.5	Clay	6	-0.577	0.638	1.215
MPE_7	3.0–13.6	Clay, sandy clay	6	-2.253	-0.813	1.44
MPE_8	3.0–17.0	Siltstone, clay, silty clay, sandy clay	6	-0.814	-0.132	0.682
MPE_9	3.0–20.1	Clayey sand, clay	6	-0.075	0.79	0.865
MPE_11	3.0–17.0	Clay, silty clay, gravelly sand shale	6	0.201	0.491	0.29





Well ID	Depth (m)	Lithology	Number of observations	Min elevation (mAHD)	Max elevation (mAHD)	Range (m)
MPE_21			6	-0.198	0.642	0.84
GW25s	3.5–6.5	Silty sand, sand	Continuous from February to April 2019	0.05	0.345	0.295
GW27s	3.5–6.5	Clay	3	-0.659	0.232	0.891
34_TL3	–	–	Continuous from February to April 2019	0.9	1.05	0.15

Notes: – data was not available

## 4.10 Groundwater flow velocities

Groundwater flow velocities can be estimated by rearranging the Darcy flow equation as follows:

$$v = \frac{ki}{n}$$

Where:

- $k$  = Hydraulic conductivity (m/day)
- $i$  = Hydraulic gradient (m/m – dimensionless)
- $n$  = Effective porosity (m<sup>3</sup>/m<sup>3</sup> – dimensionless)
- $v$  = Groundwater velocity (m/day).

The estimated regional flow velocities across the site using the data presented in section 1.1 and 4.9 above are presented in Table 4-15.

Table 4-15 Estimated groundwater flow velocities

Input Parameter	Unit	Fill			Botany Sands			Source
		Low	Likely	High	Low	Likely	High	
Hydraulic conductivity ( $k$ )	m/day	0.4	2.7 <sup>a</sup>	6.7	0.002	10 <sup>b</sup>	26.3	Estimated range from data presented in sections 4.8 and 4.9.
Gradient ( $i$ )	dimensionless	0.0025	0.005	0.005	0.002	0.005	0.01	Estimated range from Figure 4-7 and from data presented in sections 4.8 and 4.9. Former Tempe landfill is excluded due to leachate system controlled groundwater elevations.
Effective porosity ( $n$ )	dimensionless	0.2	0.1	0.01	0.32	0.2	0.11	EES (2018) and Weight and Sonderegger (2001).
Groundwater velocity ( $v$ )	m/day	0.005	0.135	3.35	1.25x10 <sup>-5</sup>	0.25	2.39	Modified Darcy equation.

<sup>a</sup> Average value from Coffey (2003) hydraulic conductivity data

<sup>b</sup> Average value from Coffey (2003), AECOM (2016, 2019) hydraulic conductivity data.





Table 4-15 suggests that groundwater flow velocities range from <1 cm/day to 2.4 m/day in the Botany Sands and from <1 cm/day to 3.4 m/day in areas of saturated fill.

The low end and high end values are expected to be conservative values that do not reflect bulk aquifer conditions and correlation between input parameters (i.e. high hydraulic conductivities are usually associated with lower gradient and higher effective porosities). Most likely groundwater flow velocities are expected to approximate 0.135 m/day for the fill aquifer and 0.25 m/day for the Botany Sands Groundwater Source. This is based on the adoption of parameters most representative of bulk formation hydraulic properties for these aquifer systems.

EES (2018) had an estimated range in average groundwater flow velocity for the Botany Sands of 1.1 to 1.3 m/day which is similar to the most likely estimate presented in Table 4-15, and is expected to be representative of the local conditions at WCXAEP.

## 4.11 Registered groundwater users

Review of available data from DoI Water identified 23 registered groundwater wells used for household, recreational, irrigation, commercial/industrial, dewatering or unknown purposes within a one kilometre radius of the project. The majority of the wells are shallow (<20 metres in depth) and expected to be screened within the Botany Sands Groundwater Source and alluvial sediments. The location of these wells is shown on Figure 4-14 and summary data for the wells is presented in Table 4-16.

Table 4-16 Registered groundwater users within one kilometre of the project site (BOM, 2019)

Well ID	Purpose	Status	Distance from site (m)	Drilled depth (m below ground)	Screen lithology	Standing water level	Salinity (mg/L)	Yield (L/s)
GW112230	Unknown	Functioning	220	4	Sand	–	–	–
GW027248	Commercial and Industrial	Unknown	357	4.8	Sand	2.4	–	0.51
GW100053	Recreation	Unknown	630	7	Sand	1	900	1.8
GW040219	Commercial and Industrial	Functioning	636	6.3	–	2.24	–	–
GW025994	Water Supply - Community	Unknown	500	13.2	Sand	4.5	–	3.09
GW023525	Water Supply - Community	Unknown	500	5.9	Sand	3	–	0.38
GW024068	Water Supply – Household use	Unknown	584	4.2	Sand	2.1	–	0.33
GW104297	Water Supply – Household use	Functioning	627	42	–	4	–	0.4
GW073521	Water Supply – Household use	Unknown	612	3	–	–	–	–
GW024655	Irrigation	Unknown	28	9.1	Sand	1.9	–	1.01
GW027749	Recreation	Unknown	766	16.4	Sand	1.8	–	–
GW027750	Recreation	Functioning	820	17.3	Sand	–	–	–

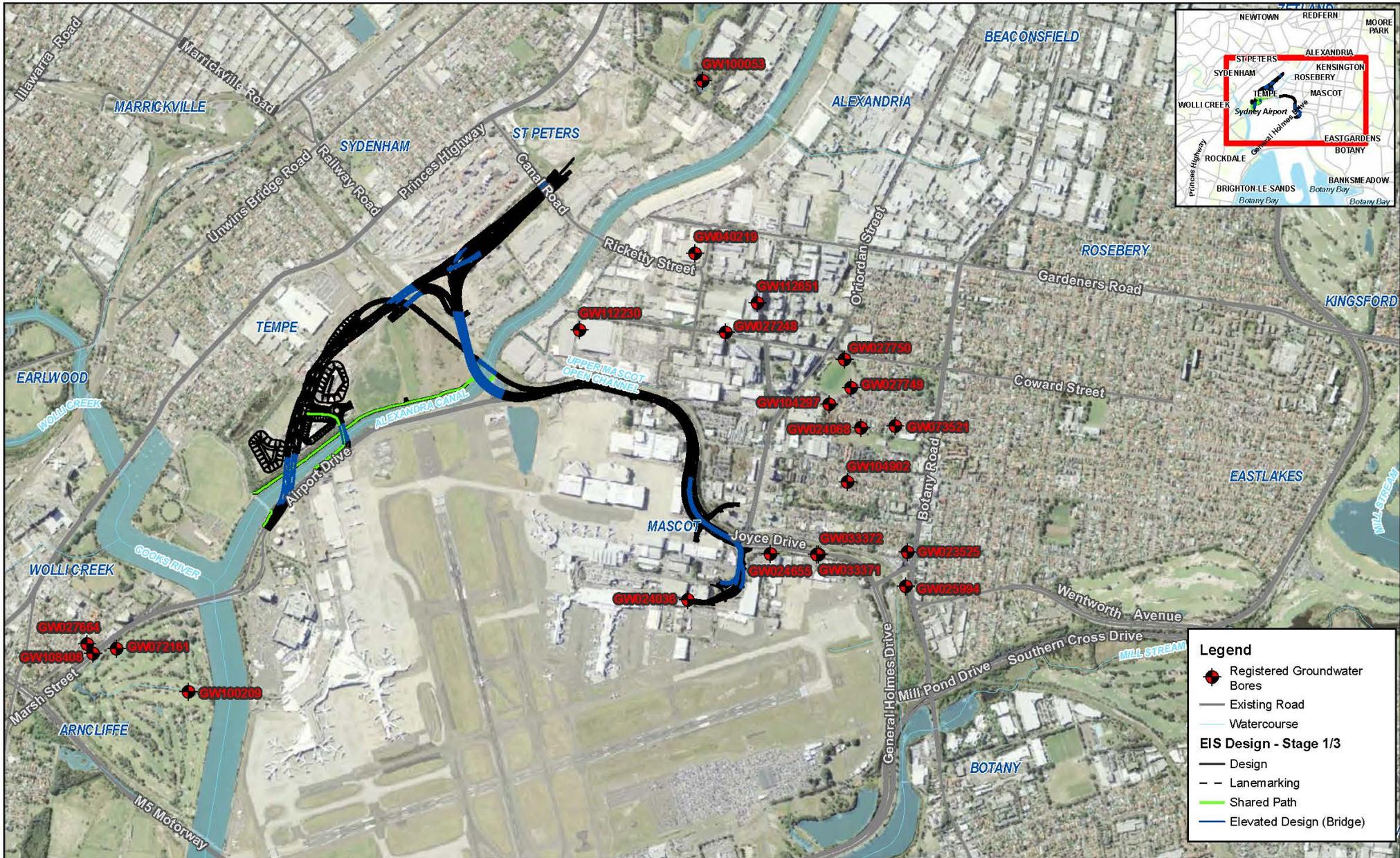




Well ID	Purpose	Status	Distance from site (m)	Drilled depth (m below ground)	Screen lithology	Standing water level	Salinity (mg/L)	Yield (L/s)
GW100209	Water Supply – Household use	Abandoned	850	108	–	–	8000	0.79
GW112651	Dewatering	Backfilled	580	6	Sand	–	–	–
GW024036	Irrigation	Unknown	5	6	Sand	–	–	–
GW072161	Recreation	Unknown	900	90.5	Sandstone	14	1300-9800	7.7
GW104902	Water Supply – Household use	Functioning	365	7.1	Sand	1.83	–	1
GW027664	Irrigation	Unknown	958	6	Sand, peat	0.7	–	1.01
GW033371	Commercial and Industrial	Unknown	30	11.8	Sand, clay, peat	–	–	–
GW033372	Commercial and Industrial	Unknown	30	11.8	Sand	–	–	–
GW108406	Water Supply – Household use	Unknown	988	8	Sand	–	–	–
GW100754	Commercial and Industrial	Functioning	630	148	Sandstone	6.0	560	8.0
GW072901	Water Supply – Household use	Unknown	760	7.0	Sand	4.0	–	0.4

Notes: ‘–’ = no data





**Legend**

- Registered Groundwater Bores
- Existing Road
- Watercourse

**EIS Design - Stage 1/3**

- Design
- Lanemarking
- Shared Path
- Elevated Design (Bridge)

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A1	10/12/2018	Registered Groundwater Users within 1km of Project Site					DRAWN	D NAIKEN	16/07/2019			
A2	22/01/2019	Registered Groundwater Users within 1km of Project Site					DRG CHECK	S CHARTERS	16/07/2019			
A3	16/07/2019	Registered Groundwater Users within 1km of Project Site										
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## 4.12 Groundwater management

A ban on groundwater extraction was implemented by the NSW Government in 2006 on parts of Botany, which is underlain by the Botany Sands Groundwater Source. Under the Temporary Water Restrictions Order, groundwater extraction is prohibited for domestic use, and monitoring is required for industrial and irrigation purposes (NSW DPI, 2018). As shown in Figure 4-15, the project is mainly within Area 2 and therefore cannot be used for industrial or domestic purposes and can only be extracted for remediation, temporary construction dewatering, testing or monitoring purposes. Any extracted water used for licensed industrial purposes must be sampled, tested and treated (if required) in accordance with a testing plan certified by a consultant as being safe and suitable for its intended use. There is also an embargo on applications for new licences to extract water from the Botany Sands Groundwater Source for domestic and commercial purposes.

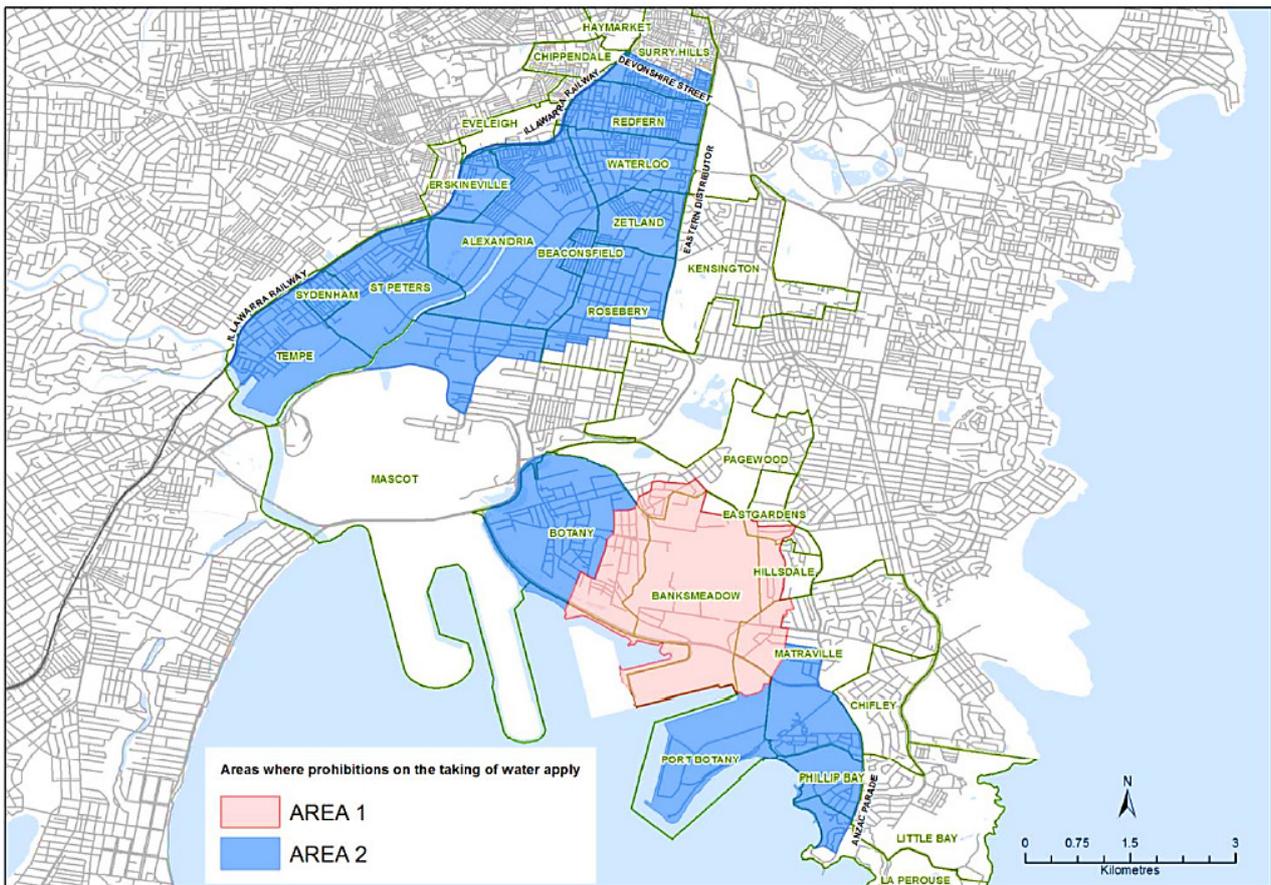


Figure 4-15 Water Restrictions Order areas (NSW Department of Industry, 2018)





## 4.13 Water balance

### 4.13.1 Botany Sands

Table 4-17 provides a general water balance for the Botany Sands Groundwater Source to the north-east of Cooks River and Botany Bay. This water balance indicates that 34,815 m<sup>3</sup>/day discharges from the aquifer to surface water features.

Only a small component of the groundwater discharge to surface water passes beneath the project site to Alexandra Canal. Based on the current understanding of the groundwater flow fields presented in Figure 4-7, this is estimated to approximate 14% of the total discharge to surface water or 4,874 m<sup>3</sup>/day. As the aquifer to the east of Alexandra Canal is thicker and is less bounded than the aquifer to the north-west, it is expected that a greater proportion of the estimated discharge to Alexandra Canal from beneath the project (4,874 m<sup>3</sup>/day) would occur in this part of the project site.

Using the most likely case groundwater velocities presented in Table 4-15, an average aquifer thickness of approximately 17 metres in areas east of Alexandra Canal (Figure 4-3) and that the width of the project site perpendicular to groundwater flow is approximately 900 metres (Figure 4-8), the groundwater discharge to Alexandra Canal from beneath eastern areas of the project site are also estimated to approximate 3,825 m<sup>3</sup>/day. This value is similar to that outlined above and indicates that the likely case hydraulic parameters used to establish groundwater velocity are representative of bulk formation properties along the project.

The construction footprint for the project occupies approximately 0.51 km<sup>2</sup> (excluding areas on the former Tempe landfill), which is less than 1% of the area of the Botany Sand aquifer in this area (61.5 km<sup>2</sup>). Subsequently, it can be expected that the existing recharge volumes within the project site would be less than 1% of the total rainfall recharge (i.e. < 540 m<sup>3</sup>/day). It is expected that recharge rates would be even lower than this given the greater proportion of sealed areas in the location of the project relative to the wider Botany Sands Groundwater Source area.

Table 4-17 Existing water balance – Botany Sands

Parameter	Inflow (m <sup>3</sup> /day)	Outflow (m <sup>3</sup> /day)	Source description
Rainfall Recharge	53,950		The water sharing plan for the greater metropolitan regions groundwater source background document (NOW, 2011) adopts an average daily rainfall recharge of 83,000 m <sup>3</sup> /day for the Botany Sands. This data applies to all areas of the Botany Sands including western (Brighton-Le Sands/Ramsgate) and southern (Kurnell) areas of Botany Bay. Hatley (2004) indicated that the aquifer system to the north and east of Cooks River (on which, the project is located) approximates two thirds of the surface area of the Botany Sands Groundwater Source or 61.5 km <sup>2</sup> .
Groundwater extraction entitlement		19,135	The NSW water register indicates that there is currently 8,120 ML/annum (22,250 m <sup>3</sup> /day) of water access licence entitlement within the Botany Sands, which is primarily concentrated in the northern areas of the Botany Sands (as presented on the BOM – Australian Groundwater Insight website). It is assumed 86% of the entitlement is located in the northern Botany Sands area as indicated in Hatley (2004).
Surface water features		34,815	Surface water features include Botany Bay, Cooks River, Georges River, Alexandra Canal and lakes (although this would be a minor component in average or dry conditions when groundwater is less likely to discharge to lakes). Value is calculated as rainfall recharge less groundwater extraction.
Groundwater Balance	53,950	53,950	Estimated as rainfall recharge less groundwater extraction and groundwater discharge.





### 4.13.2 The Former Tempe Landfill site

A water balance has been presented for the former Tempe landfill site within Technical Working Paper 16 – Landfill Assessment. Leachate discharge monitoring conducted between 11 February and 4 March 2019 indicates that daily discharge ranges between 40 m<sup>3</sup>/day and 108 m<sup>3</sup>/day. The report indicated that daily extraction rates in the order of 60 to 100 m<sup>3</sup>/day generally allowed the Inner West Council (who manage the site) to maintain groundwater levels at or about the elevation of the bentonite cut off wall and hence preventing overflow.

## 4.14 Groundwater dependent ecosystems

Potential GDEs were identified based on a review of the Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources (2011) and the Bureau of Meteorology Groundwater Dependent Ecosystems Atlas. There are no GDEs near the project site. The closest high priority GDE to the project site is the Botany Wetlands and Lachlan Swamps, located about two kilometres east of the southern end of the project. Technical Working Paper 14 – Biodiversity Development Assessment Report confirms this.

## 4.15 Contaminated sites

Technical Working Paper 5 – Contamination and Soils lists properties on the NSW EPA’s contaminated land record. The report notes three sites within 500 metres of the project site for which there are written notices on the Contaminated Land: Record of Notices issued by the NSW EPA under the *Contaminated Land Management Act 1997* (CLM Act). There are also six sites within 500 metres of the project site that are on the list of contaminated sites notified under Section 60 of the CLM Act or otherwise reported to the NSW EPA. These are listed in Table 4-18 and shown on Figure 4-16.

Table 4-18 Regulated and notified contaminated sites

Site description	Site address	Contamination type	Proximity to the site	EPA assessment and management
Former Tempe landfill	South Street, Tempe	Landfill gases, heavy metals, nutrients, petroleum hydrocarbons, polycyclic aromatic hydrocarbons, phenols, pesticides, phthalates, chlorinated hydrocarbons, volatile organic compounds, dioxins, ammonia, polychlorinated biphenyls and asbestos	Within the project site	Regulated under the CLM Act and notified site
Alexandra Canal Bed Sediments	Off Huntley Street, Alexandria	Chlorinated hydrocarbons, organochlorine pesticides, polychlorinated biphenyls and metals	Within the project site	Regulated under the CLM Act
Former Mascot Galvanising	336-348 King Street, Mascot	Zinc, lead and chromium and a low pH	Approx. 150 metres east of the project site	Regulated under the CLM Act and notified site
Cooks River Rail Terminal	20 Canal Road, St Peters	Unclassified	Within the project site	Notified site and not regulated under the CLM Act
Ing Industrial Fund	19-33 Kent Road, Mascot	Landfill	Approx. 465 metres north-east	Notified site and currently regulated under the CLM Act



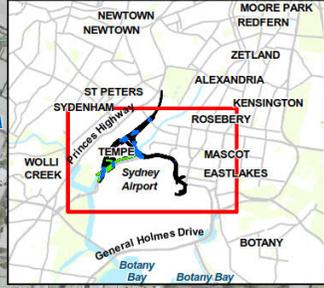
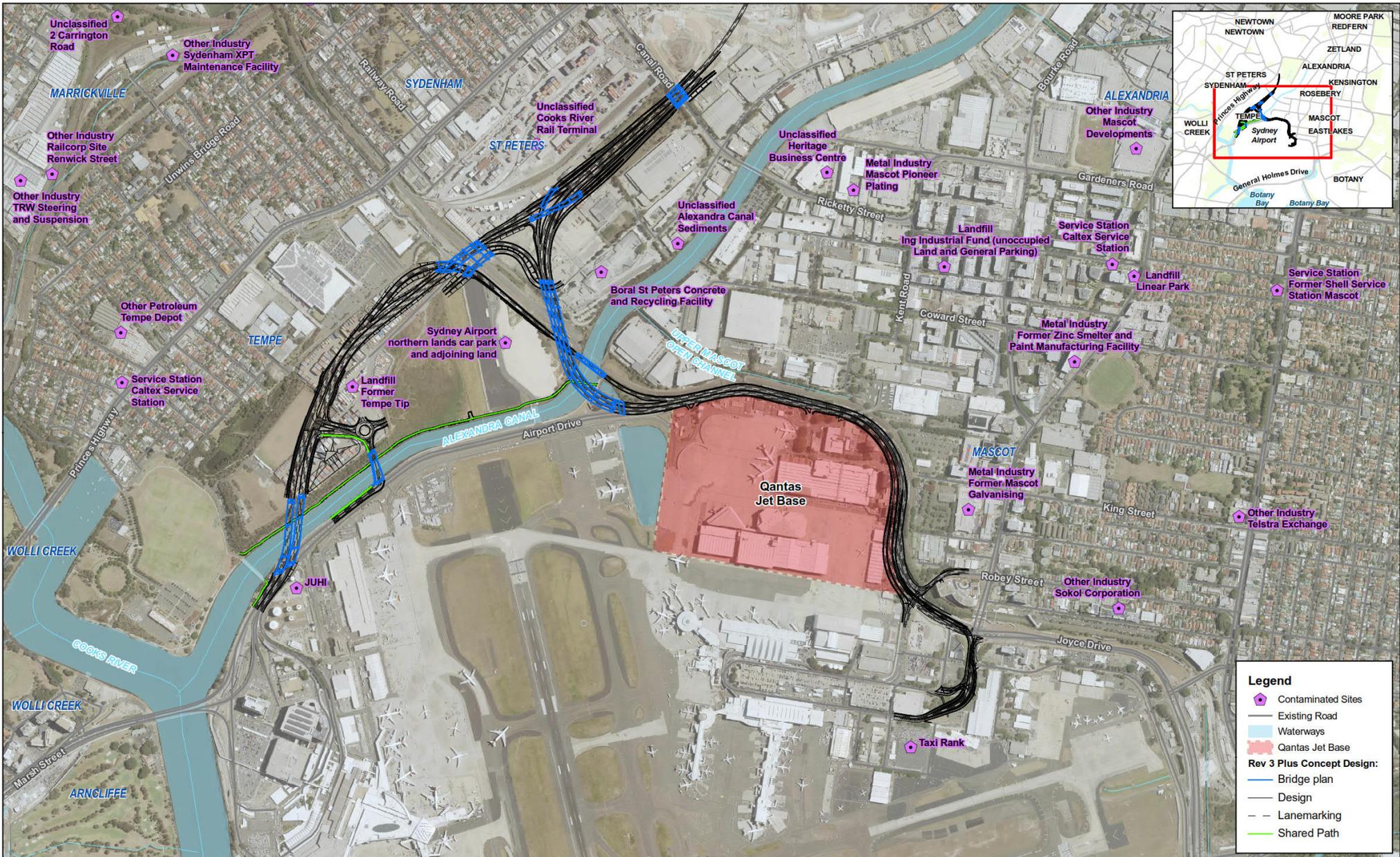


Site description	Site address	Contamination type	Proximity to the site	EPA assessment and management
Heritage Business Centre	5-9 Ricketty Street, Mascot	Unclassified	Approx. 470 metres south-east	Notified site and not regulated under the CLM Act
Sokol Corporation	50-56 Robey Street, Mascot	Other industry	Approx. 470 metres north-east	Notified site and not regulated under the CLM Act

Other sites identified in Technical Working Paper 5 – Contamination and Soils (that are not listed as a contaminated site) include:

- Sydney Airport northern lands staff car park: a long-term environmental management plan is in place due to landfill gases (from the adjacent former Tempe landfill) and asbestos in soil
- Sydney Airport: Joint User Hydrant Installation (JUHI) operates a bulk fuel storage terminal located on the corner of Airport Drive and Link Road. The site is impacted by petroleum hydrocarbons and managed by a remedial action plan
- Contaminated groundwater plumes within Qantas' lease areas of Sydney Airport associated with the release of hydrocarbons, polycyclic aromatic hydrocarbons, per- and poly-fluoroalkyl substances (PFAS) and heavy metals have been identified. The exact location of these plumes are unknown
- At the taxi parking area located between Ninth and Seventh streets, in the vicinity of the domestic terminal precinct: there is another remediation system (passive simmer) in place removing light non-aqueous phase liquid (LNAPL) from the groundwater table
- Groundwater beneath Boral's St Peters recycling facility is reported to be impacted by elevated concentrations of polycyclic aromatic hydrocarbons (PAH) and heavy end fraction petroleum hydrocarbons. There is also the potential for free tar in the soil and groundwater.





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REV	DATE	AMENDMENT / REVISION DESCRIPTION
A1	10/12/2018	Contaminated Sites
A2	18/01/2019	Contaminated Sites
A3	09/02/2019	Contaminated Sites
A4	12/07/2019	Contaminated Sites
A5	31/10/2019	Contaminated Sites updated, Rev3Plus added

DESIGN LOT CODE	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING - REV 3 PLUS
WVR No.	APPROVAL

SCALES ON A1 SIZE DRAWING

CO-ORDINATE SYSTEM: MGA ZONE 56  
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY

TITLE	NAME	DATE
DRAWN	J GREAVES	10/31/2018
DRG CHECK	S DIWELL	10/31/2018

CLIENT

PREPARED FOR

SYDNEY GATEWAY			
Groundwater Impact Assessment			A3
Figure 4-16			
Contaminated sites			
RMS REGISTRATION No.	EDMS No.	SHEET No.	ISSUE No.
FOR INFORMATION			



## 4.16 Existing water quality

### 4.16.1 Historical activities impacting groundwater quality

The groundwater quality within the project site has historically been of poor quality due to contamination by surrounding industry. The suburbs within and surrounding the project site have been heavily industrialised including chemical manufacturing, fuel storage, tanneries, galvanising, petroleum distribution facilities, landfills, dry cleaners and wool scorers. This has led to the Botany Sands Groundwater Source being contaminated with a range of pollutants. These pollutants include:

- Heavy metals
- Nutrients (ammonia, nitrogen)
- PFAS
- Pesticides
- Total recoverable hydrocarbons (TRH)
- Total xylenes (BTEX)
- Petroleum hydrocarbons including volatile organic compounds and polycyclic aromatic hydrocarbons (PAH)
- Phthalates and polychlorinated biphenyls
- Chlorinated hydrocarbons, dioxins and phenols
- LNAPL.

A summary of the available data for the project is provided below.

### 4.16.2 Water quality criteria

Groundwater across the site is currently being sampled for the analytes listed above and results are presented in Tables B1 to B6 of Appendix B. A total of 40 wells (includes 23 additional wells sampled at the former Tempe landfill along the bentonite cut-off wall) have been sampled and have draft results up to 15 May 2019.

The groundwater quality data in the tables have been compared against criteria that are protective of the surrounding receiving environment. These criteria are listed below and are presented in Tables B1 to B6 of Appendix B with acid sulfate soil results presented in Table B7 of Appendix B.

Relevant water quality criteria include:

- Human Health:
  - Australian drinking water guidelines (ADWG) values multiplied by ten in accordance with recommendations in the NEPM (2013) and NHMRC (2018) to be protective of recreational receptors in Cooks River and Alexandra Canal where groundwater could potentially be discharged
  - Where analytical data has no criteria, other sources of drinking water criteria have been adopted and multiplied by ten which includes the United States EPA recommended screening level for tap water and the world health organisation values for petroleum in drinking water
  - The PFAS National Environmental Management Plan (NEMP) provides human health recreational criteria for PFAS, which has also been adopted for potential recreational users in the Cooks River, Mill Stream and Alexandra Canal and which are expected to be the primary surface water features that treated groundwater from the Sydney Gateway road project could be discharged to
  - Human health issues associated with exposure to contaminated groundwater within excavations is not the focus of this assessment and would be managed as part of construction safety protocols





- Ecological:
  - Technical Working Paper 8 – Surface Water Quality has characterised the Alexandra Canal and Cooks Rivers as highly disturbed estuarine systems. The goal is to return these ecosystems to a less disturbed condition. For this purpose, the adoption of the ANZG (2018) guideline values for the protection of 80 per cent of species in marine ecosystems, and 95 per cent of species for toxicants that bioaccumulate, is recommended
  - The runoff from a small part of the project site would also flow through the drainage network to Mill Stream, part of the Georges River Catchment to the east. This was characterised as a highly disturbed estuarine system and thus it is recommended the ANZG (2018) guideline values for protection of 80 per cent of species in marine ecosystems is adopted, and 95 per cent of species for toxicants that bioaccumulate
  - Technical Working Paper 8 has also developed site specific water quality objectives in accordance with the referential approach in ANZG (2018). This has included the adoption of the 80<sup>th</sup> percentile observed water quality values in the Cooks River and Alexandra Canal for analytes with concentrations above the adopted ANZG (2018) criteria. These values are presented in Table B2 of Appendix B
  - The NEMP provides ecological marine criteria for PFAS, which has also been adopted for aquatic ecosystems in the Alexandra Canal and Mill Stream. These two features are expected to be the primary surface water features that would be potentially affected by groundwater discharged from the Sydney Gateway road project. The NEMP provides criteria for highly disturbed systems such as the Alexandra Canal and Mill Stream. Due to the sensitivity of issues related to PFAS and the potential for bioaccumulation, guideline values for a higher level of protection (95 per cent of marine species) have been adopted for this assessment
- Acid sulfate soils:
  - The Acid Sulfate Soil Manual (Ahern et al. 1998) provides criteria for the presence of potential acid sulfate soils. These values are presented in Table B7 of Appendix B.

### 4.16.3 Groundwater quality

#### 4.16.3.1 Summary of historical groundwater quality data

Previous studies have included surface and groundwater water sampling within and near the project site. These were reviewed to characterise the current water quality conditions and environmental values on which impacts can be assessed and management measures can be based.

#### **New M5**

Studies conducted by AECOM (2015-2016) and Golder (2016-2017) were prepared to provide groundwater data for the New M5. It should be noted that the summary below is restricted to wells screened within the Botany Sands, alluvium and fill aquifers, and within St Peters Interchange located north of the project site:

- Desktop assessment based on wells with complete analytical records reported in the NSW groundwater database was conducted. Eleven out of the 32 wells with complete data were screened within the Quaternary sediments and fill. Results show groundwater chemistry to be sodium potassium (Na/K) and chloride (Cl) type water
- November 2015 groundwater quality for wells screened within the Botany Sands Groundwater Source indicate an average electrical conductivity of 556 microsiemens per centimetre ( $\mu\text{S}/\text{cm}$ ), and pH of 6.8. For the alluvium, average electrical conductivity is 626  $\mu\text{S}/\text{cm}$ , and pH of 6.8
- April 2016 laboratory results detected concentrations of phenol, benzene, toluene, ethylbenzene and BTEX, PAH and TRH above detection limits for laboratory analytical methods but below adopted screening criteria. Results of elevated concentrations of ammonia, cobalt, and zinc were also detected exceeding ANZECC (2000) guideline values for protection of 95 per cent of marine species. Groundwater exceeding nutrient, TRH, manganese and iron criteria was detected in wells within the Arncliffe and Cooks River area.





### **WestConnex Enabling Works – Airport East Precinct**

EES (2018) conducted a groundwater study as part of the WCXAEP project. This included monitoring of 12 groundwater wells and six surface water locations, and hydraulic conductivity testing from February to April, and August 2017 as summarised below:

- Groundwater field chemistry results show acidic to neutral pH ranging from 4.91 to 7.62, average electrical conductivity of 335  $\mu\text{S}/\text{cm}$ , and highly variable oxygen reduction potential values ranging from -215 millivolts to 265.5 millivolts
- General hydrogeochemistry shows calcium, sodium, bicarbonate, chloride, and sulfate as the major chemical constituents
- Elevated concentrations of PFAS, inferred to originate from a western source and an industrial source to the east. Concentrations of perfluorooctane sulfonate and perfluorohexane sulfonate (PFOS + PFHxS) were identified above human health criteria (DOEE, 2016) in three monitoring wells with an additional three wells periodically exceeding the criteria. Concentrations of PFOS + PFHxS also exceeded direct contact / recreational criteria (DoH, 2017) at one monitoring well
- Elevated concentrations of nitrate, phosphate, and ammonium were detected and exceeded the Airports (Environment Protection) Regulations 1997 (AEPR) criteria
- For metals, there were elevated levels of dissolved iron, copper, lead, and zinc that all exceeded the AEPR criteria for marine waters
- TRH was detected in one monitoring well, however attributed to a differing background chemistry as this well is screened within the underlying clay layer
- Groundwater sampled from the WCXAEP site is indicative of background conditions within the surrounding Botany Sands Groundwater Source
- The only contaminants of concern requiring ongoing monthly monitoring and management were PFAS, ammonium and dissolved metals (copper and zinc).

### **Former Tempe landfill**

The former Tempe landfill has over 17 metres of fill in some places and is underlain by alluvial clays and sands in some areas and Ashfield Shale and Hawkesbury sandstone towards the west of the site as per the geotechnical long-sections that have been prepared for this project (Appendix B). As part of the remediation of the site, a bentonite cut-off wall was installed adjacent to Alexandra Canal and along the north-eastern and south-western boundary as well as a leachate collection/treatment system in November 2004 (Coffey, 2005). Coffey (2005) states that there is the potential for acid sulfate soils to be present within the silty/sandy clays layer at the water table around the site. The hydraulic conductivity is higher in the fill than the underlying alluvial materials.

In 2007, Coffey installed groundwater wells across the site. The results are summarised below:

- Elevated concentrations in groundwater of copper, lead, zinc and iron were detected above the ANZECC (2000) guideline values for the protection of 95 per cent of marine species
- Total petroleum hydrocarbons ( $\text{C}_6\text{-C}_{36}$ ) were detected above the Netherlands Dutch intervention level for mineral oil
- Ammonia was detected in all monitoring wells above the ANZECC (2000) trigger levels for the protection of 95 per cent of marine species.

The latest water quality at the site is shown to be impacted with ammonia, copper, lead and zinc with the highest concentrations of ammonia in monitoring wells adjacent to Alexandra Canal (Uminex, 2018a).





## Sydney Airport

The Northern Lands staff car park located to the west of Alexandra Canal was capped with a geotextile fabric due to asbestos. The site is under a long-term environmental management plan. A JBS&G (2017) report compared groundwater quality data against the AEPR criteria for marine water as it forms part of Sydney Airport.

From the following groundwater contaminants exceeded the criteria:

- Ammonia ranged from 0.06 milligrams per litre (mg/L) to 3.8 mg/L which exceed the AEPR criteria of 0.005 mg/L
- Mercury of 0.0002 mg/L exceeded the criteria of 0.0001 mg/L.

The states that the Qantas lease areas at Sydney Airport have known contaminated groundwater plumes, including the Jet Base. Other contaminants associated with this area are hydrocarbons, PAH, PFAS and heavy metals.

Douglas Partners (2014) reported on groundwater contamination near the domestic terminal. Lead, nickel, zinc and copper all exceeded the AEPR criteria for fresh water. Nickel, lead and zinc exceeded the AEPR criteria for marine water. TPH (C<sub>6</sub>–C<sub>9</sub>) exceeded the AEPR criteria for freshwater. Groundwater contamination was also present in the Qantas Jet Base. Low level contamination was reported including chlorinated solvents and surfactants.

At the taxi parking area located between Ninth and Seventh streets, there is a phase separated hydrocarbon plume recovery system in place. WSP (2018) reported that there is a passive recovery system that was installed since December 2014. Oxygen replenishing compound has also been added into the groundwater system. A total of 139 litres of LNAPL was removed during February 2017 to February 2018. Phase separated and dissolved phase hydrocarbons continue to be detected in groundwater down-gradient.

### 4.16.3.2 Sydney Gateway road project baseline groundwater data

Groundwater quality exceedances of the adopted criteria are presented in Appendix B. The exceedances are also presented in Figures C1 to C6 in Appendix C. This data has been processed to highlight the key contaminants requiring treatment at the infrastructure excavations intersecting groundwater within the project site.

The key exceedances of each of the relevant criteria are summarised below:

- Human Health (Recreational):
  - Common exceedances for arsenic, chromium, total phosphorus
  - Manganese (GW5d)
  - Naphthalene (GW23d, MPI\_15 and SG-BHTT-03)
  - TRH within the former Tempe landfill (MPI\_12, MPI\_13) and externally (MPE\_6) and at GW23d
  - Common exceedances of iron, ammonia (as NH<sub>3</sub>), chloride, sodium, total dissolved solids (TDS) and pH – slightly acidic (aesthetic criteria only)
  - Lead (GW23d)
  - Sum (PFOS + PFHxS) at GW104 near the Qantas Jet base, GW7 at the former Tempe landfill, GW100s, GW15s and WCX\_GTY\_BH004
- AEPR (1997) fresh and marine water criteria:
  - Intermittent exceedances for aluminium (freshwater)
  - Isolated exceedances for arsenic (freshwater and marine)
  - Intermittent exceedances for cadmium, chromium, copper, lead, mercury, nickel and zinc (freshwater and marine)
  - Common exceedances for iron (freshwater)
  - Intermittent exceedances of TPH criteria in wells at the former Tempe landfill and at SG-BHTT-04, WCX\_GTY\_BH\_004, GW5s and GW23d (freshwater).





- Ecological Criteria (ANZG, 2018) default guidelines values (DGV's):
  - Common exceedances of the guideline values for protection of 95 per cent and 80 per cent of species in freshwater systems for aluminium, nickel, zinc and copper. Boron, cadmium and manganese also exceeded these criteria at a number of locations within and around the former Tempe landfill and in localised other areas (cadmium only)
  - Exceedances of the guideline values for protection of 95 per cent of marine water species include cobalt, copper, lead and zinc, with exceedances of the guideline values for protection of 80 per cent of marine species for copper, lead and zinc
  - Values for the protection of 80 percent of marine and freshwater species for naphthalene at SG-BHTT-03
  - Marine and freshwater exceedances of the guideline values for protection of 80 per cent of species for ammonia (as NH<sub>3</sub>) occurred at nearly every sampling location.

Common PFOS exceedances of guideline values in freshwater and marine water (protection of 95 per cent of species) occurred at 34\_TL3, GW100s, GW104, GW10s, GW15s, GW24s, GW28A, GW7, GW8, MPE\_4, MPI\_2, MPI\_3A, MPI\_4A, MPI\_5, MPI\_6A, WCX\_GTY\_BH\_004, WCX\_GTY\_BH\_027. There were no exceedances of the NEMP guideline values for protection of 80 percent of species.

#### 4.16.3.3 Groundwater aggressivity

##### **Aggressivity assessment criteria**

The exposure classification criteria for concrete piles and steel piles presented in Australian Standard AS 2159-2009 Piling – Design and installation have been selected for assessing aggressivity of groundwater.

##### **Groundwater aggressivity results**

Concentrations of sulfate, chloride and pH have been compared against the adopted aggressivity criteria in Table B8 and Table B9 of Appendix B. It is assumed that highly permeable soils would be intersected (soil condition A). The results suggest that existing groundwater will largely present a mild to moderate risk to concrete structures intersecting groundwater. However, a severe risk to concrete structures exists at GW11d, GW5d, MPE\_2, MPE\_3, MPE\_5A, MPE\_8, MPI\_16 and WCX\_GTY\_BH\_009d.

The reported groundwater quality is mostly expected to pose a non-aggressive to mild risk to steel piles. A moderate risk to steel piles exists at GW25s, GW27s, GW5d, MPE\_2, MPE\_3, MPE\_5A, MPE\_6, MPE\_7, MPI\_16, MPE\_8 and WCX\_GTY\_BH\_009d.

#### 4.16.4 Surface water quality

##### 4.16.4.1 Summary of historical surface water quality data

##### **M4-M5 Link**

As part of the Environmental Impact Statement for the M4-M5 Link (AECOM, 2017), water samples were tested from Alexandra Canal. The test results indicated elevated pH (intermittently outside guideline levels), high turbidity, and elevated concentrations of metals (copper, lead, chromium, nickel, manganese, and zinc), nitrogen, nitrate and phosphorous.

##### **New M5**

Surface water quality was conducted for the New M5 Environmental Impact Statement (AECOM, 2015). Results for Alexandra Canal indicate metal concentrations (cadmium, chromium, lead, nickel, mercury, and ammonia) in the upper reaches to be below the ANZECC (2000) guidelines, and elevated zinc and copper concentrations in some parts.





Based on the hydrogeological assessment for the Alexandria Landfill closure (St Peters interchange), there is no hydraulic connection between Alexandria Canal and inflow to the landfill. A groundwater divide may be present between the canal and the edge of the landfill. This conclusion was further confirmed by the difference in salinity for the collected groundwater samples (low salinity) and the surface water samples from the canal (high salinity). (AECOM, 2015b).

### **WestConnex Enabling Works – Airport East Precinct**

Results from the surface water sampling completed by EES (2018) along Mill Stream located approximately 900 metres to the east and upstream of any potential project discharge are summarised below:

- Groundwater field chemistry results indicate clear and odourless samples, with pH ranging from 5.9 to 7.6, average electrical conductivity of 180  $\mu$ S, variable oxygen reduction potential values ranging from -163 to 393.2 millivolts, and dissolved oxygen of 0.49 to 24.7 parts per million
- Concentrations of ammonium (NH<sub>4</sub>-N) exceeded the AEPR fresh water criteria
- Laboratory test results had concentrations of PFAS, as well as dissolved copper, zinc and iron, that exceeded adopted freshwater ecosystem and AEPR criteria.

#### 4.16.4.2 Sydney Gateway baseline surface water data and discharge criteria

AECOM has been sampling the surface water within the project site since December 2017. There were nine sampling events undertaken from up to 11 locations. SW1 to SW8 relate to the project area and have been collected from Alexandra Canal and Cooks River. The locations of surface water monitoring points are shown on Figure 4-17.

It may be necessary to discharge extracted groundwater to surface water bodies, subject to it meeting appropriate discharge criteria. Specific discharge criteria have been developed for the project, as outlined in *Technical Working Paper 8 – Surface Water Quality* (refer to Appendix B).

The surface water discharge criteria for construction was developed using the following assumptions:

- Aquatic food and primary/secondary contact criteria were disregarded due to limited contact uses, aquatic food bans and advisory recommendations, and the temporary nature of potential construction discharges
- Guideline values for protection of 95 per cent of marine species were adopted for bio-accumulative chemicals
- For other chemicals, the 80<sup>th</sup> percentile values for monitoring sites SW1-SW2, SW5 (Alexandra Canal) and SW7-SW8 (Cooks River) for each chemical or the values for the protection of 80% of aquatic marine species, whichever is greater.

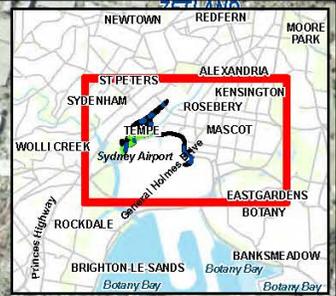
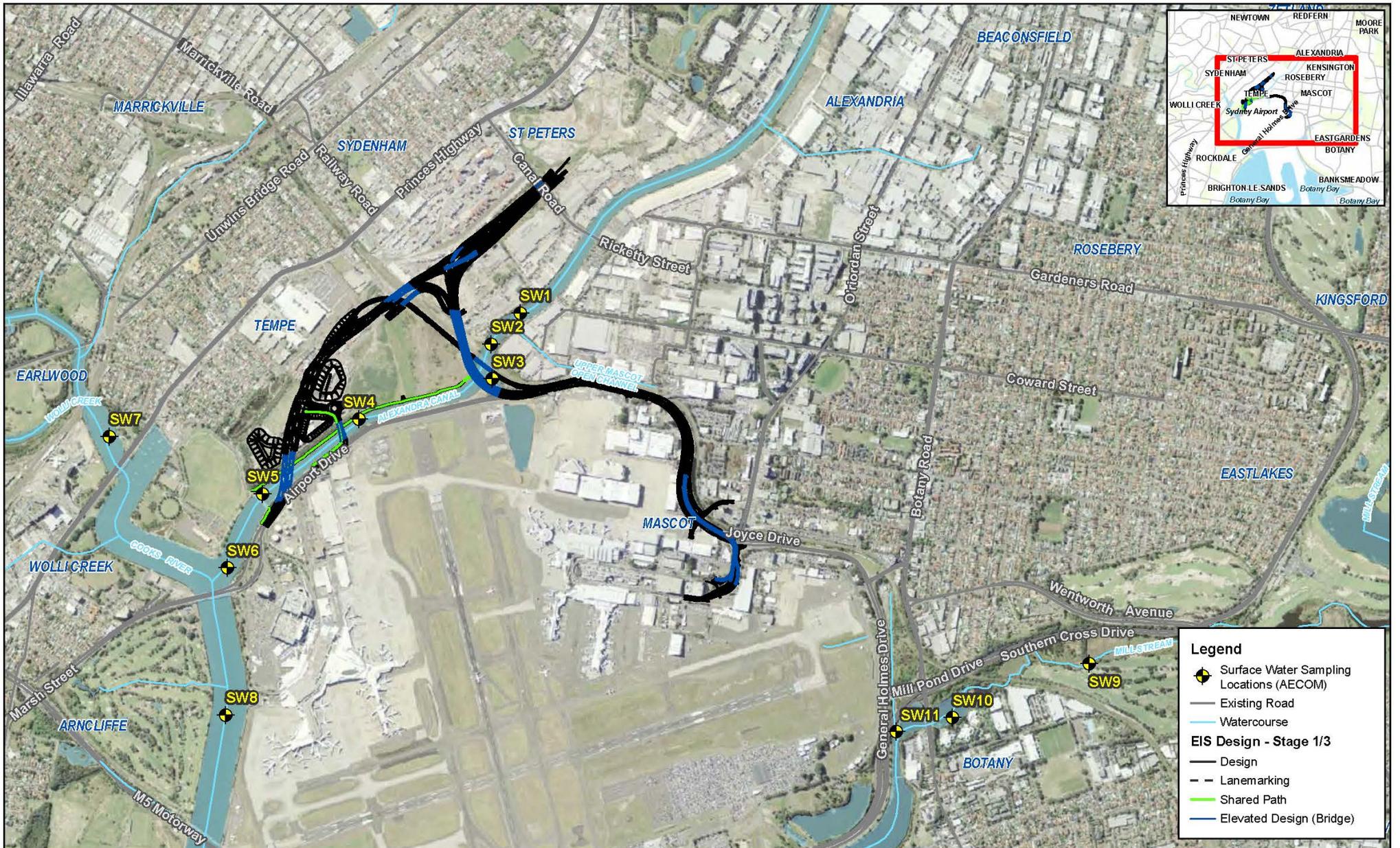
This approach resulted in the development of surface water discharge criteria that was reflective of baseline water quality and ANZG (2018) criteria that are protective of the environmental values present in surface water.

The groundwater data have been compared against these criteria, presented in Table B5 and B6 of Appendix B, to inform groundwater quality discharge requirements.

Groundwater analytical exceedances occurred at most groundwater monitoring wells within the project site for various contaminants (refer to Tables B1 to B6 of Appendix B). A summary of analytical exceedances are listed below:

- Metals (aluminium, arsenic, chromium, copper, iron, lead, manganese, mercury, zinc)
- Bicarbonate alkalinity
- Ammonia
- Total nitrogen and total phosphorus
- pH
- Total Suspended Solids (TSS)
- PFOS.





**Legend**

- Surface Water Sampling Locations (AECOM)
- Existing Road
- Watercourse

**EIS Design - Stage 1/3**

- Design
- Lanemarking
- Shared Path
- Elevated Design (Bridge)

DATA SOURCE: Aerial Imagery © ALUMINAGE - Jacobs Group (Australia) Pty Ltd 2018, © Department of Finance, Services & Innovation 2018, © Water NSW - DR Water, 2018.		DESIGN/LOT CODE	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING - REV 3 (20190114)	PLOT DATE / TIME 16/07/2019 11:22:31 AM	PLOT BY DN	CLIENT <b>NSW</b> Transport Roads & Maritime Services	SYDNEY GATEWAY	A3	
REV	DATE	AMENDMENT / REVISION DESCRIPTION	MWR No.	APPROVAL	SCALES ON A1 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY	TITLE	NAME	DATE
A1	16/01/2019	Surface Water Sampling Locations					DRWNN	D NAIKEN	16/07/2019
A2	16/07/2019	Surface Water Sampling Locations					DRS CHECK	S CHARTERS	16/07/2019
					COORDINATE SYSTEM MGA ZONE 56	HEIGHT DATUM AHD			
					DRS No.			PREPARED FOR	
							FOR INFORMATION		
							ISSUE STATUS	EDM No.	SHEET No.
							FOR INFORMATION		A2



## 5. Construction impacts

A conceptual outline of construction activities is presented in Figure 5-1. The Botany Sands Groundwater Source is the only aquifer that would interact with the construction activities. The aquifer is high yielding and of highly variable water quality due to the heavy industrial activities in the area. Groundwater elevations are generally one to two metres below ground surface across the site. The discharge points for the aquifer are Alexandra Canal, Cooks River and Botany Bay.

Construction impacts have been assessed through:

- Predictions of inflows, radii of groundwater drawdown influence and capture zones
- Impacts of groundwater drawdown from temporary excavations on water resource extraction, GDEs and areas of settlement
- Impacts of groundwater quality from disturbance of acid sulfate soils or contaminated sites
- Water balance.

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### 5.1 Summary of key findings

A summary of the key findings relevant to the construction stage is as follows:

- Recharge change impact on surface water features – removal of the capping layer at the former Tempe landfill would facilitate increased infiltration to the landfill and generate higher quantities of leachate. If not properly managed, leachate overflows into Alexandra Canal could occur. Technical Working Paper 16 – Landfill Assessment provides options to manage the increase in leachate. The other main areas of aquifer recharge are in the north of the catchment and would not be affected by the project. On an overall project site basis, no impacts to the flow in surface water features are expected
- Impact to water supply wells – there is currently nine licensed water supply wells within the area of predicted groundwater drawdown. One of the wells (GW024036) is located within the project construction footprint and may be destroyed. If well GW024036 is destroyed by construction activity, make good provisions should be implemented
- Impact to GDEs – assessment results did not identify any potential groundwater drawdown impacts on areas identified as containing GDEs
- Impact on built structures – the predictions of groundwater drawdown have been used to provide a preliminary estimate of possible settlement on adjacent structures. Settlement risks ranging from very slight to slight were predicted, which were based on desktop review of the project site and assumed sensitivity of infrastructure. These settlement predictions should be reviewed during detailed design and following confirmation of the preferred construction approach, taking into account potential impacts from groundwater interception and impacts on adjacent properties with the aim to reduce predictions to within acceptable ranges
- Impact on acid sulfate soils – the radii of groundwater drawdown influence include areas mapped as Class 2 and Class 3 acid sulfate soils. Any drawdown may potentially result in the generation of low pH groundwater that could corrode sub-surface infrastructure and impact surface water and riparian ecology at discharge points. Management would be required so that the environmental values of waterways, at least on a short term basis, are not reduced
- Groundwater/surface water quality impacts – dewatering large volumes of groundwater may result in mobilisation of contaminants in groundwater into project excavations where workers may be exposed. The groundwater might be extracted and discharged into surface water bodies or infiltrated to groundwater where contamination may be spread. This would require management





- Water balance – The maximum take would be between approximately 1,144 m<sup>3</sup>/day (existing groundwater level conditions) and 4,970 m<sup>3</sup>/day (worst case groundwater level conditions). These dewatering rates would vary throughout the construction period, with the highest rates associated with the construction of the stormwater channels discharging to Alexandra Canal from the north-west. Total volume of water abstracted over the two year period would be between 262,000 m<sup>3</sup> and 1,433,000 m<sup>3</sup>, based on the concept construction methodology.

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## 5.2 Predictions of inflow and radius of influence

Groundwater inflows and radius of influence results using the Cooper and Jacob (1946) equation are summarised in Table 5-1 and the radius of influence data is presented in Figure 5-2 to Figure 5-4. The modelling calculations showing the radii of influences are provided in Appendix C. These results assume that there is no attempt to limit the inflow of groundwater into excavations. They also assume that groundwater is extracted continuously so that the level is maintained below the bottom of the excavation for the full duration of the estimated excavation time. Table 5-1 has been colour coded to highlight excavations that are expected to have high inflow rates. The inflow rates and radii of influence for the key infrastructure are discussed below. Further discussion in relation to the AIP criteria is provided in section 6.3.

### 5.2.1 Inflow rates

- Under reasonable worst case (RWC) conditions, groundwater inflows are estimated to range between 50 m<sup>3</sup>/day and 2,135 m<sup>3</sup>/day for each of the key infrastructure listed in section 3.4.3. There are approximately 33 items of infrastructure estimated to intersect groundwater
- Under current or like case (LC) conditions, inflows are estimated to range between 3 m<sup>3</sup>/day and 579 m<sup>3</sup>/day. There are approximately 23 items of infrastructure estimated to intersect groundwater
- The locations of highest inflows are generally associated with the stormwater channel installations (Items 7 to 11 in Table 5-1) that discharge to Alexandra Canal either side of the rail alignment. These have RWC inflow rates ranging from 1,262 m<sup>3</sup>/day to 2,135 m<sup>3</sup>/day. The actual inflow volumes would be dependent on how long excavations are open each day. If they are open and closed over a 12-hour period, the actual inflow would be half of the daily inflow rates presented in Table 5-1 (for example they would range between 631 m<sup>3</sup>/day and 1,068 m<sup>3</sup>/day). These Items also have much lower inflow rates estimated using the LC groundwater elevations (ranging between 184 m<sup>3</sup>/day and 550 m<sup>3</sup>/day)
- Other stormwater outlet/line installation with RWC scenario inflow rates greater than 1,000 m<sup>3</sup>/day include Items 1, 3, 13, 16, 18, 22, 23 in Table 5-1
- There are no stormwater outlet/line installations with inflows greater than 500 m<sup>3</sup>/day under LC conditions
- The utility excavations west of Alexandra Canal have one section along the project in the RWC scenario where inflow rate is greater than 1,000 m<sup>3</sup>/day. At this location, the predicted inflows using the LC groundwater elevations are less than 170 m<sup>3</sup>/day
- The detention basin (Item 12) is estimated to have inflows in the range of 579 m<sup>3</sup>/day (LC) to 1,725 m<sup>3</sup>/day (RWC) during construction
- Nine retaining wall construction excavations are predicted to intersect groundwater under RWC conditions, with all inflow rates estimated to range from 151 m<sup>3</sup>/day to 740 m<sup>3</sup>/day. Six retaining wall excavations are predicted to intersect groundwater under LC conditions with inflow rates ranging between 9 m<sup>3</sup>/day and 224 m<sup>3</sup>/day
- The grade-separation where the eastbound terminal link passes under the Terminal 1 connection rail overpass (the underpass) is interpreted to intersect groundwater under RWC conditions only.





Table 5-1 Groundwater drawdown modelling results

ID	Item #	Item description	Excavation length (m)	Excavation width (m)	Depth of excavation (m)	Estimated excavation Time (days)	Construction GWL intersection depth – RWC GWL (m)	Construction GWL intersection depth - LC GWL (m)	Estimated Inflow - RWC GWL (m <sup>3</sup> /day)	Estimated Inflow – LC GWL (m <sup>3</sup> /day)	Radius of Influence - RWC GWL (m)	Radius of Influence - LC GWL (m)	Capture Zone - RWC GWL (m)	Capture Zone – LC GWL (m)
A	RW1 and RW2	Retaining Wall	24	1	1	3	0.203	NI	151	-	50	-	5	-
A	RW3, RW4 and RW5	Retaining Wall	24	1	1	3	0.434	NI	321	-	95	-	7	-
A	1	Stormwater outlet/line	10	3	2.65	2	2.006	1.136	1620	369	90	70	14	9
A	2	Stormwater outlet/line	10	3	1.55	2	0.49	NI	400	-	70	-	6	-
A	3	Stormwater outlet/line	10	3	2.85	2	1.885	1.015	1520	330	90	70	14	8
B	Eastbound terminal link underpass	Grade Separation	250	28	1.3	90	0.48	NI	510	-	500	-	30	-
B	RW12	Retaining Wall	24	1	1	3	NI	NI	-	-	-	-	-	-
B	RW13,RW18, RW19, RW20	Retaining Wall	24	1	1	3	1	0.725	740	224	100	80	11	8
B	RW14, RW11, RW18A	Retaining Wall	24	1	1	3	NI	NI	-	-	-	-	-	-
B	RW15, RW15A, RW16, RW16A	Retaining Wall	24	1	1	3	NI	NI	-	-	-	-	-	-
B	7	Stormwater Channel	10	5.5	3.35	2	2.409	1.539	2135	550	90	70	18	11
B	8	Stormwater Channel	10	5.5	4.15	2	1.77	0.9	1570	325	90	70	13	7
B	9	Stormwater Channel	10	5.5	2.25	2	1.434	0.564	1265	202	90	70	11	5
B	5	Stormwater outlet/line	10	3	1.75	2	NI	NI	-	-	-	-	-	-
B	6	Stormwater outlet/line	10	3	6.65	2	NI	NI	-	-	-	-	-	-
B	4	Table Drain	10	3	0.55	2	NI	NI	-	-	-	-	-	-





ID	Item #	Item description	Excavation length (m)	Excavation width (m)	Depth of excavation (m)	Estimated excavation Time (days)	Construction GWL intersection depth – RWC GWL (m)	Construction GWL intersection depth - LC GWL (m)	Estimated Inflow - RWC GWL (m <sup>3</sup> /day)	Estimated Inflow – LC GWL (m <sup>3</sup> /day)	Radius of Influence - RWC GWL (m)	Radius of Influence - LC GWL (m)	Capture Zone - RWC GWL (m)	Capture Zone – LC GWL (m)
C	12	Sedimentation / Flood retention basin	58.75	150	1.55	90	1.55	1.275	1725	579	570	470	90	60
C	RW21, RW22, RW23	Retaining Wall	24	1	1	3	1	0.557	740	165	100	80	11	8
C	RW23 - west, RW24 - west, RW31	Retaining wall	24	1	1	3	0.899	0.029	666	9	100	1	11	1
C	RW26	Retaining wall	24	1	1	3	0.95	0.08	705	24	100	10	11	2
C	RW28, RW32	Retaining wall	24	1	1	3	1	0.26	740	78	100	50	11	5
C	RW29	Retaining wall	24	1	1	3	1	0.326	740	97	100	55	11	5
C	East of RW24, East of RW23	Retaining wall	24	1	1	3	NI	NI	-	-	-	-	-	-
C	10	Stormwater Channel	10	7.5	2.25	2	2.25	1.45	2090	550	90	80	15	10
C	11	Stormwater Channel	10	7.5	3.15	2	1.356	0.486	1262	184	90	80	11	5
C	13	Stormwater outlet/line	10	3	1.95	2	1.95	1.255	1580	410	90	70	15	10
C	14	Stormwater outlet/line	10	3	1.65	2	0.598	NI	485	-	70	-	6	-
C	15	Stormwater outlet/line	10	3	1.25	2	NI	NI	-	-	-	-	-	-
C	16	Stormwater outlet/line	10	3	1.45	2	1.349	0.479	1090	157	90	55	11	5
C	17	Stormwater outlet/line	10	3	1.35	2	NI	NI	-	-	-	-	-	-
D	Qantas Drive, near Ewan Street	Retaining Wall	24	1	1	3	0.563	NI	418	-	85	-	9	-
D	RW10	Retaining Wall	24	1	1	3	0.002	NI	-	-	-	-	-	-
D	RW7	Retaining Wall	24	1	1	3	NI	NI	-	-	-	-	-	-
D	RW8/9	Retaining Wall	24	1	1	3	NI	NI	-	-	-	-	-	-





ID	Item #	Item description	Excavation length (m)	Excavation width (m)	Depth of excavation (m)	Estimated excavation Time (days)	Construction GWL intersection depth – RWC GWL (m)	Construction GWL intersection depth - LC GWL (m)	Estimated Inflow - RWC GWL (m <sup>3</sup> /day)	Estimated Inflow – LC GWL (m <sup>3</sup> /day)	Radius of Influence - RWC GWL (m)	Radius of Influence - LC GWL (m)	Capture Zone - RWC GWL (m)	Capture Zone – LC GWL (m)
D	Sir Reginald Ansett Drive	Retaining Wall	24	1	1	3	NI	NI	-	-	-	-	-	-
D	18	Stormwater outlet/line	10	3	2.45	2	1.32	0.45	1070	150	90	55	11	5
D	19	Stormwater outlet/line	10	3	0.45	2	NI	NI	-	-	-	-	-	-
D	20	Stormwater outlet/line	10	3	0.65	2	NI	NI	-	-	-	-	-	-
D	21	Stormwater outlet/line	10	3	2.05	2	0.57	NI	460	-	70	-	7	-
D	22	Stormwater outlet/line	10	3	2.65	2	1.858	0.988	1500	320	90	70	13	7
D	23	Stormwater outlet/line	10	3	3.15	2	1.804	0.934	1460	305	90	70	13	7
D	24	Stormwater outlet/line	10	3	1.35	2	0.663	NI	530	-	75	-	7	-
D	25	Stormwater outlet/line	10	3	1.65	2	1.02	0.15	825	50	90	25	10	2
D	26	Stormwater outlet/line	10	3	3.15	2	0.871	0.001	700	3	90	1	9	1
D	Alexandra Canal to Coward Street	Utilities	10	1	1.5	2	0.072	NI	50	-	5	-	2	-
D	Coward Street to Qantas Jet Base	Utilities	10	1	1.5	2	1.07	0.2	745	58	85	50	11	3
D	Qantas Jet Base to Qantas Service Road overpass	Utilities	10	1	1.5	2	0.37	NI	255	-	55	-	6	-
D	Qantas Service Road overpass to King Street	Utilities	10	1	1.5	2	0.37	NI	255	-	55	-	6	-
D	King Street to Coleman Street	Utilities	10	1	1.5	2	NI	NI	-	-	-	-	-	-
D	Coleman Street to Ninth Street	Utilities	10	1	1.5	2	1.47	0.6	1025	170	85	60	13	7





ID	Item #	Item description	Excavation length (m)	Excavation width (m)	Depth of excavation (m)	Estimated excavation Time (days)	Construction GWL intersection depth – RWC GWL (m)	Construction GWL intersection depth - LC GWL (m)	Estimated Inflow - RWC GWL (m <sup>3</sup> /day)	Estimated Inflow – LC GWL (m <sup>3</sup> /day)	Radius of Influence - RWC GWL (m)	Radius of Influence - LC GWL (m)	Capture Zone - RWC GWL (m)	Capture Zone – LC GWL (m)
D	Ninth Street to Shiers Avenue	Utilities	10	1	1.5	2	NI	NI	-	-	-	-	-	-
D	Shiers Avenue to Seventh Street (Sir Reginald Ansett Avenue)	Utilities	10	1	1.5	2	NI	NI	-	-	-	-	-	-

Notes:

NI = 'No Intersection' of groundwater interpreted

GWL = groundwater level

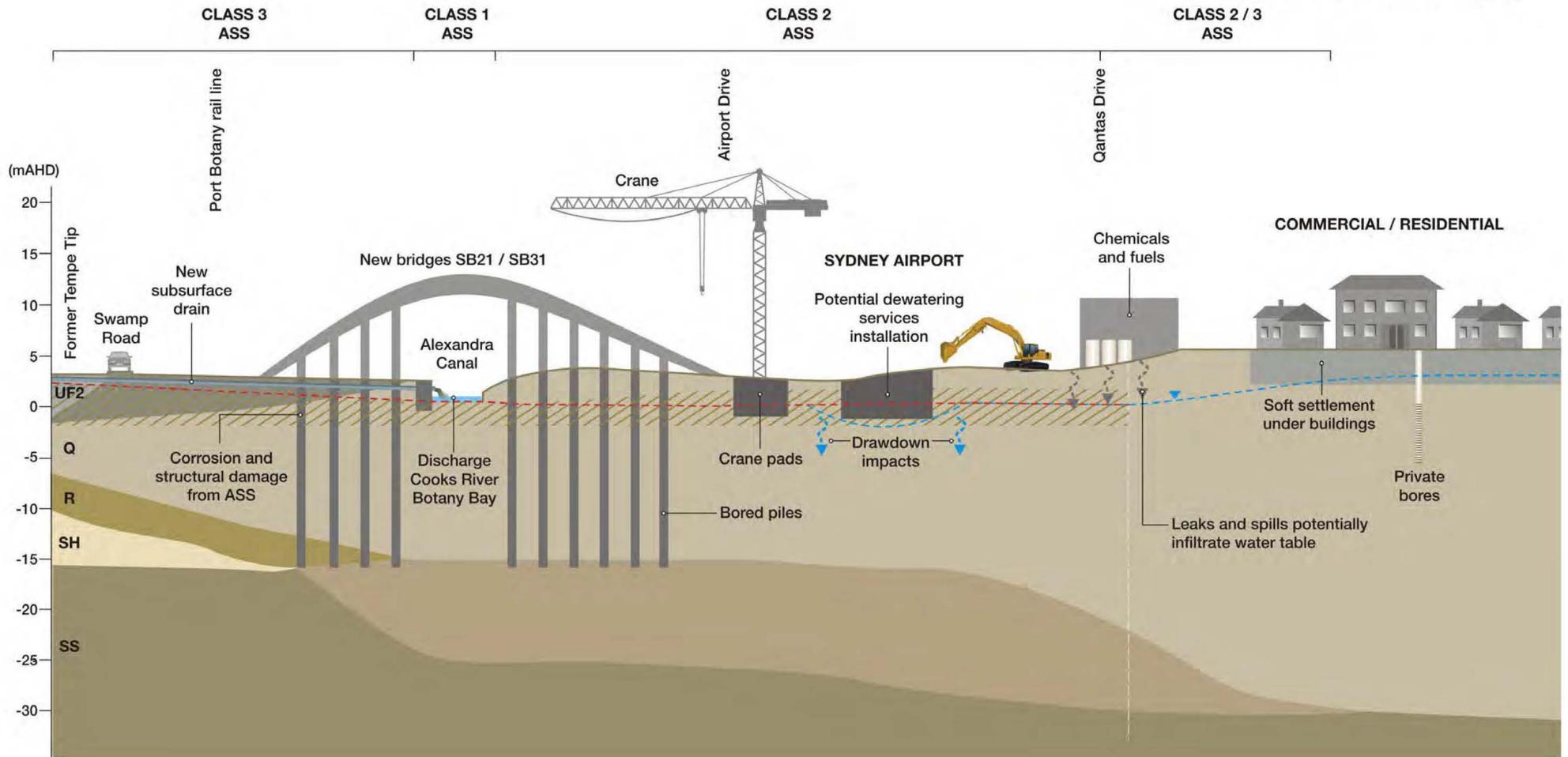
The ground level intersection depths, inflow rates and radius of influence data have been colour coded to highlight the following:

- Blue colours represent conditions under which groundwater is intersected.
- Increasing intensity of blue shading represents greater inflow / radius of influence / intersection of groundwater.



# IDEALISED HYDROGEOLOGICAL CONCEPTUAL MODEL - CONSTRUCTION

- UF2 Uncontrolled fill
- Q Quaternary sediments
- R Residual
- SH Ashfield Shale
- SS Hawkesbury Sandstone
- Disturbed terrain 2-4m (ASS)



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DESIGN LOT CODE

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING - REV 3 (20191114)

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CLIENT

SYDNEY GATEWAY

A3

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A1	06/02/2019	Construction Idealised Conceptual Site Model

WVR No.	APPROVAL

SCALES ON AS SIZE DRAWING

CO-ORDINATE SYSTEM: MGA ZONE 56  
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY

TITLE	NAME	DATE
DRAWN	D NAIKEN	06/02/2019
DRG CHECK	N ROSEN	06/02/2019

PREPARED FOR

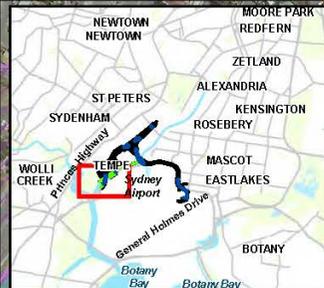
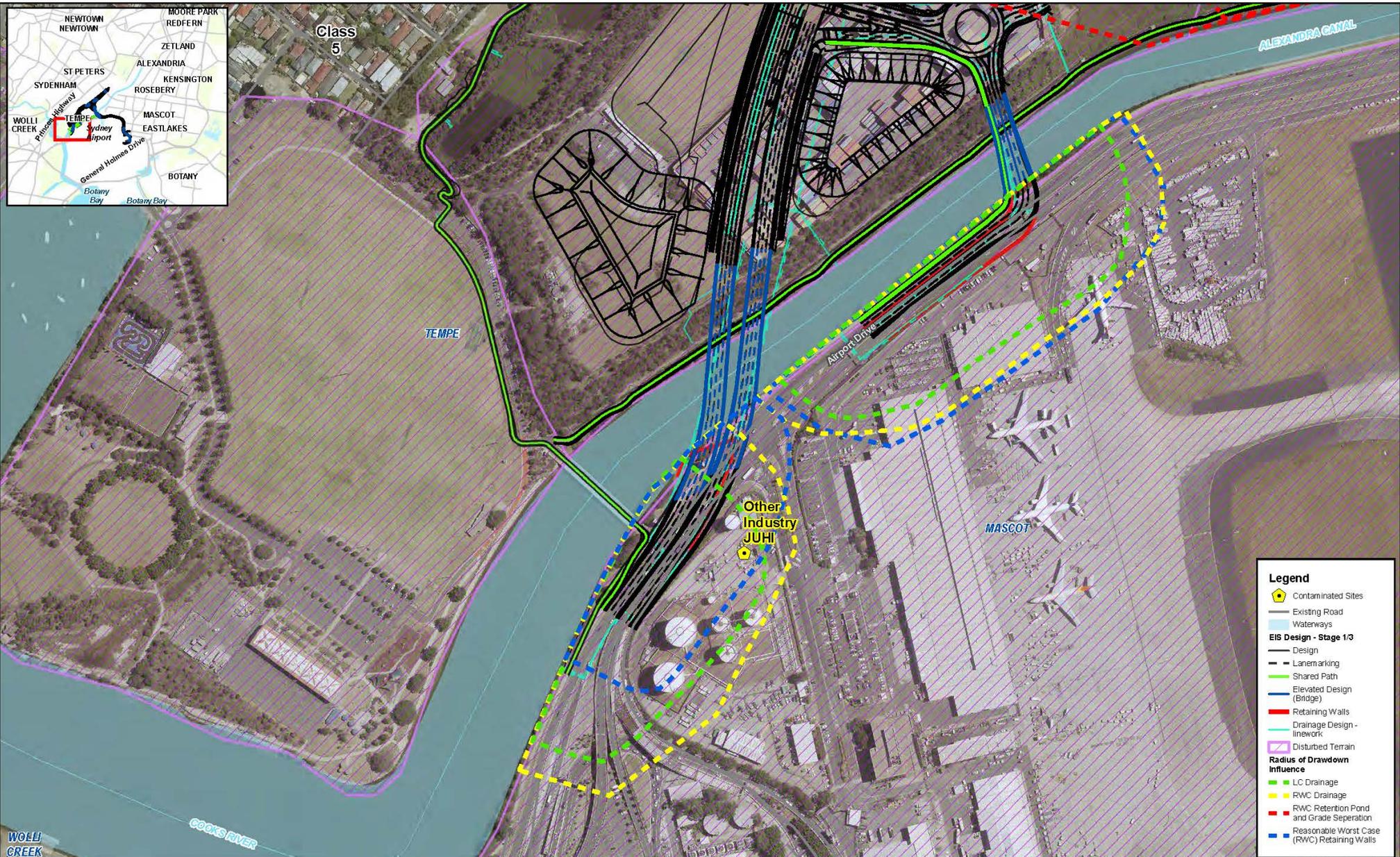
RMS REGISTRATION No.	PART
ISSUE STATUS: FOR INFORMATION	ISSUE: A1



## 5.2.2 Radii of influence and capture zones

- Given the short excavation times (< three days) proposed for stormwater lines, utilities and retaining wall construction, the radii of influence from dewatering (which is the 0.05 m drawdown contour) are estimated to be less than 100 metres. Due to the similarity between the radii of groundwater drawdown influence for stormwater lines and utilities, the radii of groundwater drawdown influence for utilities has not been presented on Figure 5-2 to Figure 5-4
- The construction of the flood detention basin is expected to result in a large radius of influence due to the longer construction time. The radius of influence is expected to be as high as 570 metres under RWC conditions and 470 metres under LC conditions. The large radius is due in part to the long estimated excavation duration
- The eastbound terminal link (underpass) is not expected to intersect groundwater during LC conditions but would intersect during RWC conditions. The radii of influence for this intersection approximated 500 m
- One registered groundwater well has been identified in the radius of influence created by the project. This includes well GW024036, which is listed as an irrigation well located on Sydney Airport
- Class 2 and Class 3 acid sulfate soils are intersected by the radius of influence indicating the potential for exposure of ASS and therefore the potential for acidification of, and increasing metals concentrations in, surrounding groundwater
- A number of contaminated sites may potentially be within the groundwater capture zones of the excavations. This includes:
  - The former Tempe landfill. Predicted capture zones for the mitigation basin (Item 12) are around 90 metres, which still may result in groundwater affected by leachate migrating into these excavations under RWC conditions, although this should be limited by the bentonite wall and leachate collection system
  - Alexandra Canal sediments. The capture zones for the stormwater channels (items 9 and 11 in Figure 3-1) being installed to the north-west of Alexandra Canal, intersect Alexandra Canal and would capture pore water from impacted sediments. The stormwater line to the east of Alexandra Canal (Item 18 Figure 3-2) would also capture pore water from impacted sediments in the canal
  - The Boral recycling and concrete site, which is located at the edge of Alexandra Canal, and flanks the stormwater channel installations. The capture zones of Item 16 in Figure 3-1 is about 11 metres under RWC conditions and appears to intersect the site. As such, impacted groundwater in localised areas of the site (to the west) has the potential to migrate into the excavation
  - Sydney Airport staff taxi parking area has a passive skimmer system installed to recover a petroleum LNAPL plume with an unknown extent. Stormwater line Item 26 in Figure 3-2 has a capture zone of 9 metres under RWC conditions which may intersect the LNAPL plume
  - The joint user hydrant installation (JUHI) site located at the western end of Airport Drive. The JUHI is in very close proximity to proposed stormwater lines (Items 1 and 2 in Figure 3-1) and retaining walls (RW1 and RW2 in Figure 3-1) in this area. As such, even though the expected RWC capture zones are generally less than 5 metres, there is a high potential for contaminated groundwater, if present beneath these facilities, to be captured by these excavations
  - Cooks River Intermodal Terminal. Any potentially contaminated groundwater beneath this facility is unlikely to be within the capture zone of any item requiring dewatering
  - Qantas Jet Base is located close to stormwater line Items 21 and 22 and the associated capture zones. As such, there is considered to be a high potential for contaminated groundwater, if present beneath these facilities, to be captured by these excavations
- Buildings, utilities and other infrastructure (including the Botany Rail Line) are located on potential soft sediments that are intersected by the radii of influence along both sides of Qantas Drive and north-west of the project site through the Northern Lands.

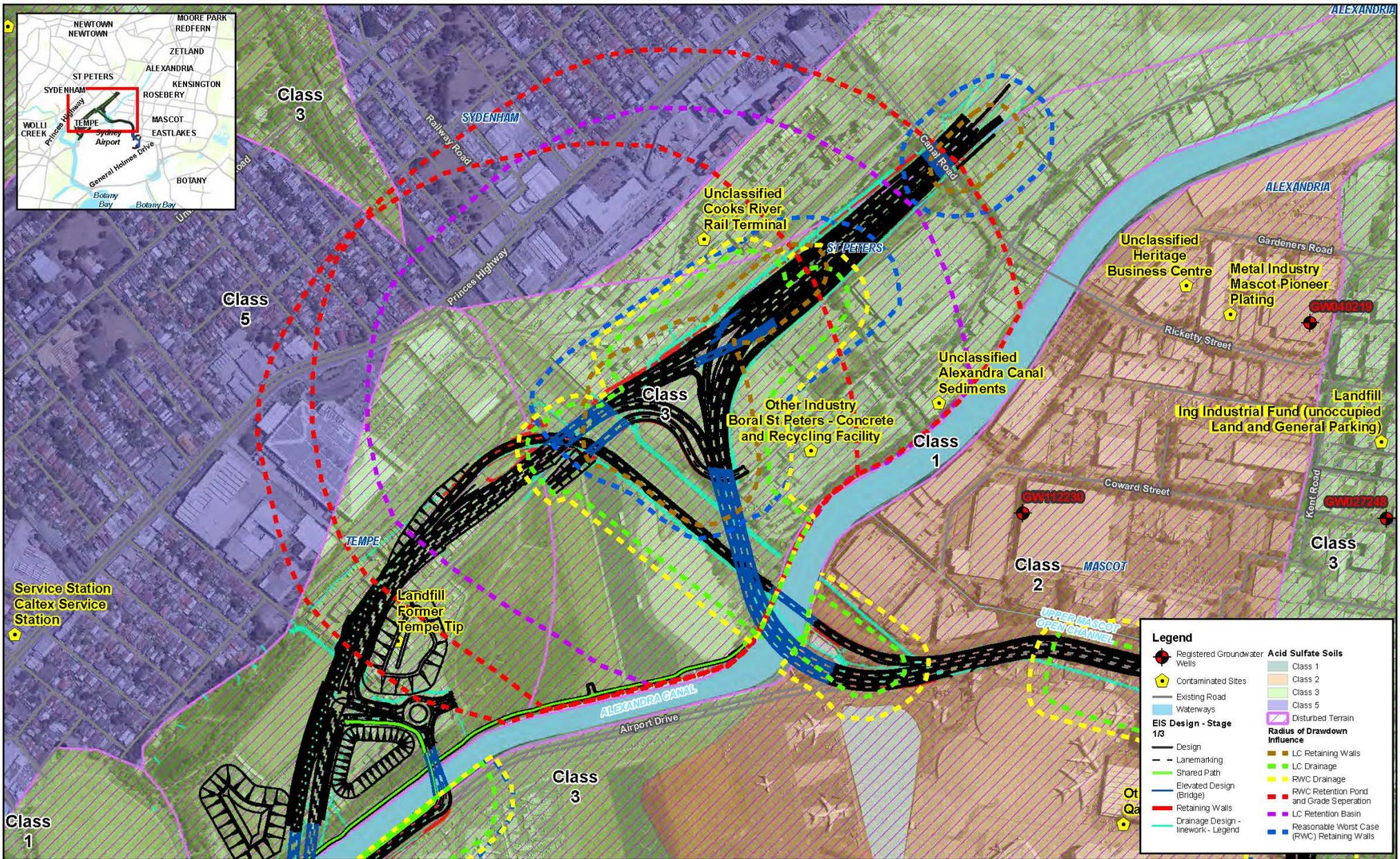




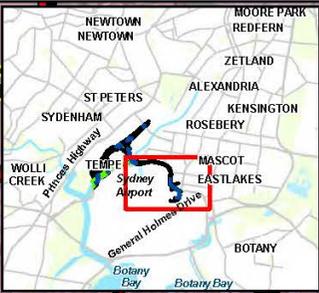
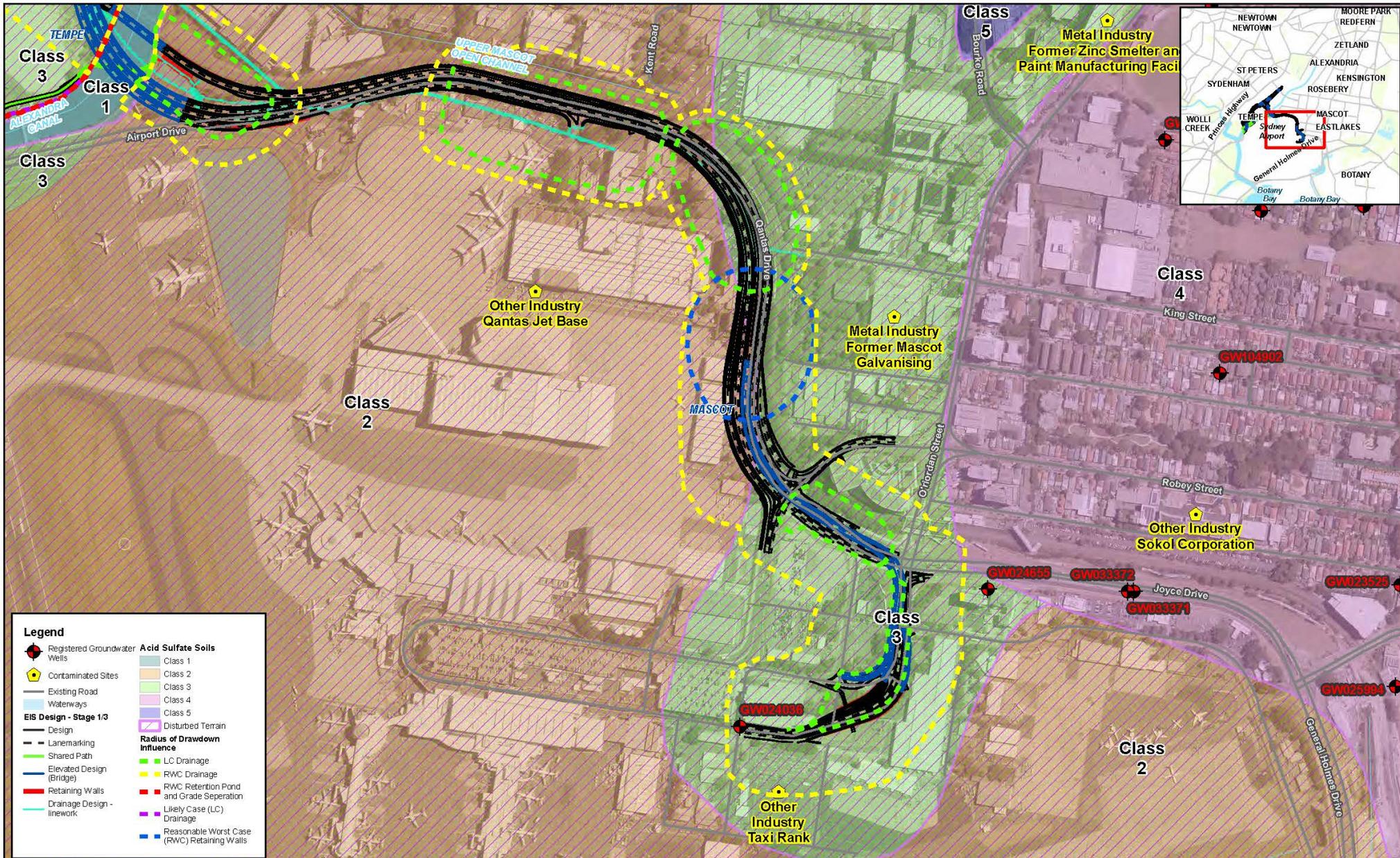
**Legend**

- Contaminated Sites
- Existing Road
- Waterways
- EIS Design - Stage 1/3**
- Design
- Shared Path
- Elevated Design (Bridge)
- Retaining Walls
- Drainage Design - Inework
- Disturbed Terrain
- Radius of Drawdown Influence**
- LC Drainage
- RWC Drainage
- RWC Retention Pond and Grade Separation
- Reasonable Worst Case (RWC) Retaining Walls

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REV	DATE	AMENDMENT / PERMISSION DESCRIPTION	MWR No.	APPROVAL	SCALES ON A1 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY	TITLE	DRWN	INAME	DATE	
A1	07/02/2019	Area A - Radius of Drawdown Influence					Groundwater Impact Assessment	DRS CHECK	S.CHARTERS	16/07/2019	
A2	08/02/2019	Area A - Radius of Drawdown Influence					Figure 5-2: Area A - Radius of drawdown influence				
A3	19/06/2019	Area A - Radius of Drawdown Influence									
A4	18/07/2019	Area A - Radius of Drawdown Influence									
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REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	SCALES ON A1 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY	TITLE															
A1	07/02/2019	Area B and Area C - Radius of Drawdown Influence					<table border="1"> <tr> <th>TITLE</th> <th>NAME</th> <th>DATE</th> </tr> <tr> <td>DRAWN</td> <td>D.HAIKEN</td> <td>19/07/2019</td> </tr> <tr> <td>DRG CHECK</td> <td>S.CHARTERS</td> <td>19/07/2019</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>	TITLE	NAME	DATE	DRAWN	D.HAIKEN	19/07/2019	DRG CHECK	S.CHARTERS	19/07/2019						
TITLE	NAME	DATE																				
DRAWN	D.HAIKEN	19/07/2019																				
DRG CHECK	S.CHARTERS	19/07/2019																				
A2	09/02/2019	Area B and Area C - Radius of Drawdown Influence					<table border="1"> <tr> <th>TITLE</th> <th>NAME</th> <th>DATE</th> </tr> <tr> <td>PREPARED FOR</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>	TITLE	NAME	DATE	PREPARED FOR											
TITLE	NAME	DATE																				
PREPARED FOR																						
A3	19/06/2019	Area B and Area C - Radius of Drawdown Influence																				
A4	04/07/2019	Area B and Area C - Radius of Drawdown Influence																				
A5	19/07/2019	Area B and Area C - Radius of Drawdown Influence																				
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ISSUE STATUS FOR INFORMATION	DATE	SHEET No.	ISSUE AS																			



Legend	
	Registered Groundwater Wells
	Contaminated Sites
	Existing Road
	Waterways
	Design
	Lanemarking
	Shared Path
	Elevated Design (Bridge)
	Retaining Walls
	Drainage Design - linework
	Acid Sulfate Soils
	Class 1
	Class 2
	Class 3
	Class 4
	Class 5
	Disturbed Terrain
	LC Drainage
	RWC Drainage
	RWC Retention Pond and Grade Separation
	Likely Case (LC) Drainage
	Reasonable Worst Case (RWC) Retaining Walls

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REV	DATE	AMENDMENT / REVISION DESCRIPTION	SCALE(S) ON AT SIZE DRAWING	TITLE	NAME	DATE	Groundwater Impact Assessment Figure 5-4: Area D - Radius of drawdown influence	
A1	07/02/2019	Area D - Radius of Drawdown Influence	  	DRWN	D NAIKEN	16/07/2019	RMS REGISTRATION NO:	
A2	08/02/2019	Area D - Radius of Drawdown Influence		DRS CHECK	S CHARTERS	16/07/2019	ISSUE STATUS FOR INFORMATION	
A3	19/06/2019	Area D - Radius of Drawdown Influence		PREPARED FOR		RMS REGISTRATION NO:		PART
A4	28/07/2019	Area D - Radius of Drawdown Influence		DRAWINGS / DESIGN PREPARED BY		EDMS NO:		SHEET NO:
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It is noted that the radius of influence would only be temporary during construction and groundwater levels would re-stabilise within pre-project ranges, within a few days to a few weeks, once construction of individual elements is complete. No ongoing dewatering would occur during operation except for isolated and infrequent maintenance activities. These activities would be undertaken under separate approvals.

## 5.3 Groundwater drawdown

Groundwater inflows and radius of influence results using the Cooper and Jacob (1946) equation are summarised in Table 5-1 and the radius of influence data is presented in Figure 5-2 to Figure 5-4. The interpreted groundwater impacts are discussed below in relation to the AIP minimal impact criteria outlined in section 2.2.2.

### 5.3.1 Water pressure changes

One registered groundwater wells have been identified in the radius of groundwater drawdown influence created by the project. This includes:

- Well GW024036, which is listed as an irrigation well on Sydney Airport. Under RWC groundwater conditions, the groundwater drawdown at the excavation near to the well is expected to be about 2.4 metres. The drawdown would reduce to less than two metres within a very short distance away from the excavation and as such, a drawdown of more than two metres at the well would be unlikely. Further to this, the well appears to be located within the project site and would likely be destroyed. Consultation with Sydney Airport Corporation would be required and a new well at an alternate suitable location may be required to replace the existing well.

### 5.3.2 Water table changes

There are no high priority GDEs located within the estimated radius of groundwater drawdown influence. The closest high priority GDE is located around two kilometres to the south-east of the site and the maximum distance that the radius of influence extends from the eastern boundary of the site is 80 metres.

The radii of influence intersect Alexandra Canal in a number of areas, which is considered to be the only surface water ecosystem affected by drawdown. This surface water feature is tidal and has a constant water supply and is unlikely to be adversely impacted by small groundwater discharge reductions associated with drawdown around excavations.

### 5.3.3 Settlement of unconsolidated sediments

The radius of drawdown influence intersects a number of built-up areas primarily around Qantas Drive, Airport Drive and north-west of the Northern Lands, which may therefore be subject to settlement. A preliminary indicative settlement estimate has been completed and is described below.

Groundwater drawdown settlement may occur following temporary construction dewatering construction activities where excavation works beneath the groundwater table result in lowering of the groundwater table. This lowering of the groundwater table causes changes in the pore water pressure distribution and the state of effective stress which could result in ground subsidence. The magnitude of these settlements at the ground surface will depend on the following:

- Duration of groundwater drawdown
- Depth and thickness of the soil profiles over which settlement occurs
- Spatial extent, distribution, and variability of the soil profiles
- Geotechnical properties of the materials (stiffness and consolidation properties); and
- Changes in groundwater pressure/ depressurization and/ or extent of recharge.

This type of settlement is relatively slow, generally occurring within about a year of construction activities. To assess groundwater drawdown, typical excavation areas were modelled in the GEO-SLOPE Ltd program SEEP/W 2007, with ground conditions as given in the geotechnical drawings.





The following preliminary estimate should be updated following appointment of the construction contractor based on detailed construction planning and appropriate geotechnical information. The damage risk criteria, or degree of severity, have been developed with reference to the “Prediction and effects of ground movements caused by tunnelling in soft ground beneath urban areas” (CIRIA, 1996) and AS 2870:2011 “Residential slabs and footings” (see Table 5-2). The results of the preliminary estimates and estimated “level of severity” are presented in Table 5-3. Over the assumed dewatering duration period (generally less than a few weeks), the results demonstrate that groundwater drawdown is not expected to induce significant settlement, therefore the preliminary settlement assessment effects are classed as “very slight” to “slight”.

Table 5-2 Damage classification - Typical values for maximum building slope and settlement for damage risk assessment based on AS 2870:2011 and CIRIA (1996)

Building and structure damage classification				Approximate equivalent ground settlements <sup>3</sup>	
Damage category	Degree of severity	Description of typical damage and repair	Approx. crack width (mm) <sup>1</sup>	Max. slope of ground (angular distortion) <sup>2</sup>	Max. settlement of structure (mm)
0	Negligible	Hairline cracks	<0.1		
1	Very slight	Fine cracks that do not need repair	<1	<1/500	<10
2	Slight	Cracks noticeable but easily filled. Doors and windows stick slightly	<5	1/500 to 1/200	10 to 50
3	Moderate	Cracks can be repaired and possibly a small amount of wall will need to be replaced. Doors and windows stick. Service pipes can fracture. Weather tightness often impaired	5 to 15 or several (>3)	1/200 to 1/50	50 to 75
4	Severe	Extensive repair work involving breaking out and replacing sections of walls, especially over doors and windows. Window frames and door frames distort. Walls lean or bulge noticeably, some loss of bearing in beams. Service pipes disrupted	15 to 25 but also depends on number of cracks	>1/50	>75

Notes:

- (1) Crack width is only one factor of assessing the category of damage and should not be used on its own as a direct measurement of it.
- (2) Local deviation of slope from the horizontal or vertical of more than 1/100 will normally be clearly visible. Overall, deviations more than 1/150 are undesirable.
- (3) The higher risk category from either slope or settlement consideration controls.





Table 5-3 Preliminary settlement estimate due to groundwater drawdown

Area	Item #	Item description	Identified nearby asset	Calculated surface settlement at the asset (mm)	Estimated level of severity
A	RW1 & RW2	Retaining wall	JUHI	25	Slight
A	RW1 & RW2	Retaining wall	High pressure gas	30	Slight
A	RW3 & RW4	Retaining wall	Airport area	30	Slight
A	3	stormwater outlet/line	high pressure gas	35	Slight
B	7	stormwater channel	Car park	10	Slight
B	8	stormwater channel	Car park	5	Very Slight
B	9	stormwater channel	ARTC rail line	10	Slight
C	10	stormwater channel	ARTC rail line	25	Slight
C	11	stormwater channel	ARTC rail line	20	Slight
C	11	stormwater channel	Boral "tank"	20	Slight
C	12	sedimentation basin	ARTC rail line	20	Slight
D	18	stormwater outlet/line	ARTC rail line	30	Slight
D	18	stormwater outlet/line	Building	5	Very slight
D	22	stormwater outlet/line	Airport area	30	Slight

## 5.4 Groundwater quality

### 5.4.1 Changes in water quality

#### 5.4.1.1 Acid Sulfate Soils

The radius of drawdown influence includes intersection of potential ASS. Oxygenation of these soils through groundwater drawdown has the potential to change groundwater quality. Areas mapped as potentially containing Class 2 and Class 3 ASS that are discussed in section 4.7 are intersected by the project and any drawdown may potentially result in the generation of low pH groundwater that could corrode sub-surface infrastructure and impact surface water and ecology at discharge points to Alexandra Canal and Cooks River. While any impacted water would be captured during construction dewatering, any oxidised sediments would potentially continue to generate low pH groundwater that could migrate to surface water environments.

This could substantially lower the pH and increase metals concentrations and therefore lower the beneficial use potential (environmental values) of the groundwater systems and receiving waterways, at least on a short term basis, and therefore requires management during construction.





#### 5.4.1.2 Contaminated sites

Groundwater drawdown from dewatering of an excavation can cause localised preferential flow towards the excavation. This may result in the migration of any contaminants present towards an excavation from nearby contaminated sites. A number of contaminated sites are present within the interpreted capture zone for the excavations. This includes:

- Alexandra Canal bed sediments. The capture zones for the stormwater channels (Items 9 and 11 in Figure 3-1 to the north-west of Alexandra Canal intersect Alexandra Canal and would capture pore water from impacted bed sediments. The stormwater line to the east of Alexandra Canal (Item 18 in Figure 3-2) would also capture pore water from impacted bed sediments in the canal. The capture zones are generally less than 20 metres for this infrastructure and are not expected to reduce the existing beneficial use potential as the excavation would be taking water that is already impacted, would therefore be removing contaminant mass and would be introducing less impacted water back into the system
- The Boral recycling and concrete sites, which are located at the edge of Alexandra Canal, and which flank the stormwater channel installations. The capture zone of Item 16 in Figure 3-1 approximates 15 metres under worst case conditions but appears to intersect the Boral sites. As such, impacted groundwater in localised areas of the site (to the west) has the potential to migrate into the excavation. Capture of impacted groundwater is not expected to reduce the existing beneficial use potential as the excavation would be taking water that is already impacted, removing contaminant mass and not be introducing water of poorer quality back into the system. Further to this, capture of impacted groundwater is not expected to reduce the existing beneficial use potential as the capture zones are less than the AIP criteria of 40 metres (Section 3.4.2)
- The staff taxi parking area where there is a passive skimmer to recover a petroleum LNAPL plume. Stormwater line Item 26 in Figure 3-2 has a capture zone of about 11 metres which may intersect plumes associated with the LNAPL petroleum plume, the extent of which is currently unknown. The same applies to the retaining walls on Sir Reginald Ansett Drive. Capture of impacted groundwater is not expected to reduce the existing beneficial use potential as the excavation would be taking water that is already impacted, removing contaminant mass and not be introducing water of poorer quality back into the system. Further to this, capture of impacted groundwater is not expected to reduce the existing beneficial use potential as the capture zones are less than the AIP criteria of 40 metres (Section 3.4.2)
- The joint user hydrant installation (JUHI) site located at the western end of Airport Drive. The JUHI is in very close proximity to the stormwater lines (Items 1 and 2 in Figure 3-1) and the retaining walls (RW1 and RW2 in Figure 3-1) in these areas. As such, even though the expected RWC capture zones are generally less than 11 metres, there is a high potential for impacted groundwater, if present beneath these facilities, to be captured by these excavations. Capture of impacted groundwater is not expected to reduce the existing beneficial use potential as the excavation would be taking water that is already impacted, removing contaminant mass and not be introducing water of poorer quality back into the system. Further to this, capture of impacted groundwater is not expected to reduce the existing beneficial use potential as the capture zones are less than the AIP criteria of 40 metres (Section 3.4.2)
- Cooks River Intermodal Terminal. Any potential impacted groundwater beneath this facility is unlikely to be within the capture zone of any item of project infrastructure that would intersect groundwater and require dewatering. If there were any existing plumes of contaminated groundwater migrating from this facility toward the Alexandra Canal it would be preferentially intersected by stormwater line Items 13 and 14 presented in Figure 3-1. Capture of impacted groundwater is not expected to reduce the existing beneficial use potential as the excavation would be taking water that is already impacted, removing contaminant mass and not be introducing water of poorer quality back into the system. Further to this, capture of impacted groundwater is not expected to reduce the existing beneficial use potential as the capture zones are less than the AIP criteria of 40 metres (Section 3.4.2)





- The Qantas Jet Base is located near to stormwater lines 21 and 22 in Figure 3-2 and is intersected by the radius of influence under RWC and LC conditions. As such there is a high potential for impacted groundwater to migrate into construction excavations. Capture of impacted groundwater is not expected to reduce the existing beneficial use potential as the excavation would be taking water that is already impacted, removing contaminant mass and not be introducing water of poorer quality back into the system. Further to this, capture of impacted groundwater is not expected to reduce the existing beneficial use potential as the capture zones are less than the AIP criteria of 40 metres (Section 3.4.2).

Further to the above, while these contaminated sites may be intersected by the capture zones, there are no sensitive receptors (including high priority GDEs and water supply wells) identified between the contaminated sites and the excavations, which are where potential water quality impacts would migrate; as such, no adverse impacts to receptors are expected.

#### 5.4.1.3 General construction activities

Isolated spills and accidents occurring during construction and diffuse impacts associated with general construction activities such as leaks from machinery can affect the quality of the groundwater. Chemicals of primary concern include hydrocarbons, and may also include herbicides, pesticides and fertiliser associated with maintaining construction areas. Impact could occur through the infiltration of spilled pollutants into the ground surface and migration to underlying groundwater.

Sedimentation basins may be used around the project to control site runoff. These basins have the potential to allow contaminated surface water to infiltrate to groundwater due to overflows or improper lining.

Impacted groundwater from the above sources may then migrate to surface water features or other receptors (such as groundwater supply wells) where the beneficial use potential (environmental value) may be lowered. As the context of these impacts, with regard to beneficial use potential, cannot be ascertained until construction occurs, management and monitoring during construction should occur to avoid impacts.

#### 5.4.1.4 Excavation dewatering

Dewatering of excavations during construction would bring groundwater to the surface which could potentially impact the surrounding environment through incorrect storage/management and discharge. Discharging contaminated construction water directly to surface water could lower the beneficial use potential (environmental value) of those surface water features. Table 5-4 presents the contaminants flowing into each excavation that have potential to impact the surrounding environment if not managed appropriately. This is based on the water quality data and exceedances of adopted criteria discussed in section 4.16.

In summary, the key analytes exceeding the adopted criteria that represent the beneficial use potential of the surrounding environment include:

- pH
- Major cations and anions (including chloride, sodium and sulfate)
- Metals, particularly aluminium, cadmium, iron, lead, nickel, manganese and zinc
- Nitrogen (all species) and phosphorus
- Total recoverable hydrocarbons, benzene, toluene, ethylbenzene and total xylenes (BTEX) and polycyclic aromatic hydrocarbons (PAHs). It is noted that BTEX exceedances are restricted to wells at the former Tempe landfill which will not be subject to excavation dewatering. They are however, potentially present in uncharacterised areas near to the JUHI and the domestic terminal taxi rank
- PFOS
- PFHxS + PFOS.





Table 5-4 Water quality exceedances for excavations intersecting groundwater

Area	Item #	Item description	Estimated Inflow - Worst Case GWL (RWC) (m <sup>3</sup> /day)	Estimated Inflow - Existing GWL (LC) (m <sup>3</sup> /day)	Contaminants exceeding criteria	Wells used	Data quality comments
A	RW1 and RW2	Retaining Wall	151	-	Suspected TRH, BTEX and PAHs from the JUHI – Sydney Airport. Potential ASS. TDS.	-	Data absent. Based on known contaminated site adjacent to alignment. Potential for ASS and TDS based on the proximity to Alexandra Canal.
A	RW3, RW4 and RW5	Retaining Wall	321	-	Suspected TRH, BTEX, PAHs and PFAS. Potential ASS. TDS.	-	Data absent. Based on known contamination at Sydney Airport adjacent to site. Potential for ASS and TDS based on the proximity to Alexandra Canal.
A	1	Stormwater outlet/line	1620	369	Suspected TRH, BTEX and PAHs from the JUHI – Sydney Airport. Potential ASS. TDS.	-	Data absent. Based on known contaminated site adjacent to alignment. Potential for ASS based on the proximity to Alexandra Canal.
A	2	Stormwater outlet/line	400	-	Suspected TRH, BTEX and PAHs from the JUHI – Sydney Airport. Potential ASS. TDS.	-	Data absent. Based on known contaminated site adjacent to alignment. Potential for ASS and TDS based on the proximity to Alexandra Canal.
A	3	Stormwater outlet/line	1520	330	Suspected TRH, BTEX, PAHs and PFAS. Potential ASS. TDS.	-	Data absent. Based on known contamination at Sydney Airport adjacent to site. Potential for ASS and TDS based on the proximity to Alexandra Canal.
B	Eastbound terminal link underpass	Grade Separation	510	-	Arsenic, Chromium, Manganese, Total Phosphorus, Ammonia, Chloride, Sodium, TDS, pH. Aluminium, Cobalt, Lead Manganese, Nickel, Zinc, Ammonia. Aluminium, Manganese, Zinc, Bicarbonate Alkalinity as CaCO <sub>3</sub> , Ammonia, Total Nitrogen, Total Phosphorus, pH. TDS, pH Potential ASS.	GW5s, GW5d	Wells located south-east from the structure.
B	RW20	Retaining Wall	740	224	Chromium, Ammonia, pH. Ammonia. Ammonia, pH. pH. Potential ASS	GW13s	Wells located to the east of the retaining wall.





Area	Item #	Item description	Estimated Inflow - Worst Case GWL (RWC) (m <sup>3</sup> /day)	Estimated Inflow - Existing GWL (LC) (m <sup>3</sup> /day)	Contaminants exceeding criteria	Wells used	Data quality comments
B	7	Stormwater Channel	2135	550	Arsenic, Chromium, Manganese, Ammonia, Total Phosphorus, Chloride, Sodium, TDS, pH. Aluminium, Cobalt, Manganese, Lead, Nickel, Zinc, Ammonia. Aluminium, Manganese, Zinc, Bicarbonate Alkalinity as CaCO <sub>3</sub> , Ammonia, Total Nitrogen, Total Phosphorus, pH. TDS, pH. Potential ASS	GW5d, GW5s	Wells located at the start of the channel.
B	8	Stormwater Channel	1570	325	Arsenic, Chromium, Manganese, Ammonia, Total Phosphorus, Chloride, Sodium, TDS, pH. Aluminium, Cobalt, Lead, Manganese, Nickel, Zinc, Ammonia. Aluminium, Manganese, Zinc, Bicarbonate Alkalinity as CaCO <sub>3</sub> , Ammonia, Total Nitrogen, Total Phosphorus, TSS, pH. TDS, pH Potential ASS	GW5s GW5d, GW25s	One well located at the start and end of the stormwater channel.
B	9	Stormwater Channel	1265	202	Arsenic, Chromium, Manganese, Ammonia, Total Phosphorus, Chloride, Sodium, TDS, pH. Aluminium, Cobalt, Lead, Manganese, Nickel, Zinc, Ammonia. Aluminium, Manganese, Zinc, Bicarbonate Alkalinity as CaCO <sub>3</sub> , Ammonia, Total Nitrogen, Total Phosphorus, TSS, pH. TDS, pH. Potential ASS	GW5s, GW5d, GW25s	One well located at the start and end of the stormwater channel.
C	12	Sedimentation / Flood retention basin	1725	579	Arsenic, Chromium, Ammonia. Ammonia, PFOS. Ammonia, Perfluorooctane sulfonic acid (PFOS). Potential ASS	GW10s	Only one well near basin located to the north.
C	RW21, RW22, RW23	Retaining Wall	740	165	Arsenic, Chromium, Ammonia. Ammonia, PFOS. Ammonia, PFOS. Potential ASS	GW10s	Only one well near these retaining walls located to the north-west.
C	RW23 - west, RW24 - west, RW31	Retaining wall	666	9	Arsenic, Chromium, Ammonia. Ammonia, PFOS. Ammonia, PFOS. Potential ASS	GW10s	Only one well near these retaining walls located to the north-west.
C	RW26	Retaining wall	705	24	Arsenic, Chromium, Ammonia. Ammonia, PFOS. Ammonia, PFOS. Potential ASS	GW10s	Only one well near these retaining walls located to the north-west.





Area	Item #	Item description	Estimated Inflow - Worst Case GWL (RWC) (m <sup>3</sup> /day)	Estimated Inflow - Existing GWL (LC) (m <sup>3</sup> /day)	Contaminants exceeding criteria	Wells used	Data quality comments
C	RW32 - RW34	Retaining wall	740	78	Arsenic, Chromium, Ammonia, Total Phosphorus. Aluminium, Cobalt, Zinc, Ammonia. Aluminium, Manganese, Bicarbonate Alkalinity as CaCO <sub>3</sub> , Ammonia, Total Nitrogen, Total Phosphorus. Potential ASS	GW4i, GW4d	Wells located close to this area
C	RW29	Retaining wall	740	97	Total Phosphorus. Copper, Nickel, Zinc, Ammonia. Aluminium, Copper, Manganese, Zinc, Bicarbonate Alkalinity as CaCO <sub>3</sub> , Ammonia, Total Nitrogen, Total Phosphorus, pH. pH. Potential ASS	GW11d, GW11s	Wells located close to this area
C	10	Stormwater Channel	2090	550	Arsenic, Chromium, Manganese, Ammonia, Total Phosphorus, Chloride, Sodium, TDS. Aluminium, Cobalt, Lead, Manganese, Nickel, Zinc, Ammonia. Aluminium, Manganese, Zinc, Bicarbonate Alkalinity as CaCO <sub>3</sub> , Ammonia, Total Nitrogen, Total Phosphorus, pH.. TDS, pH. Potential ASS	GW5s, GW5d	Only one well located to the northwest of the stormwater channel.
C	11	Stormwater Channel	1262	184	Arsenic, Chromium, Chloride, Sodium, TDS. Aluminium, Zinc, Ammonia. Aluminium, Manganese, Bicarbonate Alkalinity as CaCO <sub>3</sub> , Ammonia, Total Nitrogen, Total Phosphorus, pH. PFOS. TDS, pH. Potential ASS	GW24s	One well located to the north of the stormwater channel
C	13	Stormwater outlet/line	1580	410	Arsenic, Chromium, Ammonia. Ammonia, PFOS. Ammonia, PFOS. Potential ASS	GW10s	Only one well near to excavation located to the west.
C	14	Stormwater outlet/line	485	-	Total Phosphorus. Copper, Nickel, Zinc, Ammonia. Aluminium, Copper, Manganese, Zinc, Bicarbonate Alkalinity as CaCO <sub>3</sub> , Ammonia, Total Nitrogen, Total Phosphorus, pH. pH. Potential ASS	GW11s, GW11d	Wells located close to stormwater outlet.
C	16	Stormwater outlet/line	1090	157	Arsenic, Chromium, Ammonia. Copper, Lead, Zinc, Ammonia. Copper, Lead, Mercury, Ammonia. Potential ASS	GW2s, GW2d	One well located close to stormwater outlet.





Area	Item #	Item description	Estimated Inflow - Worst Case GWL (RWC) (m <sup>3</sup> /day)	Estimated Inflow - Existing GWL (LC) (m <sup>3</sup> /day)	Contaminants exceeding criteria	Wells used	Data quality comments
D	Qantas Drive, near Ewan Street	Retaining Wall	418	-	Arsenic, Ammonia, pH, Nickel, Zinc, Ammonia, Zinc, Ammonia, pH, pH. Potential ASS	GW14s, GW14d	Well is located near the retaining wall.
D	18	Stormwater outlet/line	1070	150	Arsenic, Chromium, Ammonia, Chloride, pH, Ammonia, Ammonia, pH, pH Potential ASS	WCX_GTY_BH009s, WCX_GTY_BH_009d	Wells located to the east of this structure.
D	21	Stormwater outlet/line	460	-	Arsenic, Chromium, Ammonia, Ammonia, pH, pH Potential ASS	GW13d, GW13s.	Wells located on the opposite side of Qantas Drive
D	22	Stormwater outlet/line	1500	320	Arsenic, Chromium, pH, PFAS, Aluminium, Zinc, Ammonia, PFOS, Aluminium, Manganese, Zinc, Bicarbonate Alkalinity as CaCO <sub>3</sub> , Ammonia, Total Nitrogen, Total Phosphorus, pH, pH. Potential ASS	GW104, GW13d, GW13s.	Wells located close to stormwater outlet.
D	23	Stormwater outlet/line	1460	305	Arsenic, Chromium, pH, Nickel, Zinc, Ammonia, Zinc, Ammonia, pH, pH. Potential ASS	GW14s, GW14d	Wells located close to stormwater outlet.
D	24	Stormwater outlet/line	530	-	Chromium, pH, PFAS, Cadmium, Copper, Zinc, PFOS, Zinc, pH, PFOS, Zinc, pH. Potential ASS.	GW15s, GW15d, WCX_GTY_BH_004	Wells located close to stormwater outlet.
D	25	Stormwater outlet/line	825	50	Chromium, pH, Cadmium, Copper, Zinc, pH, pH. Potential ASS	WCX_GTY_BH_002	One well located east of the area
D	26	Stormwater outlet/line	700	3	TRH, BTEX and PAHs from the Taxi Rank. Potential ASS	-	Data absent.

Black – exceeds human health and/or ASSMAC guidelines

Blue – exceeds ecological criteria

Green – exceeds site specific discharge criteria – Surface water

Brown – Sydney Water Industrial Trade Waste Acceptance Standard (2019)





## 5.5 Construction water balance

Due to the nature of the Botany Sands Groundwater Source, with management zones and embargos on water take, all water required for construction would be sourced from non-groundwater sources. This may include reticulated water or surface water harvesting. As such, groundwater would not be used to support the construction activities for the project.

The overall groundwater balance for this area however, may also be impacted during construction by stripping of surfaces for construction of the new road, which has potential to allow greater rainfall infiltration and by dewatering of excavations for installation of subsurface infrastructure, such as drainage. These potential impacts are discussed in more detail below.

### 5.5.1 Changes in rainfall recharge to Botany Sands

The construction and widening of roads is expected to result in stripping of existing sealed road surfaces for relaying of new roads. This may result in a potential temporary increase in recharge during construction, which is considered to be a positive impact with regards to resource availability. Stripped surfaces may temporarily be more prone to groundwater quality impacts, which would require preventative management measures.

Based on the construction footprint area relative to the overall Botany Sands Groundwater Source land area, the overall increases in recharge to the Botany Sands Groundwater Source associated with stripping is expected to be negligible (<1%). The increase in average recharge to the construction footprint area, assuming the existing surface is entirely sealed and the entire construction area (excluding the former Tempe landfill) would be stripped all at once, is expected to approximate 47 m<sup>3</sup>/day. This is a small amount (<1%) relative to the overall water balance estimated for the project in section 4.13.1 of approximately 3,825 m<sup>3</sup>/day. It would also have a negligible effect on the overall groundwater elevations (<1 mm) across the site.

While individual rainfall events would result in larger rainfall infiltration rates recharging the aquifer system and subsequent groundwater response, this is still expected to be small relative to the overall groundwater response occurring in the wider aquifer due to the same rainfall event.

Any expected increase in recharge could result in the enhanced migration of impact into and within groundwater (as discussed in section 5.4.1.3), although this is expected to be captured as part of excavation dewatering works.

#### 5.5.1.1 Changes in rainfall recharge to the former Tempe landfill

Construction of the road on the top of the landfill will require temporary stripping of the capping layer at the landfill.

Landfill water balance modelling presented in Technical Working Paper 16 – Landfill Assessment indicates that as a result of construction works, the rainfall infiltration rates (with resulting leachate disposal rates) would increase. The increase in inflows for different climatic conditions are presented below:

- Under average rainfall year conditions, the expected leachate disposal rates would increase to approximately 200 m<sup>3</sup>/day
- Under 90<sup>th</sup> percentile wet year conditions (if they occur) at the start of construction, the leachate disposal rates would increase to 450 m<sup>3</sup>/day.

### 5.5.2 Construction dewatering

Groundwater modelling has produced estimates of dewatering for individual excavations within the project site. This information has been used to estimate the dewatering that would occur on any given day during construction assuming that:

- Dewatering of excavations is systematically completed from north-west to eastern areas of the project
- Dewatering takes a period of two years to complete during construction.





These assumptions, while considered to be reasonably realistic, would need to be revisited once construction scheduling has been finalised, as scheduling of excavation dewatering effects the total volumes abstracted at any one time.

Given these construction dewatering conditions, the following dewatering volumes are estimated and summarised in Figure 5-5:

- The maximum take would be between approximately 1,144 m<sup>3</sup>/day (likely case groundwater level conditions) and 4,970 m<sup>3</sup>/day (reasonable worst case groundwater level conditions). These dewatering rates would occur generally around six months into construction dewatering works and again at one year into construction works based on the assumptions made, and are associated with the construction of the stormwater channels discharging to Alexandra Canal from the northwest
- The total volume of water abstracted over the two year period would be between 262,000 m<sup>3</sup> (LC) and 1,433,000 m<sup>3</sup> (RWC).

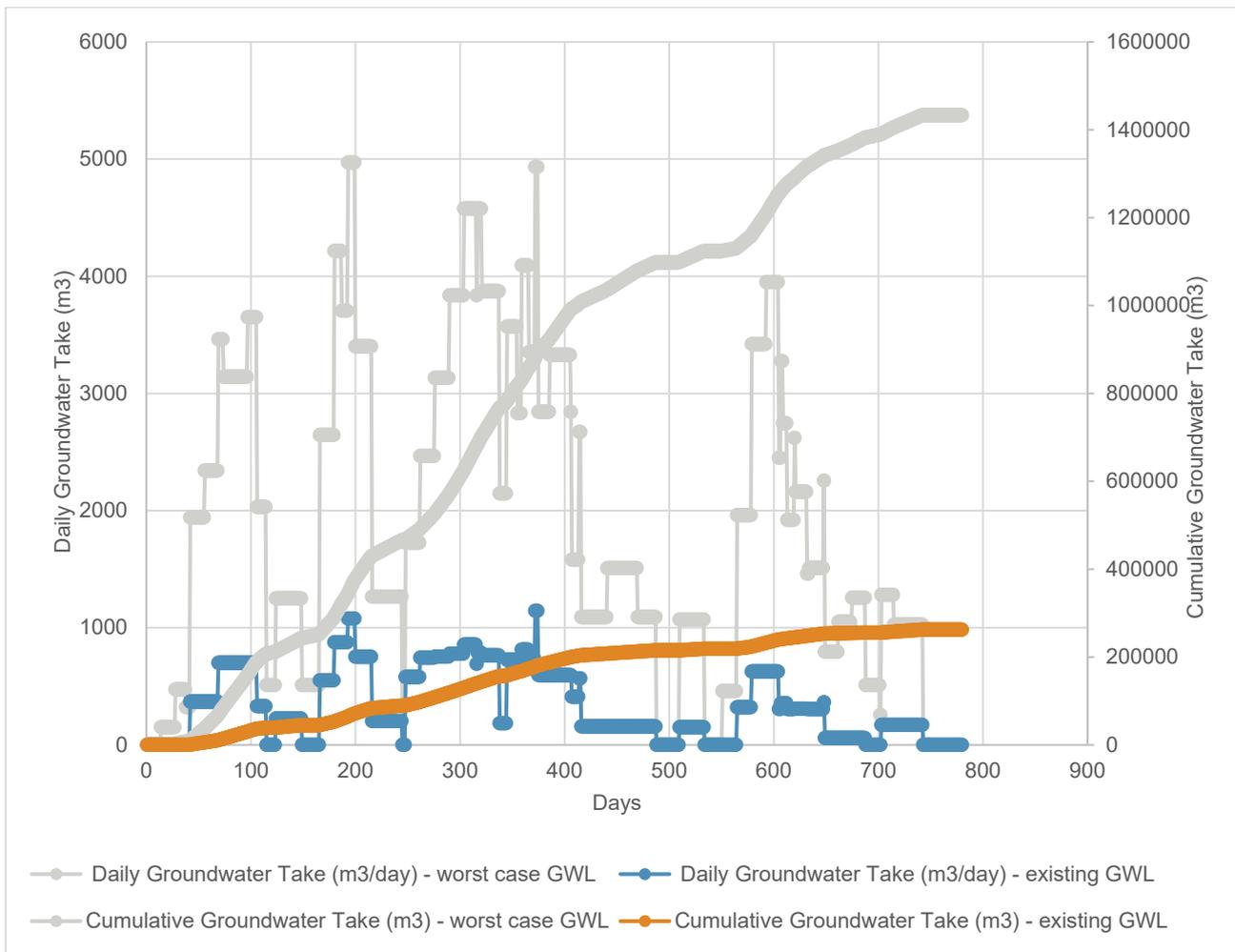


Figure 5-5 Estimated groundwater take for construction dewatering





## 5.6 Summary of impacts on Commonwealth land

A summary of the key findings relevant to Sydney Airport (Commonwealth) Land during construction are as follows:

- Impact to water supply wells – there is currently one licensed water supply well (GW024036), which is located within the project construction footprint and is registered as an irrigation well on Sydney Airport property. This well may be destroyed. As necessary, make good provisions would be implemented
- Impact to GDEs – assessment results did not identify any potential groundwater drawdown impacts on areas identified as containing GDEs
- Impact on built structures – the predictions of groundwater drawdown have been used to provide a preliminary estimate of possible settlement on adjacent man-made structures. Settlement risks ranging from very slight to slight have been identified for structures within Sydney Airport in the region of the JUHI and in the area around Sir Reginald Ansett Drive. These settlement predictions should be reviewed during detailed design with appropriate geotechnical inputs and consideration, and following confirmation of the preferred construction approach. Appropriate mitigation measures to reduce settlement predictions at affected structures to within acceptable ranges should be developed, as required, as an outcome of the review
- Impact on acid sulfate soils – the radius of groundwater drawdown includes intersection of Class 2 and Class 3 acid sulfate soils. Any drawdown may potentially result in the generation of low pH groundwater that could corrode sub-surface infrastructure and impact surface water and riparian ecology at discharge points. Management would be required so that the environmental values of waterways, at least on a short term basis, are not reduced
- Groundwater/surface water quality impacts – dewatering large volumes of groundwater may result in mobilisation of contaminants in groundwater, such as that present at the Qantas Jet Base and Taxi Ranks on Sir Reginald Ansett Drive. This may have implications for contamination management measures potentially located on Sydney Airport land in these areas. Although, given the temporary nature of drawdown influence and the expected captures zones of excavations in these areas being relatively small, the impacts are expected to be negligible.

## 5.7 Significance of impacts on Commonwealth land

Dewatering works will be undertaken on Commonwealth land near the JUHI and along Qantas Drive. The potential impacts are discussed below:

- Generation of acid sulfate soils. The scale of acid sulfate soil generation could be relatively widespread on Commonwealth land, however, the duration of most excavations are expected to limit the potential for ASS to be generated by dewatering of PASS surrounding the excavation. Once ASS has been generated it may act as an ongoing source of lower pH groundwater with greater concentrations of metals. Down-gradient infrastructure intersecting groundwater and ecology at down-gradient discharge points may be impacted. This would require management in accordance with the procedures outlined in Ahern *et al* (1998)
- GW024036 is registered as an irrigation well at Sydney Airport and may be destroyed by construction of the project, which is a significant impact with regard to scale, intensity and duration if the well is in use. Make good provisions (if required) would apply to mitigate this impact
- Settlement if buildings identified to be affected are sensitive to the settlement predicted. While the scale and duration of these impacts may be small, the effects on key infrastructure could be significant, particularly with regard to leaks being generated from the JUHI. Review of potential settlement impacts should be completed at detailed design stage





- Exposure to and discharge of impacted groundwater from contamination plumes migrating into excavations and impacting plume capture management measures. The scale, intensity and temporal nature of these impacts are expected to be small.

The impacts that have been identified would be temporary in nature and are not expected to measurably reduce the quantity, quality or availability of groundwater at identified receptors.

Given the implementation of a range of available mitigation and management options outlined in section 8, none of these potential impacts are likely to be considered significant.





## 6. Operational impacts

Potential ongoing impacts may also occur during the operation phase of the project.

Operational impacts may include potential changes to groundwater recharge, groundwater quality and groundwater levels. The main aspects of operation that potentially impact on groundwater are expected to be:

- New road surfaces (increase in impervious surfaces)
- Increased surface runoff associated with better capture of rainfall by stormwater drainage. This would reduce rainfall infiltration to groundwater
- Cuttings (there is only one major cutting proposed, where the eastbound terminal link passes beneath the Terminal 1 connection rail overpass (the underpass), although this is expected to be lined and have no ongoing dewatering).

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### 6.1 Summary of key findings

A summary of the key findings relevant to the operation stage is as follows:

- Drawdown impacts on surface water features, water supply wells and settlement of sediments – It is not envisaged that groundwater use would be needed to support project operational activities and therefore, there would be no ongoing drawdown of the groundwater table during operation and no resultant impacts. Changes to the water table or in water supply wells would be negligible
- Impacts on groundwater quality – As there would be no ongoing dewatering or significant changes to recharge, there is not expected to be changes in groundwater elevations that could generate acid sulfate soils. Further to this the new road, with associated surface water management upgrades combined with existing environmental management procedures would maintain or lower the potential for operational activities to impact groundwater quality relative to current conditions
- Water balance – Any reduction in recharge due to an increase in impervious surfaces from roads, pavements and other project structures is expected to be minimal as the areas that would be affected already feature impervious surfaces and other features that generally reduce infiltration. Areas of the former Tempe landfill affected by excavations as part of the project would receive a new cap after construction, which is expected to lower infiltration and generation of leachate by at least 10% compared to existing conditions. Overall, the water balance indicates that changes in water table elevations and resultant affects are likely to be minimal.

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### 6.2 Groundwater drawdown

Due to the nature of the Botany Sands Groundwater Source, with management zones and embargos on water take, all water required for operation would be sourced from non-groundwater sources. This may include reticulated water or potable water.

The eastbound terminal link (the underpass) has a cutting that may intersect the very top of the groundwater system in this area under real worst case conditions. This would be lined to prevent any requirement for ongoing dewatering during operation.

As such, groundwater would not be used to support operation activities for the project and there would be no ongoing drawdown of the groundwater table during operation.





Given the above conditions, the following conclusions are made in regard to the AIP minimal impact criteria presented in section 3.4.2:

- Groundwater pressure or water table changes in water supply wells would not exceed two metres and as such, impacts associated with groundwater drawdown are considered to be negligible
- Water table changes would be less than 10 per cent of the cumulative variation in the water table 40 metres from any high priority GDE (noting that there are no high priority GDE's in the vicinity of the project). As such, impacts associated with groundwater drawdown are considered to be negligible
- As there would be no ongoing dewatering of the groundwater system, settlement of unconsolidated sediment impacts would be negligible.

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## 6.3 Groundwater quality

### 6.3.1 Acid Sulfate Soils

As there would be no ongoing drawdown or significant changes to recharge and as there would be no ongoing dewatering, there is not expected to be changes to groundwater elevations during operation that are more than negligible.

As acid sulfate soils generation relies on lowering of the water table to expose potential acid sulfate soils to air, and there is no expected operation drawdown, there are no acid sulfate soils expected to be generated by operation of the project.

### 6.3.2 Contaminated sites

The groundwater flow patterns during operation would generally be the same as those currently present across the site as there would be no ongoing groundwater dewatering or more than negligible change to rainfall recharge. As such, there would be no ongoing change to the behaviour of groundwater migrating from contaminated sites during operation.

As outlined in Technical Working Paper 16 – Landfill Assessment, the parts of the former Tempe landfill affected by excavations would have a new cap installed after construction, which is expected to lower generation of leachate by at least 10 per cent compared to existing conditions. This would subsequently be collected by the leachate management system before discharge to trade waste.

On this basis, there would be no lowering of beneficial use category of the groundwater source beyond 40 metres of the activity and impacts are therefore considered to be minimal.

### 6.3.3 General operational activities

During operation, groundwater impacts could result from infiltration of contaminants released by residual site activities or spilt or leaked chemicals such as via vehicle accidents. These are ongoing potential impacts, typical of any road project, that require management.

The stormwater runoff and drainage would be designed to minimise infiltration of contaminants to groundwater and spills from accidents by redirecting any rainfall and runoff from the roads/pavements through a stormwater drainage/treatment system that is not connected to the underlying groundwater system.

Further to this, existing operational environmental management procedures would be maintained with regard to use and storage of hazardous chemicals and to respond appropriately to spills associated with accidents.

Groundwater quality in the Botany Sands Groundwater Source is broadly impacted in this area (see section 4.16) by a range of historic and ongoing industrial and commercial activities as well as the existing roads and other transport. The design would result in a reduction in leaks and spills infiltrating to groundwater and hence, a reduction in contaminant mass compared to the existing systems. This would result in an improvement in contaminant mass in groundwater and an improvement in water quality (albeit small).





Given the above, and in regard to the AIP minimal impact criteria presented in section 3.4.2 for water quality, the project would not lower the beneficial use category of the groundwater source beyond 40 metres of the activity during operation.

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## 6.4 Water balance

Due to the nature of the Botany Sands Groundwater Source, with management zones and embargos on water take, all water required for operation would be sourced from non-groundwater or potable sources. As such, groundwater would not be used to support operation activities for the project. The total take of water from the Botany Sands Groundwater Source would not be altered by the operation of the project.

A reduction in recharge due to an increase in impervious surfaces from roads, pavements and other structures is expected to be minimal as the existing areas that would be affected already feature impervious surfaces and other features that generally reduce infiltration. Any impact on the overall recharge of the Botany Sands Groundwater Source due to the project during the operational phase would be negligible.

As outlined in Technical Working Paper 16 – Landfill Assessment, the former Tempe landfill would have a new design and cap emplaced after the construction, which is expected to lower generation of leachate by at least 10 per cent compared to existing conditions. This means that less leachate volumes would require removal to maintain groundwater elevations below their currently required levels to prevent overtopping of the bentonite cut-off wall.

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## 6.5 Summary of impacts on Commonwealth land

A summary of the key findings relevant to operation within Sydney Airport land are as follows:

- Impacts on surface water features, water supply wells, acid sulfate soils and settlement of sediments – It is not envisaged that groundwater use would be needed to support project operational activities and therefore, there would be no ongoing drawdown of the groundwater table during operation and no resultant impacts. Changes to the water table or in water supply wells would be negligible
- Impacts on groundwater quality – As there would be no ongoing dewatering or significant changes to recharge, there is not expected to be changes in groundwater elevations during operation that are more than negligible
- Water balance – Any reduction in recharge due to an increase in impervious surfaces from roads, pavements and other project structures is expected to be minimal as the areas that would be affected already feature impervious surfaces and other features that generally reduce infiltration.

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## 6.6 Significance of impacts on Commonwealth land

The impacts that have been identified will be temporary in nature and are not expected to measurably reduce the quantity, quality or availability of groundwater at identified receptors and are therefore unlikely to be significant.







## 7. Cumulative impacts

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### 7.1 Botany Rail Duplication

The Botany Rail Duplication would not require construction methods that include dewatering during construction. During operation, there is also no planned dewatering needed to support operational activities.

There is a potential for cumulative diffuse water quality impacts but the impact is expected to be lower than the existing system as infrastructure would be upgraded to minimise infiltration and promote surface water capture and management. As such, no additional impacts to those identified in section 1 are expected.

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### 7.2 New M5 Project

The New M5 project (Beverly Hills to St Peters), comprises twin motorway tunnels between the M5 East Motorway (east of King Georges Road, Beverly Hills and Bexley Road, Bexley) and St Peters, including a new road interchange and upgrade of local roads to connect to Campbell Road and Euston Road, St Peters and Gardeners Road, Mascot. New M5 is due for completion in 2020. The tunnel is mostly within the Hawkesbury Sandstone and Ashfield Shale in areas near to the Sydney Gateway road project.

The northern extent of the project would tie-in to the St Peters interchange (which has been included in the New M5 project EIS). Existing dewatering of the Botany Sands would be maintained from the former Alexandria landfill during construction and operation.

The groundwater modelling undertaken for the New M5 project shows that the drawdown caused by the tunnel extends into the Botany Sands Groundwater Source. The two metre drawdown line intersects with the Sydney Gateway road project where the Terminal 1 connection rail overpass is located north of the St Peters Interchange (CDM Smith 2015). The Sydney Gateway road project would not add any additional impacts to the groundwater levels other than that currently simulated in the impact assessment (it inherently accounts for cumulative impacts in the area of impact) and as a result of the New M5 the dewatering there would be a smaller radius of influence and a smaller groundwater dewatering volume than currently simulated.

The groundwater drawdown impacts associated with the New M5 were assessed as part of the cumulative impacts assessment for the M4-M5 Link groundwater modelling and these impacts are included in the discussion below for the M4-M5 Link.

There would be potential for leachate from the former Tempe landfill to migrate to the New M5 due to drawdown impacts associated with that project. Increased rainfall infiltration during construction of the Sydney Gateway road project could increase groundwater elevations in former Tempe landfill which would create additional head to drive leachate migrate to the New M5 tunnel. However, this is not expected to occur as leachate would be controlled during construction by the leachate management system to ensure levels are kept below the top of the bentonite wall. This would ensure that leachate levels do not increase significantly compared to existing levels.

During operation, an improved landfill capping would lower rainfall infiltration and reduce leachate generation by at least 10% relative to existing rates. This would result in no net increase in leachate migration to the New M5 tunnel.

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### 7.3 M4-M5 Link

The M4-M5 Link comprises a new, multi-lane road link between the M4 East at Haberfield and the New M5. Construction of the M4-M5 Link is expected to extend to 2023 with ongoing groundwater dewatering during operation.





The M4-M5 Link is primarily located within underlying bedrock (shales and sandstones) as opposed to the Botany Sands, Quaternary alluvium and the former Tempe landfill which the Sydney Gateway road project primarily interacts with.

Exit and entry ramps for the M4-M5 Link extend through unconsolidated sediments (Quaternary alluvium and the Botany Sands) at St Peters interchange, where the former Alexandria Landfill is located. Groundwater elevations in the Botany Sands/Quaternary sediments in these areas have historically been dewatered to maintain groundwater flow into the former landfill. As such, Botany Sands/Quaternary alluvium groundwater elevations are already impacted in this area and have been since the landfill commenced. The impact assessment undertaken for the Sydney Gateway road project uses observed data that already includes these cumulative impacts.

Due to the ongoing presence of leachate in the former Alexandria landfill, it is expected that dewatering would continue in this area to maintain groundwater elevations after construction of the M4-M5 Link and St Peters interchange. Therefore there would be no additional changes to the groundwater conditions during operation of the Sydney Gateway road project to those already assessed in sections 1 and 5.6.

The groundwater modelling for M4-M5 Link project also assessed the combined impact of the M4-M5 Link and the New M5. These modelling results indicate that construction and operational groundwater drawdown would occur in the Quaternary sediments to the north-west of Alexandra Canal. Groundwater drawdown would be in the order of one to three metres across the project site in this area. This area includes the former Tempe landfill, the Terminal 1 connection rail overpass (and associated underpass) and north to the St Peters interchange as shown in Figure 7-1.

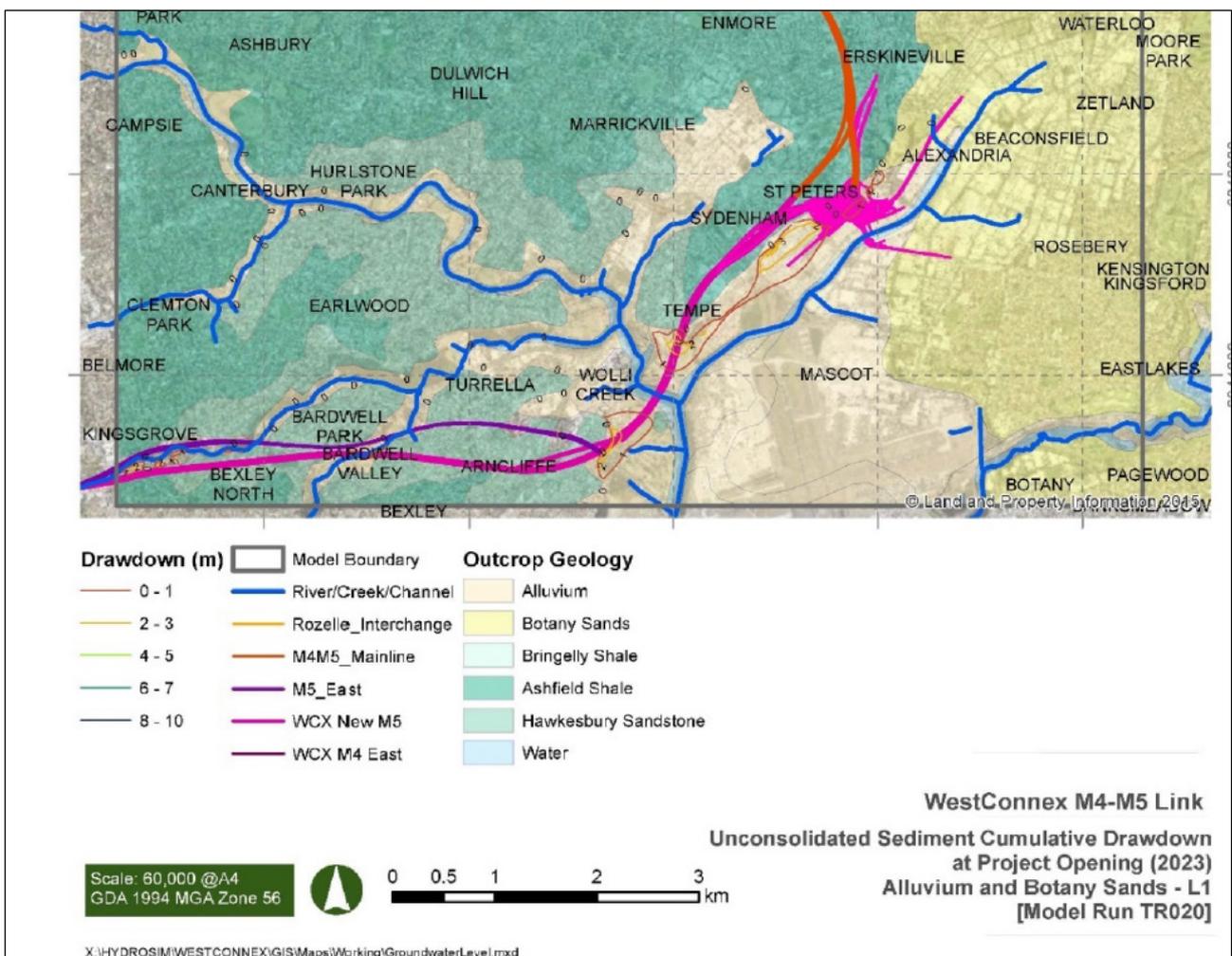


Figure 7-1 Cumulative impact from the M4-M5 Link and New M5 relating to the Sydney Gateway road project (from HydroSimulations 2017)





These drawdown impacts would result in an overall deflated groundwater system in the areas to the north-west of Alexandra Canal. The outcomes of this would be less inflow to excavations for the Sydney Gateway road project and a reduced radius of groundwater drawdown influence to that currently assessment for the Sydney Gateway road project. This means that the current groundwater drawdown assessment may be conservative as it could be using observed groundwater elevations that do not include these impacts.

The cumulative drawdown impacts associated with M4-M5 Link and New M5 projects would increase the potential for exposure of potential acid sulfate soils and generation of low pH and higher metals in groundwater.

The impacts of the Sydney Gateway road project would be reduced by the emerging M4-M5 Link and New M5 projects during construction such that there would be no net increase in cumulative impacts associated with the Sydney Gateway road project outside those currently simulated by this assessment. This conclusion also applies to the generation of unconsolidated soil settlement impacts simulated for this assessment.

During operation, drawdown impacts resulting in the generation of acid sulfate soils impacted groundwater and unconsolidated soil settlement would be entirely associated with the M4-M5 Link and New M5 projects as there would be no ongoing dewatering for the Sydney Gateway road project.

The approval for the New M5 requires that an acid sulfate soil management plan and settlement assessment is completed to manage these potential impacts. These documents should be reviewed to make sure that they are suitably designed to ensure impacts associated with the New M5 and M4-M5 Link can be clearly delineated from those associated with the Sydney Gateway road project.

### 7.3.1 WestConnex Enabling works – Airport East project

The WestConnex Enabling works – Airport East Precinct (WCXAEF) was approved in October 2015, and early work activities started in December 2015. The construction is to go through to late-2019. The Sydney Gateway road project is not due to commence until mid-2020. As such construction impacts are not expected to overlap. No operational use of groundwater is expected for operation of either project. As such operational drawdown impacts are expected to be negligible.

If in the unlikely event that the dewatering program continued for the installation of services and construction of the WCXAEF, the modelling results suggests the radius of drawdown influence for the two projects would not overlap during construction. After construction, any temporary drawdown impacts for the projects are also expected to subside as groundwater elevations recover.

No long-term cumulative impacts from operation are expected. As there would be no more than minimal change to groundwater recharge, there would be no ongoing take of groundwater for operation and the design would limit hydraulic connection with the surrounding groundwater system.

### 7.3.2 WestConnex Enabling works – Airport North project

Roads and Maritime is widening O’Riordan Street to three lanes in each direction between Bourke Road and Robey Street to improve traffic flow around the Sydney Airport and Port Botany. Certain activities associated with these works would require excavation dewatering. Construction work is proposed to commence in 2019 and is expected to be completed by 2020. It is unlikely that construction of the Airport North Precinct would overlap with the project. However, if construction overruns there is a potential for overlap and this could result in an increased groundwater drawdown and therefore a greater radius of influence as well as reduced yields if groundwater dewatering is occurring.

Given the proximity of the projects to each other, any installation works would result in overlapping drawdown impacts and increase groundwater inputs. The effect would be to extend any radius of drawdown influence, with subsequent increased potential for:

- Settlement of soft sediments
- Exposure of acid sulfate soils
- Reduce yields at industrial groundwater supply wells abstracting water from the Botany Sands.





Surface water receptors are not expected to be affected due to the distance from this area of the project to surface water features.

As construction works and depths of excavations have not been finalised, the expected cumulative radius of drawdown influence has not been established in detail. As such, further assessment of drawdown associated with both projects together would be required during detailed construction planning. Any temporary cumulative construction impacts would subside rapidly after construction.

Inflows to excavations associated with both projects can be expected to be reduced if both projects are occurring concurrently.

No long-term cumulative impacts from operation are expected as no ongoing groundwater supply is required for operation of the projects.

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## 7.4 Summary

All identified potential groundwater impacts are expected to be temporary and only occur during the construction phase with no additional long-term contribution to cumulative impacts associated with the Sydney Gateway road project.

The Botany Rail Duplication project would use construction techniques that involve groundwater dewatering, however there would be no ongoing dewatering during operation as such no cumulative impacts are predicted.

The M4-M5 Link and New M5 project could result in groundwater drawdown impacts in areas to the north-west of Alexandria Canal resulting in greater potential for exposure to acid sulfate soil, increased potential for long-term settlement of unconsolidated sediments. Due to the emergence of these impacts, the predicted impacts associated with the Sydney Gateway road project would be reduced with no increase in cumulative impacts during construction outside those currently predicted. The consolidated approval for the New M5 project requires that an acid sulfate soil management plan and settlement assessment is completed to manage these potential impacts. These documents should be reviewed by the construction contractor when developed to make sure that they are suitably designed to ensure impacts associated with the New M5 and M4-M5 Link can be clearly delineated from those associated with the Sydney Gateway road project.

Maintaining leachate levels at the former Tempe landfill at their current level would prevent any additional potential for migration of leachate to the New M5 tunnels. As infiltration would increase during construction of the Sydney Gateway road project, the operation of the leachate management system should be reviewed to ensure it continues to function as intended.

The timing and extent of impacts for the WestConnex Enabling Works Airport East Precinct would not result in any cumulative impacts for these projects.

The WestConnex Enabling Works Airport North Precinct may have cumulative impacts through increased groundwater drawdown and therefore a greater radius of influence. Overall inflows to the Sydney Gateway road project to excavations in this area would, at the very least, reduce. This would need to be assessed further at detailed design when the scheduling for each project is known.





## 8. Recommended mitigation measures

### 8.1 Construction

#### 8.1.1 Mitigating potential impacts from drawdown

A range of options are available to manage the impact relating to groundwater extraction. Generally, options can be categorised into the following:

- Techniques that do not limit groundwater ingress, where ongoing baseline data and/or more detailed design understanding indicate that drawdown related impacts are no longer adverse. In this instance, dewatered groundwater would still require management before discharge. This should be supported by monitoring to assess for impacts outside of those predicted
- Prevent groundwater ingress by revising the design to raise the base of excavations above the groundwater table.

Limit the extent of groundwater drawdown by reducing inflow into the excavations, such as by using trenchless techniques, ground treatment and/or installing infrastructure within “wet” excavations, minimise opening times of excavations and recharging (via infiltration or injection) of groundwater back to the groundwater system. These methods would require reduced groundwater management requirements but may have other technical, cost and safety implications. Mitigation measures to manage specific impacts identified are discussed further below.

##### 8.1.1.1 Former Tempe landfill

During construction within the former Tempe landfill boundary, localised removal of the capping layer would increase the potential for rainfall infiltration into this area, potentially resulting in increased leachate levels, overtopping of the bentonite wall and migration into Alexandra Canal if not managed appropriately. Technical Working Paper 16 – Landfill Assessment has undertaken modelling to assess the potential changes in leachate generated to inform the impact assessment. Details of the management measures proposed are provided in Technical Working Paper 16 – Landfill Assessment.

##### 8.1.1.2 Water supply well GW024036

A survey should be undertaken to establish the status of irrigation well GW024036 to understand if the well is still being used by Sydney Airport. If the well is still in use, any of the following make good provisions may be applicable:

- Well replacement
- Design changes to prevent well destruction and drawdown impacts
- If the well will not be destroyed and is in use then implement temporary make good provisions during construction to supplement the lost yields.

##### 8.1.1.3 Settlement of unconsolidated sediments

It is recommended that an appropriate geotechnical specialist undertakes further settlement modelling, in accordance with applicable guidelines, with appropriate input from the contractor (actual dewatering requirements) and based on detailed geotechnical information obtained from the site investigations. The assessment should predict likely settlement, identify potentially affected structures and site features, identify appropriate mitigation measures to reduce potential impacts to acceptable levels, and specific pre-condition assessment and appropriate monitoring requirements.





## 8.1.2 Mitigating potential impacts to water quality

### 8.1.2.1 Acid Sulfate Soils

Acid sulfate soils should be managed in accordance with the Acid Sulfate Soils Manual (Ahern et al. 1998), which should include the development of an acid sulfate soil management plan for the construction phase of the project. At all locations with potential drawdown impacts, the management plan should provide methods for each excavation to manage the generation of acid sulfate soils. The management plan should include a more detailed feasibility investigation to assess management methods. This feasibility study could include investigation of the following options:

- Reduced excavation opening times to limit potential for oxidation. The currently proposed method for stormwater and utilities installation would result in limited exposure and reduced potential for generation of acid sulfate soils but a monitoring program should be required in high risk areas to validate this
- Implementation of drawdown controls that reduce infiltration volumes and therefore drawdown impacts. These could include measures such as sheet piling and would generally be more applicable to larger infrastructure such as the retention basin and the underpass. In this instance sheet piling into bedrock could be required to limit drawdown in the overlying potential acid sulfate soil generating sediments
- Reducing excavation depth to above a conservative lower-end baseline groundwater elevation. Further assessment of the temporal baseline groundwater monitoring data would be required to establish low end natural groundwater elevations. The current modelling assumes high end worst case groundwater elevations, which is inherently conservative for the assessment of acid sulfate soils
- Implementation of a groundwater and inflow monitoring program linked to a groundwater management approach if low pH groundwater and potential threats to subsurface structures and materials were to emerge
- Implementation of a groundwater recharge system to minimise groundwater drawdown in appropriate circumstances. This type of system may result in significantly larger volumes of water management due to recycling of water back into the dewatered groundwater. It also requires a suitable area and hydrogeological conditions to re-inject or infiltrate the water. These areas may not be readily available for the project although infiltration techniques could be adapted to manage this such as horizontally bored infiltration galleries or using open excavations ahead or behind currently dewatered areas as infiltration points.

### 8.1.2.2 General construction activities

Construction management methods and procedures to reduce the potential for impacts to groundwater quality due to construction of the project should include:

- Emergency spill response protocols for managing clean-up of spills substances with the potential to contaminate groundwater
- Adequate and appropriate storage and handling of chemicals to reduce the potential for spills or infiltration into groundwater
- Controls to prevent groundwater of unsuitable quality from entering the surface water drainage systems
- Developing and implementing site-specific dewatering procedures to reduce the potential for discharge of groundwater with unsuitable quality (Section 8.1.3)
- Ensure that suitable storage is available to safely store collected groundwater temporarily as required.

Chemicals should be handled and stored in accordance with environmental management practices (including isolated and bunded storage areas) to minimise chemical release to the environment. Spillage control or containment systems should be based on the hydrologic conditions prevailing at the time of the spill. Containment systems should be designed to limit the potential for infiltration to the underlying groundwater systems.





### 8.1.2.3 Contaminated sites

Notwithstanding the potential for construction workers to be exposed to impacted groundwater flowing into excavations (dealt with in section 8.1.3), dewatering activities are not predicted to adversely impact the migration of impact from contaminated sites relative to the AIP minimal impact criteria. Therefore, no additional mitigation measures are proposed.

### 8.1.3 Excavation water management

A Dewatering Management Plan (DMP) should be prepared. The plan should be prepared with consideration of Roads and Maritime Technical Guideline – Environmental Management of Construction Site Dewatering (RMS, 2011).

The DMP should include:

- The proposed dewatering methods
- Measures to minimise groundwater inflows to excavations and dewatering requirements
- Protocols for identifying likely groundwater quality based on available data
- Proposed methods for managing extracted water, including on-site re-use, infiltration, reinjection, discharge to stormwater, disposal to sewer and collection for offsite disposal, including water accounting procedures
- Feasibility assessments of the proposed management options for extracted groundwater
- Adopted water quality and flow rate discharge criteria to prevent impacts to the receiving system
- Treatment requirements and system design for the proposed management options (where required)
- Procedures to limit exposure of construction workers to potentially contaminated groundwater (e.g. personnel protective equipment requirements for construction workers)
- Monitoring requirements to assess whether the management options and treatment systems (if required) are effective.

In detailing preferred approaches for managing excavation water the DMP should consider:

- Detailed construction processes, such as reduced excavation opening times, to limit potential for oxidation of ASS
- Excavation linings and other methods to reduce infiltration rates and volumes and therefore drawdown impacts and discharge/disposal requirements. These could include measures such as sheet piling and would generally be more applicable to larger infrastructure such as the retention basin and the underpass
- Changing the design to raise the excavation depth to above the low-end baseline groundwater elevations (where practicable)
- Implementation of a groundwater recharge system to minimise groundwater drawdown impacts and discharge/disposal requirements. This type of system may result in larger volumes of water management due to recycling of water back into the dewatered groundwater. It also requires a suitable area and hydrogeological conditions to re-inject or infiltrate the water. These areas may not be readily available for the project and would need to be assessed further as part of construction planning, although infiltration techniques could be adapted to manage this such as horizontally bored infiltration galleries or using open excavations ahead or behind actively dewatered areas as infiltration points. Injection/infiltration ahead of the excavation would allow recollection of construction water. The Northern Lands area may provide a centralised recharge point for excavations in this area. Water being injected would need to be of the same or better quality than the baseline groundwater conditions in the injection areas. Baseline monitoring should support this decision making. Additional assessment would be required to ensure that adopted re-infiltration/re-injection areas can accommodate the expected volumes of groundwater requiring recharge
- Discharge to surface water subject to the site specific surface water discharge criteria and discharge volume limitations outlined in Technical Working Paper 8 – Surface Water Quality. Baseline and construction based monitoring of surface water and groundwater coupled with treatment stream monitoring during construction (if needed) would support this process





- Disposal offsite to a suitably licensed waste facility. This approach would generally only be adopted where water volumes are small and in instances where there are issues with the suitability of other methods
- Groundwater quality has been compared against the Sydney Water Industrial Trade Waste Acceptance Standard (2019), displayed in Table B5 and Table B6 of Appendix B. Exceedances are summarised in Table 5-4. Primary water quality issues include TDS and pH, associated with excavations near Alexandria Canal
- A combination of the above to effectively manage the limitations of each method. In this regard with the options available and the current understanding of water quality and water volumes requiring management there is not expected to be technological limitations to the management of construction water
- Due to the interpreted large groundwater dewatering volumes, it is expected to be unfeasible to store groundwater for water quality characterisation prior to discharge. To avoid storage there will need to be a high degree of certainty in the water management system. This certainty would be developed by:
  - Detailed baseline groundwater quality monitoring of excavation areas intersecting groundwater
  - Detailed baseline groundwater quality monitoring of potentially receiving groundwater and surface water environments supplemented by suitable criteria that are protective of the environmental values of the receiving environment
  - Detailed understanding of the potential chemical changes that could occur between excavations and the receiving environment (potentially due to exposure to air). This would be informed by trial runs and or bench trial testing
  - The aforementioned monitoring and testing will inform treatment system requirement. Any treatment system will be required to have capacity to manage the expected water quality reduction targets and should be subject to trial tests to show treatment effectiveness
  - To ensure consistency in treatment over time an ongoing treatment system monitoring and maintenance program would be implemented.

The DMP should be developed in consultation with Dol Water, the NSW EPA and Sydney Water.

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## 8.2 Operation

### 8.2.1 Former Tempe landfill

There would be no ongoing impact associated with the Sydney Gateway road project on the former Tempe landfill leachate generation. This is primarily because:

- The reinstated landfill capping is expected to reduce rainfall infiltration and leachate generation
- A revised landfill and treatment collection system should be developed to maintain leachate levels within the design criteria (below the bentonite cut-off wall) of the current system.

It is noted that there would be an increased potential for leachate migration to the New M5. This potential impact is, however, entirely associated with the New M5.

No mitigation measures are required for the operational phase of the Sydney Gateway road project in this regard.





## 8.2.2 Mitigating groundwater drawdown impacts

Once operation of the project commences any ongoing drawdown activities and thus drawdown impacts are expected to be absent.

Further to this, there is no expected long-term reduction in the groundwater elevations in this area due to recharge reduction as the amount of impervious area is expected to be similar to existing conditions and any small changes are expected to be negligible relative to the entire aquifer recharge area.

No mitigation measures are required for the operational phase of the Sydney Gateway road project in this regard.

## 8.2.3 Mitigating potential impacts to water quality

The design of the project will facilitate efficient vehicular movements and have emergency response procedures that will manage the potential occurrence of accidents and spills of hazardous substances.

Operational management of the road would also include the following measures that will manage potential groundwater impacts:

- Emergency spill response protocols for managing characterisation and clean-up of spills, with subsequent post clean-up monitoring if needed to assess the effectiveness of clean-up activities
- Appropriate storage and handling procedures for chemicals.

Overall, it is expected that the project would result in reduced contamination infiltration to groundwater and improved groundwater quality conditions, than under existing conditions, albeit by a small amount.

No mitigation measures are required for the operational phase of the Sydney Gateway road project in this regard.

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## 8.3 Proposed monitoring

A groundwater monitoring program should be implemented to further characterise baseline groundwater conditions and construction and operational impacts. A summary of the recommended monitoring program is provided below.

### 8.3.1 Baseline monitoring

A baseline monitoring program has already commenced as part of the Sydney Gateway road project field investigation program. The monitoring is currently being undertaken to inform climatic variations on which construction and operational impacts can be reviewed and assessed. The location of the wells being used for baseline monitoring is included in Appendix A. This baseline program includes the installation of monitoring wells along the entire alignment at locations inside and outside the predicted radius of groundwater drawdown around excavations.

The baseline monitoring program includes:

- 73 groundwater monitoring wells, including:
  - 23 existing monitoring wells within and around the former Tempe landfill area (prefixed with MPI and MPE that were installed to monitor groundwater elevations inside and outside the bentonite walls. MPI wells generally monitor leachate levels and quality)
  - At least seven of wells screened solely within the underlying bedrock, with a reasonable distribution within the project site. The remaining wells are primarily screening in fill or unconsolidated sediments
  - At least 60 wells located outside the construction footprint, to facilitate long term consistent monitoring.
- High frequency automated data loggers have been installed in all wells (other than the 23 Tempe Landfill wells) to characterise climatic and tidal variability on groundwater elevations
- All wells are being manually monitored for groundwater elevations on a monthly basis





- All wells are being sampled for groundwater quality on a monthly basis. The samples are being analysed for contamination suites to characterise impact from landfill, historical fire-fighting foam use and general industrial activities as follows:
  - The analytical suite for all wells includes: TRH, BTEX, VOCs, PAH, OCP, OPP, PCB, VHCs, Dioxins, Total Phenolics, heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc)
  - Wells in or around landfills are also being sampled for: nutrients (ammonia, total nitrogen, nitrate/nitrite, total phosphorus), major cations (calcium, magnesium, sodium, potassium), major anions (chloride, sulfate, fluoride), ionic balance, alkalinity (bicarbonate and carbonate), hardness, total dissolved solids, total organic carbon, biochemical oxygen demand, dissolved heavy metals (aluminium, barium, cobalt, manganese)
  - Most wells are also being screened for PFAS (exclusions include GW2d, GW11d, 33\_GW15, 69\_DT1, GW18s).
- Hydraulic conductivity testing at all wells other than those existing wells at the former Tempe landfill (prefixed with MPI and MPE) for the purposes of informing this assessment.

Surface water quality monitoring is being completed along Alexandria Canal, Cooks River and Mill Stream. This will provide a baseline understanding of surface water quality and associated environmental values to which any groundwater should be treated to before discharge. Technical Working Paper 8 - Surface Water Quality provides further details of the surface water monitoring program for the Sydney Gateway road project.

### 8.3.2 Construction monitoring

The baseline surface water and groundwater monitoring program should be continued through construction for the purpose of:

- Characterising and responding to predicted impacts
- Identifying and responding to any impacts outside of those predicted.

#### 8.3.2.1 Groundwater drawdown impacts

Ongoing monitoring of groundwater elevations using the baseline monitoring program should be undertaken to identify changes in groundwater elevations across the project site where dewatering is required. The existing monitoring well locations could be used for this purpose.

#### **Water supply well GW024036**

If water supply well GW024036 is identified to still be in use and will not be destroyed, it should be incorporated into the groundwater elevation baseline monitoring program that should be continued during construction. A response any greater than two metres should be linked to make good provisions for this well.

#### **Settlement of unconsolidated sediments**

Monitoring of potential settlement would be recommended by an appropriate geotechnical specialist based on the outcomes of a more detailed assessment of potential impacts from groundwater drawdown-induced settlement.





### 8.3.2.2 Water quality monitoring

The baseline surface water and groundwater monitoring program should be continued through construction for the purpose of:

- Characterising and responding to predicted impacts
- Identifying and responding to any impacts outside of those predicted.

Assessment of water quality impacts and establishment of discharge criteria should focus on background (baseline) groundwater and surface water quality (in accordance with Technical Working Paper 8 – Surface Water Quality) conditions where baseline data is available. Other criteria such as ANZG (2018) values, NEMP (2018) values, NHMRC (2008) and AEPR (1997) should be adopted where baseline data is unavailable. Exceedance of these criteria should instigate further investigations and/or the remedial response measures.

### 8.3.2.3 Acid Sulfate Soils

At all locations with predicted acid sulfate impacts (section 5.4.1.1) the following monitoring works are recommended:

- Ongoing monitoring using the current baseline program to ensure consistency in predicted outcomes
- Ongoing monitoring of pH on a three hourly basis in all excavations with response procedures linked to criteria developed in accordance with the ASSMAC guidance (i.e. <0.2 unit change in pH) and included within the acid sulfate soil management plan.

### 8.3.2.4 General construction activities

The existing baseline monitoring program should be used as a basis for verifying the environmental performance of construction activities and identifying and responding to any acute or diffuse impact associated with construction activities.

### 8.3.2.5 Dewatering monitoring

Groundwater inflows to excavations would require monitoring to validate treatment and disposal/discharge/recharge options. Monitoring should also occur after any treatment to validate suitability for discharge. A sampling and testing strategy should be presented in the Dewatering Management Plan to validate that water being discharged has concentrations equal to or below the adopted discharge criteria.

The monitoring frequency for excavation inflow and treated outflow water should be established at a detailed design stage when treatment systems are better understood, but should be of a suitable frequency to provide confidence that construction worker health is not being impacted and that any discharge water is consistently meeting adopted criteria.

## 8.3.3 Post construction and operational monitoring

The baseline surface water and groundwater monitoring program would be continued through to operation for the purpose of:

- Monitoring the rescission of drawdown impacts associated with construction works
- Identifying and responding to any water quality impacts outside of those predicted for construction
- Verifying the environmental performance of the construction works.

Monitoring for the purposes of characterising and responding to operational groundwater quality impacts is not recommended as impacts would be less or not more than current conditions with the operational environmental management systems and procedures being implemented to manage any leaks and spills associated with operational incidents as they occur.

### 8.3.3.1 Former Tempe landfill

Ongoing operational monitoring at former Tempe landfill would be undertaken by Inner West Council as part of the licensing requirements for the landfill.





### 8.3.3.2 Groundwater drawdown

Ongoing monitoring of groundwater elevations using the baseline monitoring program should be undertaken for a short period (expected to be days to weeks) after completion of construction to confirm recovery of the groundwater system to within the baseline range in groundwater elevations. Water quality monitoring recommended in section 8.3.3.3 would cover this.

Monitoring would also be undertaken at the water supply well GW024036 if it has not been destroyed to observe post construction recovery.

Geotechnical monitoring for settlement should be established as part of additional settlement assessment works.

It is expected that groundwater recovery would be in the order of days so one monitoring round one month after construction is expected to suffice, with additional rounds completed if recovery to within baseline conditions has not been achieved.

### 8.3.3.3 Water quality monitoring

Ongoing monitoring of groundwater quality would be undertaken after completion of construction to confirm no residual impacts remain from construction and to verify that the design is meeting the required environmental standards.

It is expected that operational monitoring would continue for a maximum of one year as any diffuse impacts in groundwater would be expected to have travelled up to 250 metres (see section 4.10) and therefore would be detected in the current baseline monitoring program. Quarterly monitoring is considered to be acceptable to identify and respond to any emerging water quality impacts.

Emergency response monitoring associated with accidents, fire and other acute releases would be managed as part of operational procedures and would be undertaken as part of a separate approvals process.

Assessment of groundwater quality impacts would focus on background (baseline) groundwater conditions where baseline data is available. Changes in groundwater quality compared to baseline groundwater quality should instigate further investigations and/or the remedial response measures.





## 9. Conclusion

The groundwater assessment has been completed to identify and manage groundwater impacts associated with the construction and operation of the project.

Construction impacts relate primarily to the potential acidification of groundwater due to exposure and oxidation of acid sulfate soils, potential settlement impacts and environmental discharge of groundwater as extracted during construction.

An acid sulfate soil management plan should be developed in accordance with guidance from Ahern et al. (1998) to manage this impact.

Settlement predictions should be reviewed during detailed design and following confirmation of the preferred construction approach, taking into account likely dewatering requirements and detailed geotechnical information. Measures to mitigate any potential impacts on structures and other features, and appropriate monitoring would be developed based on the outcomes of the review.

A dewatering management plan should be developed to manage, treat and dispose/discharge/recharge groundwater extracted from excavations. The dewatering management plan should be designed to manage the volumes and water quality identified by this assessment and supplemented by any additional baseline data. Flexibility would be required for construction to manage groundwater on a site by site basis. It is expected that any number of the following methods would be employed to mitigate impacts to the surrounding environment:

- Reduction of excavation depth to above the low-end baseline groundwater elevations
- Reduced excavation opening times to limit potential for drawdown and thus oxidation/settlement
- Implementation of drawdown controls that reduce excavation inflow volumes. These would include measures such as sheet piling and pre-grouting
- Implementation of a groundwater recharge (with or without treatment) to minimise groundwater drawdown
- Treatment of groundwater in-accordance with surface water discharge criteria with subsequent discharge to surface water.

A registered irrigation well at Sydney Airport would potentially be destroyed by construction works. Make good provision may apply, subject to the well being in use.

There would be an increased potential for impacts to groundwater quality during construction, which would require management. A monitoring approach with subsequent response measures to manage any impacts outside of baseline conditions should be developed and implemented.

Impacts associated with groundwater are not anticipated during operation of the Sydney Gateway road project.







## 10. References

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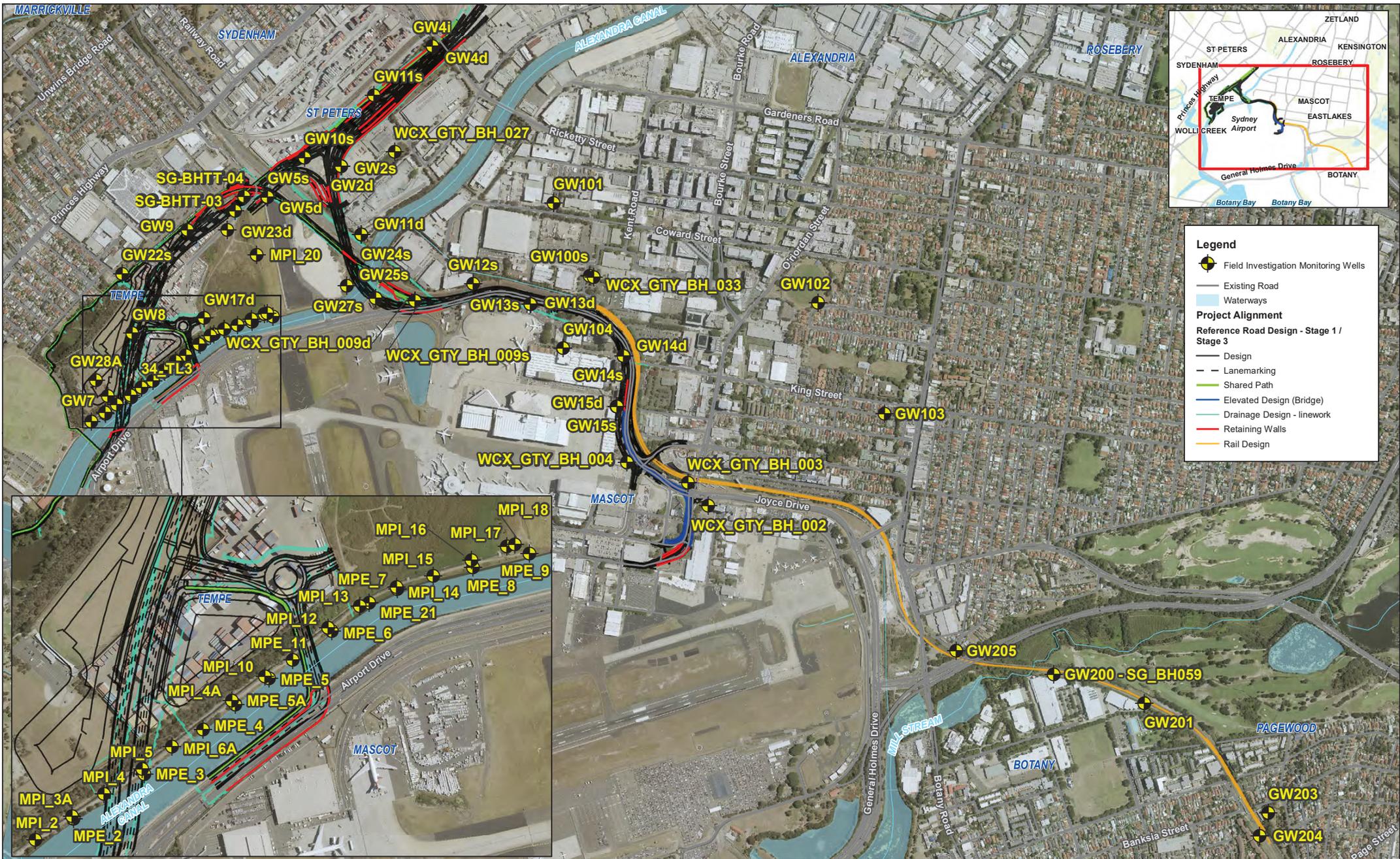
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**Appendix A**  
Field investigation summary



**Legend**

- Field Investigation Monitoring Wells
- Existing Road
- Waterways

**Project Alignment**

Reference Road Design - Stage 1 / Stage 3

- Design
- Lanemarking
- Shared Path
- Elevated Design (Bridge)
- Drainage Design - linework
- Retaining Walls
- Rail Design

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REV A1	DATE 21/06/2019	AMENDMENT / REVISION DESCRIPTION Field Investigation Monitoring Wells	WVR No. APPROVAL	SCALES ON A1 SIZE DRAWING 1:12,000	DRAWN D NAIKEN	DATE 21/06/2019	DRG CHECK P QUIMORA	PREPARED FOR	RMS REGISTRATION No. EDMS No. SHEET No. PART A1

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Field investigation monitoring wells - Appendix A

Well ID	Easting (m)	Northing (m)	Well depth (m bgl)	Screen depth (m)	Screen lithology	Number of manual GWL measurements	Number of groundwater quality samples	Data loggers	Hydraulic conductivity measurement	Notes
34_TL3	330442.855	6244245.025				6	7	Yes	Yes	Unable to locate log
GW100s	331988.66	6244625.921	6.1	2.2-6.10	Sand	3	3		Yes	
GW101	331863.565	6244877.462	6.2	1.9-6.20	Clayey Sand, Sand	4	5	Yes	Yes	
GW102	332774.612	6244535.026	7.5	3.0-7.5	Sand, Silty Sand	4	5	Yes	Yes	
GW103	333004.731	6244155.164	6	1.2-6.0	Silty Sand	3	4	Yes	Yes	
GW104	331896.331	6244379.956	6	3.0-6.0	Sand	3	3		Yes	
GW10s	331005.003	6245031.659	6.1	1.7-6.1	Clayey Sand, Clay	4	5	Yes		
GW11d	331246.136	6245245.668	16.45	13.0-16.0	Clay		2			
GW11s	331243.546	6245245.313	8.7	6.7-8.7	Clayey Sand, Sandy Clay	5	5	Yes		
GW12s	331586.485	6244600.794	6.3	2.3-6.2	Clay, Sandy Clay, Clayey Sand	1	1		Yes	
GW13d	331785.8	6244529.962	17	13.8-16.8	Clay	3	3			
GW13s	331783.042	6244530.676	6	3.0-5.9	Sand, Clay	3	3			
GW14d	332106.313	6244352.926	25	22.0-25.0	Clay	3	4			
GW14s	332104.687	6244353.19	6	3.0-6.0	Sand, Clay, Clayey Sand, Sandy Clay	4	5		Yes	
GW15d	332079.895	6244179.37	16.5	13.5-16.5	Clay	3	2			
GW15s	332081.836	6244179.483	6.1	3.1-6.1	Silty Sand	3	3			
GW17d	330670.587	6244467.871	17.5	8.5-11.5	Mixed Waste, Decomposed Waste		2			
GW-200-SG_BH059	333557.319	6243276.522					1			Unable to locate log
GW201	333899.745	6243165.058	7.01	2.5-7.0	Sand	1	1		Yes	
GW203	334326.814	6242790.837	6.3	4.0-6.3	Sand	4	4	Yes	Yes	
GW204	334297.052	6242711.503	5.4	2.3-5.3	Sand	1	2		Yes	
GW205	333251.533	6243343.959					1		Yes	No available well construction details
GW22s	330363.606	6244640.34	11.95	6.0-11.9	Shale	1	1			
GW23d	330736.587	6244785.35	19.5	6.5-11.2	Landfill		3			
GW24s	331207.088	6244765.704	6	2.50-5.0	Sand		2		Yes	
GW25s	331150.429	6244594.237	6.5	3.5-6.5	Silty Sand, Sand	4	5	Yes	Yes	
GW27s	331249.649	6244549.959	8	3.5-6.5	Clay	3	4			
GW28A	330286.472	6244270.286	18	10.0-16.0	Mixed Landfill		1			
GW2d	331131.62	6245002.055	13.5	10.50-13.50	Sand, Sandy Clay, Clay	2	2		Yes	
GW2s	331131.606	6245001.326	6.1	2.0-6.0	Sandy Clay	4	5	Yes	Yes	
GW4d	331446.873	6245409.483	14.5	11.50-14.50	Clay, Shale	4	3	Yes		
GW4i	331445.178	6245412.553	6	3.5-6.0	Sandy Clay	4	3			
GW5d	330875.451	6244896.416	17	12.50-15.50	Clay, Shale	3	3	Yes		
GW5s	330877.59	6244896.881	6	1.0-3.0	Mixture of Cobbles and Soil, Gravelly Sandy Clay	4	5	Yes		
GW7	330323.008	6244216.569	18	2.5-15.0	Mixture of Cobbles and Soil, Sandy Gravel, Sand, Mixed Landfill, Sandy Clay, Gravel		1			
GW8	330410.802	6244430.165	23.3	9.8-15.8	Gravelly Sand, Clay	2	2	Yes		
GW9	330616.673	6244767.601	19.7	5.2-10.7	Mixed Landfill, Landfill, Gravel		1			
MPE_11	330595.846	6244353.639	17	3.0-17.0	Clay, Silty Clay, Gravelly Sand Shale,	6	6			
MPE_2	330318.473	6244154.976	15	3.0-15.0	Sandy Clay, Silty Clay	6	7			
MPE_21	330692.453	6244425.839				6	6			Unable to locate log

Field investigation monitoring wells - Appendix A

Well ID	Easting (m)	Northing (m)	Well depth (m bgl)	Screen depth (m)	Screen lithology	Number of manual GWL measurements	Number of groundwater quality samples	Data loggers	Hydraulic conductivity measurement	Notes
MPE_3	330407.92	6244210.562	9	3.0-9.0	Sandy Clay, Clay, Extremely Weathered Sandstone	6	6			
MPE_4	330481.917	6244266.558	3.45	0.5-3.05	Sandy Clay, Sand, Gravel Fill	5	5			
MPE_5	330565.475	6244330.97	5.4	3.0-5.4	Sandy Clay	6	6			Unable to locate log
MPE_5A	330522.937	6244298.28				6	6			
MPE_6	330645.007	6244390.68	9.5	3.0-9.5	Clay	6	7			
MPE_7	330728.315	6244442.952	13.6	3.0-13.6	Clay, Sandy Clay	6	6			
MPE_8	330823.499	6244469.892	17	3.0-17.0	Siltstone, Clay, Silty Clay, Sandy Clay	6	7			
MPE_9	330895.032	6244487.587	20.1	3.0-20.1	Clayey Sand, Clay	6	6			
MPI_10	330560.229	6244333.311				6	6			Unable to locate log
MPI_12	330640.372	6244393.923				7	7			Unable to locate log
MPI_13	330680.506	6244421.306				7	8			Unable to locate log
MPI_14	330726.857	6244445.396				6	7			Unable to locate log
MPI_15	330773.416	6244459.116				6	8			Unable to locate log
MPI_16	330821.789	6244479.311				6	6			Unable to locate log
MPI_17	330866.291	6244496.435				6	7			Unable to locate log
MPI_18	330876.696	6244499.123				6	8			Unable to locate log
MPI_2	330269.778	6244127.869	13.9	3.0-13.9	Clay, Sandy Clay, Sand	6	7			
MPI_20	330839.723	6244698.424				6	6			Unable to locate log
MPI_3A	330316.521	6244157.585				6	6			Unable to locate log
MPI_4	330356.984	6244185.536				6	6			Unable to locate log
MPI_4A	330518.687	6244302.728				6	6			Unable to locate log
MPI_5	330405.127	6244217.016				1	1			Unable to locate log
MPI_6A	330480.653	6244274.546				5	5			Unable to locate log
SG-BHTT-03	330760.4	3244846	26				1			No available well construction details
SG-BHTT-04	330796.948	6244894.731	24.71				1			No available well construction details
WCX_GTY_BH_002	332395.541	6243838.783	4	1.0-4.0	Sand		4			
WCX_GTY_BH_003	332326	6243919	25				1			
WCX_GTY_BH_004	332115.791	6243985.373	4	1.0-4.0	Sand		4			
WCX_GTY_BH_009d	331385.101	6244539.721	25.2	20.2-25.2	Siltstone and laminite		4			
WCX_GTY_BH_009s	331382.953	6244539.017	25.2	3.0-3.5	Sand, silty sand	2	4			
WCX_GTY_BH_027	331315.477	6245051.056	21	1.0-4.0	Sand	3	4			
WCX_GTY_BH_033	331988.686	6244625.93	28	25.0-28.0	Laminite		5			



## **Appendix B** Groundwater quality summary tables















Table B1\_Groundwater Analytical Data - Human Health

		Polynuclear Aromatic Hydrocarbons																	
		ug/L																	
		Acenaphthylene	Acenaphthene	Anthracene	Fluorene	Phenanthrene	Fluoranthene	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(e)pyrene	Benzo(a)pyrene	Benzo(b)pyrene	Benzo(a)anthracene	Chrysene	Pyrene	Dibenz(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Sum of PAHs
Location Code	Field ID	Sample Type	Sampled Date	Sample Code	Lab Report	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
EOL																			
6059345 NHMRC ADWG (amended 2018) Aesthetics (10 Factor - Recreation)																			
6059345 NHMRC ADWG (amended 2018) Human Health (10 Factor - Recreation)																			
6059345 US EPA RSL - June 2017 - Tapwater (10 Factor - Recreation)		5300	18000	2900					8000	63	25			0.1	250	1200		0.25	2.5
6059345 WHD (2008) Petroleum Products in DW (10 Factor - Recreation)																			
6059345 WHD (2011) Drinking Water Guidelines (10 Factor - Recreation)																			
Statistical Summary																			
Number of Results		161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161
Number of Detects		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Minimum Detect		ND	ND	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration		<1	18	<1	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Maximum Detect		ND	18	ND	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration		0.5	0.73	0.5	0.51	0.53	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.49	2.5	0.5	0.5	0.5	0.5
Median Concentration		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Standard Deviation		0	1.8	0	0.12	0.18	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances (Detects Only)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

















Table B1\_Groundwater Analytical Data - Human Health

Location Code	Field ID	Sample Type	Sample Date	Sample Code	Lab Report	Organochlorine Pesticides (OC)																	
						Atrazine		Dieldrin		DDE		DDE-BHC											
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
6059345 NHMRC ADWG (amended 2018) Aesthetics (10 Factor - Recreation)						0.2	0.2	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2			
6059345 US EPA REL - June 2017 - Swallow (10 Factor - Recreation)						0.009	0.018	3	0.72	0.25	0.42			0.32	0.46	2.3							
6059345 WHO (2008) Petroleum Products in DW (10 Factor - Recreation)																							
6059345 WHO (2011) Drinking Water Guidelines (10 Factor - Recreation)																							
34 TL3	34 TL3	Normal	18/02/2019	211519-11	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
34 TL3	34 TL3	Normal	26/02/2019	212355-7	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
34 TL3	34 TL3	Normal	03/03/2019	212355-2	212355	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
34 TL3	34 TL3	Normal	12/03/2019	213382-3	213382	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
34 TL3	34 TL3	Normal	16/04/2019	215934-2	215934	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
34 TL3	OC2054	Interlab D	16/04/2019	ES1912221001	ES1912221	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW100a	GW100a	Normal	21/02/2019	212109-3	212109	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW100a	GW100a	Normal	03/03/2019	213103-3	213103	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW101	GW101	Normal	30/03/2019	213103-1	213103	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW101	GW101	Normal	01/04/2019	215789-5	215789	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW101	GW101	Normal	11/02/2019	211335-4	211335	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW102	GW102	Normal	03/03/2019	213103-1	213103	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW102	GW102	Normal	03/03/2019	213103-5	213103	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW102	GW102	Normal	17/04/2019	215939-3	215939	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW102	OC2051	Interlab D	03/03/2019	ES1907278001	ES1907278	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW103	GW103	Normal	21/02/2019	212109-4	212109	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW103	GW103	Normal	03/03/2019	213103-4	213103	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW103	GW103	Normal	17/04/2019	215939-6	215939	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW103	GW103	Normal	17/04/2019	215939-4	215939	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW104	GW104	Normal	20/12/2018	208653-5	208653	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW104	GW104	Normal	07/02/2019	211141-1	211141	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW104	GW104	Normal	10/04/2019	215939-4	215939	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW104	GW104	Normal	10/01/2019	209274-1	209274	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW104	GW104	Normal	14/02/2019	211612-1	211612	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW104	GW104	Normal	03/03/2019	213103-3	213103	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW104	GW104	Normal	30/04/2019	215423-3	215423	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW104	OC2051	Interlab D	03/03/2019	ES1911607001	ES1911607	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW114	GW114	Normal	01/03/2019	212548-1	212548	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW114	GW114	Normal	16/04/2019	215934-3	215934	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW114	GW114	Normal	24/02/2019	213352-2	213352	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW114	GW114	Normal	11/02/2019	211335-2	211335	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW114	GW114	Normal	13/03/2019	213502-6	213502	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW114	GW114	Normal	16/04/2019	215934-7	215934	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW114	OC142	Field D	11/02/2019	211335-3	211335	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW126	GW126	Normal	24/01/2019	210277-3	210277	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW126	GW126	Normal	18/01/2019	208653-3	208653	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW134	GW134	Normal	03/02/2019	211141-9	211141	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW134	GW134	Normal	11/04/2019	215939-4	215939	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW134	GW134	Normal	20/12/2018	208653-1	208653	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW134	GW134	Normal	03/03/2019	211141-8	211141	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW134	GW134	Normal	15/04/2019	215934-5	215934	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW144	GW144	Normal	20/12/2018	208653-4	208653	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW144	GW144	Normal	07/02/2019	211141-5	211141	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW144	GW144	Normal	16/04/2019	215934-9	215934	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW144	OC102	Field D	20/12/2018	208653-7	208653	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW144	GW144	Normal	10/01/2019	209274-2	209274	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW144	GW144	Normal	11/11/2018	211141-3	211141	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW144	GW144	Normal	10/04/2019	215939-5	215939	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW144	OC140	Field D	07/02/2019	211141-4	211141	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW144	GW144	Normal	10/04/2019	215939-6	215939	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW144	GW144	Normal	03/02/2019	211141-1	211141	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW154	GW154	Normal	07/02/2019	211141-1	211141	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW154	GW154	Normal	10/04/2019	215939-4	215939	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2			
GW154	GW154	Normal	20/12/2018	2086																			











Table B1\_Groundwater Analytical Data - Human Health

Location Code	Field ID	Sample Type	Sample Date	Sample Code	Lab Report	Organic Matter		Physio-Chemical Parameters		Resistivity (Saturated Paste)	
						Carbonate	Total Organic Carbon	Total Dissolved Solids	pH (Lab)	Total Suspended Solids	Resistivity at 25°C
						mg/L	mg/L	mg/L	pH Units	mg/L	ohm cm
6559345 NHMRC ADWG (amended 2018) Aesthetics (10 Factor - Recreation)								8000	8.5-8.5		
6559345 US EPA RSL - June 2017 - Tapered (10 Factor - Recreation)											
6559345 WHO (2008) Petroleum Products in DW (10 Factor - Recreation)											
6559345 WHO (2011) Drinking Water Guidelines (10 Factor - Recreation)											
34_TL3	34_TL3	Normal	13/02/2019	211519-11	211519	<5	-	10,000	-	22	-
34_TL3	34_TL3	Normal	19/02/2019	211841-5	211841	<5	-	1500	-	34	-
34_TL3	34_TL3	Normal	26/02/2019	212356-7	212356	<5	-	8500	-	28	-
34_TL3	34_TL3	Normal	03/03/2019	212085-2	212085	<5	140	2500	7.5	60	-
34_TL3	34_TL3	Normal	12/03/2019	213352-13	213352	<5	-	8000	-	10	-
34_TL3	34_TL3	Normal	18/04/2019	215934-2	215934	<5	150	2500	7.4	-	-
34_TL3	QC2054	Interlab D	18/04/2019	ES1919221001	ES1919221	<5	121	121	8.6	-	71
GW100a	GW100a	Normal	21/02/2019	212109-3	212109	<5	8	190	6.9	-	-
GW100a	GW100a	Normal	03/03/2019	213103-3	213103	<5	7	300	6.9	-	-
GW100a	GW100a	Normal	11/04/2019	215954-8	215954	<5	12	230	6.8	-	-
GW101	GW101	Normal	08/01/2019	209135-1	209135	<5	14	480	-	-	-
GW101	GW101	Normal	11/02/2019	211335-4	211335	<5	13	550	-	-	-
GW101	GW101	Normal	03/03/2019	213103-1	213103	<5	18	330	8.3	-	-
GW101	GW101	Normal	15/04/2019	215789-5	215789	<5	14	1100	6.9	-	-
GW101	QC2039	Interlab D	11/02/2019	ES1904415001	ES1904416	<5	12	120	-	-	-
GW102	GW102	Normal	09/01/2019	209135-2	209135	<5	16	120	-	-	-
GW102	GW102	Normal	11/02/2019	211335-6	211335	<5	13	190	-	-	-
GW102	GW102	Normal	03/03/2019	213103-5	213103	<5	14	150	8.3	-	-
GW102	GW102	Normal	17/04/2019	215939-8	215939	<5	17	160	6.6	-	-
GW102	QC2051	Interlab D	03/03/2019	ES1907278001	ES1907278	11	15	6.04	-	-	8450
GW103	GW103	Normal	21/02/2019	212109-4	212109	<5	12	150	-	-	-
GW103	GW103	Normal	03/03/2019	213103-4	213103	<5	12	150	7.1	-	-
GW103	GW103	Normal	17/04/2019	215939-6	215939	<5	10	170	6.4	-	-
GW103	Field D	Field D	03/03/2019	215934-7	215934	<5	9	290	6.6	-	-
GW104	GW104	Normal	20/12/2018	208653-2	208653	-	-	-	-	-	-
GW104	GW104	Normal	17/02/2019	211141-7	211141	<5	18	990	-	-	-
GW104	GW104	Normal	11/04/2019	215496-4	215496	<5	19	490	6.1	-	-
GW10a	GW10a	Normal	10/01/2019	209274-1	209274	-	-	-	-	-	-
GW10b	GW10b	Normal	14/02/2019	211612-1	211612	-	-	-	-	-	-
GW10b	GW10b	Normal	03/03/2019	213103-7	213103	-	-	-	7.2	-	-
GW10b	GW10b	Normal	09/04/2019	215423-2	215423	-	-	-	7.5	-	-
GW10b	QC2053	Interlab D	09/04/2019	ES1916160001	ES1916160	-	-	-	7.44	-	1100
GW11d	QC2051	Interlab D	10/03/2019	212548-1	212548	-	-	-	6.1	-	-
GW11d	GW11d	Normal	18/04/2019	215934-8	215934	-	-	-	7.1	-	-
GW11a	GW11a	Normal	04/01/2019	210231-11	210231	<5	7	420	-	-	-
GW11a	GW11a	Normal	11/02/2019	211335-2	211335	-	-	-	-	-	-
GW11a	GW11a	Normal	13/03/2019	213502-6	213502	-	-	-	7.5	-	-
GW11a	GW11a	Normal	11/02/2019	211335-3	211335	-	-	-	7.6	-	-
GW11a	QC1042	Field D	11/02/2019	211335-3	211335	-	-	-	-	-	-
GW12a	GW12a	Normal	24/01/2019	210277-3	210277	-	-	-	-	-	-
GW13a	GW13a	Normal	11/04/2019	215954-9	215954	-	-	-	6.8	-	-
GW13a	GW13a	Normal	02/02/2019	211141-9	211141	-	-	-	-	-	-
GW13a	GW13a	Normal	11/04/2019	215954-5	215954	-	-	-	-	-	-
GW13a	GW13a	Normal	02/02/2019	211141-8	211141	-	-	-	-	-	-
GW13a	GW13a	Normal	11/04/2019	215954-4	215954	-	-	-	6.5	-	-
GW14d	GW14d	Normal	20/12/2018	208653-6	208653	-	-	-	-	-	-
GW14d	GW14d	Normal	17/02/2019	211141-5	211141	-	-	-	-	-	-
GW14d	GW14d	Normal	10/04/2019	215496-6	215496	-	-	-	-	-	-
GW14d	QC1032	Field D	20/12/2018	208653-7	208653	-	-	-	-	-	-
GW14a	QC145	Normal	10/01/2019	209274-2	209274	-	-	-	-	-	-
GW14a	GW14a	Normal	17/02/2019	211141-13	211141	-	-	-	-	-	-
GW14a	GW14a	Normal	10/04/2019	215496-5	215496	-	-	-	6.2	-	-
GW14a	QC1040	Field D	17/02/2019	211141-4	211141	-	-	-	-	-	-
GW14a	QC1033	Field D	03/04/2019	215496-1	215496	-	-	-	6.2	-	-
GW15d	GW15d	Normal	17/02/2019	211141-2	211141	-	-	-	-	-	-
GW15d	GW15d	Normal	10/04/2019	215496-8	215496	-	-	-	5.8	-	-
GW15a	GW15a	Normal	20/12/2018	208653-3	208653	-	-	-	-	-	-
GW15a	GW15a	Normal	17/02/2019	211141-1	211141	-	-	-	-	-	-
GW15a	GW15a	Normal	03/03/2019	213103-9	213103	-	-	-	5.8	-	-
GW17a	GW17a	Normal	28/03/2019	214591-1	214591	<5	31	1400	7.4	-	-
GW17a	GW17a	Normal	15/04/2019	215789-4	215789	<5	20	950	7.2	-	-
GW20a - SC BH058	GW20a	Normal	11/03/2019	213261-11	213261	-	-	-	-	-	-
GW201	GW201	Normal	24/01/2019	210277-4	210277	-	-	-	-	-	-
GW203	GW203	Normal	09/01/2019	209210-2	209210	<5	3	170	-	-	-
GW203	GW203	Normal	13/03/2019	211510-1	211510	-	-	-	-	-	-
GW203	GW203	Normal	11/03/2019	213240-4	213240	-	-	-	6.1	-	-
GW203	GW203	Normal	17/04/2019	215939-7	215939	-	-	-	6.2	-	-
GW204	GW204	Normal	24/01/2019	210277-5	210277	-	-	-	-	-	-
GW204	QC1037	Field D	24/01/2019	210277-2	210277	-	-	-	-	-	-
GW22a	GW22a	Normal	11/04/2019	215954-3	215954	-	-	-	-	-	-
GW22a	GW22a	Normal	09/04/2019	215423-8	215423	<5	14	760	6.8	-	-
GW23a	GW23a	Normal	17/01/2019	209762-2	209762	<5	680	2500	-	-	-
GW23a	GW23a	Normal	20/02/2019	211435-3	211435	<5	280	2300	-	-	-
GW23a	GW23a	Normal	09/04/2019	215423-1	215423	<5	210	1900	7.5	-	-
GW24a	GW24a	Normal	13/03/2019	213502-5	213502	<5	20	1900	6.6	-	-
GW24a	GW24a	Normal	13/04/2019	215657-1	215657	<5	21	850	-	-	-
GW25a	GW25a	Normal	09/01/2019	209210-1	209210	<5	29	20,000	-	-	-
GW25a	GW25a	Normal	14/02/2019	211612-2	211612	<5	40	18,000	-	-	-
GW25a	GW25a	Normal	03/03/2019	213103-8	213103	<5	39	15,000	7.6	24	-
GW25a	GW25a	Normal	17/04/2019	215939-9	215939	<5	28	15,000	7.6	-	-
GW25a	QC2028	Interlab D	09/01/2019	ES1900712001	ES1900712	<5	24	-	-	-	-
GW27a	GW27a	Normal	17/01/2019	209762-3	209762	<5	34	26,000	-	-	-
GW27a	GW27a	Normal	22/02/2019	212103-1	212103	<5	47	17,000	-	-	-
GW27a	GW27a	Normal	18/04/2019	215934-5	215934	<5	53	17,000	7.3	-	-
GW27a	QC2044	Interlab D	22/02/2019	ES1905700001	ES1905700	<5	49	-	-	-	-
GW28a	GW28a	Normal	18/04/2019	215934-1	215934	<5	160	7800	6.8	-	-
GW2a	GW2a	Normal	11/03/2019	213240-3	213240	-	-	-	-	-	-
GW2a	GW2a	Normal	09/04/2019	215423-7	215423	-	-	-	7.6	-	-
GW2a	GW2a	Normal	17/01/2019	209762-1	209762	-	-	-	-	-	-
GW2a	GW2a	Normal	11/02/2019	211335-1	211335	-	-	-	-	-	-
GW2a	GW2a	Normal	03/03/2019	213103-6	213103	-	-	-	7.1	-	-
GW2a	GW2a	Normal	09/04/2019	215423-3	215423	-	-	-	7.4	-	-
GW2a	QC1033	Field D	17/01/2019	209762-7	209762	-	-	-	-	-	-
GW4a	GW4a	Normal	21/02/2019	212109-1	212109	<5	22	1200	-	-	-
GW4a	GW4a	Normal	13/03/2019	213502-4	213502	<5	21	1100	7.3	-	-
GW4a	GW4a	Normal	15/04/2019	215789-2	215789	<5	17	1500	7.2	-	-
GW4a	GW4a	Normal	21/02/2019	212109-2	212109	<5	80	1800	-	-	-
GW4a	GW4a	Normal	13/03/2019								

Table B1\_Groundwater Analytical Data - Human Health

Location Code	Field ID	Sample Type	Sample Date	Sample Code	Lab Report	Organic Matter		Physico-Chemical Parameters			Resistivity (Saturated Paste)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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<table border="1"> <thead> <tr> <th>Location Code</th> <th>Field ID</th> <th>Sample Type</th> <th>Sample Date</th> <th>Sample Code</th> <th>Lab Report</th> <th>&lt;5</th> <th>22</th> <th>17,000</th> <th>-</th> <th>-</th> <th>-</th> <th>-</th> </tr> </thead> <tbody> <tr><td>MPE 7</td><td>MPE 7</td><td>Normal</td><td>12/02/2019</td><td>211437-8</td><td>211437</td><td>&lt;5</td><td>22</td><td>17,000</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPE 7</td><td>MPE 7</td><td>Normal</td><td>18/02/2019</td><td>211785-9</td><td>211785</td><td>&lt;5</td><td>19,000</td><td>82</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPE 7</td><td>MPE 7</td><td>Normal</td><td>25/02/2019</td><td>212251-10</td><td>212251</td><td>&lt;5</td><td>19,000</td><td>100</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPE 7</td><td>MPE 7</td><td>Normal</td><td>4/03/2019</td><td>212783-10</td><td>212783</td><td>&lt;5</td><td>28,000</td><td>120</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPE 8</td><td>MPE 8</td><td>Normal</td><td>11/03/2019</td><td>213297-10</td><td>213297</td><td>&lt;5</td><td>22,000</td><td>41</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPE 8</td><td>MPE 8</td><td>Normal</td><td>12/12/2018</td><td>208060-1</td><td>208060</td><td>&lt;5</td><td>17</td><td>28,000</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPE 8</td><td>MPE 8</td><td>Normal</td><td>12/02/2019</td><td>211437-6</td><td>211437</td><td>&lt;5</td><td>27,000</td><td>110</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPE 8</td><td>MPE 8</td><td>Normal</td><td>18/02/2019</td><td>211785-5</td><td>211785</td><td>&lt;5</td><td>27,000</td><td>82</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPE 8</td><td>MPE 8</td><td>Normal</td><td>25/02/2019</td><td>212251-5</td><td>212251</td><td>&lt;5</td><td>25,000</td><td>49</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPE 8</td><td>MPE 8</td><td>Normal</td><td>4/03/2019</td><td>212783-6</td><td>212783</td><td>&lt;5</td><td>15,000</td><td>41</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPE 8</td><td>MPE 8</td><td>Normal</td><td>11/03/2019</td><td>213297-5</td><td>213297</td><td>&lt;5</td><td>21,000</td><td>53</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPE 8</td><td>QC1048</td><td>Field D</td><td>25/02/2019</td><td>212251-6</td><td>212251</td><td>&lt;5</td><td>25,000</td><td>40</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPE 9</td><td>MPE 9</td><td>Normal</td><td>12/12/2018</td><td>208060-5</td><td>208060</td><td>&lt;5</td><td>29</td><td>8400</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPE 9</td><td>MPE 9</td><td>Normal</td><td>13/02/2019</td><td>211437-4</td><td>211437</td><td>&lt;5</td><td>21,000</td><td>280</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPE 9</td><td>MPE 9</td><td>Normal</td><td>18/02/2019</td><td>211785-4</td><td>211785</td><td>&lt;5</td><td>14,000</td><td>130</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPE 9</td><td>MPE 9</td><td>Normal</td><td>25/02/2019</td><td>212251-4</td><td>212251</td><td>&lt;5</td><td>18,000</td><td>89</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPE 9</td><td>MPE 9</td><td>Normal</td><td>4/03/2019</td><td>212783-5</td><td>212783</td><td>&lt;5</td><td>19,000</td><td>82</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPE 9</td><td>MPE 9</td><td>Normal</td><td>11/03/2019</td><td>213297-4</td><td>213297</td><td>&lt;5</td><td>21,000</td><td>89</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 10</td><td>MPI 10</td><td>Normal</td><td>11/12/2018</td><td>208061-6</td><td>208061</td><td>&lt;5</td><td>35</td><td>2000</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 10</td><td>MPI 10</td><td>Normal</td><td>13/02/2019</td><td>211518-4</td><td>211518</td><td>&lt;5</td><td>1400</td><td>32</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 10</td><td>MPI 10</td><td>Normal</td><td>18/02/2019</td><td>211841-11</td><td>211841</td><td>&lt;5</td><td>1300</td><td>60</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 10</td><td>MPI 10</td><td>Normal</td><td>28/02/2019</td><td>212520-11</td><td>212520</td><td>&lt;5</td><td>1200</td><td>27</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 10</td><td>MPI 10</td><td>Normal</td><td>5/03/2019</td><td>212782-5</td><td>212782</td><td>&lt;5</td><td>1300</td><td>28</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 10</td><td>MPI 10</td><td>Normal</td><td>11/03/2019</td><td>213297-19</td><td>213297</td><td>&lt;5</td><td>1300</td><td>52</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 12</td><td>MPI 12</td><td>Normal</td><td>12/12/2018</td><td>208061-8</td><td>208061</td><td>&lt;5</td><td>19</td><td>800</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 12</td><td>MPI 12</td><td>Normal</td><td>13/02/2019</td><td>211518-1</td><td>211518</td><td>&lt;5</td><td>870</td><td>23</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 12</td><td>MPI 12</td><td>Normal</td><td>18/02/2019</td><td>211785-13</td><td>211785</td><td>&lt;5</td><td>750</td><td>27</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 12</td><td>MPI 12</td><td>Normal</td><td>25/02/2019</td><td>212250-3</td><td>212250</td><td>&lt;5</td><td>920</td><td>11</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 12</td><td>MPI 12</td><td>Normal</td><td>5/03/2019</td><td>212782-2</td><td>212782</td><td>&lt;5</td><td>800</td><td>11</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 12</td><td>MPI 12</td><td>Normal</td><td>11/12/2018</td><td>213297-10</td><td>213297</td><td>&lt;5</td><td>910</td><td>7</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 12</td><td>QC1023</td><td>Field D</td><td>11/12/2018</td><td>208061-10</td><td>208061</td><td>&lt;5</td><td>21</td><td>8000</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 13</td><td>MPI 13</td><td>Normal</td><td>11/12/2018</td><td>208061-12</td><td>208061</td><td>&lt;5</td><td>35</td><td>1000</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 13</td><td>MPI 13</td><td>Normal</td><td>12/02/2019</td><td>211437-11</td><td>211437</td><td>&lt;5</td><td>1400</td><td>46</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 13</td><td>MPI 13</td><td>Normal</td><td>18/02/2019</td><td>211785-12</td><td>211785</td><td>&lt;5</td><td>1100</td><td>45</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 13</td><td>MPI 13</td><td>Normal</td><td>28/02/2019</td><td>212520-11</td><td>212520</td><td>&lt;5</td><td>1300</td><td>51</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 13</td><td>MPI 13</td><td>Normal</td><td>4/03/2019</td><td>212783-11</td><td>212783</td><td>&lt;5</td><td>1300</td><td>37</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 13</td><td>MPI 13</td><td>Normal</td><td>11/03/2019</td><td>213297-12</td><td>213297</td><td>&lt;5</td><td>1200</td><td>22</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 13</td><td>QC2043</td><td>Interlab D</td><td>18/02/2019</td><td>ES1905389001</td><td>ES1905389</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>105</td></tr> <tr><td>MPI 13</td><td>QC2043</td><td>Interlab D</td><td>18/02/2019</td><td>ES1905389001</td><td>ES1905389</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>42</td></tr> <tr><td>MPI 14</td><td>MPI 14</td><td>Normal</td><td>12/12/2018</td><td>208060-3</td><td>208060</td><td>&lt;5</td><td>45</td><td>1800</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 14</td><td>MPI 14</td><td>Normal</td><td>12/02/2019</td><td>211437-9</td><td>211437</td><td>&lt;5</td><td>1900</td><td>34</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 14</td><td>MPI 14</td><td>Normal</td><td>18/02/2019</td><td>211785-10</td><td>211785</td><td>&lt;5</td><td>1900</td><td>22</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 14</td><td>MPI 14</td><td>Normal</td><td>25/02/2019</td><td>212251-9</td><td>212251</td><td>&lt;5</td><td>1700</td><td>12</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 14</td><td>MPI 14</td><td>Normal</td><td>4/03/2019</td><td>212783-9</td><td>212783</td><td>&lt;5</td><td>1900</td><td>45</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 14</td><td>QC2041</td><td>Interlab D</td><td>12/02/2019</td><td>ES1904828001</td><td>ES1904828</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>193</td></tr> <tr><td>MPI 15</td><td>MPI 15</td><td>Normal</td><td>18/02/2019</td><td>211785-11</td><td>211785</td><td>&lt;5</td><td>1200</td><td>10</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 15</td><td>MPI 15</td><td>Normal</td><td>12/12/2018</td><td>208060-13</td><td>208060</td><td>&lt;5</td><td>34</td><td>1400</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 15</td><td>MPI 15</td><td>Normal</td><td>12/02/2019</td><td>211437-7</td><td>211437</td><td>&lt;5</td><td>1400</td><td>22</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 15</td><td>MPI 15</td><td>Normal</td><td>18/02/2019</td><td>211785-8</td><td>211785</td><td>&lt;5</td><td>1300</td><td>14</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 15</td><td>MPI 15</td><td>Normal</td><td>4/03/2019</td><td>212783-8</td><td>212783</td><td>&lt;5</td><td>1200</td><td>25</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 15</td><td>MPI 15</td><td>Normal</td><td>11/03/2019</td><td>213297-7</td><td>213297</td><td>&lt;5</td><td>1400</td><td>20</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 15</td><td>QC1046</td><td>Field D</td><td>11/03/2019</td><td>211785-8</td><td>211785</td><td>&lt;5</td><td>1200</td><td>8</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 15</td><td>QC2044B</td><td>Interlab D</td><td>25/02/2019</td><td>ES1906040001</td><td>ES1906040</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>33</td></tr> <tr><td>MPI 16</td><td>MPI 16</td><td>Normal</td><td>12/12/2018</td><td>208060-4</td><td>208060</td><td>&lt;5</td><td>130</td><td>29,000</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 16</td><td>MPI 16</td><td>Normal</td><td>12/02/2019</td><td>211437-5</td><td>211437</td><td>&lt;5</td><td>11,000</td><td>120</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 16</td><td>MPI 16</td><td>Normal</td><td>18/02/2019</td><td>211785-6</td><td>211785</td><td>&lt;5</td><td>35,000</td><td>240</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 16</td><td>MPI 16</td><td>Normal</td><td>25/02/2019</td><td>212251-7</td><td>212251</td><td>&lt;5</td><td>29,000</td><td>140</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 16</td><td>MPI 16</td><td>Normal</td><td>4/03/2019</td><td>212783-7</td><td>212783</td><td>&lt;5</td><td>12,500</td><td>150</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 16</td><td>MPI 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20</td><td>Normal</td><td>18/02/2019</td><td>211785-5</td><td>211785</td><td>&lt;5</td><td>2000</td><td>190</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 20</td><td>MPI 20</td><td>Normal</td><td>25/02/2019</td><td>212251-1</td><td>212251</td><td>&lt;5</td><td>2100</td><td>28</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 20</td><td>MPI 20</td><td>Normal</td><td>4/03/2019</td><td>212783-1</td><td>212783</td><td>&lt;5</td><td>2000</td><td>23</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 20</td><td>MPI 20</td><td>Normal</td><td>12/02/2019</td><td>211437-1</td><td>211437</td><td>&lt;5</td><td>2300</td><td>68</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 3A</td><td>MPI 3A</td><td>Normal</td><td>11/12/2018</td><td>208061-11</td><td>208061</td><td>&lt;5</td><td>44</td><td>18,000</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 3A</td><td>MPI 3A</td><td>Normal</td><td>13/02/2019</td><td>211518-15</td><td>211518</td><td>&lt;5</td><td>17,000</td><td>88</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 3A</td><td>MPI 3A</td><td>Normal</td><td>18/02/2019</td><td>211785-14</td><td>211785</td><td>&lt;5</td><td>20,000</td><td>96</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 3A</td><td>MPI 3A</td><td>Normal</td><td>28/02/2019</td><td>212355-9</td><td>212355</td><td>&lt;5</td><td>3800</td><td>33</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 3A</td><td>MPI 3A</td><td>Normal</td><td>6/03/2019</td><td>212985-4</td><td>212985</td><td>&lt;5</td><td>5400</td><td>99</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 3A</td><td>MPI 3A</td><td>Normal</td><td>12/03/2019</td><td>213382-10</td><td>213382</td><td>&lt;5</td><td>5900</td><td>22</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>MPI 4</td><td>MPI 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7	Normal	12/02/2019	211437-8	211437	<5	22	17,000	-	-	-	-	MPE 7	MPE 7	Normal	18/02/2019	211785-9	211785	<5	19,000	82	-	-	-	-	MPE 7	MPE 7	Normal	25/02/2019	212251-10	212251	<5	19,000	100	-	-	-	-	MPE 7	MPE 7	Normal	4/03/2019	212783-10	212783	<5	28,000	120	-	-	-	-	MPE 8	MPE 8	Normal	11/03/2019	213297-10	213297	<5	22,000	41	-	-	-	-	MPE 8	MPE 8	Normal	12/12/2018	208060-1	208060	<5	17	28,000	-	-	-	-	MPE 8	MPE 8	Normal	12/02/2019	211437-6	211437	<5	27,000	110	-	-	-	-	MPE 8	MPE 8	Normal	18/02/2019	211785-5	211785	<5	27,000	82	-	-	-	-	MPE 8	MPE 8	Normal	25/02/2019	212251-5	212251	<5	25,000	49	-	-	-	-	MPE 8	MPE 8	Normal	4/03/2019	212783-6	212783	<5	15,000	41	-	-	-	-	MPE 8	MPE 8	Normal	11/03/2019	213297-5	213297	<5	21,000	53	-	-	-	-	MPE 8	QC1048	Field D	25/02/2019	212251-6	212251	<5	25,000	40	-	-	-	-	MPE 9	MPE 9	Normal	12/12/2018	208060-5	208060	<5	29	8400	-	-	-	-	MPE 9	MPE 9	Normal	13/02/2019	211437-4	211437	<5	21,000	280	-	-	-	-	MPE 9	MPE 9	Normal	18/02/2019	211785-4	211785	<5	14,000	130	-	-	-	-	MPE 9	MPE 9	Normal	25/02/2019	212251-4	212251	<5	18,000	89	-	-	-	-	MPE 9	MPE 9	Normal	4/03/2019	212783-5	212783	<5	19,000	82	-	-	-	-	MPE 9	MPE 9	Normal	11/03/2019	213297-4	213297	<5	21,000	89	-	-	-	-	MPI 10	MPI 10	Normal	11/12/2018	208061-6	208061	<5	35	2000	-	-	-	-	MPI 10	MPI 10	Normal	13/02/2019	211518-4	211518	<5	1400	32	-	-	-	-	MPI 10	MPI 10	Normal	18/02/2019	211841-11	211841	<5	1300	60	-	-	-	-	MPI 10	MPI 10	Normal	28/02/2019	212520-11	212520	<5	1200	27	-	-	-	-	MPI 10	MPI 10	Normal	5/03/2019	212782-5	212782	<5	1300	28	-	-	-	-	MPI 10	MPI 10	Normal	11/03/2019	213297-19	213297	<5	1300	52	-	-	-	-	MPI 12	MPI 12	Normal	12/12/2018	208061-8	208061	<5	19	800	-	-	-	-	MPI 12	MPI 12	Normal	13/02/2019	211518-1	211518	<5	870	23	-	-	-	-	MPI 12	MPI 12	Normal	18/02/2019	211785-13	211785	<5	750	27	-	-	-	-	MPI 12	MPI 12	Normal	25/02/2019	212250-3	212250	<5	920	11	-	-	-	-	MPI 12	MPI 12	Normal	5/03/2019	212782-2	212782	<5	800	11	-	-	-	-	MPI 12	MPI 12	Normal	11/12/2018	213297-10	213297	<5	910	7	-	-	-	-	MPI 12	QC1023	Field D	11/12/2018	208061-10	208061	<5	21	8000	-	-	-	-	MPI 13	MPI 13	Normal	11/12/2018	208061-12	208061	<5	35	1000	-	-	-	-	MPI 13	MPI 13	Normal	12/02/2019	211437-11	211437	<5	1400	46	-	-	-	-	MPI 13	MPI 13	Normal	18/02/2019	211785-12	211785	<5	1100	45	-	-	-	-	MPI 13	MPI 13	Normal	28/02/2019	212520-11	212520	<5	1300	51	-	-	-	-	MPI 13	MPI 13	Normal	4/03/2019	212783-11	212783	<5	1300	37	-	-	-	-	MPI 13	MPI 13	Normal	11/03/2019	213297-12	213297	<5	1200	22	-	-	-	-	MPI 13	QC2043	Interlab D	18/02/2019	ES1905389001	ES1905389	-	-	-	-	-	-	105	MPI 13	QC2043	Interlab D	18/02/2019	ES1905389001	ES1905389	-	-	-	-	-	-	42	MPI 14	MPI 14	Normal	12/12/2018	208060-3	208060	<5	45	1800	-	-	-	-	MPI 14	MPI 14	Normal	12/02/2019	211437-9	211437	<5	1900	34	-	-	-	-	MPI 14	MPI 14	Normal	18/02/2019	211785-10	211785	<5	1900	22	-	-	-	-	MPI 14	MPI 14	Normal	25/02/2019	212251-9	212251	<5	1700	12	-	-	-	-	MPI 14	MPI 14	Normal	4/03/2019	212783-9	212783	<5	1900	45	-	-	-	-	MPI 14	QC2041	Interlab D	12/02/2019	ES1904828001	ES1904828	-	-	-	-	-	-	193	MPI 15	MPI 15	Normal	18/02/2019	211785-11	211785	<5	1200	10	-	-	-	-	MPI 15	MPI 15	Normal	12/12/2018	208060-13	208060	<5	34	1400	-	-	-	-	MPI 15	MPI 15	Normal	12/02/2019	211437-7	211437	<5	1400	22	-	-	-	-	MPI 15	MPI 15	Normal	18/02/2019	211785-8	211785	<5	1300	14	-	-	-	-	MPI 15	MPI 15	Normal	4/03/2019	212783-8	212783	<5	1200	25	-	-	-	-	MPI 15	MPI 15	Normal	11/03/2019	213297-7	213297	<5	1400	20	-	-	-	-	MPI 15	QC1046	Field D	11/03/2019	211785-8	211785	<5	1200	8	-	-	-	-	MPI 15	QC2044B	Interlab D	25/02/2019	ES1906040001	ES1906040	-	-	-	-	-	-	33	MPI 16	MPI 16	Normal	12/12/2018	208060-4	208060	<5	130	29,000	-	-	-	-	MPI 16	MPI 16	Normal	12/02/2019	211437-5	211437	<5	11,000	120	-	-	-	-	MPI 16	MPI 16	Normal	18/02/2019	211785-6	211785	<5	35,000	240	-	-	-	-	MPI 16	MPI 16	Normal	25/02/2019	212251-7	212251	<5	29,000	140	-	-	-	-	MPI 16	MPI 16	Normal	4/03/2019	212783-7	212783	<5	12,500	150	-	-	-	-	MPI 16	MPI 16	Normal	11/03/2019	213297-6	213297	<5	12,000	35	-	-	-	-	MPI 17	MPI 17	Normal	12/02/2019	211437-1	211437	<5	2600	81	-	-	-	-	MPI 17	MPI 17	Normal	18/02/2019	211785-3	211785	<5	2300	220	-	-	-	-	MPI 17	MPI 17	Normal	25/02/2019	212251-2	212251	<5	2600	8	-	-	-	-	MPI 17	MPI 17	Normal	4/03/2019	212783-1	212783	<5	2600	37	-	-	-	-	MPI 17	MPI 17	Normal	11/03/2019	213297-2	213297	<5	3100	14	-	-	-	-	MPI 17	QC1044	Field D	12/02/2019	211437-12	211437	<5	2600	83	-	-	-	-	MPI 17	QC1044	Field D	12/02/2019	212783-4	212783	<5	2600	18	-	-	-	-	MPI 18	MPI 18	Normal	13/12/2018	208048-2	208048	<5	40	2600	-	-	-	-	MPI 18	MPI 18	Normal	12/02/2019	211437-3	211437	<5	2800	190	-	-	-	-	MPI 18	MPI 18	Normal	18/02/2019	211785-15	211785	<5	4300	220	-	-	-	-	MPI 18	MPI 18	Normal	18/02/2019	211785-2	211785	<5	2600	22	-	-	-	-	MPI 18	MPI 18	Normal	25/02/2019	212251-3	212251	<5	2700	28	-	-	-	-	MPI 18	MPI 18	Normal	4/03/2019	212783-3	212783	<5	2800	5	-	-	-	-	MPI 18	MPI 18	Normal	11/03/2019	213297-3	213297	<5	2900	8	-	-	-	-	MPI 18	QC2046	Interlab D	4/03/2019	ES19069614001	ES19069614	-	-	-	-	-	-	18	MPI 2	MPI 2	Normal	13/12/2018	208048-1	208048	<5	180	5700	-	-	-	-	MPI 2	MPI 2	Normal	13/02/2019	211518-14	211518	<5	4200	200	-	-	-	-	MPI 2	MPI 2	Normal	18/02/2019	211785-13	211785	<5	5200	110	-	-	-	-	MPI 2	MPI 2	Normal	28/02/2019	212355-12	212355	<5	5700	45	-	-	-	-	MPI 2	MPI 2	Normal	6/03/2019	212985-5	212985	<5	4700	100	-	-	-	-	MPI 2	MPI 2	Normal	12/03/2019	213382-12	213382	<5	7400	80	-	-	-	-	MPI 2	QC1048	Field D	6/03/2019	212985-7	212985	<5	5500	90	-	-	-	-	MPI 20	MPI 20	Normal	11/03/2019	213297-1	213297	<5	2100	34	-	-	-	-	MPI 20	MPI 20	Normal	12/12/2018	208060-10	208060	<5	44	2100	-	-	-	-	MPI 20	MPI 20	Normal	18/02/2019	211785-5	211785	<5	2000	190	-	-	-	-	MPI 20	MPI 20	Normal	25/02/2019	212251-1	212251	<5	2100	28	-	-	-	-	MPI 20	MPI 20	Normal	4/03/2019	212783-1	212783	<5	2000	23	-	-	-	-	MPI 20	MPI 20	Normal	12/02/2019	211437-1	211437	<5	2300	68	-	-	-	-	MPI 3A	MPI 3A	Normal	11/12/2018	208061-11	208061	<5	44	18,000	-	-	-	-	MPI 3A	MPI 3A	Normal	13/02/2019	211518-15	211518	<5	17,000	88	-	-	-	-	MPI 3A	MPI 3A	Normal	18/02/2019	211785-14	211785	<5	20,000	96	-	-	-	-	MPI 3A	MPI 3A	Normal	28/02/2019	212355-9	212355	<5	3800	33	-	-	-	-	MPI 3A	MPI 3A	Normal	6/03/2019	212985-4	212985	<5	5400	99	-	-	-	-	MPI 3A	MPI 3A	Normal	12/03/2019	213382-10	213382	<5	5900	22	-	-	-	-	MPI 4	MPI 4	Normal	12/12/2018	208060-8	208060	<5	46	21,000	-	-	-	-	MPI 4	MPI 4	Normal	13/02/2019	211518-12	211518	<5	27,000	440	-	-	-	-	MPI 4	MPI 4	Normal	18/02/2019	211785-11	211785	<5	3000	240	-	-	-	-	MPI 4	MPI 4	Normal	25/02/2019	212251-11	212251	<5	3300	110	-	-	-	-	MPI 4	MPI 4	Normal	4/03/2019	212783-11	212783	<5	22,000	260	-	-	-	-	MPI 4A	MPI 4A	Normal	12/02/2019	211437-2	211437	<5	75	2700	-	-	-	-	MPI 4A	MPI 4A	Normal	11/12/2018	208061-4	208061	<5	2700	240	-	-	-	-	MPI 4A	MPI 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MPI 4	MPI 4	Normal	18/02/2019	211785-11	211785	<5	3000	240	-	-	-	-																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
MPI 4	MPI 4	Normal	25/02/2019	212251-11	212251	<5	3300	110	-	-	-	-																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
MPI 4	MPI 4	Normal	4/03/2019	212783-11	212783	<5	22,000	260	-	-	-	-																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
MPI 4A	MPI 4A	Normal	12/02/2019	211437-2	211437	<5	75	2700	-	-	-	-																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
MPI 4A	MPI 4A	Normal	11/12/2018	208061-4	208061	<5	2700	240	-	-	-	-																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
MPI 4A	MPI 4A	Normal	13/02/2019	211518-7	211518	<5	2700	18	-	-	-	-																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
MPI 4A	MPI 4A	Normal	18/02/2019	211785-1	211785	<5	2700	35	-	-	-	-																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
MPI 4A	MPI 4A	Normal	28/02/2019	212355-4	212355	<5	2700	6	-</																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								

Table B2\_Groundwater Analytical Data - Ecological

							Metals														
							Aluminium (Filtered)	Arsenic (Filtered)	Barium	Barium (Filtered)	Boron	Caesium (Filtered)	Chromium (Filtered)	Cobalt (Filtered)	Copper (Filtered)	Iron	Lead (Filtered)	Manganese (Filtered)	Mercury (Filtered)	Nickel (Filtered)	
							ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
EOL							10	1	1	1	50	0.1	1	1	1	10	1	5	0.05	1	
ANZG (2016) Freshwater 80% toxicant DGVs							150				1300	0.8			2.5		9.4	3600	5.4	17	
ANZG (2016) Marine water 80% toxicant DGVs												36		150	6	12		1.4	560		
ANZG (2016) Marine water 95% toxicant DGVs												5.5		1.3		4.4		0.4	70		
ANZG (2016) Freshwater 95% toxicant DGVs							55				370	0.2		1.4		3.4	1900	0.6	11		
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report																
34 TL3	34 TL3	Normal	13/02/2019	211519-11	211519	-	-	48	-	-	-	-	-	-	2300	-	-	-	-	-	-
34 TL3	34 TL3	Normal	19/02/2019	211841-5	211841	-	-	44	-	-	-	-	-	-	8300	-	-	-	-	-	-
34 TL3	34 TL3	Normal	26/02/2019	212355-7	212355	-	-	47	-	-	-	-	-	-	5900	-	-	-	-	-	-
34 TL3	34 TL3	Normal	6/03/2019	212885-2	212885	20	4	-	22	-	<0.1	11	3	<1	-	<1	39	<0.05	8	-	-
34 TL3	34 TL3	Normal	12/03/2019	213382-13	213382	-	-	60	-	-	-	-	-	-	3400	-	-	-	-	-	-
34 TL3	34 TL3	Normal	16/04/2019	215934-2	215934	40	4	-	45	-	<0.1	13	7	<1	-	<1	46	<0.05	7	-	-
34 TL3	QC2054	Interlab D	16/04/2019	ES1912221001	ES1912221	28	6.3	-	50.1	-	<0.05	15	0.1	<0.5	-	<0.1	47.6	<0.04	10.2	-	-
GW100s	GW100s	Normal	21/02/2019	212109-3	212109	60	8	-	16	-	<0.1	<1	<1	<1	-	<1	21	<0.05	<1	-	-
GW100s	GW100s	Normal	6/03/2019	213103-3	213103	70	9	-	23	-	<0.1	<1	<1	<1	-	<1	13	<0.05	<1	-	-
GW100s	GW100s	Normal	11/04/2019	215934-8	215934	8	3	-	18	-	<0.1	<1	<1	<1	-	<1	2	<0.05	<1	-	-
GW101	GW101	Normal	9/01/2019	209135-1	209135	40	<1	-	16	-	0.2	<1	<1	<1	-	<1	630	<0.05	<1	-	-
GW101	GW101	Normal	11/02/2019	211335-4	211335	40	<1	-	15	-	<0.1	<1	<1	<1	-	<1	550	<0.05	<1	-	-
GW101	GW101	Normal	8/03/2019	213103-1	213103	70	<1	-	16	-	<0.1	<1	<1	<1	-	<1	590	<0.05	<1	-	-
GW101	GW101	Normal	15/04/2019	215789-5	215789	40	<1	-	14	-	<0.1	<1	<1	<1	-	<1	590	<0.05	<1	-	-
GW101	QC2039	Interlab D	11/03/2019	ES1904415001	ES1904415	40	0.5	-	16.4	-	<0.05	0.8	0.4	<0.1	-	<0.1	527	<0.04	<0.5	-	-
GW102	GW102	Normal	9/01/2019	209135-2	209135	650	3	-	11	-	<0.1	<1	<1	<1	-	1	6	<0.05	<1	-	-
GW102	GW102	Normal	11/02/2019	211335-6	211335	530	3	-	10	-	<0.1	<1	<1	<1	-	<1	5	<0.05	7	-	-
GW102	GW102	Normal	8/03/2019	213103-5	213103	560	2	-	11	-	<0.1	<1	<1	<1	-	<1	5	<0.05	1	-	-
GW102	GW102	Normal	17/04/2019	215939-9	215939	730	3	-	9	-	<0.1	<1	<1	<1	-	2	5	<0.05	1	-	-
GW102	QC2051	Interlab D	8/03/2019	ES1907278001	ES1907278	560	2.6	-	11.8	-	<0.05	0.4	0.4	<0.5	-	1	5.8	<0.05	<1	-	-
GW103	GW103	Normal	21/02/2019	212109-4	212109	220	2	-	19	-	<0.1	<1	<1	<1	-	<1	5	<0.05	<1	-	-
GW103	GW103	Normal	8/03/2019	213103-4	213103	310	5	-	16	-	<0.1	<1	<1	<1	-	<1	6	<0.05	<1	-	-
GW103	GW103	Normal	17/04/2019	215939-6	215939	80	8	-	40	-	<0.1	<1	<1	<1	-	<1	9	<0.05	<1	-	-
GW103	QC1055	Field D	17/04/2019	215939-4	215939	80	7	-	40	-	<0.1	<1	<1	<1	-	<1	9	<0.05	<1	-	-
GW104	GW104	Normal	20/12/2018	208653-2	208653	40	1	-	7	-	<0.1	<1	<1	<1	-	<1	1	5.8	<0.05	2	-
GW104	GW104	Normal	7/02/2019	211411-7	211411	180	<1	-	28	-	<0.1	1	<1	<1	-	<1	99	<0.05	2	-	-
GW104	GW104	Normal	10/04/2019	215496-4	215496	210	<1	-	27	-	<0.1	<1	<1	<1	-	<1	84	<0.05	2	-	-
GW10s	GW10s	Normal	10/01/2019	209274-1	209274	-	10	-	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	3	-	-
GW10s	GW10s	Normal	14/02/2019	211612-1	211612	-	14	-	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	2	-	-
GW10s	GW10s	Normal	6/03/2019	213103-7	213103	-	8	-	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	9	-	-
GW10s	GW10s	Normal	9/04/2019	215423-2	215423	-	8	-	-	-	<0.1	2	<1	<1	-	<1	-	<0.05	<1	-	-
GW10s	QC2053	Interlab D	9/04/2019	ES191607001	ES191607	-	8	-	-	-	<0.05	0.8	-	<0.5	-	<0.1	-	<0.04	1.5	-	-
GW11d	GW11d	Normal	1/03/2019	212548-1	212548	-	<1	-	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	46	-	-
GW11d	GW11d	Normal	16/04/2019	215934-8	215934	-	<1	-	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	<1	-	-
GW11s	GW11s	Normal	24/01/2019	210231-1	210231	40	<1	-	45	-	<0.1	<1	<1	<1	-	<1	240	<0.05	<1	-	-
GW11s	GW11s	Normal	11/02/2019	211335-2	211335	-	<1	-	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	<1	-	-
GW11s	GW11s	Normal	13/03/2019	213502-6	213502	-	<1	-	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	<1	-	-
GW11s	GW11s	Normal	16/04/2019	215934-7	215934	-	<1	-	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	<1	-	-
GW11s	QC1042	Field D	11/02/2019	211335-3	211335	-	<1	-	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	<1	-	-
GW12s	GW12s	Normal	24/01/2019	210277-3	210277	-	21	-	-	-	<0.1	18	<1	<1	-	<1	-	<0.05	7	-	-
GW13d	GW13d	Normal	20/12/2018	208653-2	208653	-	3	-	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	<1	-	-
GW13d	GW13d	Normal	8/02/2019	211411-9	211411	-	4	-	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	<1	-	-
GW13d	GW13d	Normal	11/04/2019	215594-5	215594	-	4	-	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	<1	-	-
GW13s	GW13s	Normal	20/12/2018	208653-1	208653	-	<1	-	-	-	<0.1	1	<1	<1	-	<1	-	<0.05	<1	-	-
GW13s	GW13s	Normal	8/02/2019	211411-8	211411	-	<1	-	-	-	<0.1	1	<1	<1	-	<1	-	<0.05	<1	-	-
GW13s	GW13s	Normal	11/04/2019	215594-4	215594	-	1	-	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	<1	-	-
GW14d	GW14d	Normal	20/12/2018	208653-6	208653	-	1	-	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	16	-	-
GW14d	GW14d	Normal	7/02/2019	211411-5	211411	-	<1	-	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	17	-	-
GW14d	GW14d	Normal	10/04/2019	215496-6	215496	-	1	-	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	8	-	-
GW14d	QC1032	Field D	20/12/2018	208653-7	208653	-	<1	-	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	<1	-	-
GW14s	GW14s	Normal	10/01/2019	209274-2	209274	-	<1	-	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	7	-	-
GW14s	GW14s	Normal	7/02/2019	211411-3	211411	-	<1	-	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	<1	-	-
GW14s	GW14s	Normal	10/04/2019	215496-5	215496	-	<1	-	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	<1	-	-
GW14s	QC1040	Field D	7/02/2019	211411-4	211411	-	<1	-	-	-	<0.1	1	<1	<1	-	<1	-	<0.05	<1	-	-
GW14s	QC1053	Field D	10/04/2019	215496-1	215496	-	<1	-	-	-	<0.1	1	<1	<1	-	<1	-	<0.05	2	-	-
GW15d	GW15d	Normal	7/02/2019	2																	

Table B2\_Groundwater Analytical Data - Ecological

						Metals														
						Aluminium (Filtered)	Arsenic (Filtered)	Barium	Barium (Filtered)	Boron	Chromium (Filtered)	Chromium (Filtered)	Cobalt (Filtered)	Copper (Filtered)	Iron	Lead (Filtered)	Manganese (Filtered)	Mercury (Filtered)	Nickel (Filtered)	
						ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
EOL						10	1	1	1	50	0.1	1	1	1	10	1	5	0.05	1	
ANZG (2018) Freshwater 80% toxicant DGVs						150				1300	0.8			2.5		9.4	3600	5.4	17	
ANZG (2018) Marine water 80% toxicant DGVs										36			150	8		12		1.4	560	
ANZG (2018) Marine water 95% toxicant DGVs										5.5			1.3			4.4		0.4	10	
ANZG (2018) Freshwater 95% toxicant DGVs						55				370	0.2			1.4		3.4	1900	0.6	11	
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	Aluminium (Filtered)	Arsenic (Filtered)	Barium	Barium (Filtered)	Boron	Chromium (Filtered)	Chromium (Filtered)	Cobalt (Filtered)	Copper (Filtered)	Iron	Lead (Filtered)	Manganese (Filtered)	Mercury (Filtered)	Nickel (Filtered)	
MPE 2	QC1050	Field D	12/03/2019	213382-3	213382			37							6000					
MPE 21	MPE 21	Normal	12/12/2018	208060-6	208060	10	5		550		0.1									<0.05
MPE 21	MPE 21	Normal	12/02/2019	211437-10	211437			740								2700				
MPE 21	MPE 21	Normal	18/02/2019	211785-11	211785			1500								66000				
MPE 21	MPE 21	Normal	25/02/2019	212251-11	212251			760								4000				
MPE 21	MPE 21	Normal	4/03/2019	212783-12	212783			900								9700				
MPE 21	MPE 21	Normal	11/03/2019	213297-11	213297			870								8400				
MPE 3	MPE 3	Normal	11/12/2018	208061-3	208061	30	<1		23		<0.1	<1	<1	<1		<1	41		<0.05	<1
MPE 3	MPE 3	Normal	13/02/2019	211519-9	211519			26								1100				
MPE 3	MPE 3	Normal	19/02/2019	211841-6	211841			22								1400				
MPE 3	MPE 3	Normal	28/02/2019	212355-8	212355			29								2600				
MPE 3	MPE 3	Normal	09/03/2019	212985-1	212985			28								3600				
MPE 3	MPE 3	Normal	12/03/2019	213382-8	213382			27								2900				
MPE 4	MPE 4	Normal	13/02/2019	211519-8	211519			76								19000				
MPE 4	MPE 4	Normal	19/02/2019	211841-4	211841			77								11000				
MPE 4	MPE 4	Normal	28/02/2019	212355-6	212355			81								7100				
MPE 4	MPE 4	Normal	5/03/2019	212782-9	212782			80								19000				
MPE 4	MPE 4	Normal	12/03/2019	213382-7	213382			87								2600				
MPE 5	MPE 5	Normal	11/12/2018	208061-7	208061	80	2		43		<0.1	3	4	<1		<1	27		<0.05	1
MPE 5	MPE 5	Normal	13/02/2019	211519-5	211519			66								2300				
MPE 5	MPE 5	Normal	19/02/2019	211841-12	211841			52								3200				
MPE 5	MPE 5	Normal	28/02/2019	212355-1	212355			56								3600				
MPE 5	MPE 5	Normal	5/03/2019	212782-4	212782			55								5500				
MPE 5	MPE 5	Normal	11/03/2019	213297-18	213297			49								5500				
MPE 5A	MPE 5A	Normal	11/12/2018	208061-5	208061	20	<1		130		4.6	1	<1			2	42		<0.05	43
MPE 5A	MPE 5A	Normal	13/02/2019	211519-6	211519			150								30000				
MPE 5A	MPE 5A	Normal	19/02/2019	211841-2	211841			150								140000				
MPE 5A	MPE 5A	Normal	28/02/2019	212355-3	212355			150								14000				
MPE 5A	MPE 5A	Normal	5/03/2019	212782-6	212782			130								16000				
MPE 5A	MPE 5A	Normal	12/03/2019	213382-4	213382			260								92000				
MPE 6	MPE 6	Normal	11/12/2018	208061-8	208061	30	<1		310		<0.1	2	<1	<1		<1	210		<0.05	<1
MPE 6	MPE 6	Normal	13/02/2019	211519-2	211519			300								8600				
MPE 6	MPE 6	Normal	18/02/2019	211785-14	211785			350								1900				
MPE 6	MPE 6	Normal	25/02/2019	212251-14	212251			540								880				
MPE 6	MPE 6	Normal	5/03/2019	212782-1	212782			600								3700				
MPE 6	MPE 6	Normal	11/03/2019	213297-14	213297			520								1900				
MPE 6	QC1049	Field D	11/03/2019	213297-15	213297			480								1400				
MPE 7	MPE 7	Normal	12/12/2018	208060-2	208060	10	2		170		<0.1		<1	<1		<1	920		<0.05	1
MPE 7	MPE 7	Normal	12/02/2019	211437-8	211437			250								40000				
MPE 7	MPE 7	Normal	18/02/2019	211785-9	211785			280								42000				
MPE 7	MPE 7	Normal	25/02/2019	212251-10	212251			270								38000				
MPE 7	MPE 7	Normal	4/03/2019	212783-10	212783			250								66000				
MPE 7	MPE 7	Normal	11/03/2019	213297-10	213297			450								15000				
MPE 8	MPE 8	Normal	12/12/2018	208060-1	208060	10	2		190		<0.1	<1	1	<1		<1	1400		<0.05	2
MPE 8	MPE 8	Normal	12/02/2019	211437-6	211437			220								25000				
MPE 8	MPE 8	Normal	18/02/2019	211785-5	211785			190								19000				
MPE 8	MPE 8	Normal	25/02/2019	212251-5	212251			190								14000				
MPE 8	MPE 8	Normal	4/03/2019	212783-6	212783			210								15000				
MPE 8	MPE 8	Normal	11/03/2019	213297-5	213297			210								16000				
MPE 8	MPE 8	Normal	11/03/2019	213297-5	213297			190								15000				
MPE 9	QC1046	Field D	25/02/2019	212251-6	212251			190								15000				
MPE 9	MPE 9	Normal	12/12/2018	208060-5	208060	10	3		220		<0.1	3	2	<1		<1	300		<0.05	5
MPE 9	MPE 9	Normal	12/02/2019	211437-4	211437			1800								47000				
MPE 9	MPE 9	Normal	18/02/2019	211785-4	211785			740								22000				
MPE 9	MPE 9	Normal	25/02/2019	212251-4	212251			670								22000				
MPE 9	MPE 9	Normal	4/03/2019	212783-5	212783			560								21000				
MPE 9	MPE 9	Normal	11/03/2019	213297-4	213297			500								22000				
MPI 10	MPI 10	Normal	11/12/2018	208061-6	208061	20	11		620		<0.1	2	2	<1		<1	420		<0.05	2
MPI 10	MPI 10	Normal	13/02/2019	211519-4	211519			630								8600				
MPI 10	MPI 10	Normal	19/02/2019	211841-11	211841			780								13000				
MPI 10	MPI 10	Normal	26/02/2019	212355-2	212355			740								12000				
MPI 10	MPI 10	Normal	5/03/2019	212782-5	212782			750								13000				
MPI 10	MPI 10	Normal	11/03/2019	213297-19	213297			650								12000				
MPI 12	MPI 12	Normal	11/12/2018	208061-2	208061	30	20		630		<0.1	1	<1	<1		<1	380		<0.05	<1
MPI 12	MPI 12	Normal	13/02/2019	211519-1	211519			640								3700				
MPI 12	MPI 12	Normal	18/02/2019	211785-13	211785			680								9000				
MPI 12	MPI 12	Normal	28/02/2019	212520-3	212520			690								8400				
MPI 12	MPI 12	Normal	5/03/2019	212782-2	212782			730												

Table B2\_Groundwater Analytical Data - Ecological

	Metals													
	Aluminium (Filtered)	Arsenic (Filtered)	Barium	Barium (Filtered)	Boron	Chromium (Filtered)	Chromium (Filtered)	Cobalt (Filtered)	Copper (Filtered)	Iron	Lead (Filtered)	Manganese (Filtered)	Mercury (Filtered)	Nickel (Filtered)
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
EOL	10	1	1	1	1	50	0.1	1	1	1	10	1	5	0.05
ANZG (2018) Freshwater 80% toxicant DGVs	150					1300	0.8		2.5		9.4	3600	5.4	17
ANZG (2018) Marine water 80% toxicant DGVs						36		150	8		12		1.4	560
ANZG (2018) Marine water 95% toxicant DGVs						5.5		1.3			4.4		0.4	10
ANZG (2016) Freshwater 95% toxicant DGVs	55					370	0.2		1.4		3.4	1900	0.6	11

Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	Aluminium (Filtered)	Arsenic (Filtered)	Barium	Barium (Filtered)	Boron	Chromium (Filtered)	Chromium (Filtered)	Cobalt (Filtered)	Copper (Filtered)	Iron	Lead (Filtered)	Manganese (Filtered)	Mercury (Filtered)	Nickel (Filtered)	
MPI 3A	MPI 3A	Normal	11/12/2018	208061-1	208061	20	5	92	-	<0.1	3	2	<1	-	<1	150	<0.05	3	-	
MPI 3A	MPI 3A	Normal	13/02/2019	211519-15	211519	-	140	-	-	-	-	-	-	-	19,000	-	-	-	-	-
MPI 3A	MPI 3A	Normal	19/02/2019	211841-9	211841	-	89	-	-	-	-	-	-	-	14,000	-	-	-	-	-
MPI 3A	MPI 3A	Normal	26/02/2019	212355-9	212355	-	150	-	-	-	-	-	-	-	6900	-	-	-	-	-
MPI 3A	MPI 3A	Normal	6/03/2019	212985-4	212985	-	160	-	-	-	-	-	-	-	10,000	-	-	-	-	-
MPI 3A	MPI 3A	Normal	12/03/2019	213382-10	213382	-	150	-	-	-	-	-	-	-	1900	-	-	-	-	-
MPI 4	MPI 4	Normal	12/12/2018	208060-6	208060	<10	18	31	-	<0.1	1	7	<1	-	190,000	<1	270	<0.05	2	
MPI 4	MPI 4	Normal	13/02/2019	211519-12	211519	-	37	-	-	-	-	-	-	-	190,000	-	-	-	-	-
MPI 4	MPI 4	Normal	19/02/2019	211841-8	211841	-	34	-	-	-	-	-	-	-	65,000	-	-	-	-	-
MPI 4	MPI 4	Normal	26/02/2019	212355-11	212355	-	34	-	-	-	-	-	-	-	45,000	-	-	-	-	-
MPI 4	MPI 4	Normal	6/03/2019	212985-6	212985	-	33	-	-	-	-	-	-	-	95,000	-	-	-	-	-
MPI 4	MPI 4	Normal	12/03/2019	213382-9	213382	-	37	-	-	-	-	-	-	-	83,000	-	-	-	-	-
MPI 4A	MPI 4A	Normal	11/12/2018	208061-4	208061	50	4	340	-	<0.1	10	2	<1	-	1	43	<0.05	3	-	
MPI 4A	MPI 4A	Normal	13/02/2019	211519-7	211519	-	400	-	-	-	-	-	-	-	3700	-	-	-	-	-
MPI 4A	MPI 4A	Normal	19/02/2019	211841-1	211841	-	330	-	-	-	-	-	-	-	3000	-	-	-	-	-
MPI 4A	MPI 4A	Normal	26/02/2019	212355-4	212355	-	390	-	-	-	-	-	-	-	3900	-	-	-	-	-
MPI 4A	MPI 4A	Normal	6/03/2019	212985-7	212985	-	410	-	-	-	-	-	-	-	37,000	-	-	-	-	-
MPI 4A	MPI 4A	Normal	12/03/2019	213382-5	213382	-	390	-	-	-	-	-	-	-	3500	-	-	-	-	-
MPI 5	MPI 5	Normal	12/12/2018	208060-7	208060	30	5	64	-	<0.1	11	6	<1	-	<1	47	<0.05	6	-	
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	-	82	-	-	-	-	-	-	-	6400	-	-	-	-	-
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841	-	85	-	-	-	-	-	-	-	7100	-	-	-	-	-
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	-	86	-	-	-	-	-	-	-	5100	-	-	-	-	-
MPI 6A	MPI 6A	Normal	6/03/2019	212985-9	212985	-	96	-	-	-	-	-	-	-	5300	-	-	-	-	-
MPI 6A	MPI 6A	Normal	12/03/2019	213382-6	213382	-	110	-	-	-	-	-	-	-	4500	-	-	-	-	-
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	190	9	280	-	0.1	16	8	-	-	22	210	<0.05	15	-	
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	<10	1	770	-	<0.1	5	4	<1	-	<1	68	<0.05	4	-	
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	-	11	-	-	<0.1	4	2	<1	-	<1	-	<0.05	2	-	
WCX_GTY_BH_002	WCX_GTY_BH	Normal	19/12/2018	208565-1	208565	-	<1	-	-	<0.1	1	2	<1	-	<1	-	<0.05	<1	-	
WCX_GTY_BH_002	WCX_GTY_BH	Normal	28/02/2019	212520-5	212520	-	<1	-	-	<0.1	1	2	<1	-	<1	-	<0.05	<1	-	
WCX_GTY_BH_002	WCX_GTY_BH	Normal	15/03/2019	213632-2	213632	-	<1	-	-	<0.1	2	2	<1	-	<1	-	<0.05	<1	-	
WCX_GTY_BH_002	WCX_GTY_BH	Normal	11/04/2019	215594-7	215594	-	<1	-	-	<0.1	2	1	<1	-	<1	-	<0.05	1	-	
WCX_GTY_BH_003	WCX_GTY_BH	Normal	6/03/2019	213103-2	213103	-	<1	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	3	-	
WCX_GTY_BH_004	QC2052	Interlab D	15/03/2019	ES1907999001	ES1907999	-	0.7	-	-	<0.05	0.8	-	<0.5	-	<0.1	-	<0.04	<0.5	-	
WCX_GTY_BH_004	WCX_GTY_BH	Normal	28/02/2019	212520-6	212520	-	<1	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	<1	-	
WCX_GTY_BH_004	WCX_GTY_BH	Normal	15/03/2019	213632-3	213632	-	<1	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	<1	-	
WCX_GTY_BH_004	WCX_GTY_BH	Normal	17/04/2019	215939-1	215939	-	<1	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	<1	-	
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	17/12/2018	208319-2	208319	-	18	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	<1	-	
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	13/02/2019	211510-3	211510	-	2	-	-	<0.1	3	2	<1	-	<1	-	<0.05	5	-	
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	15/03/2019	213632-1	213632	-	2	-	-	<0.1	4	2	<1	-	<1	-	<0.05	1	-	
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	11/04/2019	215594-10	215594	-	16	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	<1	-	
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	17/12/2018	208319-1	208319	-	1	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	<1	-	
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	13/02/2019	211510-2	211510	-	<1	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	<1	-	
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	6/03/2019	212985-9	212985	-	1	-	-	<0.1	1	1	<1	-	<1	-	<0.05	<1	-	
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	11/04/2019	215594-9	215594	-	2	-	-	<0.1	1	1	<1	-	<1	-	<0.05	<1	-	
WCX_GTY_BH_027	QC1046	Field D	22/02/2019	212103-3	212103	-	4	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	2	-	
WCX_GTY_BH_027	WCX_GTY_BH	Normal	17/01/2019	209762-4	209762	-	5	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	2	-	
WCX_GTY_BH_027	WCX_GTY_BH	Normal	22/02/2019	212103-2	212103	-	4	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	2	-	
WCX_GTY_BH_027	WCX_GTY_BH	Normal	16/04/2019	215594-6	215594	-	8	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	1	-	
WCX_GTY_BH_033	QC1054	Field D	11/04/2019	215594-2	215594	-	<1	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	2	-	
WCX_GTY_BH_033	QC2031	Interlab D	19/12/2018	ES1838735001	ES1838735	-	0.7	-	-	<0.05	0.3	-	<0.5	-	<0.1	-	<0.04	<0.5	-	
WCX_GTY_BH_033	WCX_GTY_BH	Normal	19/12/2018	208565-2	208565	-	<1	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	<1	-	
WCX_GTY_BH_033	WCX_GTY_BH	Normal	13/02/2019	211510-4	211510	-	<1	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	12	-	
WCX_GTY_BH_033	WCX_GTY_BH	Normal	11/04/2019	215594-6	215594	-	<1	-	-	<0.1	<1	<1	<1	-	<1	-	<0.05	2	-	

Statistical Summary	Aluminium (Filtered)	Arsenic (Filtered)	Barium	Barium (Filtered)	Boron	Chromium (Filtered)	Chromium (Filtered)	Cobalt (Filtered)	Copper (Filtered)	Iron	Lead (Filtered)	Manganese (Filtered)	Mercury (Filtered)	Nickel (Filtered)
Number of Results	86	161	138	86	4	161	161	86	161	142	161	86	161	161
Number of Detects	71	101	138	86	4	10	82	51	20	142	20	83	3	89
Minimum Concentration	<5	0.5	22	9	1990	<0.05	0.3	0.4	<0.5	400	<0.1	<5	<0.04	<0.5
Minimum Detect	10	0.5	22	9	1990	0.1	0.3	0.4	1	400	1	5	0.2	1
Maximum Concentration	730	1100	1800	1000	4490	4.6	92	53	200	190000	120	9900	0.5	130
Maximum Detect	730	1100	1800	1000	4490	4.6	92	53	200	190000	120	9900	0.5	130
Average Concentration	81	11	436	251	2755	0.091	3.2	3.8	4.6	16541	1.7	584	0.03	5.6
Median Concentration														





Table B2\_Groundwater Analytical Data - Ecological

Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	Total Petroleum Hydrocarbons										Total Recoverable Hydrocarbons									
						Eric (Filtered)	B6-C9 fraction	C10-C14 fraction	C15-C28 fraction	C29-C36 fraction	C10-C36 fraction (sum)	B6-C10 fraction	B6-C10 fraction (minus BTEX(F1))	C10-C16 fraction	C10-C16 (minus Naphthalene)(F2)	C16-C24 fraction	C24-C40 fraction	C10-C40 fraction (sum)							
µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L									
EOL						1	10	50	100	100	50	10	10	50	100	100	100	100							
ANZG (2018) Freshwater 80% toxicant DGVs						31																			
ANZG (2018) Marine water 80% toxicant DGVs						43																			
ANZG (2018) Marine water 85% toxicant DGVs						15																			
ANZG (2018) Freshwater 95% toxicant DGVs						8																			
MPI 3A	MPI 3A	Normal	11/12/2018	208061-1	208061	4	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
MPI 3A	MPI 3A	Normal	13/02/2019	211519-15	211519	-	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
MPI 3A	MPI 3A	Normal	19/02/2019	211841-9	211841	-	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
MPI 3A	MPI 3A	Normal	26/02/2019	212355-9	212355	-	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
MPI 3A	MPI 3A	Normal	6/03/2019	212985-4	212985	-	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
MPI 3A	MPI 3A	Normal	12/03/2019	213382-10	213382	-	<10	<50	<100	<100	<250	<10	<10	<50	<50	130	<100	-							
MPI 4	MPI 4	Normal	12/12/2018	208060-8	208060	4	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
MPI 4	MPI 4	Normal	13/02/2019	211519-12	211519	-	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
MPI 4	MPI 4	Normal	19/02/2019	211841-8	211841	-	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
MPI 4	MPI 4	Normal	26/02/2019	212355-11	212355	-	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
MPI 4	MPI 4	Normal	6/03/2019	212985-6	212985	-	<100	<50	<100	<100	<250	<100	<100	<50	<50	<100	<100	-							
MPI 4	MPI 4	Normal	12/03/2019	213382-9	213382	-	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
MPI 4A	MPI 4A	Normal	11/12/2018	208061-4	208061	8	14	180	210	<100	490	110	110	150	150	190	<100	-							
MPI 4A	MPI 4A	Normal	13/02/2019	211519-7	211519	-	-	-	-	-	-	-	-	-	-	-	-	-							
MPI 4A	MPI 4A	Normal	19/02/2019	211841-1	211841	-	<10	200	170	<100	470	62	62	170	170	150	<100	-							
MPI 4A	MPI 4A	Normal	26/02/2019	212355-4	212355	-	20	240	<100	<100	440	83	83	180	180	<100	<100	-							
MPI 4A	MPI 4A	Normal	6/03/2019	212985-7	212985	-	<10	250	410	<100	760	24	24	220	220	360	<100	-							
MPI 4A	MPI 4A	Normal	12/03/2019	213382-5	213382	-	<100	250	380	<100	730	<100	<100	260	260	290	<100	-							
MPI 5	MPI 5	Normal	12/12/2018	208060-7	208060	7	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	-	<100	<50	<100	<100	<250	<100	<100	<50	<50	<100	<100	-							
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841	-	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	-	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
MPI 6A	MPI 6A	Normal	6/03/2019	212782-9	212782	-	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
MPI 6A	MPI 6A	Normal	12/03/2019	213382-6	213382	-	<1000	180	300	200	680	<1000	<1000	240	240	370	170	-							
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	5	<10	260	630	140	-	17	16	360	290	620	<100	-							
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	7	<10	220	440	<100	760	34	34	310	310	350	<100	-							
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	8	<10	82	<100	<100	282	<10	<10	65	65	<100	<100	-							
WCX GTY BH 002	WCX GTY BH	Normal	19/12/2018	208565-1	208565	8	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
WCX GTY BH 002	WCX GTY BH	Normal	28/02/2019	212520-5	212520	8	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
WCX GTY BH 002	WCX GTY BH	Normal	15/03/2019	213632-2	213632	7	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
WCX GTY BH 002	WCX GTY BH	Normal	11/04/2019	215594-7	215594	13	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
WCX GTY BH 003	WCX GTY BH	Normal	8/03/2019	213103-2	213103	6	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
WCX GTY BH 004	QC2052	Interlab D	15/03/2019	ES1907999001	ES1907999	4	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100							
WCX GTY BH 004	WCX GTY BH	Normal	28/02/2019	212520-6	212520	11	<10	86	480	<100	666	<10	<10	240	240	320	<100	-							
WCX GTY BH 004	WCX GTY BH	Normal	15/03/2019	213632-3	213632	4	<10	<50	150	<100	300	<10	<10	<50	<50	150	<100	-							
WCX GTY BH 004	WCX GTY BH	Normal	17/04/2019	215939-1	215939	5	<10	<50	<100	<100	-	<10	<10	<50	<50	<100	<100	-							
WCX GTY BH 009d	WCX GTY BH	Normal	17/12/2018	208319-2	208319	5	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
WCX GTY BH 009d	WCX GTY BH	Normal	13/02/2019	211510-3	211510	6	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
WCX GTY BH 009d	WCX GTY BH	Normal	11/04/2019	213632-1	213632	6	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
WCX GTY BH 009d	WCX GTY BH	Normal	11/04/2019	215594-10	215594	4	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
WCX GTY BH 009s	WCX GTY BH	Normal	17/12/2018	208319-1	208319	5	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
WCX GTY BH 009s	WCX GTY BH	Normal	13/02/2019	211510-2	211510	2	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
WCX GTY BH 009s	WCX GTY BH	Normal	6/03/2019	212985-9	212985	4	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
WCX GTY BH 009s	WCX GTY BH	Normal	11/04/2019	215594-9	215594	5	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
WCX GTY BH 027	QC1046	Field D	22/02/2019	212103-3	212103	11	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
WCX GTY BH 027	WCX GTY BH	Normal	17/01/2019	209762-4	209762	11	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
WCX GTY BH 027	WCX GTY BH	Normal	22/02/2019	212103-2	212103	11	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
WCX GTY BH 027	WCX GTY BH	Normal	16/04/2019	215594-6	215594	8	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
WCX GTY BH 033	QC1054	Field D	11/04/2019	215594-2	215594	4	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
WCX GTY BH 033	QC2031	Interlab D	19/12/2018	ES1838735001	ES1838735	5	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100	<100							
WCX GTY BH 033	WCX GTY BH	Normal	19/12/2018	208565-2	208565	6	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
WCX GTY BH 033	WCX GTY BH	Normal	13/02/2019	211510-4	211510	10	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							
WCX GTY BH 033	WCX GTY BH	Normal	11/04/2019	215594-8	215594	9	<10	<50	<100	<100	<250	<10	<10	<50	<50	<100	<100	-							

Statistical Summary																	
Number of Results	161	283	283	283	283	267	283	283	283	283	283	283	283	283	283	12	
Number of Detects	156	9	40	52	13	63	21	21	65	65	42	9	0				
Minimum Concentration	<1	<10	<50	<100	<50	<50	<10	<10	<50	<50	<100	<100	<100				
Minimum Detect	1	11	50	100	120	60	10	10	51	51	100	110	ND				
Maximum Concentration	10000	1400	1300	3300	8500	7500	2400	1500	1400	1400	4300	8500	<100				
Maximum Detect	10000	1400	1300	3300	8500	7500	2400	1500	1400	1400	4300	8500	ND				
Average Concentration	246	21	46	121	86	264	26	23	60	59	131	93	50				
Median Concentration	6	5	25	50	50	125	5	5	25	25	50	50	50				
Standard Deviation	1239	97	32	312	397	596	151	103	109	108	405	515	0				
Number of Guideline Exceedances	114	4	0	0	0	18	0	0	1	283	6	4	0				
Number of Guideline Exceedances(Detects Only)	114</																



Table B2\_Groundwater Analytical Data - Ecological

EQI	Location Code	Field ID	Sample Type	Sample Date	SampleCode	Lab Report	BTEX										Naphthalene		Monocyclic Aromatic Hydrocarbons											
							Benzene		Toluene		Ethylbenzene		m,p-Xylene		o-Xylene		Total Xylenes		Total BTEX	Naphthalene	Naphthalene (NOC)	Styrene	Isopropylbenzene	n-butylbenzene	n-propylbenzene	p-Isopropyltoluene	sec-butylbenzene	tert-butylbenzene	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene
							1	2	1	2	1	2	1	2	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1
2000							840																							
1300																														
700																														
950							350																							

Table B2\_Groundwater Analytical Data - Ecological

	BTEX										Naphthalene		Monocyclic Aromatic Hydrocarbons									
	Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene	Total Xylenes	Total BTEX	Naphthalene	Naphthalene (NOC)	Styrene	Isopropylbenzene	n-butylbenzene	p-propylbenzene	p-Isopropyltoluene	sec-butylbenzene	tert-butylbenzene	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene				
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L			
EOI	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1			
ANZG (2018) Freshwater 80% toxicant DGVs	2000					840			85													
ANZG (2018) Marine water 80% toxicant DGVs	1300								120													
ANZG (2018) Marine water 85% toxicant DGVs	710								70													
ANZG (2018) Freshwater 95% toxicant DGVs	950					350			16													
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report																	
MPI 3A	MPI 3A	Normal	11/12/2018	208061-1	208061	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
MPI 3A	MPI 3A	Normal	13/02/2019	211519-15	211519	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
MPI 3A	MPI 3A	Normal	19/02/2019	211841-9	211841	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
MPI 3A	MPI 3A	Normal	26/02/2019	212355-9	212355	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
MPI 3A	MPI 3A	Normal	6/03/2019	212985-4	212985	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
MPI 3A	MPI 3A	Normal	12/03/2019	213382-10	213382	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
MPI 4	MPI 4	Normal	12/12/2018	208060-8	208060	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
MPI 4	MPI 4	Normal	13/02/2019	211519-12	211519	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
MPI 4	MPI 4	Normal	19/02/2019	211841-8	211841	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
MPI 4	MPI 4	Normal	26/02/2019	212355-11	212355	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
MPI 4	MPI 4	Normal	6/03/2019	212985-6	212985	<10	<10	<10	<20	<10	<30	<30	<10	-	<1	<1	<1	<1	<1			
MPI 4	MPI 4	Normal	12/03/2019	213382-9	213382	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
MPI 4A	MPI 4A	Normal	11/12/2018	208061-4	208061	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
MPI 4A	MPI 4A	Normal	13/02/2019	211519-7	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
MPI 4A	MPI 4A	Normal	19/02/2019	211841-1	211841	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
MPI 4A	MPI 4A	Normal	26/02/2019	212355-4	212355	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
MPI 4A	MPI 4A	Normal	6/03/2019	212782-7	212782	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
MPI 4A	MPI 4A	Normal	12/03/2019	213382-5	213382	<10	<10	<10	<20	<10	<30	<30	<10	-	<1	<1	<1	<1	<1			
MPI 5	MPI 5	Normal	12/12/2018	208060-7	208060	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	<10	<10	<10	<20	<10	<30	<30	<10	-	<1	<1	<1	<1	<1			
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
MPI 6A	MPI 6A	Normal	5/03/2019	212782-9	212782	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
MPI 6A	MPI 6A	Normal	12/03/2019	213382-6	213382	<100	<100	<200	<100	<300	<300	<300	<100	-	<1	<1	<1	<1	<1			
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
WCX GTY BH 002	WCX GTY BH	Normal	19/12/2018	208565-1	208565	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
WCX GTY BH 002	WCX GTY BH	Normal	28/02/2019	212520-5	212520	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
WCX GTY BH 002	WCX GTY BH	Normal	15/03/2019	213632-2	213632	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
WCX GTY BH 002	WCX GTY BH	Normal	11/04/2019	215594-7	215594	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
WCX GTY BH 003	WCX GTY BH	Normal	8/03/2019	213103-2	213103	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
WCX GTY BH 004	OC2052	Interlab D	15/03/2019	ES1907999001	ES1907999	<1	<2	<2	<2	<2	<2	<2	<1	-	<1	<1	<1	<1	<1			
WCX GTY BH 004	WCX GTY BH	Normal	28/02/2019	212520-6	212520	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
WCX GTY BH 004	WCX GTY BH	Normal	15/03/2019	213632-3	213632	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
WCX GTY BH 004	WCX GTY BH	Normal	17/04/2019	215939-1	215939	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
WCX GTY BH 009	WCX GTY BH	Normal	17/12/2018	208319-2	208319	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
WCX GTY BH 009	WCX GTY BH	Normal	13/02/2019	211510-2	211510	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
WCX GTY BH 009	WCX GTY BH	Normal	11/04/2019	215594-9	215594	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
WCX GTY BH 027	OC1046	Field D	22/02/2019	212103-3	212103	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
WCX GTY BH 027	WCX GTY BH	Normal	17/01/2019	209762-4	209762	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
WCX GTY BH 027	WCX GTY BH	Normal	22/02/2019	212103-2	212103	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
WCX GTY BH 027	WCX GTY BH	Normal	16/04/2019	215934-6	215934	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
WCX GTY BH 033	OC1054	Field D	11/04/2019	215594-2	215594	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
WCX GTY BH 033	OC2031	Interlab D	19/12/2018	ES1838735001	ES1838735	<1	<2	<2	<2	<2	<2	<2	<1	-	<1	<1	<1	<1	<1			
WCX GTY BH 033	WCX GTY BH	Normal	19/12/2018	208565-2	208565	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
WCX GTY BH 033	WCX GTY BH	Normal	13/02/2019	211510-4	211510	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
WCX GTY BH 033	WCX GTY BH	Normal	11/04/2019	215594-8	215594	<1	<1	<1	<2	<1	<3	<3	<1	-	<1	<1	<1	<1	<1			
Statistical Summary																						
Number of Results	283	283	283	283	283	267	267	279	12	161	161	161	161	161	161	161	161	161	161			
Number of Detects	3	2	2	2	2	2	4	5	0	0	7	3	5	2	2	0	4	2	2			
Minimum Concentration	<1	<1	<1	<2	<1	<2	<1	<5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1			
Minimum Detect	1	4	5	23	14	37	4	2	ND	ND	1	1	7	1	ND	1	2	1	2			
Maximum Concentration	<100	<100	<100	450	270	720	<300	<100	<5	<10	<10	<16	<13	<10	<10	<170	49	49	49			
Maximum Detect	2	75	93	450	270	720	169	80	ND	ND	10	4	16	13	2	ND	170	49	49			
Average Concentration	1.5	1.8	1.8	4.6	2.5	7.4	5.2	1.7	2.5	0.82	1.1	0.86	1.1	0.94	0.84	0.82	1.9	1.1	1.1			
Median Concentration	0.5	0.5	0.5																			





Table B2\_Groundwater Analytical Data - Ecological

						Polynuclear Aromatic Hydrocarbons															
						Acenaphthylene	Acenaphthene	Anthracene	Fluorene	Phenanthrene	Fluoranthene	Benzo(a)anthracene	Benzo(k)fluoranthene	Benzo(b)fluoranthene	Benzo(e)pyrene	Benzo(a)pyrene	Benzo(a)anthracene	Indeno(1,2,3-cd)pyrene	Sum of PAHs		
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L		
EQL						1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.5	
ANZG (2018) Freshwater 80% toxicant DGVs																					
ANZG (2018) Marine water 80% toxicant DGVs																					
ANZG (2018) Marine water 95% toxicant DGVs																					
ANZG (2018) Freshwater 95% toxicant DGVs																					
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report																
MPI 3A	MPI 3A	Normal	11/12/2018	208861-1	208861	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
MPI 3A	MPI 3A	Normal	13/02/2019	211519-15	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	<1		
MPI 3A	MPI 3A	Normal	19/02/2019	211841-9	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	<1		
MPI 3A	MPI 3A	Normal	26/02/2019	212355-9	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	<1		
MPI 3A	MPI 3A	Normal	06/03/2019	212985-4	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	<1		
MPI 3A	MPI 3A	Normal	12/03/2019	213382-10	213382	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
MPI 4	MPI 4	Normal	12/12/2018	208060-8	208060	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
MPI 4	MPI 4	Normal	13/02/2019	211519-12	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	<1		
MPI 4	MPI 4	Normal	19/02/2019	211841-8	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	<1		
MPI 4	MPI 4	Normal	26/02/2019	212355-11	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	<1		
MPI 4	MPI 4	Normal	06/03/2019	212985-6	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	<10		
MPI 4	MPI 4	Normal	12/03/2019	213382-9	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	<1		
MPI 4A	MPI 4A	Normal	11/12/2018	208061-4	208061	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
MPI 4A	MPI 4A	Normal	13/02/2019	211519-7	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI 4A	MPI 4A	Normal	19/02/2019	211841-1	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	<1		
MPI 4A	MPI 4A	Normal	26/02/2019	212355-4	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	<1		
MPI 4A	MPI 4A	Normal	06/03/2019	212985-3	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	<1		
MPI 4A	MPI 4A	Normal	12/03/2019	213382-5	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	<10		
MPI 5	MPI 5	Normal	12/12/2018	208060-7	208060	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	<10		
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	<1		
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	<1		
MPI 6A	MPI 6A	Normal	06/03/2019	212985-2	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	<1		
MPI 6A	MPI 6A	Normal	12/03/2019	213382-6	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	<100		
SG-BH11-03	SG-BH11-03	Normal	17/04/2019	215939-5	215939	<1	3	<1	2	2	<1	<1	<1	<1	<1	<1	<1	<1	<1		
SG-BH11-04	SG-BH11-04	Normal	15/04/2019	215789-3	215789	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 002	WCX GTY BH	Normal	19/12/2018	208565-3	208565	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 002	WCX GTY BH	Normal	28/02/2019	212520-5	212520	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 002	WCX GTY BH	Normal	15/03/2019	213632-2	213632	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 002	WCX GTY BH	Normal	11/04/2019	215594-7	215594	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 003	WCX GTY BH	Normal	06/03/2019	213103-2	213103	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 004	QC292	Interlab D	15/03/2019	ES1907999001	ES1907999	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5		
WCX GTY BH 004	WCX GTY BH	Normal	28/02/2019	212520-6	212520	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 004	WCX GTY BH	Normal	15/03/2019	213632-3	213632	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 004	WCX GTY BH	Normal	17/04/2019	215939-1	215939	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 009d	WCX GTY BH	Normal	17/12/2018	208319-2	208319	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 009d	WCX GTY BH	Normal	13/02/2019	211510-3	211510	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 009d	WCX GTY BH	Normal	15/03/2019	213632-1	213632	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 009d	WCX GTY BH	Normal	11/04/2019	215594-10	215594	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 009s	WCX GTY BH	Normal	17/12/2018	208319-1	208319	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 009s	WCX GTY BH	Normal	13/02/2019	211510-2	211510	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 009s	WCX GTY BH	Normal	06/03/2019	212985-9	212985	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 009s	WCX GTY BH	Normal	11/04/2019	215594-9	215594	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 027	QC1046	Field D	22/02/2019	212103-3	212103	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 027	WCX GTY BH	Normal	17/01/2019	209762-4	209762	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 027	WCX GTY BH	Normal	22/02/2019	212103-2	212103	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 027	WCX GTY BH	Normal	16/04/2019	215934-6	215934	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 033	QC1054	Field D	11/04/2019	215594-2	215594	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 033	QC2031	Interlab D	19/12/2018	ES1838735001	ES1838735	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5		
WCX GTY BH 033	WCX GTY BH	Normal	19/12/2018	208565-2	208565	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 033	WCX GTY BH	Normal	13/02/2019	211510-4	211510	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
WCX GTY BH 033	WCX GTY BH	Normal	11/04/2019	215594-6	215594	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		

Statistical Summary																			
Number of Results	161	161	161	161	161	161	161	161	161	8	8	153	161	153	161	161	161	161	263
Number of Detects	0	7	0	2	6	0	0	0	0	0	0	0	0	0	0	0	0	0	11
Minimum Concentration	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1
Minimum Detect	ND	1	ND	1	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14
Maximum Concentration	<1	18	<1	2	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<100
Maximum Detect	ND	18	ND	2	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	31
Average Concentration	0.5	0.73	0.5	0.51	0.53	0.5	0.5	0.5	0.5	1	0.49	2.5	0.5	0.5	0.5	0.5	0.5	0.5	3.3
Median Concentration	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	2.5	0.5	0.5	0.5	0.5	0.5	0.5	7
Standard Deviation	0	18	0	0.12	0.18	0	0	0	0	0	0.05	0	0	0	0	0	0	0	6.5
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	161	0	0	0	0	0	0	0	161	161
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11



Table B2\_Groundwater Analytical Data - Ecological

			Phenolic Compounds														
			Phenol	p-Chlorophenol	2,4-Dichlorophenol (o-Cresol)	2,6-Dichlorophenol (m,p-Cresol)	p-Nitrophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,6-Dichlorophenol	4-Chloro-3-methylphenol	2,4,6-Trichlorophenol	2,4,5-Trichlorophenol	Pentachlorophenol	Sum of Phenols (halogenated)	Sum of Phenols (non-halogenated)	Sum of Phenols
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EDL			1	1	1	1	1	1	1	1	1	1	1	1	1	1	50
ANZG (2018) Freshwater 80% toxicant DGVs			1200	870				270				95			27		
ANZG (2018) Marine water 80% toxicant DGVs			720												55		
ANZG (2018) Marine water 95% toxicant DGVs															23		
ANZG (2018) Freshwater 95% toxicant DGVs			320	490			160					20			10		
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report												
MPE 2	QC1050	Field D	12/03/2019	213382-3	213382	-	-	-	-	-	-	-	-	-	-	-	-
MPE 21	MPE 21	Normal	12/12/2018	208060-6	208060	-	-	-	-	-	-	-	-	-	-	-	<50
MPE 21	MPE 21	Normal	12/02/2019	211437-10	211437	-	-	-	-	-	-	-	-	-	-	-	-
MPE 21	MPE 21	Normal	18/02/2019	211785-11	211785	-	-	-	-	-	-	-	-	-	-	-	-
MPE 21	MPE 21	Normal	25/02/2019	212251-11	212251	-	-	-	-	-	-	-	-	-	-	-	-
MPE 21	MPE 21	Normal	4/03/2019	212783-12	212783	-	-	-	-	-	-	-	-	-	-	-	-
MPE 21	MPE 21	Normal	11/03/2019	213297-11	213297	-	-	-	-	-	-	-	-	-	-	-	-
MPE 3	MPE 3	Normal	11/12/2018	208061-3	208061	-	-	-	-	-	-	-	-	-	-	-	<50
MPE 3	MPE 3	Normal	13/02/2019	211519-9	211519	-	-	-	-	-	-	-	-	-	-	-	-
MPE 3	MPE 3	Normal	19/02/2019	211841-6	211841	-	-	-	-	-	-	-	-	-	-	-	-
MPE 3	MPE 3	Normal	26/02/2019	212355-8	212355	-	-	-	-	-	-	-	-	-	-	-	-
MPE 3	MPE 3	Normal	6/03/2019	212985-1	212985	-	-	-	-	-	-	-	-	-	-	-	-
MPE 3	MPE 3	Normal	12/03/2019	213382-8	213382	-	-	-	-	-	-	-	-	-	-	-	-
MPE 4	MPE 4	Normal	13/02/2019	211519-8	211519	-	-	-	-	-	-	-	-	-	-	-	-
MPE 4	MPE 4	Normal	19/02/2019	211841-4	211841	-	-	-	-	-	-	-	-	-	-	-	-
MPE 4	MPE 4	Normal	26/02/2019	212355-6	212355	-	-	-	-	-	-	-	-	-	-	-	-
MPE 4	MPE 4	Normal	5/03/2019	212782-8	212782	-	-	-	-	-	-	-	-	-	-	-	-
MPE 4	MPE 4	Normal	12/03/2019	213382-7	213382	-	-	-	-	-	-	-	-	-	-	-	-
MPE 5	MPE 5	Normal	11/12/2018	208061-7	208061	-	-	-	-	-	-	-	-	-	-	-	<50
MPE 5	MPE 5	Normal	13/02/2019	211519-5	211519	-	-	-	-	-	-	-	-	-	-	-	-
MPE 5	MPE 5	Normal	19/02/2019	211841-12	211841	-	-	-	-	-	-	-	-	-	-	-	-
MPE 5	MPE 5	Normal	26/02/2019	212355-1	212355	-	-	-	-	-	-	-	-	-	-	-	-
MPE 5	MPE 5	Normal	5/03/2019	212782-4	212782	-	-	-	-	-	-	-	-	-	-	-	-
MPE 5	MPE 5	Normal	11/03/2019	213297-18	213297	-	-	-	-	-	-	-	-	-	-	-	-
MPE 5A	MPE 5A	Normal	11/12/2018	208061-5	208061	-	-	-	-	-	-	-	-	-	-	-	<50
MPE 5A	MPE 5A	Normal	13/02/2019	211519-6	211519	-	-	-	-	-	-	-	-	-	-	-	-
MPE 5A	MPE 5A	Normal	19/02/2019	211841-9	211841	-	-	-	-	-	-	-	-	-	-	-	-
MPE 5A	MPE 5A	Normal	26/02/2019	212355-3	212355	-	-	-	-	-	-	-	-	-	-	-	-
MPE 5A	MPE 5A	Normal	5/03/2019	212782-6	212782	-	-	-	-	-	-	-	-	-	-	-	-
MPE 5A	MPE 5A	Normal	12/03/2019	213382-4	213382	-	-	-	-	-	-	-	-	-	-	-	-
MPE 6	MPE 6	Normal	11/12/2018	208061-8	208061	-	-	-	-	-	-	-	-	-	-	-	<50
MPE 6	MPE 6	Normal	13/02/2019	211519-2	211519	-	-	-	-	-	-	-	-	-	-	-	-
MPE 6	MPE 6	Normal	19/02/2019	211785-14	211785	-	-	-	-	-	-	-	-	-	-	-	-
MPE 6	MPE 6	Normal	25/02/2019	212251-14	212251	-	-	-	-	-	-	-	-	-	-	-	-
MPE 6	MPE 6	Normal	5/03/2019	212782-1	212782	-	-	-	-	-	-	-	-	-	-	-	-
MPE 6	MPE 6	Normal	11/03/2019	213297-14	213297	-	-	-	-	-	-	-	-	-	-	-	-
MPE 6	QC1049	Field D	11/03/2019	213297-15	213297	-	-	-	-	-	-	-	-	-	-	-	-
MPE 7	MPE 7	Normal	12/12/2018	208060-2	208060	-	-	-	-	-	-	-	-	-	-	-	<50
MPE 7	MPE 7	Normal	12/02/2019	211437-8	211437	-	-	-	-	-	-	-	-	-	-	-	-
MPE 7	MPE 7	Normal	18/02/2019	211785-9	211785	-	-	-	-	-	-	-	-	-	-	-	-
MPE 7	MPE 7	Normal	25/02/2019	212251-10	212251	-	-	-	-	-	-	-	-	-	-	-	-
MPE 7	MPE 7	Normal	4/03/2019	212783-10	212783	-	-	-	-	-	-	-	-	-	-	-	-
MPE 7	MPE 7	Normal	11/03/2019	213297-19	213297	-	-	-	-	-	-	-	-	-	-	-	-
MPE 8	MPE 8	Normal	12/12/2018	208060-1	208060	-	-	-	-	-	-	-	-	-	-	-	<50
MPE 8	MPE 8	Normal	12/02/2019	211437-6	211437	-	-	-	-	-	-	-	-	-	-	-	-
MPE 8	MPE 8	Normal	18/02/2019	211785-5	211785	-	-	-	-	-	-	-	-	-	-	-	-
MPE 8	MPE 8	Normal	25/02/2019	212251-5	212251	-	-	-	-	-	-	-	-	-	-	-	-
MPE 8	MPE 8	Normal	4/03/2019	212783-6	212783	-	-	-	-	-	-	-	-	-	-	-	-
MPE 8	MPE 8	Normal	11/03/2019	213297-5	213297	-	-	-	-	-	-	-	-	-	-	-	-
MPE 8	QC1046	Field D	25/02/2019	212251-6	212251	-	-	-	-	-	-	-	-	-	-	-	-
MPE 9	MPE 9	Normal	12/12/2018	208060-5	208060	-	-	-	-	-	-	-	-	-	-	-	<50
MPE 9	MPE 9	Normal	12/02/2019	211437-4	211437	-	-	-	-	-	-	-	-	-	-	-	-
MPE 9	MPE 9	Normal	18/02/2019	211785-4	211785	-	-	-	-	-	-	-	-	-	-	-	-
MPE 9	MPE 9	Normal	25/02/2019	212251-4	212251	-	-	-	-	-	-	-	-	-	-	-	-
MPE 9	MPE 9	Normal	4/03/2019	212783-5	212783	-	-	-	-	-	-	-	-	-	-	-	-
MPE 9	MPE 9	Normal	11/03/2019	213297-4	213297	-	-	-	-	-	-	-	-	-	-	-	-
MPI 10	MPI 10	Normal	11/12/2018	208061-6	208061	-	-	-	-	-	-	-	-	-	-	-	<50
MPI 10	MPI 10	Normal	13/02/2019	211519-4	211519	-	-	-	-	-	-	-	-	-	-	-	-
MPI 10	MPI 10	Normal	19/02/2019	211841-11	211841	-	-	-	-	-	-	-	-	-	-	-	-
MPI 10	MPI 10	Normal	26/02/2019	212355-2	212355	-	-	-	-	-	-	-	-	-	-	-	-
MPI 10	MPI 10	Normal	5/03/2019	212782-5	212782	-	-	-	-	-	-	-	-	-	-	-	-
MPI 10	MPI 10	Normal	11/03/2019	213297-19	213297	-	-	-	-	-	-	-	-	-	-	-	-
MPI 12	MPI 12	Normal	11/12/2018	208061-9	208061	-	-	-	-	-	-	-	-	-	-	-	<50
MPI 12	MPI 12	Normal	13/02/2019	211519-1	211519	-	-	-	-	-	-	-	-	-	-	-	-
MPI 12	MPI 12	Normal	18/02/2019	211785-13	211785	-	-	-	-	-	-	-	-	-	-	-	-
MPI 12	MPI 12	Normal	28/02/2019	212520-3	212520	-	-	-	-	-	-	-	-	-	-	-	-
MPI 12	MPI 12	Normal	5/03/2019	212782-2	212782	-	-	-	-	-	-	-	-	-	-	-	-
MPI 12	MPI 12	Normal	11/03/2019	213297-13	213297	-	-	-	-	-	-	-	-	-	-	-	-
MPI 12	QC1023	Field D	11/12/2018	208061-10	208061	-	-	-	-	-	-	-	-	-	-	-	<50
MPI 13	MPI 13	Normal	11/12/2018	208061-12	208061	-	-	-	-	-	-	-	-	-	-	-	<50
MPI 13	MPI 13	Normal	12/02/2019	211437-11	211437	-	-	-	-	-	-	-	-	-	-	-	-
MPI 13	MPI 13	Normal	18/02/2019	211785-12	211785	-	-	-	-	-	-	-	-	-	-	-	-
MPI 13	MPI 13	Normal	26/02/2019	212251-2	212251	-	-	-	-	-	-	-	-	-	-	-	-
MPI 13	MPI 13	Normal	4/03/2019	212783-11	212783	-	-	-	-	-	-	-	-	-	-	-	-
MPI 13	MPI 13	Normal	11/03/2019	213297-12	213297	-	-	-	-								

Table B2\_Groundwater Analytical Data - Ecological

						Phenolic Compounds																			
						Phenol	p-Chlorophenol	2,4-Methylphenol (o-Cresol)	2,6-Methylphenol (m,p-Cresol)	2-Nitrophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,6-Dichlorophenol	4-Chloro-3-methylphenol	2,4,6-Trichlorophenol	2,4,6-Trichlorophenol	Pentachlorophenol	Sum of Phenols (halogenated)	Sum of Phenols (non-halogenated)	Sum of Phenols					
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L					
EOL						1	1	1	2	1	1	1	1	1	1	2					50				
ANZG (2018) Freshwater 80% toxicant DGVs						1200	870				270				95		27								
ANZG (2018) Marine water 80% toxicant DGVs						720											55								
ANZG (2018) Marine water 95% toxicant DGVs						420										22									
ANZG (2018) Freshwater 95% toxicant DGVs						320	490			160				20		10									
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report																				
MPI 3A	MPI 3A	Normal	11/12/2018	208061-1	208061	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
MPI 3A	MPI 3A	Normal	13/02/2019	211519-15	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
MPI 3A	MPI 3A	Normal	19/02/2019	211841-9	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
MPI 3A	MPI 3A	Normal	26/02/2019	212355-9	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
MPI 3A	MPI 3A	Normal	6/03/2019	212985-4	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
MPI 3A	MPI 3A	Normal	12/03/2019	213382-10	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
MPI 4	MPI 4	Normal	12/12/2018	208060-8	208060	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
MPI 4	MPI 4	Normal	13/02/2019	211519-12	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
MPI 4	MPI 4	Normal	19/02/2019	211841-8	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
MPI 4	MPI 4	Normal	26/02/2019	212355-11	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
MPI 4	MPI 4	Normal	6/03/2019	212985-6	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
MPI 4	MPI 4	Normal	12/03/2019	213382-9	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
MPI 4A	MPI 4A	Normal	11/12/2018	208061-4	208061	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
MPI 4A	MPI 4A	Normal	13/02/2019	211519-7	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
MPI 4A	MPI 4A	Normal	19/02/2019	211841-1	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
MPI 4A	MPI 4A	Normal	26/02/2019	212355-4	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
MPI 4A	MPI 4A	Normal	5/03/2019	212782-7	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
MPI 4A	MPI 4A	Normal	12/03/2019	213382-5	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
MPI 5	MPI 5	Normal	12/12/2018	208060-7	208060	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
MPI 6A	MPI 6A	Normal	5/03/2019	212782-9	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
MPI 6A	MPI 6A	Normal	12/03/2019	213382-6	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 002	WCX GTY BH	Normal	19/12/2018	208565-1	208565	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 002	WCX GTY BH	Normal	28/02/2019	212520-5	212520	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 002	WCX GTY BH	Normal	15/03/2019	213632-2	213632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 002	WCX GTY BH	Normal	11/04/2019	215594-7	215594	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 003	WCX GTY BH	Normal	8/03/2019	213103-2	213103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 004	QC2062	Interlab D	15/03/2019	ES1907999001	ES1907999	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<2	<8	<4	<50	<50				
WCX GTY BH 004	WCX GTY BH	Normal	28/02/2019	212520-6	212520	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 004	WCX GTY BH	Normal	15/03/2019	213632-3	213632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 004	WCX GTY BH	Normal	17/04/2019	215939-1	215939	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 009d	WCX GTY BH	Normal	17/12/2018	208319-2	208319	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 009d	WCX GTY BH	Normal	13/02/2019	211510-3	211510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 009d	WCX GTY BH	Normal	15/03/2019	213632-1	213632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 009d	WCX GTY BH	Normal	11/04/2019	215594-10	215594	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 009s	WCX GTY BH	Normal	17/12/2018	208319-1	208319	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 009s	WCX GTY BH	Normal	13/02/2019	211510-2	211510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 009s	WCX GTY BH	Normal	6/03/2019	212985-9	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 009s	WCX GTY BH	Normal	11/04/2019	215594-9	215594	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 027	QC1046	Field D	22/02/2019	212103-3	212103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 027	WCX GTY BH	Normal	17/01/2019	209762-4	209762	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 027	WCX GTY BH	Normal	22/02/2019	212103-2	212103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 027	WCX GTY BH	Normal	16/04/2019	215934-6	215934	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 033	QC1054	Field D	11/04/2019	215594-2	215594	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 033	QC2031	Interlab D	19/12/2018	ES1838735001	ES1838735	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<2	<8	<4	<50	<50				
WCX GTY BH 033	WCX GTY BH	Normal	19/12/2018	208565-2	208565	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 033	WCX GTY BH	Normal	13/02/2019	211510-4	211510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
WCX GTY BH 033	WCX GTY BH	Normal	11/04/2019	215594-6	215594	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
<b>Statistical Summary</b>																									
Number of Results						8	8	8	8	8	8	8	8	8	8	8	6	6	154						
Number of Detects						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3		
Minimum Concentration						<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<2	<8	<4	<50					
Minimum Detect						ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	70	
Maximum Concentration						<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<2	<8	<4	200					
Maximum Detect						ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	200	
Average Concentration						0.5	0.5	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	1	4	2	27						
Median Concentration						0.5	0.5	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	1	4	2	25						
Standard Deviation						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	
Number of Guideline Exceedances						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of Guideline Exceedances (Detects Only)						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Table B2\_Groundwater Analytical Data - Ecological

						Halogenated Aromatic Compounds																							
						Bromobenzene	Chlorobenzene	1-Chlorotoluene	4-Chlorotoluene	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	Bromochloromethane	Dichlorodifluoromethane (Freon 12)	Chloromethane	Vinyl chloride	Bromomethane	Chloroethane	Trichlorofluoromethane (Freon 11)	1,1-Dichloroethane	Iodomethane	1,1-Dichloroethane	1,1,2-Dichloroethane	trans-1,2-Dichloroethane			
						ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L		
EOL						1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
ANZG (2018) Freshwater 80% toxicant DGVs										270	520	100	30	300															
ANZG (2018) Marine water 80% toxicant DGVs																													
ANZG (2018) Marine water 95% toxicant DGVs																													
ANZG (2018) Freshwater 95% toxicant DGVs										160	260	60	10	170															
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report																								
MPE 2	QC1040	Field D	12/02/2019	213382-3	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 21	MPE 21	Normal	12/02/2019	21437-10	21437	<1	2	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1			
MPE 21	MPE 21	Normal	18/02/2019	211785-11	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 21	MPE 21	Normal	25/02/2019	212251-11	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 21	MPE 21	Normal	4/03/2019	212783-12	212783	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 21	MPE 21	Normal	11/03/2019	213297-11	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 3	MPE 3	Normal	11/12/2018	208061-3	208061	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1			
MPE 3	MPE 3	Normal	13/02/2019	211519-9	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 3	MPE 3	Normal	19/02/2019	211841-6	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 3	MPE 3	Normal	26/02/2019	212355-8	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 3	MPE 3	Normal	6/03/2019	212985-7	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 3	MPE 3	Normal	12/03/2019	213382-8	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 4	MPE 4	Normal	13/02/2019	211519-8	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 4	MPE 4	Normal	19/02/2019	211841-4	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 4	MPE 4	Normal	26/02/2019	212355-6	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 4	MPE 4	Normal	6/03/2019	212782-9	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 4	MPE 4	Normal	12/03/2019	213382-7	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 5	MPE 5	Normal	11/12/2018	208061-7	208061	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1			
MPE 5	MPE 5	Normal	13/02/2019	211519-5	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 5	MPE 5	Normal	19/02/2019	211841-12	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 5	MPE 5	Normal	26/02/2019	212355-1	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 5	MPE 5	Normal	6/03/2019	212782-4	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 5	MPE 5	Normal	11/03/2019	213297-18	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 5A	MPE 5A	Normal	11/12/2018	208061-5	208061	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1			
MPE 5A	MPE 5A	Normal	13/02/2019	211519-6	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 5A	MPE 5A	Normal	19/02/2019	211841-2	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 5A	MPE 5A	Normal	26/02/2019	212355-3	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 5A	MPE 5A	Normal	6/03/2019	212782-6	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 5A	MPE 5A	Normal	12/03/2019	213382-4	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 6	MPE 6	Normal	11/12/2018	208061-8	208061	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1			
MPE 6	MPE 6	Normal	13/02/2019	211519-2	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 6	MPE 6	Normal	19/02/2019	211785-14	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 6	MPE 6	Normal	25/02/2019	212251-14	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 6	MPE 6	Normal	5/03/2019	212782-1	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 6	MPE 6	Normal	11/03/2019	213297-14	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 6	QC1049	Field D	11/03/2019	213297-15	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 7	MPE 7	Normal	12/02/2019	208060-2	208060	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1			
MPE 7	MPE 7	Normal	18/02/2019	211785-9	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 7	MPE 7	Normal	25/02/2019	212251-10	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 7	MPE 7	Normal	4/03/2019	212783-10	212783	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 7	MPE 7	Normal	11/03/2019	213297-10	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 8	MPE 8	Normal	12/12/2018	208060-1	208060	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1			
MPE 8	MPE 8	Normal	12/02/2019	211437-6	211437	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 8	MPE 8	Normal	18/02/2019	211785-5	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 8	MPE 8	Normal	25/02/2019	212251-5	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 8	MPE 8	Normal	4/03/2019	212783-6	212783	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 8	MPE 8	Normal	11/03/2019	213297-5	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 8	QC1046	Field D	25/02/2019	212251-6	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 9	MPE 9	Normal	12/12/2018	208060-5	208060	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1			
MPE 9	MPE 9	Normal	12/02/2019	211437-4	211437	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 9	MPE 9	Normal	18/02/2019	211785-4	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 9	MPE 9	Normal	25/02/2019	212251-4	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 9	MPE 9	Normal	4/03/2019	212783-5	212783	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 9	MPE 9	Normal	11/03/2019	213297-4	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI 10	MPI 10	Normal	11/12/2018	208061-6	208061	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1			
MPI 10	MPI 10	Normal	13/																										

Table B2\_Groundwater Analytical Data - Ecological

		Halogenated Aromatic Compounds																					
		Bromobenzene	Chlorobenzene	o-Chlorotoluene	p-Chlorotoluene	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	1,2,3-Trichlorobenzene	1,2,4,7-Trichlorobenzene	Bromochloromethane	Dichlorodifluoromethane (Freon 12)	Chloromethane	Vinyl chloride	Bromomethane	Chloroethane	Trichlorofluoromethane (Freon 11)	1,1-Dichloroethane	Iodomethane	1,1-Dichloroethane	cis-1,2-Dichloroethane	trans-1,2-Dichloroethane	
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EOL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ANZG (2018) Freshwater 80% toxicant DGVs						270	520	100	30	300													
ANZG (2018) Marine water 80% toxicant DGVs										240													
ANZG (2018) Marine water 95% toxicant DGVs										30													
ANZG (2018) Freshwater 95% toxicant DGVs						160	260	60	10	170													
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report																		
MPI 3A	MPI 3A	Normal	11/11/2018	208061-1	208061	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
MPI 3A	MPI 3A	Normal	13/02/2019	211519-15	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI 3A	MPI 3A	Normal	19/02/2019	211841-9	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI 3A	MPI 3A	Normal	26/02/2019	212355-9	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI 3A	MPI 3A	Normal	6/03/2019	212985-4	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI 3A	MPI 3A	Normal	12/03/2019	213382-10	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI 4	MPI 4	Normal	12/12/2018	208060-8	208060	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
MPI 4	MPI 4	Normal	13/02/2019	211519-12	211519	-	-	-	-	-	-	-	-	-	<10	<10	<10	<10	<10	<10	<1	<1	<1
MPI 4	MPI 4	Normal	19/02/2019	211841-8	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI 4	MPI 4	Normal	26/02/2019	212355-11	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI 4	MPI 4	Normal	6/03/2019	212985-6	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI 4	MPI 4	Normal	12/03/2019	213382-9	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI 4A	MPI 4A	Normal	11/12/2018	208061-4	208061	<1	1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
MPI 4A	MPI 4A	Normal	13/02/2019	211519-7	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI 4A	MPI 4A	Normal	19/02/2019	211841-1	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI 4A	MPI 4A	Normal	26/02/2019	212355-4	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI 4A	MPI 4A	Normal	6/03/2019	212985-5	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI 4A	MPI 4A	Normal	12/03/2019	213382-5	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI 5	MPI 5	Normal	12/12/2018	208060-7	208060	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI 6A	MPI 6A	Normal	6/03/2019	212985-2	212982	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI 6A	MPI 6A	Normal	12/03/2019	213382-6	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	<1	3	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	<1	5	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 002	WCX GTY BH	Normal	19/12/2018	208565-1	208565	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 002	WCX GTY BH	Normal	28/02/2019	212520-5	212520	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 002	WCX GTY BH	Normal	15/03/2019	213632-2	213632	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 002	WCX GTY BH	Normal	11/04/2019	215594-7	215594	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 003	WCX GTY BH	Normal	8/03/2019	213103-2	213103	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 004	OC2052	Interlab D	15/03/2018	ES1907999001	ES1907999	<5	<5	<5	<5	<5	<5	<5	<5	<5	<50	<50	<50	<50	<50	<50	<5	<5	<5
WCX GTY BH 004	WCX GTY BH	Normal	28/02/2019	212520-6	212520	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 004	WCX GTY BH	Normal	15/03/2019	213632-3	213632	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 004	WCX GTY BH	Normal	17/04/2019	215939-1	215939	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 009d	WCX GTY BH	Normal	17/12/2018	208319-2	208319	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 009d	WCX GTY BH	Normal	13/02/2019	211510-2	211510	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 009d	WCX GTY BH	Normal	13/02/2019	211510-3	211510	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 009d	WCX GTY BH	Normal	15/03/2019	213632-1	213632	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 009d	WCX GTY BH	Normal	11/04/2019	215594-10	215594	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 009s	WCX GTY BH	Normal	17/12/2018	208319-1	208319	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 009s	WCX GTY BH	Normal	13/02/2019	211510-2	211510	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 009s	WCX GTY BH	Normal	13/02/2019	211510-3	211510	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 009s	WCX GTY BH	Normal	11/04/2019	215594-9	215594	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 027	OC1046	Field D	22/02/2019	212103-3	212103	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 027	WCX GTY BH	Normal	17/01/2019	209762-4	209762	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 027	WCX GTY BH	Normal	22/02/2019	212103-2	212103	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 027	WCX GTY BH	Normal	16/04/2019	215594-6	215594	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 033	OC1054	Field D	11/04/2019	215594-2	215594	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 033	OC2031	Interlab D	19/12/2018	ES1838735001	ES1838735	<5	<5	<5	<5	<5	<5	<5	<5	<5	<50	<50	<50	<50	<50	<50	<5	<5	<5
WCX GTY BH 033	WCX GTY BH	Normal	19/12/2018	208565-2	208565	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1	<1	<1
WCX GTY BH 033	WCX GTY BH	Normal	13/0																				

















Table B2\_Groundwater Analytical Data - Ecological

						Organochlorine Pesticides (OC)																									
						Aldrin	Dieldrin	Aldrin + Dieldrin	γ-BHC	β-BHC	α-BHC	γ-BHC (Lindane)	δ-Chlordane	trans-Chlordane	Chlordane	DDD	DDE	DDT	DDT+DDE+DDD	Endosulfan 1	Endosulfan 2	Endosulfan sulfate	Ererin	Ererin aldehyde	Ererin ketone	Heptachlor	Heptachlor epoxide	Hexachlorobenzene (HCB)			
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L		
EOL						0.2	0.2	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
ANZG (2018) Freshwater 80% toxicant DGVs															0.27			0.04		0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
ANZG (2018) Marine water 80% toxicant DGVs																															0.08
ANZG (2018) Marine water 95% toxicant DGVs																															0.08
ANZG (2018) Freshwater 95% toxicant DGVs												0.2			0.08			0.01												0.08	
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	Aldrin	Dieldrin	Aldrin + Dieldrin	γ-BHC	β-BHC	α-BHC	γ-BHC (Lindane)	δ-Chlordane	trans-Chlordane	Chlordane	DDD	DDE	DDT	DDT+DDE+DDD	Endosulfan 1	Endosulfan 2	Endosulfan sulfate	Ererin	Ererin aldehyde	Ererin ketone	Heptachlor	Heptachlor epoxide	Hexachlorobenzene (HCB)			
MPI 3A	MPI 3A	Normal	11/12/2018	212961-1	212961	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
MPI 3A	MPI 3A	Normal	13/02/2019	211519-15	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI 3A	MPI 3A	Normal	19/02/2019	211841-9	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI 3A	MPI 3A	Normal	26/02/2019	212355-9	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI 3A	MPI 3A	Normal	6/03/2019	212985-4	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI 3A	MPI 3A	Normal	12/03/2019	213382-10	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI 4	MPI 4	Normal	12/12/2018	208060-8	208060	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
MPI 4	MPI 4	Normal	13/02/2019	211519-12	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI 4	MPI 4	Normal	19/02/2019	211841-8	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI 4	MPI 4	Normal	26/02/2019	212355-11	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI 4	MPI 4	Normal	6/03/2019	212985-6	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI 4	MPI 4	Normal	12/03/2019	213382-9	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI 4A	MPI 4A	Normal	11/12/2018	208061-4	208061	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
MPI 4A	MPI 4A	Normal	13/02/2019	211519-7	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI 4A	MPI 4A	Normal	19/02/2019	211841-1	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI 4A	MPI 4A	Normal	26/02/2019	212355-4	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI 4A	MPI 4A	Normal	6/03/2019	212985-7	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI 4A	MPI 4A	Normal	12/03/2019	213382-5	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI 5	MPI 5	Normal	12/12/2018	208060-7	208060	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI 6A	MPI 6A	Normal	5/03/2019	212782-9	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI 6A	MPI 6A	Normal	12/03/2019	213382-6	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
Unknown	Unknown	Normal	15/12/2018	208565-3	208565	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
WCX GTY BH 002	WCX GTY BH	Normal	19/12/2018	208565-1	208565	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
WCX GTY BH 002	WCX GTY BH	Normal	28/02/2019	212520-5	212520	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
WCX GTY BH 002	WCX GTY BH	Normal	15/03/2019	213632-2	213632	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
WCX GTY BH 002	WCX GTY BH	Normal	11/04/2019	215594-7	215594	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
WCX GTY BH 003	WCX GTY BH	Normal	8/03/2019	213103-2	213103	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
WCX GTY BH 004	QC2052	Interlab D	15/03/2019	ES1907999001	ES1907999	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
WCX GTY BH 004	WCX GTY BH	Normal	28/02/2019	212520-6	212520	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
WCX GTY BH 004	WCX GTY BH	Normal	15/03/2019	213632-3	213632	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
WCX GTY BH 004	WCX GTY BH	Normal	17/04/2019	215939-1	215939	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
WCX GTY BH 009d	WCX GTY BH	Normal	17/12/2018	208319-2	208319	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
WCX GTY BH 009d	WCX GTY BH	Normal	13/02/2019	211510-3	211510	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
WCX GTY BH 009d	WCX GTY BH	Normal	15/03/2019	213632-1	213632	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
WCX GTY BH 009d	WCX GTY BH	Normal	11/04/2019	215594-10	215594	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
WCX GTY BH 009s	WCX GTY BH	Normal	17/12/2018	208319-1	208319	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
WCX GTY BH 009s	WCX GTY BH	Normal	13/02/2019	211510-2	211510	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<																			





Table B2\_Groundwater Analytical Data - Ecological

						Organophosphorus Pesticides (OP)																		Solvents						
						Methoxychlor	Azinphos Methyl	Bromophos-ethyl	Carbofenthothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenamiphos	Fenitrothion	Fenitrothion	Fenitrothion	Malathion	Monocrotophos	Parathion	Parathion-methyl	Phosphos-ethyl	Prothiophos	Rotenone	Cylohexane	
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
EOL						0.2	0.2	0.5	0.5	0.2	0.2	0.5	0.2	0.5	0.2	0.5	0.2	0.5	0.2	0.5	0.2	0.5	0.2	0.5	0.2	0.5	0.2	0.5	0.2	1
ANZG (2018) Freshwater 80% toxicant DGVs						0.11				0.2				0.08		0.3			0.4		1.1		0.04		2	0.5	0.5	0.2		
ANZG (2018) Marine water 80% toxicant DGVs										0.03																				
ANZG (2018) Marine water 95% toxicant DGVs										0.008																				
ANZG (2018) Freshwater 95% toxicant DGVs						0.02				0.01				0.01		0.15			0.2		0.05		0.004							
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report																									
MPI 3A	MPI 3A	Normal	11/12/2018	208061-1	208061	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<1
MPI 3A	MPI 3A	Normal	13/02/2019	211519-15	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 3A	MPI 3A	Normal	19/02/2019	211841-9	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 3A	MPI 3A	Normal	26/02/2019	212355-9	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 3A	MPI 3A	Normal	6/03/2019	212985-4	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 3A	MPI 3A	Normal	12/03/2019	213382-10	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4	MPI 4	Normal	12/12/2018	208060-8	208060	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<1		
MPI 4	MPI 4	Normal	13/02/2019	211519-12	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4	MPI 4	Normal	19/02/2019	211841-8	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4	MPI 4	Normal	26/02/2019	212355-11	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4	MPI 4	Normal	6/03/2019	212985-6	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4	MPI 4	Normal	12/03/2019	213382-9	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4A	MPI 4A	Normal	11/12/2018	208061-4	208061	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<1		
MPI 4A	MPI 4A	Normal	13/02/2019	211519-7	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4A	MPI 4A	Normal	19/02/2019	211841-1	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4A	MPI 4A	Normal	26/02/2019	212355-4	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4A	MPI 4A	Normal	6/03/2019	212985-7	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4A	MPI 4A	Normal	12/03/2019	213382-5	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 5	MPI 5	Normal	12/12/2018	208060-7	208060	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<1		
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 6A	MPI 6A	Normal	6/03/2019	212782-9	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 6A	MPI 6A	Normal	12/03/2019	213382-6	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<1		
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<1		
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<1		
WCX GTY BH 002	WCX GTY BH	Normal	19/12/2018	208565-1	208565	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<1		
WCX GTY BH 002	WCX GTY BH	Normal	26/02/2019	212520-5	212520	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<1		
WCX GTY BH 002	WCX GTY BH	Normal	15/03/2019	213632-2	213632	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<1		
WCX GTY BH 002	WCX GTY BH	Normal	11/04/2019	215594-7	215594	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<1		
WCX GTY BH 003	WCX GTY BH	Normal	8/03/2019	213103-2	213103	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<1		
WCX GTY BH 004	QC2052 Interlab D	Normal	13/03/2019	ES1907999001	ES1907999	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<2	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	
WCX GTY BH 004	WCX GTY BH	Normal	26/02/2019	212520-6	212520	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<1		
WCX GTY BH 004	WCX GTY BH	Normal	15/03/2019	213632-3	213632	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<1		
WCX GTY BH 004	WCX GTY BH	Normal	17/04/2019	215939-1	215939	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<1		
WCX GTY BH 009d	WCX GTY BH	Normal	17/12/2018	208319-2	208319	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<1		
WCX GTY BH 009d	WCX GTY BH	Normal	13/02/2019	211510-2	211510	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<1		
WCX GTY BH 009d	WCX GTY BH	Normal	13/03/2019	211510-3	211510	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<1		
WCX GTY BH 009d	WCX GTY BH	Normal	15/03/2019	213632-1	213632	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<1		
WCX GTY BH 009d	WCX GTY BH	Normal	11/04/2019	215594-10	215594	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<1		
WCX GTY BH 009e	WCX GTY BH	Normal	17/12/2018	208319-1	208319	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<1		
WCX GTY BH 009e	WCX GTY BH	Normal	13/02/2019	211510-2	211510	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<1		
WCX GTY BH 009e	WCX GTY BH	Normal	6/03/2019	212985-9	212985	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<1		
WCX GTY BH 009e	WCX GTY BH	Normal	11/04/2019	215594-9	215594	<0.2																								







Table B2\_Groundwater Analytical Data - Ecological

							Ionic Balance
							%
EOL							0.01
ANZG (2018) Freshwater 80% toxicant DGVs							
ANZG (2018) Marine water 80% toxicant DGVs							
ANZG (2018) Marine water 95% toxicant DGVs							
ANZG (2018) Freshwater 95% toxicant DGVs							
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report		
34 TL3	34 TL3	Normal	13/02/2019	211519-11	211519	-	
34 TL3	34 TL3	Normal	19/02/2019	211841-5	211841	-	
34 TL3	34 TL3	Normal	26/02/2019	212355-7	212355	-	
34 TL3	34 TL3	Normal	6/03/2019	212985-2	212985	-	
34 TL3	34 TL3	Normal	12/03/2019	213382-13	213382	-	
34 TL3	34 TL3	Normal	16/04/2019	215934-2	215934	-	
34 TL3	QC2054	Interlab_D	16/04/2019	ES1912221001	ES1912221	10.3	
GW100s	GW100s	Normal	21/02/2019	212109-3	212109	-	
GW100s	GW100s	Normal	8/03/2019	213103-3	213103	-	
GW100s	GW100s	Normal	11/04/2019	215934-8	215934	-	
GW101	GW101	Normal	9/01/2019	209135-1	209135	-	
GW101	GW101	Normal	11/02/2019	211335-4	211335	-	
GW101	GW101	Normal	8/03/2019	213103-1	213103	-	
GW101	QC2039	Interlab_D	11/02/2019	ES1904415001	ES1904415	2.92	
GW102	GW102	Normal	9/01/2019	209135-2	209135	-	
GW102	GW102	Normal	11/02/2019	211335-6	211335	-	
GW102	GW102	Normal	8/03/2019	213103-5	213103	-	
GW102	QC2051	Interlab_D	17/04/2019	ES19939-8	ES19939	-	
GW102	QC2051	Interlab_D	8/03/2019	ES1907278001	ES1907278	-	
GW103	GW103	Normal	21/02/2019	212109-4	212109	-	
GW103	GW103	Normal	8/03/2019	213103-4	213103	-	
GW103	GW103	Normal	17/04/2019	215939-6	215939	-	
GW103	QC1055	Field_D	17/04/2019	215939-4	215939	-	
GW104	GW104	Normal	20/12/2018	208653-5	208653	-	
GW104	GW104	Normal	7/02/2019	211141-7	211141	-	
GW104	GW104	Normal	10/04/2019	215496-4	215496	-	
GW10s	GW10S	Normal	10/01/2019	209274-1	209274	-	
GW10s	GW10s	Normal	14/02/2019	211612-1	211612	-	
GW10s	GW10s	Normal	8/03/2019	213103-7	213103	-	
GW10s	GW10s	Normal	9/04/2019	215423-2	215423	-	
GW10s	QC2053	Interlab_D	9/04/2019	ES1911607001	ES1911607	-	
GW11d	GW11d	Normal	1/03/2019	212548-1	212548	-	
GW11d	GW11d	Normal	16/04/2019	215934-8	215934	-	
GW11s	GW11s	Normal	24/01/2019	210231-1	210231	-	
GW11s	GW11s	Normal	11/02/2019	211335-2	211335	-	
GW11s	GW11s	Normal	13/03/2019	213502-6	213502	-	
GW11s	GW11s	Normal	16/04/2019	215934-7	215934	-	
GW11s	QC1042	Field_D	11/02/2019	211335-3	211335	-	
GW12s	GW12S	Normal	24/01/2019	210277-3	210277	-	
GW13d	GW13d	Normal	20/12/2018	208653-2	208653	-	
GW13d	GW13d	Normal	8/02/2019	211141-9	211141	-	
GW13d	GW13d	Normal	11/04/2019	215934-5	215934	-	
GW13s	GW13s	Normal	20/12/2018	208653-1	208653	-	
GW13s	GW13s	Normal	8/02/2019	211141-8	211141	-	
GW13s	GW13s	Normal	11/04/2019	215934-4	215934	-	
GW14d	GW14d	Normal	20/12/2018	208653-6	208653	-	
GW14d	GW14d	Normal	7/02/2019	211141-5	211141	-	
GW14d	GW14d	Normal	10/04/2019	215496-6	215496	-	
GW14d	QC1032	Field_D	20/12/2018	208653-7	208653	-	
GW14s	GW14S	Normal	10/01/2019	209274-2	209274	-	
GW14s	GW14s	Normal	7/02/2019	211141-3	211141	-	
GW14s	GW14s	Normal	10/04/2019	215496-5	215496	-	
GW14s	QC1040	Field_D	7/02/2019	211141-4	211141	-	
GW14s	QC1053	Field_D	10/04/2019	215496-1	215496	-	
GW15d	GW15d	Normal	7/02/2019	211141-2	211141	-	
GW15d	GW15d	Normal	10/04/2019	215496-8	215496	-	
GW15s	GW15s	Normal	20/12/2018	208653-3	208653	-	
GW15s	GW15s	Normal	7/02/2019	211141-1	211141	-	
GW15s	GW15s	Normal	10/04/2019	215496-7	215496	-	
GW17d	GW17d	Normal	28/03/2019	214591-1	214591	-	
GW17d	GW17d	Normal	15/04/2019	215789-4	215789	-	
GW200 - SG BH059	GW200 - SG B	Normal	17/01/2019	209761-1	209761	-	
GW201	GW201	Normal	24/01/2019	210277-4	210277	-	
GW203	GW203	Normal	9/01/2019	209210-2	209210	-	
GW203	GW203	Normal	13/02/2019	211510-1	211510	-	
GW203	GW203	Normal	11/03/2019	213240-4	213240	-	
GW203	GW203	Normal	17/04/2019	215939-7	215939	-	
GW204	GW204	Normal	24/01/2019	210277-5	210277	-	
GW204	QC1037	Field_D	24/01/2019	210277-2	210277	-	
GW205	GW205	Normal	24/01/2019	210277-6	210277	-	
GW22s	GW22s	Normal	9/04/2019	215423-8	215423	-	
GW23d	GW23d	Normal	17/01/2019	209762-2	209762	-	
GW23d	GW23d	Normal	12/02/2019	211435-3	211435	-	
GW23d	GW23d	Normal	9/04/2019	215423-1	215423	-	
GW24s	GW24s	Normal	13/03/2019	213502-5	213502	-	
GW24s	GW24s	Normal	12/04/2019	215657-1	215657	-	
GW25s	GW25s	Normal	9/01/2019	209210-1	209210	-	
GW25s	GW25s	Normal	14/02/2019	211612-2	211612	-	
GW25s	GW25s	Normal	6/03/2019	212985-8	212985	-	
GW25s	GW25s	Normal	17/04/2019	215939-9	215939	-	
GW25s	QC2038	Interlab_D	9/01/2019	ES1900712001	ES1900712	1.07	
GW27s	GW27s	Normal	17/01/2019	209762-3	209762	-	
GW27s	GW27s	Normal	22/02/2019	212103-1	212103	-	
GW27s	GW27s	Normal	16/04/2019	215934-5	215934	-	
GW27s	QC2044	Interlab_D	22/02/2019	ES1905703001	ES1905703	7.82	
GW28A	GW28A	Normal	16/04/2019	215934-1	215934	-	
GW2d	GW2d	Normal	11/03/2019	213240-3	213240	-	
GW2d	GW2d	Normal	9/04/2019	215423-7	215423	-	
GW2s	GW2s	Normal	17/01/2019	209762-1	209762	-	
GW2s	GW2s	Normal	11/02/2019	211335-1	211335	-	
GW2s	GW2s	Normal	8/03/2019	213103-6	213103	-	
GW2s	GW2s	Normal	9/04/2019	215423-6	215423	-	
GW2s	QC1033	Field_D	17/01/2019	209762-7	209762	-	
GW4d	GW4d	Normal	21/02/2019	212109-1	212109	-	
GW4d	GW4d	Normal	13/03/2019	213502-4	213502	-	
GW4d	GW4d	Normal	15/04/2019	215789-2	215789	-	
GW4i	GW4i	Normal	21/02/2019	212109-2	212109	-	
GW4i	GW4i	Normal	13/03/2019	213502-3	213502	-	
GW4i	GW4i	Normal	15/04/2019	215789-1	215789	-	
GW5d	GW5d	Normal	28/02/2019	212520-7	212520	-	
GW5d	GW5d	Normal	12/03/2019	213388-3	213388	-	
GW5d	GW5d	Normal	16/04/2019	215934-1	215934	-	
GW5s	GW5s	Normal	9/01/2019	209135-6	209135	-	
GW5s	GW5s	Normal	12/02/2019	211435-1	211435	-	
GW5s	GW5s	Normal	12/03/2019	213388-4	213388	-	
GW5s	GW5s	Normal	16/04/2019	215934-3	215934	-	
GW5s	QC1029	Field_D	9/01/2019	209135-3	209135	-	
GW7	GW7	Normal	9/04/2019	215423-3	215423	-	
GW8	GW8	Normal	28/02/2019	212520-1	212520	-	
GW8	GW8	Normal	12/03/2019	213388-5	213388	-	
GW9	GW9	Normal	18/04/2019	216057-1	216057	-	
MPE 11	MPE 11	Normal	12/12/2018	208060-9	208060	-	
MPE 11	MPE 11	Normal	13/02/2019	211519-3	211519	-	
MPE 11	MPE 11	Normal	18/02/2019	211785-15	211785	-	
MPE 11	MPE 11	Normal	25/02/2019	212251-15	212251	-	
MPE 11	MPE 11	Normal	5/03/2019	212782-3	212782	-	
MPE 11	MPE 11	Normal	11/03/2019	213397-16	213397	-	
MPE 2	MPE 2	Normal	11/12/2018	208061-2	208061	-	
MPE 2	MPE 2	Normal	13/02/2019	211519-13	211519	-	
MPE 2	MPE 2	Normal	19/02/2019	211841-7	211841	-	
MPE 2	MPE 2	Normal	26/02/2019	212355-10	212355	-	
MPE 2	MPE 2	Normal	6/03/2019	212985-3	212985	-	
MPE 2	MPE 2	Normal	12/03/2019	213382-11	213382	-	

Table B2\_Groundwater Analytical Data - Ecological

Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	Ionic Balance
EOL						0.01
ANZG (2018) Freshwater 80% toxicant DGVs						
ANZG (2018) Marine water 80% toxicant DGVs						
ANZG (2018) Freshwater 95% toxicant DGVs						
MPE 2	QC1049	Field D	12/03/2019	213382-3	213382	-
MPE 21	MPE 21	Normal	12/12/2018	208060-6	208060	-
MPE 21	MPE 21	Normal	12/02/2019	211437-10	211437	-
MPE 21	MPE 21	Normal	18/02/2019	211785-11	211785	-
MPE 21	MPE 21	Normal	25/02/2019	212251-11	212251	-
MPE 21	MPE 21	Normal	4/03/2019	212783-12	212783	-
MPE 21	MPE 21	Normal	11/03/2019	213297-11	213297	-
MPE 3	MPE 3	Normal	11/12/2018	208061-3	208061	-
MPE 3	MPE 3	Normal	13/02/2019	211519-9	211519	-
MPE 3	MPE 3	Normal	19/02/2019	211841-6	211841	-
MPE 3	MPE 3	Normal	26/02/2019	212355-8	212355	-
MPE 3	MPE 3	Normal	6/03/2019	212985-1	212985	-
MPE 3	MPE 3	Normal	12/03/2019	213382-8	213382	-
MPE 4	MPE 4	Normal	13/02/2019	211519-8	211519	-
MPE 4	MPE 4	Normal	19/02/2019	211841-4	211841	-
MPE 4	MPE 4	Normal	26/02/2019	212355-6	212355	-
MPE 4	MPE 4	Normal	6/03/2019	212782-9	212782	-
MPE 4	MPE 4	Normal	12/03/2019	213382-7	213382	-
MPE 5	MPE 5	Normal	11/12/2018	208061-7	208061	-
MPE 5	MPE 5	Normal	13/02/2019	211519-5	211519	-
MPE 5	MPE 5	Normal	19/02/2019	211841-12	211841	-
MPE 5	MPE 5	Normal	26/02/2019	212355-1	212355	-
MPE 5	MPE 5	Normal	6/03/2019	212782-4	212782	-
MPE 5	MPE 5	Normal	11/03/2019	213297-18	213297	-
MPE 5A	MPE 5A	Normal	11/12/2018	208061-5	208061	-
MPE 5A	MPE 5A	Normal	13/02/2019	211519-6	211519	-
MPE 5A	MPE 5A	Normal	19/02/2019	211841-2	211841	-
MPE 5A	MPE 5A	Normal	26/02/2019	212355-3	212355	-
MPE 5A	MPE 5A	Normal	6/03/2019	212782-6	212782	-
MPE 5A	MPE 5A	Normal	12/03/2019	213382-4	213382	-
MPE 6	MPE 6	Normal	11/12/2018	208061-8	208061	-
MPE 6	MPE 6	Normal	13/02/2019	211519-2	211519	-
MPE 6	MPE 6	Normal	18/02/2019	211785-14	211785	-
MPE 6	MPE 6	Normal	25/02/2019	212251-14	212251	-
MPE 6	MPE 6	Normal	6/03/2019	212782-1	212782	-
MPE 6	MPE 6	Normal	11/03/2019	213297-14	213297	-
MPE 6	QC1049	Field D	11/03/2019	213297-15	213297	-
MPE 7	MPE 7	Normal	12/12/2018	208060-2	208060	-
MPE 7	MPE 7	Normal	12/02/2019	211437-8	211437	-
MPE 7	MPE 7	Normal	18/02/2019	211785-9	211785	-
MPE 7	MPE 7	Normal	25/02/2019	212251-10	212251	-
MPE 7	MPE 7	Normal	4/03/2019	212783-10	212783	-
MPE 7	MPE 7	Normal	11/03/2019	213297-10	213297	-
MPE 8	MPE 8	Normal	12/12/2018	208060-1	208060	-
MPE 8	MPE 8	Normal	12/02/2019	211437-6	211437	-
MPE 8	MPE 8	Normal	18/02/2019	211785-5	211785	-
MPE 8	MPE 8	Normal	25/02/2019	212251-5	212251	-
MPE 8	MPE 8	Normal	4/03/2019	212783-6	212783	-
MPE 8	MPE 8	Normal	11/03/2019	213297-5	213297	-
MPE 9	QC1046	Field D	25/02/2019	212251-6	212251	-
MPE 9	MPE 9	Normal	12/12/2018	208060-5	208060	-
MPE 9	MPE 9	Normal	12/02/2019	211437-4	211437	-
MPE 9	MPE 9	Normal	18/02/2019	211785-4	211785	-
MPE 9	MPE 9	Normal	25/02/2019	212251-4	212251	-
MPE 9	MPE 9	Normal	4/03/2019	212783-5	212783	-
MPE 9	MPE 9	Normal	11/03/2019	213297-4	213297	-
MPI 10	MPI 10	Normal	11/12/2018	208061-6	208061	-
MPI 10	MPI 10	Normal	13/02/2019	211519-4	211519	-
MPI 10	MPI 10	Normal	19/02/2019	211841-11	211841	-
MPI 10	MPI 10	Normal	26/02/2019	212355-2	212355	-
MPI 10	MPI 10	Normal	6/03/2019	212782-5	212782	-
MPI 10	MPI 10	Normal	11/03/2019	213297-19	213297	-
MPI 12	MPI 12	Normal	11/12/2018	208061-9	208061	-
MPI 12	MPI 12	Normal	13/02/2019	211519-1	211519	-
MPI 12	MPI 12	Normal	18/02/2019	211785-13	211785	-
MPI 12	MPI 12	Normal	26/02/2019	212520-3	212520	-
MPI 12	MPI 12	Normal	6/03/2019	212782-2	212782	-
MPI 12	MPI 12	Normal	11/03/2019	213297-13	213297	-
MPI 12	QC1023	Field D	11/12/2018	208061-10	208061	-
MPI 13	MPI 13	Normal	11/12/2018	208061-12	208061	-
MPI 13	MPI 13	Normal	12/02/2019	211437-11	211437	-
MPI 13	MPI 13	Normal	18/02/2019	211785-12	211785	-
MPI 13	MPI 13	Normal	28/02/2019	212520-2	212520	-
MPI 13	MPI 13	Normal	4/03/2019	212783-11	212783	-
MPI 13	MPI 13	Normal	11/03/2019	213297-12	213297	-
MPI 13	QC2043	Interlab D	18/02/2019	ES1905388001	ES1905388	1.31
MPI 13	QC2045	Interlab D	28/02/2019	ES1906314001	ES1906314	0.29
MPI 14	MPI 14	Normal	12/12/2018	208060-3	208060	-
MPI 14	MPI 14	Normal	12/02/2019	211437-9	211437	-
MPI 14	MPI 14	Normal	18/02/2019	211785-10	211785	-
MPI 14	MPI 14	Normal	25/02/2019	212251-9	212251	-
MPI 14	MPI 14	Normal	4/03/2019	212783-9	212783	-
MPI 14	QC2041	Interlab D	12/02/2019	ES1904929001	ES1904928	7.89
MPI 15	MPI 15	Normal	18/02/2019	211785-7	211785	-
MPI 15	MPI 15	Normal	12/12/2018	208060-13	208060	-
MPI 15	MPI 15	Normal	12/02/2019	211437-7	211437	-
MPI 15	MPI 15	Normal	25/02/2019	212251-8	212251	-
MPI 15	MPI 15	Normal	4/03/2019	212783-8	212783	-
MPI 15	MPI 15	Normal	11/03/2019	213297-7	213297	-
MPI 15	QC1046	Field D	18/02/2019	211785-8	211785	-
MPI 15	QC2044B	Interlab D	25/02/2019	ES1906049001	ES1906049	8.88
MPI 16	MPI 16	Normal	12/12/2018	208060-4	208060	-
MPI 16	MPI 16	Normal	12/02/2019	211437-5	211437	-
MPI 16	MPI 16	Normal	18/02/2019	211785-6	211785	-
MPI 16	MPI 16	Normal	25/02/2019	212251-7	212251	-
MPI 16	MPI 16	Normal	4/03/2019	212783-7	212783	-
MPI 16	MPI 16	Normal	11/03/2019	213297-6	213297	-
MPI 17	MPI 17	Normal	12/02/2019	211437-2	211437	-
MPI 17	MPI 17	Normal	18/02/2019	211785-3	211785	-
MPI 17	MPI 17	Normal	25/02/2019	212251-2	212251	-
MPI 17	MPI 17	Normal	4/03/2019	212783-2	212783	-
MPI 17	MPI 17	Normal	11/03/2019	213297-2	213297	-
MPI 17	QC1044	Field D	12/02/2019	211437-12	211437	-
MPI 17	QC1047	Field D	4/03/2019	212783-4	212783	-
MPI 18	MPI 18	Normal	13/12/2018	208046-2	208046	-
MPI 18	MPI 18	Normal	12/02/2019	211437-3	211437	-
MPI 18	MPI 18	Normal	13/02/2019	211519-16	211519	-
MPI 18	MPI 18	Normal	18/02/2019	211785-2	211785	-
MPI 18	MPI 18	Normal	25/02/2019	212251-3	212251	-
MPI 18	MPI 18	Normal	4/03/2019	212783-3	212783	-
MPI 18	MPI 18	Normal	11/03/2019	213297-3	213297	-
MPI 18	QC2046	Interlab D	4/03/2019	ES1906814001	ES1906814	7.67
MPI 2	MPI 2	Normal	13/12/2018	208046-1	208046	-
MPI 2	MPI 2	Normal	13/02/2019	211519-14	211519	-
MPI 2	MPI 2	Normal	19/02/2019	211841-10	211841	-
MPI 2	MPI 2	Normal	26/02/2019	212355-12	212355	-
MPI 2	MPI 2	Normal	6/03/2019	212985-5	212985	-
MPI 2	MPI 2	Normal	12/03/2019	213382-12	213382	-
MPI 2	QC1048	Field D	6/03/2019	212985-7	212985	-
MPI 20	MPE 20	Normal	11/03/2019	213297-1	213297	-
MPI 20	MPI 20	Normal	12/12/2018	208060-10	208060	-
MPI 20	MPI 20	Normal	18/02/2019	211785-1	211785	-
MPI 20	MPI 20	Normal	25/02/2019	212251-1	212251	-
MPI 20	MPI 20	Normal	4/03/2019	212783-1	212783	-
MPI 20	MPI 20	Normal	12/02/2019	211437-1	211437	-

Table B2\_Groundwater Analytical Data - Ecological

						Ionic Balance
						%
EOL						0.01
ANZG (2018) Freshwater 80% toxicant DGVs						
ANZG (2018) Marine water 80% toxicant DGVs						
ANZG (2018) Marine water 95% toxicant DGVs						
ANZG (2018) Freshwater 95% toxicant DGVs						
Location Code	Field ID	Sample Type	Sample Date	SampleCode	Lab Report	
MPI 3A	MPI 3A	Normal	11/12/2018	208061-1	208061	-
MPI 3A	MPI 3A	Normal	13/02/2019	211519-15	211519	-
MPI 3A	MPI 3A	Normal	19/02/2019	211841-9	211841	-
MPI 3A	MPI 3A	Normal	26/02/2019	212355-9	212355	-
MPI 3A	MPI 3A	Normal	6/03/2019	212985-4	212985	-
MPI 3A	MPI 3A	Normal	12/03/2019	213382-10	213382	-
MPI 4	MPI 4	Normal	12/12/2018	208060-8	208060	-
MPI 4	MPI 4	Normal	13/02/2019	211519-12	211519	-
MPI 4	MPI 4	Normal	19/02/2019	211841-8	211841	-
MPI 4	MPI 4	Normal	26/02/2019	212355-11	212355	-
MPI 4	MPI 4	Normal	6/03/2019	212985-6	212985	-
MPI 4	MPI 4	Normal	12/03/2019	213382-9	213382	-
MPI 4A	MPI 4A	Normal	11/12/2018	208061-4	208061	-
MPI 4A	MPI 4A	Normal	13/02/2019	211519-7	211519	-
MPI 4A	MPI 4A	Normal	19/02/2019	211841-1	211841	-
MPI 4A	MPI 4A	Normal	26/02/2019	212355-4	212355	-
MPI 4A	MPI 4A	Normal	6/03/2019	212782-7	212782	-
MPI 4A	MPI 4A	Normal	12/03/2019	213382-5	213382	-
MPI 5	MPI 5	Normal	12/12/2018	208060-7	208060	-
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	-
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841	-
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	-
MPI 6A	MPI 6A	Normal	6/03/2019	212782-9	212782	-
MPI 6A	MPI 6A	Normal	12/03/2019	213382-6	213382	-
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	-
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	-
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	-
WCX GTY BH 002	WCX GTY BH	Normal	19/12/2018	208565-1	208565	-
WCX GTY BH 002	WCX GTY BH	Normal	28/02/2019	212520-5	212520	-
WCX GTY BH 002	WCX GTY BH	Normal	15/03/2019	213632-2	213632	-
WCX GTY BH 002	WCX GTY BH	Normal	11/04/2019	215594-7	215594	-
WCX GTY BH 003	WCX GTY BH	Normal	6/03/2019	213103-2	213103	-
WCX GTY BH 004	QC2052	Interlab D	15/03/2019	ES190769901	ES1907999	-
WCX GTY BH 004	WCX GTY BH	Normal	28/02/2019	212520-6	212520	-
WCX GTY BH 004	WCX GTY BH	Normal	15/03/2019	213632-3	213632	-
WCX GTY BH 004	WCX GTY BH	Normal	17/04/2019	215939-1	215939	-
WCX GTY BH 009d	WCX GTY BH	Normal	17/12/2018	208319-2	208319	-
WCX GTY BH 009d	WCX GTY BH	Normal	13/02/2019	211510-3	211510	-
WCX GTY BH 009d	WCX GTY BH	Normal	15/03/2019	213632-1	213632	-
WCX GTY BH 009d	WCX GTY BH	Normal	11/04/2019	215594-10	215594	-
WCX GTY BH 009s	WCX GTY BH	Normal	17/12/2018	208319-1	208319	-
WCX GTY BH 009s	WCX GTY BH	Normal	13/02/2019	211510-2	211510	-
WCX GTY BH 009s	WCX GTY BH	Normal	6/03/2019	212985-9	212985	-
WCX GTY BH 009s	WCX GTY BH	Normal	11/04/2019	215594-9	215594	-
WCX GTY BH 027	QC1046	Field D	22/02/2019	212103-3	212103	-
WCX GTY BH 027	WCX GTY BH	Normal	17/01/2019	209762-4	209762	-
WCX GTY BH 027	WCX GTY BH	Normal	22/02/2019	212103-2	212103	-
WCX GTY BH 027	WCX GTY BH	Normal	16/04/2019	215594-6	215594	-
WCX GTY BH 033	QC1054	Field D	11/04/2019	215594-2	215594	-
WCX GTY BH 033	QC2031	Interlab D	19/12/2018	ES1838735001	ES1838735	-
WCX GTY BH 033	WCX GTY BH	Normal	19/12/2018	208565-2	208565	-
WCX GTY BH 033	WCX GTY BH	Normal	13/02/2019	211510-4	211510	-
WCX GTY BH 033	WCX GTY BH	Normal	11/04/2019	215594-6	215594	-
<b>Statistical Summary</b>						
Number of Results						9
Number of Detects						9
Minimum Concentration						0.26
Minimum Detect						0.26
Maximum Concentration						10.3
Maximum Detect						10.3
Average Concentration						5.4
Median Concentration						7.67
Standard Deviation						3.3
Number of Guideline Exceedances						0
Number of Guideline Exceedances(Detects Only)						0

Table B2\_Groundwater Analytical Data - Ecological

						Organic Matter		Physio-Chemical Parameters			Resistivity (Saturated Paste)
						Carbonate	Total Organic Carbon	Total Dissolved Solids	pH (Lab)	Total Suspended Solids	Resistivity at 25°C ohm cm
						mg/L	mg/L	mg/L	mg/L	mg/L	
EOL						5	1		0.01		1
ANZG (2018) Freshwater 80% toxicant DGVs											
ANZG (2018) Marine water 80% toxicant DGVs											
ANZG (2018) Marine water 95% toxicant DGVs											
ANZG (2018) Freshwater 95% toxicant DGVs											
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report						
34 TL3	34 TL3	Normal	13/02/2019	211519-11	211519	<5	-	10,000	-	22	-
34 TL3	34 TL3	Normal	19/02/2019	211841-5	211841	<5	-	8500	-	34	-
34 TL3	34 TL3	Normal	26/02/2019	212355-7	212355	<5	-	8800	-	28	-
34 TL3	34 TL3	Normal	6/03/2019	212985-2	212985	<5	140	8400	7.5	80	-
34 TL3	34 TL3	Normal	12/03/2019	213382-13	213382	<5	-	8000	-	10	-
34 TL3	34 TL3	Normal	16/04/2019	215934-2	215934	<5	160	6400	7.4	-	-
34 TL3	QC2054	Interlab_D	16/04/2019	ES1912221001	ES1912221	-	121	-	8.6	-	71
GW100s	GW100s	Normal	21/02/2019	212109-3	212109	<5	8	190	-	-	-
GW100s	GW100s	Normal	8/03/2019	213103-3	213103	<5	-	300	6.9	-	-
GW100s	GW100s	Normal	11/04/2019	215594-8	215594	<5	12	230	5.9	-	-
GW101	GW101	Normal	8/01/2019	209135-1	209135	<5	14	480	-	-	-
GW101	GW101	Normal	11/02/2019	211335-4	211335	<5	13	550	-	-	-
GW101	GW101	Normal	8/03/2019	213103-1	213103	<5	18	530	8.3	-	-
GW101	GW101	Normal	15/04/2019	215789-5	215789	<5	14	1100	6.9	-	-
GW101	QC2039	Interlab_D	11/02/2019	ES190415001	ES190415	-	-	-	-	-	-
GW102	GW102	Normal	8/01/2019	209135-2	209135	<5	16	120	-	-	-
GW102	GW102	Normal	11/02/2019	211335-6	211335	<5	13	190	-	-	-
GW102	GW102	Normal	8/03/2019	213103-5	213103	<5	14	150	6.3	-	-
GW102	GW102	Normal	17/04/2019	215939-8	215939	<5	17	160	5.8	-	-
GW102	QC2051	Interlab_D	8/03/2019	ES1907278001	ES1907278	-	-	-	6.04	-	6450
GW103	GW103	Normal	21/02/2019	212109-4	212109	<5	12	120	-	-	-
GW103	GW103	Normal	8/03/2019	213103-4	213103	<5	12	150	7.1	-	-
GW103	GW103	Normal	17/04/2019	215939-6	215939	<5	10	170	6.4	-	-
GW103	QC1055	Field_D	17/04/2019	215939-4	215939	<5	9	260	6.6	-	-
GW104	GW104	Normal	20/12/2018	208653-5	208653	<5	-	-	-	-	-
GW104	GW104	Normal	7/02/2019	211141-7	211141	<5	18	590	-	-	-
GW104	GW104	Normal	10/04/2019	215496-4	215496	<5	19	460	6.1	-	-
GW10s	GW10s	Normal	10/01/2019	209274-1	209274	-	-	-	-	-	-
GW10s	GW10s	Normal	14/02/2019	211612-1	211612	-	-	-	-	-	-
GW10s	GW10s	Normal	8/03/2019	213103-7	213103	<5	-	-	7.2	-	-
GW10s	GW10s	Normal	9/04/2019	215423-2	215423	-	-	-	7.5	-	-
GW10s	QC2053	Interlab_D	9/04/2019	ES1911607001	ES1911607	-	-	-	7.54	-	1100
GW11d	GW11d	Normal	1/03/2019	212548-1	212548	-	-	-	6.1	-	-
GW11d	GW11d	Normal	16/04/2019	215934-8	215934	-	-	-	7.1	-	-
GW11s	GW11s	Normal	24/01/2019	210231-1	210231	<5	7	420	-	-	-
GW11s	GW11s	Normal	11/02/2019	211335-2	211335	-	-	-	-	-	-
GW11s	GW11s	Normal	13/03/2019	213502-6	213502	-	-	-	7.5	-	-
GW11s	GW11s	Normal	16/04/2019	215934-7	215934	-	-	-	7.6	-	-
GW11s	QC1042	Field_D	11/02/2019	211335-3	211335	-	-	-	-	-	-
GW12s	GW12s	Normal	24/01/2019	210277-3	210277	-	-	-	-	-	-
GW13d	GW13d	Normal	20/12/2018	208653-2	208653	-	-	-	-	-	-
GW13d	GW13d	Normal	8/02/2019	211141-9	211141	-	-	-	-	-	-
GW13d	GW13d	Normal	11/04/2019	215594-5	215594	-	-	-	6.8	-	-
GW13s	GW13s	Normal	20/12/2018	208653-1	208653	-	-	-	-	-	-
GW13s	GW13s	Normal	8/02/2019	211141-8	211141	-	-	-	-	-	-
GW13s	GW13s	Normal	11/04/2019	215594-4	215594	-	-	-	6.5	-	-
GW14d	GW14d	Normal	20/12/2018	208653-6	208653	-	-	-	-	-	-
GW14d	GW14d	Normal	7/02/2019	211141-5	211141	-	-	-	-	-	-
GW14d	GW14d	Normal	10/04/2019	215496-6	215496	-	-	-	12	-	-
GW14d	QC1032	Field_D	20/12/2018	208653-7	208653	-	-	-	-	-	-
GW14s	GW14s	Normal	10/01/2019	209274-2	209274	-	-	-	-	-	-
GW14s	GW14s	Normal	7/02/2019	211141-3	211141	-	-	-	-	-	-
GW14s	GW14s	Normal	10/04/2019	215496-5	215496	-	-	-	6.2	-	-
GW14s	QC1040	Field_D	7/02/2019	211141-4	211141	-	-	-	-	-	-
GW14s	QC1053	Field_D	10/04/2019	215496-1	215496	-	-	-	6.2	-	-
GW15d	GW15d	Normal	7/02/2019	211141-2	211141	-	-	-	-	-	-
GW15d	GW15d	Normal	10/04/2019	215496-8	215496	-	-	-	5.9	-	-
GW15s	GW15s	Normal	20/12/2018	208653-8	208653	-	-	-	-	-	-
GW15s	GW15s	Normal	7/02/2019	211141-1	211141	-	-	-	-	-	-
GW15s	GW15s	Normal	10/04/2019	215496-7	215496	-	-	-	5.8	-	-
GW17d	GW17d	Normal	28/03/2019	214591-1	214591	<5	31	1400	7.4	-	-
GW17d	GW17d	Normal	15/04/2019	215789-4	215789	<5	20	950	7.2	-	-
GW200 - SG BH059	GW200 - SG BH059	Normal	17/01/2019	209761-1	209761	-	-	-	-	-	-
GW201	GW201	Normal	24/01/2019	210277-4	210277	-	-	-	-	-	-
GW203	GW203	Normal	9/01/2019	209210-2	209210	<5	3	170	-	-	-
GW203	GW203	Normal	13/02/2019	211510-1	211510	-	-	-	-	-	-
GW203	GW203	Normal	11/03/2019	213240-4	213240	-	-	-	6.1	-	-
GW203	GW203	Normal	17/04/2019	215939-7	215939	-	-	-	6.2	-	-
GW204	GW204	Normal	24/01/2019	210277-5	210277	-	-	-	-	-	-
GW204	QC1037	Field_D	24/01/2019	210277-2	210277	-	-	-	-	-	-
GW205	GW205	Normal	24/01/2019	210277-6	210277	-	-	-	-	-	-
GW22s	GW22s	Normal	8/04/2019	215423-8	215423	<5	14	760	6.8	-	-
GW23d	GW23d	Normal	17/01/2019	209762-2	209762	<5	620	2500	-	-	-
GW23d	GW23d	Normal	12/02/2019	211435-3	211435	<5	260	2300	-	-	-
GW23d	GW23d	Normal	9/04/2019	215423-1	215423	<5	210	1900	7.5	-	-
GW24s	GW24s	Normal	13/03/2019	213502-5	213502	<5	20	19,000	6.6	-	-
GW24s	GW24s	Normal	12/04/2019	215657-1	215657	<5	21	860	6.7	-	-
GW25s	GW25s	Normal	9/01/2019	209210-1	209210	<5	29	20,000	-	-	-
GW25s	GW25s	Normal	14/02/2019	211612-2	211612	<5	40	18,000	-	-	-
GW25s	GW25s	Normal	6/03/2019	212985-8	212985	<5	38	15,000	7.6	24	-
GW25s	GW25s	Normal	17/04/2019	215939-9	215939	<5	28	15,000	7.6	-	-
GW25s	QC2026	Interlab_D	9/01/2019	ES1900712001	ES1900712	-	-	-	-	-	-
GW27s	GW27s	Normal	17/01/2019	209762-3	209762	<5	34	28,000	-	-	-
GW27s	GW27s	Normal	22/02/2019	212103-1	212103	<5	47	17,000	-	-	-
GW27s	GW27s	Normal	16/04/2019	215934-5	215934	<5	53	17,000	7.3	-	-
GW27s	QC2044	Interlab_D	22/02/2019	ES1905703001	ES1905703	-	-	-	49	-	-
GW28A	GW28A	Normal	16/04/2019	215934-1	215934	<5	160	760	6.8	-	-
GW2d	GW2d	Normal	11/03/2019	213240-3	213240	-	-	-	7.2	-	-
GW2d	GW2d	Normal	9/04/2019	215423-7	215423	-	-	-	7.6	-	-
GW2s	GW2s	Normal	17/01/2019	209762-1	209762	-	-	-	-	-	-
GW2s	GW2s	Normal	11/02/2019	211335-1	211335	-	-	-	-	-	-
GW2s	GW2s	Normal	8/03/2019	213103-6	213103	<5	-	-	7.1	-	-
GW2s	GW2s	Normal	9/04/2019	215423-6	215423	-	-	-	7.4	-	-
GW2s	QC1033	Field_D	17/01/2019	209762-7	209762	-	-	-	-	-	-
GW4d	GW4d	Normal	21/02/2019	212109-1	212109	<5	22	1200	-	-	-
GW4d	GW4d	Normal	13/03/2019	213502-4	213502	<5	21	1100	7.2	-	-
GW4d	GW4d	Normal	15/04/2019	215789-2	215789	<5	17	1500	7.2	-	-
GW4i	GW4i	Normal	21/02/2019	212109-2	212109	<5	80	1800	-	-	-
GW4i	GW4i	Normal	13/03/2019	213502-3	213502	<5	75	1700	7.3	-	-
GW4i	GW4i	Normal	15/04/2019	215789-1	215789	<5	83	2000	7.4	-	-
GW5d	GW5d	Normal	28/02/2019	212520-7	212520	<5	12	31,000	5.6	-	-
GW5d	GW5d	Normal	12/03/2019	213388-3	213388	<5	13	35,000	6.1	-	-
GW5d	GW5d	Normal	18/04/2019	215934-4	215934	<5	13	35,000	5.6	-	-
GW5s	GW5s	Normal	8/01/2019	209135-6	209135	<5	18	860	-	-	-
GW5s	GW5s	Normal	12/02/2019	211435-1	211435	<5	21	1000	-	-	-
GW5s	GW5s	Normal	12/03/2019	213388-4	213388	<5	21	910	7.8	-	-
GW5s	GW5s	Normal	16/04/2019	215934-3	215934	<5	23	860	7.5	-	-
GW5s	QC1029	Field_D	8/01/2019	209135-3	209135	<5	13	480	-	-	-
GW7	GW7	Normal	8/04/2019	215423-3	215423	170	110	3400	8.5	-	-
GW8	GW8	Normal	28/02/2019	212520-1	212520	<5	110	780	7.2	-	-
GW8	GW8	Normal	12/03/2019	213388-5	213388	<5	50	850	7.2	-	-
GW9	GW9	Normal	18								

Table B2\_Groundwater Analytical Data - Ecological

						Organic Matter		Physio-Chemical Parameters			Resistivity (Saturated Paste)	
						Carbonate	Total Organic Carbon	Total Dissolved Solids	pH (Lab)	Total Suspended Solids	Resistivity at 25°C	
						mg/L	mg/L	mg/L	pH Units	mg/L	ohm cm	
						5	1	5	0.01	5	1	
ANZG (2018) Freshwater 80% toxicant DGVs												
ANZG (2018) Marine water 80% toxicant DGVs												
ANZG (2018) Marine water 95% toxicant DGVs												
ANZG (2018) Freshwater 95% toxicant DGVs												
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report							
MPE 2	QC1060	Field D	12/03/2019	213382-3	213382	<5	-	26,000	-	40	-	-
MPE 21	MPE 21	Normal	12/02/2019	209060-6	209060	<5	33	1200	-	100	-	-
MPE 21	MPE 21	Normal	12/02/2019	211437-10	211437	<5	-	1400	-	100	-	-
MPE 21	MPE 21	Normal	18/02/2019	211785-11	211785	<5	-	1700	-	700	-	-
MPE 21	MPE 21	Normal	25/02/2019	212251-11	212251	<5	-	1500	-	21	-	-
MPE 21	MPE 21	Normal	4/03/2019	212783-12	212783	<5	-	1400	-	45	-	-
MPE 21	MPE 21	Normal	11/03/2019	213297-11	213297	<5	-	1600	-	57	-	-
MPE 3	MPE 3	Normal	11/12/2018	208061-3	208061	<5	11	31,000	-	-	-	-
MPE 3	MPE 3	Normal	13/02/2019	211519-9	211519	<5	-	35,000	-	25	-	-
MPE 3	MPE 3	Normal	19/02/2019	211841-6	211841	<5	-	36,000	-	20	-	-
MPE 3	MPE 3	Normal	26/02/2019	212355-8	212355	<5	-	32,000	-	46	-	-
MPE 3	MPE 3	Normal	6/03/2019	212985-1	212985	<5	-	30,000	-	19	-	-
MPE 3	MPE 3	Normal	12/03/2019	213382-8	213382	<5	-	35,000	-	16	-	-
MPE 4	MPE 4	Normal	13/02/2019	211519-8	211519	<5	-	18,000	-	46	-	-
MPE 4	MPE 4	Normal	19/02/2019	211841-4	211841	<5	-	14,000	-	36	-	-
MPE 4	MPE 4	Normal	26/02/2019	212355-6	212355	<5	-	14,000	-	41	-	-
MPE 4	MPE 4	Normal	6/03/2019	212782-8	212782	<5	-	16,000	-	36	-	-
MPE 4	MPE 4	Normal	12/03/2019	213382-7	213382	<5	-	14,000	-	10	-	-
MPE 5	MPE 5	Normal	11/12/2018	208061-7	208061	<5	63	12,000	-	-	-	-
MPE 5	MPE 5	Normal	13/02/2019	211519-5	211519	<5	-	14,000	-	27	-	-
MPE 5	MPE 5	Normal	19/02/2019	211841-12	211841	<5	-	13,000	-	53	-	-
MPE 5	MPE 5	Normal	26/02/2019	212355-1	212355	<5	-	12,000	-	30	-	-
MPE 5	MPE 5	Normal	5/03/2019	212782-4	212782	<5	-	13,000	-	22	-	-
MPE 5	MPE 5	Normal	11/03/2019	213297-18	213297	<5	-	13,000	-	13	-	-
MPE 5A	MPE 5A	Normal	11/12/2018	208061-5	208061	<5	10	25,000	-	-	-	-
MPE 5A	MPE 5A	Normal	13/02/2019	211519-6	211519	<5	-	27,000	-	1200	-	-
MPE 5A	MPE 5A	Normal	19/02/2019	211841-2	211841	<5	-	34,000	-	92	-	-
MPE 5A	MPE 5A	Normal	26/02/2019	212355-3	212355	<5	-	30,000	-	13	-	-
MPE 5A	MPE 5A	Normal	5/03/2019	212782-6	212782	<5	-	27,000	-	20	-	-
MPE 5A	MPE 5A	Normal	12/03/2019	213382-4	213382	<5	-	31,000	-	410	-	-
MPE 6	MPE 6	Normal	11/12/2018	208061-8	208061	<5	37	11,000	-	-	-	-
MPE 6	MPE 6	Normal	13/02/2019	211519-2	211519	<5	-	24,000	-	209	-	-
MPE 6	MPE 6	Normal	19/02/2019	211785-14	211785	<5	-	14,000	-	19	-	-
MPE 6	MPE 6	Normal	25/02/2019	212251-14	212251	<5	-	16,000	-	16	-	-
MPE 6	MPE 6	Normal	5/03/2019	212782-1	212782	<5	-	22,000	-	21	-	-
MPE 6	MPE 6	Normal	11/03/2019	213297-14	213297	<5	-	20,000	-	7	-	-
MPE 6	QC1049	Field D	11/03/2019	213297-15	213297	<5	-	20,000	-	8	-	-
MPE 7	MPE 7	Normal	12/12/2018	208060-2	208060	<5	22	17,000	-	-	-	-
MPE 7	MPE 7	Normal	12/02/2019	211437-8	211437	<5	-	20,000	-	80	-	-
MPE 7	MPE 7	Normal	18/02/2019	211785-9	211785	<5	-	19,000	-	82	-	-
MPE 7	MPE 7	Normal	25/02/2019	212251-10	212251	<5	-	16,000	-	100	-	-
MPE 7	MPE 7	Normal	4/03/2019	212783-10	212783	<5	-	28,000	-	120	-	-
MPE 7	MPE 7	Normal	11/03/2019	213297-10	213297	<5	-	12,000	-	92	-	-
MPE 8	MPE 8	Normal	12/12/2018	208060-1	208060	<5	17	26,000	-	-	-	-
MPE 8	MPE 8	Normal	12/02/2019	211437-6	211437	<5	-	27,000	-	110	-	-
MPE 8	MPE 8	Normal	18/02/2019	211785-5	211785	<5	-	27,000	-	62	-	-
MPE 8	MPE 8	Normal	25/02/2019	212251-5	212251	<5	-	25,000	-	49	-	-
MPE 8	MPE 8	Normal	4/03/2019	212783-6	212783	<5	-	13,000	-	41	-	-
MPE 8	MPE 8	Normal	11/03/2019	213297-5	213297	<5	-	23,000	-	52	-	-
MPE 8	QC1046	Field D	25/02/2019	212251-6	212251	<5	-	25,000	-	40	-	-
MPE 9	MPE 9	Normal	12/12/2018	208060-5	208060	<5	29	8400	-	-	-	-
MPE 9	MPE 9	Normal	12/02/2019	211437-4	211437	<5	-	16,000	-	280	-	-
MPE 9	MPE 9	Normal	18/02/2019	211785-4	211785	<5	-	14,000	-	130	-	-
MPE 9	MPE 9	Normal	25/02/2019	212251-4	212251	<5	-	16,000	-	89	-	-
MPE 9	MPE 9	Normal	4/03/2019	212783-5	212783	<5	-	19,000	-	82	-	-
MPE 9	MPE 9	Normal	11/03/2019	213297-4	213297	<5	-	21,000	-	69	-	-
MPI 10	MPI 10	Normal	11/12/2018	208061-6	208061	<5	35	2000	-	-	-	-
MPI 10	MPI 10	Normal	13/02/2019	211519-4	211519	<5	-	1400	-	32	-	-
MPI 10	MPI 10	Normal	19/02/2019	211841-11	211841	<5	-	1300	-	60	-	-
MPI 10	MPI 10	Normal	26/02/2019	212355-2	212355	<5	-	1200	-	57	-	-
MPI 10	MPI 10	Normal	5/03/2019	212782-5	212782	<5	-	1300	-	28	-	-
MPI 10	MPI 10	Normal	11/03/2019	213297-19	213297	<5	-	1300	-	52	-	-
MPI 12	MPI 12	Normal	11/12/2018	208061-9	208061	<5	19	800	-	-	-	-
MPI 12	MPI 12	Normal	13/02/2019	211519-1	211519	<5	-	870	-	23	-	-
MPI 12	MPI 12	Normal	18/02/2019	211785-13	211785	<5	-	750	-	27	-	-
MPI 12	MPI 12	Normal	28/02/2019	212520-3	212520	<5	-	920	-	73	-	-
MPI 12	MPI 12	Normal	5/03/2019	212782-2	212782	<5	-	800	-	11	-	-
MPI 12	MPI 12	Normal	11/03/2019	213297-13	213297	<5	-	910	-	7	-	-
MPI 12	QC1023	Field D	11/12/2018	208061-10	208061	<5	21	300	-	-	-	-
MPI 13	MPI 13	Normal	11/12/2018	208061-12	208061	<5	35	1000	-	-	-	-
MPI 13	MPI 13	Normal	12/02/2019	211437-11	211437	<5	-	1400	-	16	-	-
MPI 13	MPI 13	Normal	18/02/2019	211785-12	211785	<5	-	1100	-	46	-	-
MPI 13	MPI 13	Normal	28/02/2019	212520-2	212520	<5	-	1300	-	51	-	-
MPI 13	MPI 13	Normal	4/03/2019	212783-11	212783	<5	-	1300	-	27	-	-
MPI 13	MPI 13	Normal	11/03/2019	213297-12	213297	<5	-	1200	-	22	-	-
MPI 13	QC2043	Interlab D	18/02/2019	ES1905388001	ES1905388	-	-	-	-	105	-	-
MPI 13	QC2045	Interlab D	28/02/2019	ES1906314001	ES1906314	-	-	-	-	42	-	-
MPI 14	MPI 14	Normal	12/12/2018	208060-3	208060	<5	45	1800	-	-	-	-
MPI 14	MPI 14	Normal	12/02/2019	211437-9	211437	<5	-	1900	-	34	-	-
MPI 14	MPI 14	Normal	18/02/2019	211785-10	211785	<5	-	1600	-	22	-	-
MPI 14	MPI 14	Normal	25/02/2019	212251-9	212251	<5	-	1700	-	12	-	-
MPI 14	MPI 14	Normal	4/03/2019	212783-9	212783	<5	-	1900	-	<5	-	-
MPI 14	MPI 14	Normal	11/03/2019	213297-9	213297	<5	-	1600	-	6	-	-
MPI 14	QC2041	Interlab D	12/02/2019	ES1904828001	ES1904828	-	-	-	-	193	-	-
MPI 15	MPI 15	Normal	18/02/2019	211785-7	211785	<5	-	1200	-	10	-	-
MPI 15	MPI 15	Normal	12/12/2018	208060-13	208060	<5	34	1400	-	-	-	-
MPI 15	MPI 15	Normal	12/02/2019	211437-7	211437	<5	-	1400	-	22	-	-
MPI 15	MPI 15	Normal	25/02/2019	212251-8	212251	<5	-	1300	-	24	-	-
MPI 15	MPI 15	Normal	4/03/2019	212783-8	212783	<5	-	1200	-	<5	-	-
MPI 15	MPI 15	Normal	11/03/2019	213297-7	213297	<5	-	1400	-	20	-	-
MPI 15	QC1046	Field D	18/02/2019	211785-8	211785	<5	-	1200	-	8	-	-
MPI 15	QC2044B	Interlab D	25/02/2019	ES1906049001	ES1906049	-	-	-	-	33	-	-
MPI 16	MPI 16	Normal	12/12/2018	208060-4	208060	<5	130	29,000	-	120	-	-
MPI 16	MPI 16	Normal	12/02/2019	211437-5	211437	<5	-	11,000	-	20	-	-
MPI 16	MPI 16	Normal	18/02/2019	211785-6	211785	<5	-	35,000	-	240	-	-
MPI 16	MPI 16	Normal	25/02/2019	212251-7	212251	<5	-	29,000	-	140	-	-
MPI 16	MPI 16	Normal	4/03/2019	212783-7	212783	<5	-	12,000	-	150	-	-
MPI 16	MPI 16	Normal	11/03/2019	213297-6	213297	<5	-	12,000	-	35	-	-
MPI 17	MPI 17	Normal	12/02/2019	211437-2	211437	<5	-	2600	-	61	-	-
MPI 17	MPI 17	Normal	18/02/2019	211785-3	211785	<5	-	2600	-	230	-	-
MPI 17	MPI 17	Normal	25/02/2019	212251-2	212251	<5	-	2700	-	8	-	-
MPI 17	MPI 17	Normal	4/03/2019	212783-2	212783	<5	-	2600	-	27	-	-
MPI 17	MPI 17	Normal	11/03/2019	213297-2	213297	<5	-	3100	-	14	-	-
MPI 17	QC1044	Field D	12/02/2019	211437-12	211437	<5	-	2600				

Table B2\_Groundwater Analytical Data - Ecological

						Organic Matter		Physio-Chemical Parameters			Resistivity (Saturated Paste)	
						Carbonate	Total Organic Carbon	Total Dissolved Solids	pH (Lab)	Total Suspended Solids	Resistivity at 25°C	
						mg/L	mg/L	mg/L	pH Units	mg/L	ohm cm	
EQL						5	1	5	0.01	5	1	
ANZG (2018) Freshwater 80% toxicant DGVs												
ANZG (2018) Marine water 80% toxicant DGVs												
ANZG (2018) Marine water 95% toxicant DGVs												
ANZG (2018) Freshwater 95% toxicant DGVs												
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report							
MPI 3A	MPI 3A	Normal	11/12/2018	208861-1	208861	<5	44	19 000	-	-	-	-
MPI 3A	MPI 3A	Normal	13/02/2019	211519-15	211519	<5	-	17 000	-	-	-	86
MPI 3A	MPI 3A	Normal	19/02/2019	211841-9	211841	<5	-	20 000	-	-	-	96
MPI 3A	MPI 3A	Normal	26/02/2019	212355-9	212355	<5	-	3800	-	-	-	33
MPI 3A	MPI 3A	Normal	6/03/2019	212985-4	212985	<5	-	5400	-	-	-	99
MPI 3A	MPI 3A	Normal	12/03/2019	213382-10	213382	<5	-	5600	-	-	-	22
MPI 4	MPI 4	Normal	12/12/2018	208960-8	208960	<5	46	21 000	-	-	-	-
MPI 4	MPI 4	Normal	13/02/2019	211519-12	211519	<5	-	27 000	-	-	-	440
MPI 4	MPI 4	Normal	19/02/2019	211841-8	211841	<5	-	20 000	-	-	-	240
MPI 4	MPI 4	Normal	26/02/2019	212355-11	212355	<5	-	8300	-	-	-	110
MPI 4	MPI 4	Normal	6/03/2019	212985-6	212985	<5	-	22 000	-	-	-	260
MPI 4	MPI 4	Normal	12/03/2019	213382-9	213382	<5	-	23 000	-	-	-	240
MPI 4A	MPI 4A	Normal	11/12/2018	208061-4	208061	<5	75	2700	-	-	-	-
MPI 4A	MPI 4A	Normal	13/02/2019	211519-7	211519	<5	-	2700	-	-	-	16
MPI 4A	MPI 4A	Normal	19/02/2019	211841-1	211841	<5	-	2700	-	-	-	<5
MPI 4A	MPI 4A	Normal	26/02/2019	212355-4	212355	<5	-	2700	-	-	-	6
MPI 4A	MPI 4A	Normal	6/03/2019	212985-7	212985	<5	-	2900	-	-	-	10
MPI 4A	MPI 4A	Normal	12/03/2019	213382-5	213382	<5	-	2800	-	-	-	16
MPI 5	MPI 5	Normal	12/12/2018	208060-7	208060	<5	170	7200	-	-	-	-
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	<5	-	3000	-	-	-	48
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841	<5	-	3100	-	-	-	34
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	<5	-	2900	-	-	-	27
MPI 6A	MPI 6A	Normal	5/03/2019	212782-9	212782	<5	-	3200	-	-	-	21
MPI 6A	MPI 6A	Normal	12/03/2019	213382-6	213382	<5	-	3100	-	-	-	44
SG-BH11-03	SG-BH11-03	Normal	17/04/2019	215939-5	215939	<5	89	-	7.2	-	-	-
SG-BH11-04	SG-BH11-04	Normal	15/04/2019	215789-3	215789	<5	26	940	6.9	-	-	-
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	-	-	-	-	-	-	-
WCX GTY BH 002	WCX GTY BH	Normal	19/12/2018	208565-1	208565	-	-	-	-	-	-	-
WCX GTY BH 002	WCX GTY BH	Normal	28/02/2019	212520-5	212520	-	-	-	6	-	-	-
WCX GTY BH 002	WCX GTY BH	Normal	15/03/2019	213632-2	213632	-	-	-	6.2	-	-	-
WCX GTY BH 002	WCX GTY BH	Normal	11/04/2019	215594-7	215594	-	-	-	5.9	-	-	-
WCX GTY BH 003	WCX GTY BH	Normal	8/03/2019	213103-2	213103	-	-	-	6.7	-	-	-
WCX GTY BH 004	QC2052	Interlab D	15/03/2019	ES190799001	ES1907999	-	-	-	6.39	-	-	3170
WCX GTY BH 004	WCX GTY BH	Normal	28/02/2019	212520-6	212520	-	-	-	6.2	-	-	-
WCX GTY BH 004	WCX GTY BH	Normal	15/03/2019	213632-3	213632	-	-	-	6.7	-	-	-
WCX GTY BH 004	WCX GTY BH	Normal	17/04/2019	215939-1	215939	-	-	-	6.5	-	-	-
WCX GTY BH 009d	WCX GTY BH	Normal	17/12/2018	208319-2	208319	-	-	-	-	-	-	-
WCX GTY BH 009d	WCX GTY BH	Normal	13/02/2019	211510-3	211510	-	-	-	-	-	-	-
WCX GTY BH 009d	WCX GTY BH	Normal	15/03/2019	213632-1	213632	-	-	-	7.3	-	-	-
WCX GTY BH 009d	WCX GTY BH	Normal	11/04/2019	215594-10	215594	-	-	-	6.5	-	-	-
WCX GTY BH 009s	WCX GTY BH	Normal	17/12/2018	208319-1	208319	-	-	-	-	-	-	-
WCX GTY BH 009s	WCX GTY BH	Normal	13/02/2019	211510-2	211510	-	-	-	-	-	-	-
WCX GTY BH 009s	WCX GTY BH	Normal	6/03/2019	212985-9	212985	-	-	-	6.9	-	-	-
WCX GTY BH 009s	WCX GTY BH	Normal	11/04/2019	215594-9	215594	-	-	-	6.8	-	-	-
WCX GTY BH 027	QC1046	Field D	22/02/2019	212103-3	212103	-	-	-	-	-	-	-
WCX GTY BH 027	WCX GTY BH	Normal	17/01/2019	209762-4	209762	-	-	-	-	-	-	-
WCX GTY BH 027	WCX GTY BH	Normal	22/02/2019	212103-2	212103	-	-	-	-	-	-	-
WCX GTY BH 027	WCX GTY BH	Normal	16/04/2019	215934-6	215934	-	-	-	6.7	-	-	-
WCX GTY BH 033	QC1054	Field D	11/04/2019	215594-2	215594	-	-	-	6.1	-	-	-
WCX GTY BH 033	QC2031	Interlab D	19/12/2018	ES1838735001	ES1838735	-	-	-	-	-	-	-
WCX GTY BH 033	WCX GTY BH	Normal	19/12/2018	208565-2	208565	-	-	-	-	-	-	-
WCX GTY BH 033	WCX GTY BH	Normal	13/02/2019	211510-4	211510	-	-	-	-	-	-	-
WCX GTY BH 033	WCX GTY BH	Normal	11/04/2019	215594-6	215594	-	-	-	6.1	-	-	-
<b>Statistical Summary</b>												
Number of Results						218	86	217	74	144		4
Number of Detects						1	86	217	74	140		4
Minimum Concentration						<5	3	120	5.6	<5		71
Minimum Detect						170	3	120	5.6	6		71
Maximum Concentration						170	1100	41000	12	1200		6450
Maximum Detect						170	1100	41000	12	1200		6450
Average Concentration						3.3	64	9846	6.9	77		2698
Median Concentration						2.5	23.5	3400	6.9	36.5		2135
Standard Deviation						11	138	10794	0.91	131		2814
Number of Guideline Exceedances						0	0	97	29	0		0
Number of Guideline Exceedances(Detects Only)						0	0	97	29	0		0





Table B3\_Groundwater Analytical Data - Airport (Environmental Protection) Regulations Vapour Intrusion

		Metals														
		Aluminium (Filtered)	Arsenic (Filtered)	Barium	Barium (Filtered)	Boron	Calcium (Filtered)	Chromium (Filtered)	Cobalt (Filtered)	Copper (Filtered)	Iron	Lead (Filtered)	Manganese (Filtered)	Mercury (Filtered)	Nickel (Filtered)	
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	
EOL		10	1	1	1	50	0.1	1	1	1	10	1	5	0.05	1	
Commonwealth 1997 - Airports (Environmental Protection) Regulations Fresh Water		100	20	-	-	-	-	-	-	-	1000	-	-	-	-	
Commonwealth 1997 - Airports (Environmental Protection) Regulations Marine Water		-	50	96	-	-	2	50	-	5	-	5	-	0.1	15	
NEPM 2013 Table 1A(4) Com/Ind HSL D GW for Vapour Intrusion, Sand		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2-4m		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report											
MPI 3A	MPI 3A	Normal	6/03/2019	212985-4	212985	-	-	160	-	-	-	-	10,000	-	-	-
MPI 3A	MPI 3A	Normal	12/03/2019	213382-10	213382	-	-	150	-	-	-	-	1900	-	-	-
MPI 4	MPI 4	Normal	12/12/2018	208060-8	208060	<10	18	-	31	-	<0.1	1	2	<1	<1	270
MPI 4	MPI 4	Normal	13/02/2019	211519-12	211519	-	-	37	-	-	-	-	190,000	-	-	<0.05
MPI 4	MPI 4	Normal	19/02/2019	211841-8	211841	-	-	34	-	-	-	-	65,000	-	-	-
MPI 4	MPI 4	Normal	26/02/2019	212355-11	212355	-	-	34	-	-	-	-	25,000	-	-	-
MPI 4	MPI 4	Normal	6/03/2019	212985-6	212985	-	-	33	-	-	-	-	93,000	-	-	-
MPI 4	MPI 4	Normal	12/03/2019	213382-9	213382	-	-	37	-	-	-	-	83,000	-	-	-
MPI 4A	MPI 4A	Normal	11/12/2018	208061-4	208061	50	4	-	340	-	<0.1	10	2	<1	1700	43
MPI 4A	MPI 4A	Normal	13/02/2019	211519-7	211519	-	-	400	-	-	-	-	3500	-	-	<0.05
MPI 4A	MPI 4A	Normal	19/02/2019	211841-1	211841	-	-	330	-	-	-	-	3000	-	-	-
MPI 4A	MPI 4A	Normal	26/02/2019	212355-4	212355	-	-	390	-	-	-	-	3800	-	-	-
MPI 4A	MPI 4A	Normal	5/03/2019	212782-7	212782	-	-	410	-	-	-	-	3700	-	-	-
MPI 4A	MPI 4A	Normal	12/03/2019	213382-5	213382	-	-	390	-	-	-	-	3500	-	-	-
MPI 5	MPI 5	Normal	12/12/2018	208060-7	208060	30	5	-	64	-	<0.1	11	6	<1	<1	47
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	-	-	82	-	-	-	-	8400	-	-	-
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841	-	-	85	-	-	-	-	7100	-	-	-
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	-	-	86	-	-	-	-	5100	-	-	-
MPI 6A	MPI 6A	Normal	6/03/2019	212985-9	212985	-	-	96	-	-	-	-	5300	-	-	-
MPI 6A	MPI 6A	Normal	12/03/2019	213382-6	213382	-	-	110	-	-	-	-	8500	-	-	-
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	190	9	-	280	-	0.1	10	8	-	210	<0.05
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	<10	1	-	770	-	<0.1	5	4	<1	<1	88
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	-	11	-	-	-	<0.1	4	-	<1	-	<0.05
WCX GTY BH 002	WCX GTY BH	Normal	19/12/2018	208565-1	208565	-	<1	-	-	-	<0.1	1	-	-	-	<0.05
WCX GTY BH 002	WCX GTY BH	Normal	28/02/2019	212520-5	212520	-	<1	-	-	-	<0.1	1	-	-	-	<0.05
WCX GTY BH 002	WCX GTY BH	Normal	15/03/2019	213632-2	213632	-	<1	-	-	-	<0.1	2	-	-	-	<0.05
WCX GTY BH 002	WCX GTY BH	Normal	11/04/2019	215594-7	215594	-	<1	-	-	-	<0.1	2	-	-	-	<0.05
WCX GTY BH 003	WCX GTY BH	Normal	8/03/2019	213103-2	213103	-	<1	-	-	-	<0.1	<1	-	-	-	<0.05
WCX GTY BH 004	OC2052	Interlab D	15/03/2019	ES1907999001	ES1907999	-	0.7	-	-	-	<0.05	0.8	-	<0.1	-	<0.04
WCX GTY BH 004	WCX GTY BH	Normal	28/02/2019	212520-6	212520	-	<1	-	-	-	<0.1	<1	-	-	-	<0.05
WCX GTY BH 004	WCX GTY BH	Normal	15/03/2019	213632-3	213632	-	<1	-	-	-	<0.1	<1	-	-	-	<0.05
WCX GTY BH 004	WCX GTY BH	Normal	17/04/2019	215939-1	215939	-	<1	-	-	-	<0.1	<1	-	-	-	<0.05
WCX GTY BH 009d	WCX GTY BH	Normal	17/12/2018	208319-2	208319	-	18	-	-	-	<0.1	<1	-	-	-	<0.05
WCX GTY BH 009d	WCX GTY BH	Normal	13/02/2019	211510-3	211510	-	2	-	-	-	<0.1	3	-	-	-	<0.05
WCX GTY BH 009d	WCX GTY BH	Normal	15/03/2019	213632-1	213632	-	2	-	-	-	<0.1	4	-	-	-	<0.05
WCX GTY BH 009d	WCX GTY BH	Normal	11/04/2019	215594-10	215594	-	16	-	-	-	<0.1	<1	-	-	-	<0.05
WCX GTY BH 009s	WCX GTY BH	Normal	17/12/2018	208319-1	208319	-	1	-	-	-	<0.1	<1	-	-	-	<0.05
WCX GTY BH 009s	WCX GTY BH	Normal	13/02/2019	211510-2	211510	-	<1	-	-	-	<0.1	<1	-	-	-	<0.05
WCX GTY BH 009s	WCX GTY BH	Normal	6/03/2019	212985-8	212985	-	1	-	-	-	<0.1	1	-	-	-	<0.05
WCX GTY BH 009s	WCX GTY BH	Normal	11/04/2019	215594-9	215594	-	2	-	-	-	<0.1	1	-	-	-	<0.05
WCX GTY BH 027	OC1046	Field D	22/02/2019	212103-3	212103	-	4	-	-	-	<0.1	<1	-	-	-	<0.05
WCX GTY BH 027	WCX GTY BH	Normal	17/01/2019	209762-4	209762	-	5	-	-	-	<0.1	<1	-	-	-	<0.05
WCX GTY BH 027	WCX GTY BH	Normal	22/02/2019	212103-2	212103	-	4	-	-	-	<0.1	<1	-	-	-	<0.05
WCX GTY BH 027	WCX GTY BH	Normal	16/04/2019	215934-6	215934	-	8	-	-	-	<0.1	<1	-	-	-	<0.05
WCX GTY BH 033	OC1054	Field D	11/04/2019	215594-2	215594	-	<1	-	-	-	<0.1	<1	-	-	-	<0.05
WCX GTY BH 033	OC2031	Interlab D	19/12/2018	ES1838735001	ES1838735	-	0.7	-	-	-	<0.05	0.3	-	<0.5	-	<0.04
WCX GTY BH 033	WCX GTY BH	Normal	19/12/2018	208565-2	208565	-	<1	-	-	-	<0.1	<1	-	-	-	<0.05
WCX GTY BH 033	WCX GTY BH	Normal	13/02/2019	211510-4	211510	-	<1	-	-	-	<0.1	<1	-	-	-	<0.05
WCX GTY BH 033	WCX GTY BH	Normal	11/04/2019	215594-6	215594	-	<1	-	-	-	<0.1	<1	-	-	-	<0.05

Statistical Summary																
Number of Results	86	161	138	86	4	161	161	86	161	142	161	86	161	161		
Number of Detects	71	101	138	86	4	10	82	51	20	142	20	83	3	89		
Minimum Concentration	<5	0.5	22	9	1990	<0.05	0.3	0.4	<0.5	400	<0.1	<5	<0.04	<0.5		
Minimum Detect	10	0.5	22	9	1990	0.1	0.3	0.4	1	400	1	5	0.2	1		
Maximum Concentration	730	1100	1800	1000	4490	4.6	92	53	200	190000	120	9900	0.5	130		
Maximum Detect	730	1100	1800	1000	4490	4.6	92	53	200	190000	120	9900	0.5	130		
Average Concentration	81	11	436	251	2755	0.091	3.2	3.8	4.6	16541	1.7	584	0.03	5.6		
Median Concentration	30	2	325	140	2270	0.05	0.5	1	0.5	9150	0.5	150	0.025	1		
Standard Deviation	146	87	379	265	1171	0.37	9.7	8.9	23	24958	9.6	1742	0.043	14		
Number of Guideline Exceedances	26	160	0	0	4	7	161	48	17	139	20	8	3	17		
Number of Guideline Exceedances (Detects Only)	26	100	0	0	4	7	161	48	17	139	20	8	3	17		



Table B3\_Groundwater Analytical Data - Airport (Environmental Protection) Regulations Vapour Intrusion

EQL	Total Petroleum Hydrocarbons										Total Recoverable Hydrocarbons					
	Zinc (Filteraid)	C6-C9 fraction	C10-C14 fraction	C15-C28 fraction	C29-C36 fraction	C10-C36 fraction (Σum)	C6-C10 fraction	C6-C10 fraction (minus BTEX)(F1)	C10-C16 fraction	C10-C16 fraction (minus Naphthalene)(F2)	C16-C34 fraction	C34-C40 fraction	C10-C40 fraction (Σum)			
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L			
1	10	50	100	100	100	50	10	50	50	100	100	100	100			
Commonwealth 1997 - Airports (Environmental Protection) Regulations Fresh Water																
Commonwealth 1997 - Airports (Environmental Protection) Regulations Marine Water	50					50										
NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Sand																
2-4m							6000		NL							
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report											
MPE 21	MPE 21	Normal	12/02/2019	211437-10	211437	-	-	-	-	-	-	-	-			
MPE 21	MPE 21	Normal	18/02/2019	211785-11	211785	-	<10	<50	110	<100	260	<10	<10			
MPE 21	MPE 21	Normal	25/02/2019	212251-11	212251	-	<10	<50	<100	<100	<250	<10	<10			
MPE 21	MPE 21	Normal	03/03/2019	212783-12	212783	-	<10	<50	<100	<100	<250	<10	<10			
MPE 21	MPE 21	Normal	11/03/2019	213297-11	213297	-	<10	<50	<100	<100	<250	<10	<10			
MPE 3	MPE 3	Normal	11/12/2018	208061-3	208061	4	<10	<50	<100	<100	<250	<10	<10			
MPE 3	MPE 3	Normal	13/02/2019	211519-9	211519	-	<10	<50	<100	<100	<250	<10	<10			
MPE 3	MPE 3	Normal	19/02/2019	211841-6	211841	-	<10	<50	<100	<100	<250	<10	<10			
MPE 3	MPE 3	Normal	26/02/2019	212355-8	212355	-	<10	<50	<100	<100	<250	<10	<10			
MPE 3	MPE 3	Normal	6/03/2019	212985-1	212985	-	<10	<50	<100	<100	<250	<10	<10			
MPE 3	MPE 3	Normal	12/03/2019	213382-8	213382	-	<10	<50	<100	<100	<250	<10	<10			
MPE 4	MPE 4	Normal	13/02/2019	211519-8	211519	-	<10	<50	<100	<100	<250	<10	<10			
MPE 4	MPE 4	Normal	19/02/2019	211841-4	211841	-	<10	<50	<100	<100	<250	<10	<10			
MPE 4	MPE 4	Normal	26/02/2019	212355-6	212355	-	<10	<50	<100	<100	<250	<10	<10			
MPE 4	MPE 4	Normal	5/03/2019	212782-8	212782	-	<10	<50	<100	<100	<250	<10	<10			
MPE 4	MPE 4	Normal	12/03/2019	213382-7	213382	-	<10	<50	130	130	310	<10	<10			
MPE 5	MPE 5	Normal	11/12/2018	208061-7	208061	4	<10	<50	<100	<100	<250	<10	<10			
MPE 5	MPE 5	Normal	13/02/2019	211519-5	211519	-	<10	<50	<100	<100	<250	<10	<10			
MPE 5	MPE 5	Normal	19/02/2019	211841-12	211841	-	<10	<50	<100	<100	<250	<10	<10			
MPE 5	MPE 5	Normal	26/02/2019	212355-1	212355	-	<10	<50	<100	<100	<250	<10	<10			
MPE 5	MPE 5	Normal	5/03/2019	212782-4	212782	-	<10	<50	<100	<100	<250	<10	<10			
MPE 5	MPE 5	Normal	11/03/2019	213297-18	213297	-	<100	<50	120	<100	270	<100	54			
MPE 5A	MPE 5A	Normal	11/12/2018	208061-5	208061	4	<10	<50	<100	<100	<250	<10	<10			
MPE 5A	MPE 5A	Normal	13/02/2019	211519-6	211519	-	<10	<50	<100	<100	<250	<10	<10			
MPE 5A	MPE 5A	Normal	19/02/2019	211841-2	211841	-	<10	<50	<100	<100	<250	<10	<10			
MPE 5A	MPE 5A	Normal	26/02/2019	212355-3	212355	-	<10	140	<100	<100	340	<10	<10			
MPE 5A	MPE 5A	Normal	5/03/2019	212782-6	212782	-	<10	<50	<100	<100	<250	<10	<10			
MPE 5A	MPE 5A	Normal	12/03/2019	213382-4	213382	-	<10	<50	190	<100	340	<10	<10			
MPE 6	MPE 6	Normal	11/12/2018	208061-8	208061	4	<10	<50	950	6500	<10	<10	<10			
MPE 6	MPE 6	Normal	13/02/2019	211519-2	211519	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	19/02/2019	211841-1	211841	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	26/02/2019	212355-5	212355	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	5/03/2019	212782-2	212782	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	11/03/2019	213297-16	213297	-	<100	<50	120	<100	270	<100	54			
MPE 6	MPE 6	Normal	18/02/2019	211785-4	211785	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	25/02/2019	212251-14	212251	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	5/03/2019	212782-1	212782	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	11/03/2019	213297-14	213297	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	18/02/2019	211785-5	211785	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	25/02/2019	212251-5	212251	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	5/03/2019	212782-5	212782	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	11/03/2019	213297-5	213297	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	18/02/2019	211785-3	211785	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	25/02/2019	212251-6	212251	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	5/03/2019	212782-3	212782	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	11/03/2019	213297-7	213297	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	18/02/2019	211785-6	211785	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	25/02/2019	212251-8	212251	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	5/03/2019	212782-7	212782	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	11/03/2019	213297-9	213297	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	18/02/2019	211785-7	211785	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	25/02/2019	212251-9	212251	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	5/03/2019	212782-9	212782	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	11/03/2019	213297-13	213297	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	18/02/2019	211785-8	211785	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	25/02/2019	212251-10	212251	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	5/03/2019	212782-11	212782	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	11/03/2019	213297-15	213297	-	<100	<50	<100	<100	<250	<100	54			
MPE 6	MPE 6	Normal	18/02/2019	211785-11	211785	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	25/02/2019	212251-11	212251	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	5/03/2019	212782-13	212782	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	11/03/2019	213297-17	213297	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	18/02/2019	211785-12	211785	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	25/02/2019	212251-12	212251	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	5/03/2019	212782-15	212782	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	11/03/2019	213297-19	213297	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	18/02/2019	211785-13	211785	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	25/02/2019	212251-13	212251	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	5/03/2019	212782-17	212782	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	11/03/2019	213297-21	213297	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	18/02/2019	211785-14	211785	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	25/02/2019	212251-14	212251	-	<10	<50	<100	<100	<250	<10	<10			
MPE 6	MPE 6	Normal	5/03/2019	212782-19	212782	-	<100	<50	130	<100	280	<100	88			
MPE 6	MPE 6	Normal	11/12/2018	208061-9	208061	4	<10	99	460	1100						

Table B3\_Groundwater Analytical Data - Airport (Environmental Protection) Regulations Vapour Intrusion

Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	Total Petroleum Hydrocarbons							Total Recoverable Hydrocarbons						
						Zinc (Filtered)	C6-C9 fraction	C10-C14 fraction	C15-C28 fraction	C29-C36 fraction	C10-C36 fraction (Σum)	C6-C10 fraction	C6-C10 fraction (minus BTEX)(F1)	C10-C16 fraction	C10-C16 (minus Naphthalene)(F2)	C16-C34 fraction	C34-C40 fraction	C10-C40 fraction (Σum)	
EQL						1	10	50	100	100	50	10	10	50	100	100	100	100	
Commonwealth 1997 - Airports (Environmental Protection) Regulations Fresh Water																			
Commonwealth 1997 - Airports (Environmental Protection) Regulations Marine Water						50													
NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Sand																			
2-4m												6000		NL					
<b>Statistical Summary</b>																			
Number of Results	161	283	283	263	263	267	283	283	283	283	263	283	283	283	283	283	12		
Number of Detects	156	9	40	52	13	83	21	21	65	65	42	9	0	0	0	0	0		
Minimum Concentration	<1	<10	<50	<100	<50	<50	<10	<10	<50	<100	<100	<100	<100	<100	<100	<100	ND		
Minimum Detect	1	11	50	100	120	60	10	10	51	100	110	100	100	100	100	100	ND		
Maximum Concentration	10000	1400	1300	3300	6500	7500	2400	1500	1400	1400	4300	8500	<100						
Maximum Detect	10000	1400	1300	3300	6500	7500	2400	1500	1400	1400	4300	8500	ND						
Average Concentration	246	21	46	121	86	264	26	23	69	59	131	93	50						
Median Concentration	6	5	25	50	50	125	5	5	25	25	50	50	50						
Standard Deviation	1239	97	92	312	397	596	151	103	109	108	405	515	0						
Number of Guideline Exceedances	114	4	0	0	0	18	0	0	1	283	6	4	0						
Number of Guideline Exceedances (Detects Only)	114	1	0	0	0	18	0	0	1	283	6	4	0						

Table B3\_Groundwater Analytical Data - Airport (Environmental Protection) Regulations Vapour Intrusion

EQI	Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	BTEX										Naphthalene		Monocyclic Aromatic Hydrocarbons																							
							Benzene		Toluene		Ethylbenzene		m,p-Xylene		o-Xylene		Total Xylenes		Total BTEX		Naphthalene		Naphthalene (VOC)		Styrene		Isopropylbenzene		p-Butylbenzene		p-Propylbenzene		Isopropyltoluene		sec-Butylbenzene		tert-Butylbenzene		1,2-dimethylbenzene		1,3-dimethylbenzene	
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L		
	Commonwealth 1997 - Airports (Environmental Protection) Regulations Fresh Water						300	300	100	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1							
	Commonwealth 1997 - Airports (Environmental Protection) Regulations Marine Water						300	300	100	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
	NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Sand						5000	NL	NL																																	
	34 TL3	34 TL3	Normal	13/02/2019	211519-11	211519	<10	<10	<10	<20	<10	<30	<30	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	34 TL3	34 TL3	Normal	19/02/2019	212841-5	212841	<10	<10	<10	<20	<10	<30	<30	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	34 TL3	34 TL3	Normal	26/03/2019	212355-7	212355	<10	<10	<10	<20	<10	<30	<30	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	34 TL3	34 TL3	Normal	06/03/2019	212985-2	212985	<10	<10	<10	<20	<10	<30	<30	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	34 TL3	34 TL3	Normal	12/03/2019	213382-13	213382	<100	<100	<100	<200	<100	<300	<300	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	34 TL3	34 TL3	Normal	16/04/2019	215934-2	215934	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	GW100s	GW100s	Interlab D	16/04/2019	ES191221001	ES191221	<1	<2	<2	<2	<2	<3	<3	<1	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5						
	GW100s	GW100s	Normal	21/02/2019	212109-3	212109	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	GW100s	GW100s	Normal	8/03/2019	213103-3	213103	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	GW100s	GW100s	Normal	11/04/2019	215594-8	215594	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	GW101	GW101	Normal	8/01/2019	209135-1	209135	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	GW101	GW101	Normal	11/02/2019	211335-4	211335	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	GW101	GW101	Normal	8/03/2019	213103-1	213103	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	GW101	GW101	Normal	15/04/2019	215789-5	215789	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	GW101	QC2039	Interlab D	11/02/2019	ES1904415001	ES1904415	<1	<2	<2	<2	<2	<3	<3	<1	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5							
	GW102	GW102	Normal	8/01/2019	209135-2	209135	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	GW102	GW102	Normal	11/02/2019	211335-6	211335	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	GW102	GW102	Normal	8/03/2019	213103-5	213103	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	GW102	GW102	Normal	17/04/2019	215939-8	215939	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	GW102	QC2051	Interlab D	8/03/2019	ES1907278001	ES1907278	<1	<2	<2	<2	<2	<3	<3	<1	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5							
	GW103	GW103	Normal	21/02/2019	212109-4	212109	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
	GW103	GW103	Normal	8/03/2019	213103-4	213103	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	GW103	GW103	Normal	17/04/2019	215939-6	215939	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	GW103	QC1055	Field D	17/04/2019	215939-4	215939	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	GW104	GW104	Normal	20/12/2018	208653-5	208653	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
	GW104	GW104	Normal	7/02/2019	21141-7	21141	<10	<10	<10	<20	<10	<30	<30	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10						
	GW104	GW104	Normal	10/04/2019	215496-4	215496	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	GW10s	GW10s	Normal	10/01/2019	209274-1	209274	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	GW10s	GW10s	Normal	14/02/2019	211612-1	211612	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	GW10s	GW10s	Normal	8/03/2019	213103-7	213103	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	GW10s	QC105s	Field D	8/04/2019	215423-2	215423	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
	GW10s	QC2053	Interlab D	9/04/2019	ES1911607001	ES1911607	<1	<2	<2	<2	<2	<3	<3	<1	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5							
	GW11d	GW11d	Normal	10/03/2019	212548-1	212548	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
	GW11d	GW11d	Normal	16/04/2019	215934-8	215934	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
	GW11s	GW11s	Normal	24/01/2018	210231-1	210231	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
	GW11s	GW11s	Normal	11/02/2019	211335-2	211335	<1	<1	<1	<2	<1	<3	<3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
	GW11s	GW11s	Normal	13/03/2019	213502-6																																					







Table B3\_Groundwater Analytical Data - Airport (Environmental Protection) Regulations Vapour Intrusion

		Polynuclear Aromatic Hydrocarbons															
		Acenaphthylene	Acenaphthene	Anthracene	Fluorene	Phenanthrene	Fluoranthene	Benzo(a)anthracene	Benzo(k)fluoranthene	Benzo(b)fluoranthene	Benzo(e)pyrene	Benzo(a)pyrene	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(e)pyrene	Sum of PAHs
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
EOL																	
Commonwealth 1997 - Airports (Environmental Protection) Regulations Fresh Water																	
Commonwealth 1997 - Airports (Environmental Protection) Regulations Marine Water																	
NEPM 2013 Table 1A(4) Commlnd HSL d GW for Vapour Intrusion, Sand																	
2-4m																	
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report												
MPE 21	MPE 21	Normal	12/02/2019	211437-10	211437	-	-	-	-	-	-	-	-	-	-	-	-
MPE 21	MPE 21	Normal	18/02/2019	211785-11	211785	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 21	MPE 21	Normal	25/02/2019	212251-11	212251	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 21	MPE 21	Normal	4/03/2019	212783-12	212783	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 21	MPE 21	Normal	11/03/2019	213297-11	213297	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 3	MPE 3	Normal	11/12/2018	208061-3	208061	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
MPE 3	MPE 3	Normal	13/02/2019	211519-9	211519	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 3	MPE 3	Normal	19/02/2019	211841-6	211841	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 3	MPE 3	Normal	26/02/2019	212355-8	212355	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 3	MPE 3	Normal	6/03/2019	212985-1	212985	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 3	MPE 3	Normal	12/03/2019	213382-8	213382	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 4	MPE 4	Normal	13/02/2019	211519-9	211519	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 4	MPE 4	Normal	19/02/2019	211841-4	211841	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 4	MPE 4	Normal	26/02/2019	212355-8	212355	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 4	MPE 4	Normal	6/03/2019	212782-8	212782	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 4	MPE 4	Normal	12/03/2019	213382-7	213382	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 5	MPE 5	Normal	11/12/2018	208061-7	208061	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
MPE 5	MPE 5	Normal	13/02/2019	211519-5	211519	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 5	MPE 5	Normal	19/02/2019	211841-12	211841	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 5	MPE 5	Normal	26/02/2019	212355-1	212355	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 5	MPE 5	Normal	6/03/2019	212782-4	212782	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 5	MPE 5	Normal	11/03/2019	213297-18	213297	-	-	-	-	-	-	-	-	-	-	-	<10
MPE 5A	MPE 5A	Normal	11/12/2018	208061-5	208061	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
MPE 5A	MPE 5A	Normal	13/02/2019	211519-6	211519	-	-	-	-	-	-	-	-	-	-	-	<10
MPE 5A	MPE 5A	Normal	19/02/2019	211841-2	211841	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 5A	MPE 5A	Normal	26/02/2019	212355-3	212355	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 5A	MPE 5A	Normal	6/03/2019	212782-6	212782	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 5A	MPE 5A	Normal	12/03/2019	213382-4	213382	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 6	MPE 6	Normal	11/12/2018	208061-9	208061	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
MPE 6	MPE 6	Normal	13/02/2019	211519-2	211519	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 6	MPE 6	Normal	18/02/2019	211785-14	211785	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 6	MPE 6	Normal	25/02/2019	212251-14	212251	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 6	MPE 6	Normal	6/03/2019	212782-1	212782	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 6	MPE 6	Normal	11/03/2019	213297-14	213297	-	-	-	-	-	-	-	-	-	-	-	<10
MPE 7	MPE 7	Normal	12/12/2018	208060-2	208060	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
MPE 7	MPE 7	Normal	12/02/2019	211437-8	211437	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 7	MPE 7	Normal	18/02/2019	211785-9	211785	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 7	MPE 7	Normal	25/02/2019	212251-10	212251	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 7	MPE 7	Normal	4/03/2019	212783-10	212783	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 7	MPE 7	Normal	11/03/2019	213297-10	213297	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 8	MPE 8	Normal	12/12/2018	208060-1	208060	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
MPE 8	MPE 8	Normal	12/02/2019	211437-6	211437	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 8	MPE 8	Normal	18/02/2019	211785-5	211785	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 8	MPE 8	Normal	25/02/2019	212251-5	212251	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 8	MPE 8	Normal	4/03/2019	212783-6	212783	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 8	MPE 8	Normal	11/03/2019	213297-5	213297	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 9	MPE 9	Field D	25/02/2019	212519-6	212519	-	-	-	-	-	-	-	-	-	-	-	<10
MPE 9	MPE 9	Normal	12/12/2018	208060-5	208060	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
MPE 9	MPE 9	Normal	12/02/2019	211437-4	211437	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 9	MPE 9	Normal	18/02/2019	211785-4	211785	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 9	MPE 9	Normal	25/02/2019	212251-4	212251	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 9	MPE 9	Normal	4/03/2019	212783-5	212783	-	-	-	-	-	-	-	-	-	-	-	<1
MPE 9	MPE 9	Normal	11/03/2019	213297-4	213297	-	-	-	-	-	-	-	-	-	-	-	<1
MPI 10	MPI 10	Normal	11/12/2018	208061-6	208061	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
MPI 10	MPI 10	Normal	13/02/2019	211519-4	211519	-	-	-	-	-	-	-	-	-	-	-	<1
MPI 10	MPI 10	Normal	19/02/2019	211841-11	211841	-	-	-	-	-	-	-	-	-	-	-	<1
MPI 10	MPI 10	Normal	26/02/2019	212355-2	212355	-	-	-	-	-	-	-	-	-	-	-	<1
MPI 10	MPI 10	Normal	6/03/2019	212782-5	212782	-	-	-	-	-	-	-	-	-	-	-	<1
MPI 10	MPI 10	Normal	11/03/2019	213297-19	213297	-	-	-	-	-	-	-	-	-	-	-	<10
MPI 12	MPI 12	Normal	11/12/2018	208061-9	208061	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
MPI 12	MPI 12	Normal	13/02/2019	211519-1	211519	-	-	-	-	-	-	-	-	-	-	-	<10
MPI 12	MPI 12	Normal	18/02/2019	211785-13	211785	-	-	-	-	-	-	-	-	-	-	-	<1
MPI 12	MPI 12	Normal	25/02/2019	212520-3	212520	-	-	-	-	-	-	-	-	-	-	-	<1
MPI 12	MPI 12	Normal	6/03/2019	212782-2	212782	-	-	-	-	-	-	-	-	-	-	-	<1
MPI 12	MPI 12	Normal	11/03/2019	213297-13	213297	-	-	-	-	-	-	-	-	-	-	-	<1
MPI 12	MPI 12	Field D	11/12/2018	208061-10	208061	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
MPI 13	MPI 13	Normal	11/12/2018	208061-12	208061	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
MPI 13	MPI 13	Normal	12/02/2019	211437-11	211437	-	-	-	-	-	-	-	-	-	-	-	<1
MPI 13	MPI 13	Normal	18/02/2019	211785-12	211785	-	-	-	-	-	-	-	-	-	-	-	<1
MPI 13	MPI 13	Normal	28/02/2019	212520-2	212520	-	-	-	-	-	-	-	-	-	-	-	<1
MPI 13	MPI 13	Normal	4/03/2019	212783-11	212783	-	-	-	-	-	-	-	-	-	-	-	<1
MPI 13	MPI 13	Normal	11/03/2019	213297-12	213297	-	-	-	-	-	-	-	-	-	-	-	<1
MPI 13	MPI 13	Interlab D	18/02/2019	ES1905388001	ES1905388	-	-	-	-	-	-	-	-	-	-	-	<1
MPI 13	MPI 13	Interlab D	28/02/2019	ES1906314001	ES1906314	-	-	-	-	-	-	-	-	-	-	-	<1
MPI 14	MPI 14	Normal	12/12/2018	208060-3													

Table B3\_Groundwater Analytical Data - Airport (Environmental Protection) Regulations Vapour Intrusion

		Polynuclear Aromatic Hydrocarbons														
		Acenaphthylene	Acenaphthene	Anthracene	Fluorene	Phenanthrene	Fluoranthene	Benz(a)anthracene	Benzofluoranthene	Sum of PAHs						
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
EOL																
Commonwealth 1997 - Airports (Environmental Protection) Regulations Fresh Water																
Commonwealth 1997 - Airports (Environmental Protection) Regulations Marine Water																
NEPM 2013 Table 1A(4) Commlnd HSL D GW for Vapour Intrusion, Sand																
2-4m																
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report											
MPI 3A	MPI 3A	Normal	6/03/2019	212985-4	212985	-	-	-	-	-	-	-	-	-	-	<1
MPI 3A	MPI 3A	Normal	12/03/2019	213382-10	213382	-	-	-	-	-	-	-	-	-	-	<1
MPI 4	MPI 4	Normal	12/12/2018	208060-8	208060	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
MPI 4	MPI 4	Normal	13/02/2019	211519-12	211519	-	-	-	-	-	-	-	-	-	-	<1
MPI 4	MPI 4	Normal	19/02/2019	211841-8	211841	-	-	-	-	-	-	-	-	-	-	<1
MPI 4	MPI 4	Normal	26/02/2019	212355-11	212355	-	-	-	-	-	-	-	-	-	-	<1
MPI 4	MPI 4	Normal	6/03/2019	212985-6	212985	-	-	-	-	-	-	-	-	-	-	<10
MPI 4	MPI 4	Normal	12/03/2019	213382-9	213382	-	-	-	-	-	-	-	-	-	-	<1
MPI 4A	MPI 4A	Normal	11/12/2018	208061-4	208061	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
MPI 4A	MPI 4A	Normal	13/02/2019	213382-5	213382	-	-	-	-	-	-	-	-	-	-	<10
MPI 4A	MPI 4A	Normal	19/02/2019	211841-1	211841	-	-	-	-	-	-	-	-	-	-	<1
MPI 4A	MPI 4A	Normal	26/02/2019	212355-4	212355	-	-	-	-	-	-	-	-	-	-	<1
MPI 4A	MPI 4A	Normal	5/03/2019	212782-7	212782	-	-	-	-	-	-	-	-	-	-	<1
MPI 4A	MPI 4A	Normal	12/03/2019	213382-6	213382	-	-	-	-	-	-	-	-	-	-	<1
MPI 5	MPI 5	Normal	12/12/2018	208060-7	208060	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	-	-	-	-	-	-	-	-	-	-	<10
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841	-	-	-	-	-	-	-	-	-	-	<1
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	-	-	-	-	-	-	-	-	-	-	<1
MPI 6A	MPI 6A	Normal	6/03/2019	212782-9	212782	-	-	-	-	-	-	-	-	-	-	<1
MPI 6A	MPI 6A	Normal	12/03/2019	213382-8	213382	-	-	-	-	-	-	-	-	-	-	<100
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	<1	3	<1	2	2	<1	<1	<1	<1	<1	<1
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
WCX GTY BH 002	WCX GTY BH	Normal	19/12/2018	208565-1	208565	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
WCX GTY BH 002	WCX GTY BH	Normal	28/02/2019	212520-5	212520	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
WCX GTY BH 002	WCX GTY BH	Normal	15/03/2019	213632-2	213632	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
WCX GTY BH 002	WCX GTY BH	Normal	11/04/2019	215594-7	215594	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
WCX GTY BH 003	WCX GTY BH	Normal	8/03/2019	213103-2	213103	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
WCX GTY BH 004	QC2052	Interlab D	15/03/2019	ES1907999001	ES1907999	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5
WCX GTY BH 004	WCX GTY BH	Normal	28/02/2019	212520-6	212520	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
WCX GTY BH 004	WCX GTY BH	Normal	15/03/2019	213632-3	213632	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
WCX GTY BH 004	WCX GTY BH	Normal	17/04/2019	215939-1	215939	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
WCX GTY BH 0094	WCX GTY BH	Normal	17/12/2018	208319-2	208319	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
WCX GTY BH 0094	WCX GTY BH	Normal	13/02/2019	211510-3	211510	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
WCX GTY BH 0094	WCX GTY BH	Normal	15/03/2019	213632-1	213632	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
WCX GTY BH 0094	WCX GTY BH	Normal	11/04/2019	215594-10	215594	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
WCX GTY BH 0094	WCX GTY BH	Normal	17/12/2018	208319-1	208319	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
WCX GTY BH 0094	WCX GTY BH	Normal	13/02/2019	211510-2	211510	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
WCX GTY BH 0094	WCX GTY BH	Normal	6/03/2019	212985-9	212985	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
WCX GTY BH 0094	WCX GTY BH	Normal	11/04/2019	215594-9	215594	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
WCX GTY BH 027	QC1046	Field D	22/02/2019	212103-3	212103	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
WCX GTY BH 027	WCX GTY BH	Normal	17/01/2019	209762-4	209762	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
WCX GTY BH 027	WCX GTY BH	Normal	22/02/2019	212103-2	212103	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
WCX GTY BH 027	WCX GTY BH	Normal	16/04/2019	215934-6	215934	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
WCX GTY BH 033	QC1054	Field D	11/04/2019	215594-2	215594	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
WCX GTY BH 033	QC2031	Interlab D	19/12/2018	ES1838735001	ES1838735	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5
WCX GTY BH 033	WCX GTY BH	Normal	19/12/2018	208565-2	208565	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
WCX GTY BH 033	WCX GTY BH	Normal	13/02/2019	211510-4	211510	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
WCX GTY BH 033	WCX GTY BH	Normal	11/04/2019	215594-6	215594	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<14
<b>Statistical Summary</b>																
Number of Results	161	161	161	161	161	161	161	8	8	153	161	153	161	161	161	161
Number of Detects	0	7	0	2	6	0	0	0	0	0	0	0	0	0	0	11
Minimum Concentration	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Minimum Detect	ND	1	ND	1	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<1	18	<1	2	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<100
Maximum Detect	ND	18	ND	2	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	31
Average Concentration	0.5	0.73	0.5	0.51	0.53	0.5	0.5	0.5	0.5	1	0.49	0.5	0.5	0.5	0.5	5.3
Median Concentration	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5	0.5	0.5	7
Standard Deviation	0	1.8	0	0.12	0.18	0	0	0	0	0	0.05	0	0	0	0	6.5
Number of Guideline Exceedances	0	0	0	0	0	0	0	161	0	0	161	0	0	0	161	0
Number of Guideline Exceedances (Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11





Table B3\_Groundwater Analytical Data - Airport (Environmental Protection) Regulations Vapour Intrusion

		Phenolic Compounds														
		Phenol	2-Chlorophenol	2-Methylphenol (o-Cresol)	2,4-Dichlorophenol	2-Nitrophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,6-Dichlorophenol	4-Chloro-3-methylphenol	2,4,6-Trichlorophenol	2,4,6-Trichlorophenol	Pentachlorophenol	Sum of Phenols (halogenated)	Sum of Phenols (non-halogenated)	Sum of Phenols
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQIL																
Commonwealth 1997 - Airports (Environmental Protection) Regulations Fresh Water																
Commonwealth 1997 - Airports (Environmental Protection) Regulations Marine Water																
NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Sand		50				0.1				10			8	0.2		50
2-4m																
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report											
MPI 3A	MPI 3A	Normal	6/03/2019	212985-4	212985	-	-	-	-	-	-	-	-	-	-	-
MPI 3A	MPI 3A	Normal	12/03/2019	213382-10	213382	-	-	-	-	-	-	-	-	-	-	-
MPI 4	MPI 4	Normal	12/12/2018	208060-8	208060	-	-	-	-	-	-	-	-	-	-	<50
MPI 4	MPI 4	Normal	13/02/2019	211519-12	211519	-	-	-	-	-	-	-	-	-	-	-
MPI 4	MPI 4	Normal	19/02/2019	211841-8	211841	-	-	-	-	-	-	-	-	-	-	-
MPI 4	MPI 4	Normal	26/02/2019	212355-11	212355	-	-	-	-	-	-	-	-	-	-	-
MPI 4	MPI 4	Normal	6/03/2019	212985-6	212985	-	-	-	-	-	-	-	-	-	-	-
MPI 4	MPI 4	Normal	12/03/2019	213382-9	213382	-	-	-	-	-	-	-	-	-	-	-
MPI 4A	MPI 4A	Normal	11/12/2018	208061-4	208061	-	-	-	-	-	-	-	-	-	-	<50
MPI 4A	MPI 4A	Normal	13/02/2019	213382-5	213382	-	-	-	-	-	-	-	-	-	-	-
MPI 4A	MPI 4A	Normal	19/02/2019	211841-1	211841	-	-	-	-	-	-	-	-	-	-	-
MPI 4A	MPI 4A	Normal	26/02/2019	212355-4	212355	-	-	-	-	-	-	-	-	-	-	-
MPI 4A	MPI 4A	Normal	5/03/2019	212782-7	212782	-	-	-	-	-	-	-	-	-	-	-
MPI 4A	MPI 4A	Normal	12/03/2019	213382-5	213382	-	-	-	-	-	-	-	-	-	-	-
MPI 5	MPI 5	Normal	12/12/2018	208060-7	208060	-	-	-	-	-	-	-	-	-	-	<50
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	-	-	-	-	-	-	-	-	-	-	-
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841	-	-	-	-	-	-	-	-	-	-	-
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	-	-	-	-	-	-	-	-	-	-	-
MPI 6A	MPI 6A	Normal	5/03/2019	212782-9	212782	-	-	-	-	-	-	-	-	-	-	-
MPI 6A	MPI 6A	Normal	12/03/2019	213382-6	213382	-	-	-	-	-	-	-	-	-	-	-
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	-	-	-	-	-	-	-	-	-	-	<50
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	-	-	-	-	-	-	-	-	-	-	<50
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 002	WCX GTY BH	Normal	19/12/2018	208565-1	208565	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 002	WCX GTY BH	Normal	28/02/2019	212520-5	212520	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 002	WCX GTY BH	Normal	15/03/2019	213632-2	213632	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 002	WCX GTY BH	Normal	11/04/2019	215594-7	215594	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 003	WCX GTY BH	Normal	9/03/2019	213103-2	213103	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 004	QC2052	Interlab D	15/03/2019	ES1907999001	ES1907999	<1	<1	<1	<2	<1	<1	<1	<1	<1	<2	<8
WCX GTY BH 004	WCX GTY BH	Normal	28/02/2019	212520-6	212520	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 004	WCX GTY BH	Normal	15/03/2019	213632-3	213632	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 004	WCX GTY BH	Normal	17/04/2019	215939-1	215939	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 009d	WCX GTY BH	Normal	17/12/2018	208319-2	208319	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 009d	WCX GTY BH	Normal	13/02/2019	211519-3	211519	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 009d	WCX GTY BH	Normal	15/03/2019	213632-1	213632	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 009d	WCX GTY BH	Normal	11/04/2019	215594-10	215594	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 009s	WCX GTY BH	Normal	17/12/2018	208319-1	208319	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 009s	WCX GTY BH	Normal	13/02/2019	211519-2	211519	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 009s	WCX GTY BH	Normal	6/03/2019	212985-9	212985	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 009s	WCX GTY BH	Normal	11/04/2019	215594-9	215594	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 027	QC1046	Field D	22/02/2019	212103-3	212103	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 027	WCX GTY BH	Normal	17/01/2019	209782-4	209782	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 027	WCX GTY BH	Normal	22/02/2019	212103-2	212103	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 027	WCX GTY BH	Normal	16/04/2019	215934-6	215934	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 033	QC1054	Field D	11/04/2019	215594-2	215594	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 033	QC2031	Interlab D	19/12/2018	ES1838735001	ES1838735	<1	<1	<1	<2	<1	<1	<1	<1	<1	<2	<8
WCX GTY BH 033	WCX GTY BH	Normal	19/12/2018	208565-2	208565	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 033	WCX GTY BH	Normal	13/02/2019	211519-4	211519	-	-	-	-	-	-	-	-	-	-	<50
WCX GTY BH 033	WCX GTY BH	Normal	11/04/2019	215594-6	215594	-	-	-	-	-	-	-	-	-	-	<50
<b>Statistical Summary</b>																
Number of Results		8	8	8	8	8	8	8	8	8	8	8	8	6	6	154
Number of Detects		0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Minimum Concentration		<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<2	<8	<4
Minimum Detect		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	70
Maximum Concentration		<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<2	<8	<4
Maximum Detect		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	200
Average Concentration		0.5	0.5	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	4	27
Median Concentration		0	0	0	0	0	0	0	0	0	0	0	0	1	4	2
Standard Deviation		0	0	0	0	0	0	0	0	0	0	0	0	0	0	16
Number of Guideline Exceedances		0	0	0	0	0	0	0	0	0	0	0	0	8	0	0
Number of Guideline Exceedances (Detects Only)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Table B3\_Groundwater Analytical Data - Airport (Environmental Protection) Regulations Vapour Intrusion

						Halogenated Aromatic Compounds																									
						Bromobenzene	Chlorobenzene	2-Chlorotoluene	4-Chlorotoluene	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	Bromochloromethane	Dichlorodifluoromethane (Freon 12)	Chloromethane	Vinyl chloride	Bromomethane	Chloroethane	Trichlorofluoromethane (Freon 11)	1,1-Dichloroethane	Iodomethane	1,1-Dichloroethane	1,1,1-Trichloroethane	1,1,2-Dichloroethane	trans-1,2-Dichloroethane				
						ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L			
EQUL						1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Commonwealth 1997 - Airports (Environmental Protection) Regulations Fresh Water																															
Commonwealth 1997 - Airports (Environmental Protection) Regulations Marine Water										2.5	2.5	1	0.5	0.5																	
NEPM 2013 Table 1A(4) Comm/Ind HSL GW for Vapour Intrusion, Sand																															
2-4m																															
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report																										
MPE 21	MPE 21	Normal	12/02/2019	211437-10	211437	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 21	MPE 21	Normal	18/02/2019	211785-11	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 21	MPE 21	Normal	25/02/2019	212251-11	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 21	MPE 21	Normal	4/03/2019	212783-12	212783	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 21	MPE 21	Normal	11/03/2019	213297-11	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 3	MPE 3	Normal	11/12/2018	208061-3	208061	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
MPE 3	MPE 3	Normal	13/02/2019	211519-9	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 3	MPE 3	Normal	19/02/2019	211841-6	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 3	MPE 3	Normal	26/02/2019	212355-8	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 3	MPE 3	Normal	6/03/2019	212985-1	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 3	MPE 3	Normal	12/03/2019	213382-8	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 4	MPE 4	Normal	13/02/2019	211519-8	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 4	MPE 4	Normal	19/02/2019	211841-4	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 4	MPE 4	Normal	26/02/2019	212355-6	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 4	MPE 4	Normal	5/03/2019	212782-6	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 4	MPE 4	Normal	12/03/2019	213382-7	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 5	MPE 5	Normal	11/12/2018	208061-7	208061	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
MPE 5	MPE 5	Normal	13/02/2019	211519-5	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 5	MPE 5	Normal	19/02/2019	211841-12	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 5	MPE 5	Normal	26/02/2019	212355-1	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 5	MPE 5	Normal	6/03/2019	212782-4	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 5	MPE 5	Normal	11/03/2019	213297-18	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 5A	MPE 5A	Normal	11/12/2018	208061-5	208061	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
MPE 5A	MPE 5A	Normal	13/02/2019	211519-6	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 5A	MPE 5A	Normal	19/02/2019	211841-2	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 5A	MPE 5A	Normal	26/02/2019	212355-3	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 5A	MPE 5A	Normal	5/03/2019	212782-6	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 5A	MPE 5A	Normal	12/03/2019	213382-4	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 6	MPE 6	Normal	11/12/2018	208061-8	208061	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
MPE 6	MPE 6	Normal	13/02/2019	211519-2	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 6	MPE 6	Normal	18/02/2019	211785-14	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 6	MPE 6	Normal	25/02/2019	212251-14	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 6	MPE 6	Normal	5/03/2019	212782-1	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 6	MPE 6	Normal	11/03/2019	213297-14	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 6	QC1049	Field D	11/03/2019	213297-15	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 7	MPE 7	Normal	12/12/2018	208060-2	208060	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
MPE 7	MPE 7	Normal	12/02/2019	211437-8	211437	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 7	MPE 7	Normal	18/02/2019	211785-9	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 7	MPE 7	Normal	25/02/2019	212251-10	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 7	MPE 7	Normal	4/03/2019	212783-10	212783	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 7	MPE 7	Normal	11/03/2019	213297-10	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 8	MPE 8	Normal	12/12/2018	208060-1	208060	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
MPE 8	MPE 8	Normal	12/02/2019	211437-6	211437	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 8	MPE 8	Normal	18/02/2019	211785-5	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 8	MPE 8	Normal	25/02/2019	212251-5	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 8	MPE 8	Normal	4/03/2019	212783-6	212783	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 8	MPE 8	Normal	11/03/2019	213297-5	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 8	QC1046	Field D	25/02/2019	212251-6	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 9	MPE 9	Normal	12/12/2018	208060-5	208060	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
MPE 9	MPE 9	Normal	12/02/2019	211437-4	211437	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 9	MPE 9	Normal	18/02/2019	211785-4	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 9	MPE 9	Normal	25/02/2019	212251-4	212251	-	-	-	-</																						













Table B3\_Groundwater Analytical Data - Airport (Environmental Protection) Regulations Vapour Intrusion

			Trihalomethanes				Polychlorinated Biphenyls								Oxygenated Compounds				Sulfonated Compounds	
			Bromochloromethane	Bromobromomethane	Chlorobromomethane	Dibromochloromethane	Polychlorinated Biphenyls	Arachlor 1016	Arachlor 1221	Arachlor 1232	Arachlor 1242	Arachlor 1248	Arachlor 1254	Arachlor 1260	Vinyl acetate	2-Butanone (MEK)	2-n-hexanone (MBK)	4-Methyl-2-pentanone (MIBK)	Carbon disulfide	
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
EOL			1	1	1	1	1	2	2	2	2	2	2	2	50	50	50	50	5	
Commonwealth 1997 - Airports (Environmental Protection) Regulations Fresh Water							0.001													
Commonwealth 1997 - Airports (Environmental Protection) Regulations Marine Water																				
NEM1 2013 Table 1A(4) ComvInd HSL D GW for Vapour Intrusion, Sand																				
2-4m																				
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report															
MPI 3A	MPI 3A	Normal	6/03/2019	212985-4	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 3A	MPI 3A	Normal	12/03/2019	213382-10	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4	MPI 4	Normal	12/12/2018	208060-8	208060	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
MPI 4	MPI 4	Normal	13/02/2019	211519-12	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4	MPI 4	Normal	19/02/2019	211841-9	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4	MPI 4	Normal	26/02/2019	212355-11	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4	MPI 4	Normal	6/03/2019	212985-6	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4	MPI 4	Normal	12/03/2019	213382-9	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4A	MPI 4A	Normal	11/12/2018	208061-4	208061	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
MPI 4A	MPI 4A	Normal	13/02/2019	213382-6	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4A	MPI 4A	Normal	19/02/2019	211841-1	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4A	MPI 4A	Normal	26/02/2019	212355-4	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4A	MPI 4A	Normal	5/03/2019	212782-7	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4A	MPI 4A	Normal	12/03/2019	213382-5	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 5	MPI 5	Normal	12/12/2018	208060-7	208060	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 6A	MPI 6A	Normal	5/03/2019	212782-9	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 6A	MPI 6A	Normal	12/03/2019	213382-8	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 002	WCX GTY BH	Normal	19/12/2018	208565-1	208565	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 002	WCX GTY BH	Normal	28/02/2019	212520-5	212520	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 002	WCX GTY BH	Normal	15/03/2019	213632-2	213632	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 002	WCX GTY BH	Normal	11/04/2019	215594-7	215594	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 003	WCX GTY BH	Normal	6/03/2019	213103-2	213103	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 004	QC2032	Interlab_D	15/03/2019	ES1907999001	ES1907999	<5	<5	<5	<5	<1	-	-	-	-	<50	<50	<50	<50	<5	
WCX GTY BH 004	WCX GTY BH	Normal	28/02/2019	212520-6	212520	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 004	WCX GTY BH	Normal	15/03/2019	213632-3	213632	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 004	WCX GTY BH	Normal	17/04/2019	215939-1	215939	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 009d	WCX GTY BH	Normal	17/12/2018	208319-2	208319	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 009d	WCX GTY BH	Normal	13/02/2019	211510-3	211510	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 009d	WCX GTY BH	Normal	15/03/2019	213632-1	213632	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 009d	WCX GTY BH	Normal	11/04/2019	215594-10	215594	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 009s	WCX GTY BH	Normal	17/12/2018	208319-1	208319	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 009s	WCX GTY BH	Normal	13/02/2019	211510-2	211510	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 009s	WCX GTY BH	Normal	6/03/2019	212985-9	212985	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 009s	WCX GTY BH	Normal	11/04/2019	215594-9	215594	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 027	QC1046	Field_D	22/02/2019	212103-3	212103	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 027	WCX GTY BH	Normal	17/01/2019	209762-4	209762	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 027	WCX GTY BH	Normal	22/02/2019	212103-2	212103	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 027	WCX GTY BH	Normal	16/04/2019	215934-6	215934	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 033	QC1054	Field_D	11/04/2019	215594-2	215594	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 033	QC2031	Interlab_D	19/12/2018	ES1838735001	ES1838735	<5	<5	<5	<5	<1	-	-	-	-	<50	<50	<50	<50	<5	
WCX GTY BH 033	WCX GTY BH	Normal	19/12/2018	208565-2	208565	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 033	WCX GTY BH	Normal	13/02/2019	211510-4	211510	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
WCX GTY BH 033	WCX GTY BH	Normal	11/04/2019	215594-6	215594	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
<b>Statistical Summary</b>																				
Number of Results						161	161	161	161	8	153	153	153	153	153	153	8	8	8	8
Number of Detects						2	0	0	2	0	0	0	0	0	0	0	0	0	0	1
Minimum Concentration						<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<50	<50	<50	<50
Minimum Detect						ND	ND	1	ND	ND	ND	ND	ND	ND						
Maximum Concentration						<10	<10	<10	<10	<1	<20	<20	<20	<20	<20	<50	<50	<50	<50	
Maximum Detect						ND	ND	1	ND	ND	ND	ND	ND	ND						
Average Concentration						0.82	0.82	0.83	0.82	0.5	1.1	1.1	1.1	1.1	1.1	1.1	25	25	25	25
Median Concentration						1.1	1.1	1.1	1.1	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0	0	0	0
Standard Deviation						1.1	1.1	1.1	1.1	0	0	0	0	0	0	0	0	0	0	4.8
Number of Guideline Exceedances						16	0	16	8	8										



Table B3\_Groundwater Analytical Data - Airport (Environmental Protection) Regulations Vapour Intrusion

							Organochlorine Pesticides (OC)																										
							Alrin	Dieldrin	Alrin + Dieldrin	γ-BHC	β-BHC	δ-BHC	β-BHC (Lindane)	γ-Chlordane	trans-Chlordane	Chlordane	DDD	DDE	DDT	DDT+DDE+DDD	Endosulfan 1	Endosulfan 2	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor epoxide	Heachlorobenzene (HCB)				
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L			
EQL							0.2	0.2	0.5	0.2	0.2	0.2	0.003	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.2	0.2	0.2	0.2	0.2	0.5	0.2	0.2	0.2		
Commonwealth 1997 - Airports (Environmental Protection) Regulations Fresh Water																																	
Commonwealth 1997 - Airports (Environmental Protection) Regulations Marine Water							0.01	0.002					0.003				0.004		0.014	0.001						0.003			0.01			0.003	
NPM 2013 Table 1A(4) Com/In/nd HSL D GW for Vapour Intrusion, Sand																																	
2-4m																																	
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report																												
MPE 21	MPE 21	Normal	12/02/2019	211437-10	211437	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 21	MPE 21	Normal	18/02/2019	211785-11	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 21	MPE 21	Normal	25/02/2019	212251-11	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 21	MPE 21	Normal	4/03/2019	212783-12	212783	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 21	MPE 21	Normal	11/03/2019	213297-11	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE 3	MPE 3	Normal	11/12/2018	208061-3	208061	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
MPE 3	MPE 3	Normal	13/02/2019	211519-9	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 3	MPE 3	Normal	19/02/2019	211841-6	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 3	MPE 3	Normal	28/02/2019	212355-8	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 3	MPE 3	Normal	03/03/2019	212985-1	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 3	MPE 3	Normal	12/03/2019	213382-8	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 4	MPE 4	Normal	13/02/2019	211519-8	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 4	MPE 4	Normal	19/02/2019	211841-4	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 4	MPE 4	Normal	28/02/2019	212355-6	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPE 4	MPE 4	Normal	03/03/2019	212782-8	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE 4	MPE 4	Normal	12/03/2019	213382-7	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE 5	MPE 5	Normal	11/12/2018	208061-7	208061	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
MPE 5	MPE 5	Normal	13/02/2019	211519-5	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE 5	MPE 5	Normal	19/02/2019	211841-12	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE 5	MPE 5	Normal	28/02/2019	212355-1	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE 5	MPE 5	Normal	03/03/2019	212782-4	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE 5	MPE 5	Normal	11/03/2019	213297-18	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE 5A	MPE 5A	Normal	11/12/2018	208061-5	208061	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
MPE 5A	MPE 5A	Normal	13/02/2019	211519-6	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE 5A	MPE 5A	Normal	19/02/2019	211841-2	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE 5A	MPE 5A	Normal	28/02/2019	212355-3	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE 5A	MPE 5A	Normal	03/03/2019	212782-6	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE 5A	MPE 5A	Normal	12/03/2019	213382-4	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE 6	MPE 6	Normal	11/12/2018	208061-1	208061	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
MPE 6	MPE 6	Normal	13/02/2019	211519-2	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE 6	MPE 6	Normal	18/02/2019	211785-14	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE 6	MPE 6	Normal	25/02/2019	212251-14	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE 6	MPE 6	Normal	03/03/2019	212782-1	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE 6	MPE 6	Normal	11/03/2019	213297-14	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE 6	QC1049	Field D	11/03/2019	213297-15	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE 7	MPE 7	Normal	12/12/2018	208060-2	208060	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
MPE 7	MPE 7	Normal	12/02/2019	211437-8	211437	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE 7	MPE 7	Normal	18/02/2019	211785-9	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE 7	MPE 7	Normal	25/02/2019	212251-10	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE 7	MPE 7	Normal	4/03/2019	212783-10	212783	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE 7	MPE 7	Normal	11/03/2019	213297-10	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE 8	MPE 8	Normal	12/12/																														







Table B3\_Groundwater Analytical Data - Airport (Environmental Protection) Regulations Vapour Intrusion

							Organophosphorus Pesticides (OP)																		Solvents					
							Methoxychlor	Azinphos Methyl	Bromophos-ethyl	Carbofenthiathion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenamiphos	Fenitrothion	Fenitrothion	Fenitrothion	Malathion	Monocrotophos	Parathion	Parathion-methyl	Phosphor-ethyl	Prothiophos	Romnel	Cyclohexane
							ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
EQL							0.2	0.2	0.2	0.5	0.2	0.2	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.2	0.5	0.2	0.2	0.2	0.5	0.5	0.2	0.2	1
Commonwealth 1997 - Airports (Environmental Protection) Regulations Fresh Water																														
Commonwealth 1997 - Airports (Environmental Protection) Regulations Marine Water							0.04				0.001													0.1	0.004					
NPEM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion Sand																														
2-4m																														
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report																									
MPI 3A	MPI 3A	Normal	6/03/2019	212985-4	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 3A	MPI 3A	Normal	12/03/2019	213382-10	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4	MPI 4	Normal	12/12/2018	208060-8	208060	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1
MPI 4	MPI 4	Normal	13/02/2019	211519-12	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4	MPI 4	Normal	19/02/2019	211841-3	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4	MPI 4	Normal	26/02/2019	212355-11	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4	MPI 4	Normal	6/03/2019	212985-6	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4	MPI 4	Normal	12/03/2019	213382-9	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4A	MPI 4A	Normal	17/12/2018	208061-4	208061	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	
MPI 4A	MPI 4A	Normal	13/02/2019	211519-7	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4A	MPI 4A	Normal	19/02/2019	211841-1	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4A	MPI 4A	Normal	26/02/2019	212355-4	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4A	MPI 4A	Normal	5/03/2019	212782-7	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 4A	MPI 4A	Normal	12/03/2019	213382-5	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 5	MPI 5	Normal	12/12/2018	208060-7	208060	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 6A	MPI 6A	Normal	5/03/2019	212782-9	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 6A	MPI 6A	Normal	12/03/2019	213382-6	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	
WCX GTY BH 002	WCX GTY BH	Normal	19/12/2018	208565-1	208565	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	
WCX GTY BH 002	WCX GTY BH	Normal	28/02/2019	212520-5	212520	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	
WCX GTY BH 002	WCX GTY BH	Normal	15/03/2019	213632-2	213632	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	
WCX GTY BH 004	WCX GTY BH	Normal	11/04/2019	215594-7	215594	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	
WCX GTY BH 003	WCX GTY BH	Normal	9/03/2019	213103-2	213103	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	
WCX GTY BH 004	QC2052	Interlab D	15/03/2019	ES190799001	ES1907999	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	
WCX GTY BH 004	WCX GTY BH	Normal	28/02/2019	212520-6	212520	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	
WCX GTY BH 004	WCX GTY BH	Normal	15/03/2019	213632-3	213632	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	
WCX GTY BH 004	WCX GTY BH	Normal	17/04/2019	215939-1	215939	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	
WCX GTY BH 009d	WCX GTY BH	Normal	17/12/2018	208319-2	208319	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	
WCX GTY BH 009d	WCX GTY BH	Normal	13/02/2019	211510-3	211510	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	
WCX GTY BH 009d	WCX GTY BH	Normal	15/03/2019	213632-1	213632	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	
WCX GTY BH 009d	WCX GTY BH	Normal	11/04/2019	215594-10	215594	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	
WCX GTY BH 009s	WCX GTY BH	Normal	17/12/2018	208319-1	208319	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	
WCX GTY BH 009s	WCX GTY BH	Normal	13/02/2019	211510-2	211510	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2</																	







Table B3\_Groundwater Analytical Data - Airport (Environmental Protection) Regulations Vapour Intrusion

						Organic Matter		Physio-Chemical Parameters			Resistivity (Saturated Paste)
						Carbonate	Total Organic Carbon	Total Dissolved Solids	pH (Lab)	Total Suspended Solids	Resistivity @ 25°C
						mg/L	mg/L	mg/L	pH Units	mg/L	ohm.cm
EOL						5	1	5	0.01	5	
Commonwealth 1997 - Airports (Environmental Protection) Regulations Fresh Water											
Commonwealth 1997 - Airports (Environmental Protection) Regulations Marine Water											
NEMF 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Sand											
2-4m											
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report						
34 TL3	34 TL3	Normal	13/02/2019	211519-11	211519	<5	-	10,000	-	22	-
34 TL3	34 TL3	Normal	19/02/2019	21841-5	211841	<5	-	8500	-	34	-
34 TL3	34 TL3	Normal	26/02/2019	212355-7	212355	<5	-	8800	-	28	-
34 TL3	34 TL3	Normal	6/03/2019	212985-2	212985	<5	140	8400	7.5	80	-
34 TL3	34 TL3	Normal	12/03/2019	213382-13	213382	<5	-	8000	-	10	-
34 TL3	34 TL3	Normal	16/04/2019	215934-2	215934	<5	150	6400	7.4	-	-
GW100s	GC2054	Interlab D	16/04/2019	ES1912221001	ES1912221	-	121	-	8.6	-	71
GW100s	GW100s	Normal	21/02/2019	212105-3	212109	<5	8	190	-	-	-
GW100s	GW100s	Normal	8/03/2019	213103-3	213103	<5	7	300	6.9	-	-
GW100s	GW100s	Normal	11/04/2019	215594-8	215594	<5	12	230	5.9	-	-
GW101	GW101	Normal	8/01/2019	209135-1	209135	<5	14	480	-	-	-
GW101	GW101	Normal	11/02/2019	211335-4	211335	<5	13	190	-	-	-
GW101	GW101	Normal	8/03/2019	213103-1	213103	<5	18	530	8.3	-	-
GW101	GW101	Normal	15/04/2019	215789-5	215789	<5	14	1100	6.9	-	-
GW101	GC2039	Interlab D	11/02/2019	ES1904415001	ES1904415	-	12	-	-	-	-
GW102	GW102	Normal	8/01/2019	209135-2	209135	<5	16	120	-	-	-
GW102	GW102	Normal	11/02/2019	211335-6	211335	<5	13	190	-	-	-
GW102	GW102	Normal	8/03/2019	213103-5	213103	<5	14	150	6.3	-	-
GW102	GW102	Normal	17/04/2019	215939-6	215939	<5	17	160	5.6	-	-
GW102	GC2051	Interlab D	8/03/2019	ES1907278001	ES1907278	-	11	-	6.04	-	6450
GW103	GW103	Normal	21/02/2019	212108-4	212109	<5	12	120	-	-	-
GW103	GW103	Normal	8/03/2019	213103-4	213103	<5	12	150	7.1	-	-
GW103	GW103	Normal	17/04/2019	215939-6	215939	<5	10	170	6.4	-	-
GW103	GC1055	Field D	17/04/2019	215939-4	215939	<5	9	260	6.6	-	-
GW104	GW104	Normal	20/12/2018	208653-5	208653	-	-	-	-	-	-
GW104	GW104	Normal	7/02/2019	211411-7	211411	<5	18	590	-	-	-
GW104	GW104	Normal	10/04/2019	215496-4	215496	-	-	460	6.1	-	-
GW10s	GW10s	Normal	10/01/2019	209274-1	209274	-	-	-	-	-	-
GW10s	GW10s	Normal	14/02/2019	211612-1	211612	-	-	-	-	-	-
GW10s	GW10s	Normal	8/03/2019	213103-7	213103	-	-	-	7.2	-	-
GW10s	GW10s	Normal	9/04/2019	215423-2	215423	-	-	-	7.6	-	-
GW10s	GC2053	Interlab D	9/04/2019	ES1911607001	ES1911607	-	-	-	7.54	-	1100
GW11d	GW11d	Normal	1/03/2019	212548-1	212548	-	-	-	6.1	-	-
GW11d	GW11d	Normal	16/04/2019	215934-8	215934	-	-	-	7.1	-	-
GW11s	GW11s	Normal	24/01/2018	210231-1	210231	<5	7	420	-	-	-
GW11s	GW11s	Normal	11/02/2019	211335-2	211335	-	-	-	-	-	-
GW11s	GW11s	Normal	13/03/2019	213502-6	213502	-	-	-	7.5	-	-
GW11s	GW11s	Normal	16/04/2019	215934-7	215934	-	-	-	7.6	-	-
GW11s	GC1042	Field D	11/02/2019	211335-3	211335	-	-	-	-	-	-
GW12s	GW12s	Normal	24/01/2019	210277-3	210277	-	-	-	-	-	-
GW13d	GW13d	Normal	20/12/2018	208653-2	208653	-	-	-	-	-	-
GW13d	GW13d	Normal	8/02/2019	211141-9	211141	-	-	-	-	-	-
GW13d	GW13d	Normal	11/04/2019	215594-5	215594	-	-	-	6.8	-	-
GW13s	GW13s	Normal	20/12/2018	208653-1	208653	-	-	-	-	-	-
GW13s	GW13s	Normal	8/02/2019	211141-8	211141	-	-	-	-	-	-
GW13s	GW13s	Normal	11/04/2019	215594-4	215594	-	-	-	6.5	-	-
GW14d	GW14d	Normal	20/12/2018	208653-6	208653	-	-	-	-	-	-
GW14d	GW14d	Normal	7/02/2019	211141-5	211141	-	-	-	-	-	-
GW14d	GW14d	Normal	10/04/2019	215496-6	215496	-	-	-	12	-	-
GW14s	GC1032	Field D	20/12/2018	208653-7	208653	-	-	-	-	-	-
GW14s	GW14s	Normal	10/01/2019	209274-2	209274	-	-	-	-	-	-
GW14s	GW14s	Normal	7/02/2019	211141-3	211141	-	-	-	-	-	-
GW14s	GW14s	Normal	10/04/2019	215496-5	215496	-	-	-	6.2	-	-
GW14s	GC1040	Field D	7/02/2019	211141-4	211141	-	-	-	-	-	-
GW14s	GC1053	Field D	10/04/2019	215496-1	215496	-	-	-	6.2	-	-
GW15d	GW15d	Normal	7/02/2019	211141-2	211141	-	-	-	-	-	-
GW15d	GW15d	Normal	10/04/2019	215496-8	215496	-	-	-	5.9	-	-
GW15s	GW15s	Normal	20/12/2018	208653-3	208653	-	-	-	-	-	-
GW15s	GW15s	Normal	7/02/2019	211141-1	211141	-	-	-	-	-	-
GW15s	GW15s	Normal	10/04/2019	215496-7	215496	-	-	-	5.8	-	-
GW17d	GW17d	Normal	28/03/2019	214591-1	214591	<5	31	1400	7.4	-	-
GW17d	GW17d	Normal	15/04/2019	215789-4	215789	<5	20	950	7.2	-	-
GW200 - SG BH059	GW200 - SG BH059	Normal	17/01/2019	209761-1	209761	-	-	-	-	-	-
GW201	GW201	Normal	24/01/2019	210277-4	210277	-	-	-	-	-	-
GW203	GW203	Normal	9/01/2019	209210-2	209210	<5	3	170	-	-	-
GW203	GW203	Normal	13/02/2019	211510-1	211510	-	-	-	-	-	-
GW203	GW203	Normal	11/03/2019	213240-4	213240	-	-	-	6.1	-	-
GW203	GW203	Normal	17/04/2019	215939-7	215939	-	-	-	6.2	-	-
GW204	GW204	Normal	24/01/2019	210277-5	210277	-	-	-	-	-	-
GW204	GC1037	Field D	24/01/2019	210277-2	210277	-	-	-	-	-	-
GW205	GW205	Normal	24/01/2019	210277-6	210277	-	-	-	-	-	-
GW22s	GW22s	Normal	9/04/2019	215423-8	215423	<5	14	760	6.8	-	-
GW23d	GW23d	Normal	17/01/2019	209762-2	209762	<5	620	2500	-	-	-
GW23d	GW23d	Normal	12/02/2019	211435-3	211435	<5	260	2300	-	-	-
GW23d	GW23d	Normal	9/04/2019	215423-1	215423	<5	25	1900	7.5	-	-
GW24s	GW24s	Normal	13/03/2019	213502-5	213502	<5	20	19,000	6.6	-	-
GW24s	GW24s	Normal	12/04/2019	215657-1	215657	<5	21	8600	6.7	-	-
GW25s	GW25s	Normal	9/01/2019	209210-1	209210	<5	29	20,000	-	-	-
GW25s	GW25s	Normal	14/02/2019	211612-2	211612	<5	40	18,000	-	-	-
GW25s	GW25s	Normal	6/03/2019	212985-8	212985	<5	38	15,000	7.6	24	-
GW25s	GW25s	Normal	17/04/2019	215939-9	215939	<5	28	15,000	7.6	-	-
GW25s	GC2026	Interlab D	9/01/2019	ES1900712001	ES1900712	-	24	-	-	-	-
GW27s	GW27s	Normal	17/01/2019	209762-3	209762	<5	34	26,000	-	-	-
GW27s	GW27s	Normal	22/02/2019	212103-1	212103	<5	13	1100	-	-	-
GW27s	GW27s	Normal	16/04/2019	215934-5	215934	<5	53	17,000	7.3	-	-
GW27s	GC2044	Interlab D	22/02/2019	ES1905703001	ES1905703	-	49	-	-	-	-
GW28A	GW28A	Normal	16/04/2019	215934-1	215934	<5	160	7800	6.8	-	-
GW2d	GW2d	Normal	11/03/2019	213240-3	213240	-	-	-	7.2	-	-
GW2d	GW2d	Normal	9/04/2019	215423-7	215423	-	-	-	7.6	-	-
GW2s	GW2s	Normal	17/01/2019	209762-1	209762	-	-	-	-	-	-
GW2s	GW2s	Normal	11/02/2019	211335-1	211335	-	-	-	-	-	-
GW2s	GW2s	Normal	8/03/2019	213103-6	213103	-	-	-	7.1	-	-
GW2s	GW2s	Normal	9/04/2019	215423-6	215423	-	-	-	7.4	-	-
GW2s	GC1033	Field D	17/01/2019	209762-7	209762	-	-	-	-	-	-
GW4d	GW4d	Normal	21/02/2019	212109-1	212109	<5	22	1200	-	-	-
GW4d	GW4d	Normal	13/03/2019	213502-4	213502	<5	21	1100	7.2	-	-
GW4d	GW4d	Normal	15/04/2019	215789-2	215789	<5	17	1500	7.2	-	-
GW4i	GW4i	Normal	21/02/2019	212109-2	212109	<5	80	1800	-	-	-
GW4i	GW4i	Normal	13/03/2019	213502-3	213502	<5	75	2100	7.3	-	-
GW4i	GW4i	Normal	15/04/20								

Table B3\_Groundwater Analytical Data - Airport (Environmental Protection) Regulations Vapour Intrusion

EQCL	Organic Matter		Physico-Chemical Parameters			Resistivity (Saturated Paste)	
	Carbonate	Total Organic Carbon	Total Dissolved Solids	pH (Lab)	Total Suspended Solids	Resistivity at 25°C	
	mg/L	mg/L	mg/L	pH Units	mg/L	ohm cm	
	5	1	5	0.01	5	1	
Commonwealth 1997 - Airports (Environmental Protection) Regulations Fresh Water							
Commonwealth 1997 - Airports (Environmental Protection) Regulations Marine Water							
NEPM 2013 Table 1A(4) CommInd HSL D GW for Vapour Intrusion, Sand							
2-4m							
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report		
MPE 21	MPE 21	Normal	12/02/2019	211437-10	211437	<5	-
MPE 21	MPE 21	Normal	18/02/2019	211785-11	211785	<5	-
MPE 21	MPE 21	Normal	25/02/2019	212251-11	212251	<5	-
MPE 21	MPE 21	Normal	4/03/2019	212783-12	212783	<5	-
MPE 21	MPE 21	Normal	11/03/2019	213297-11	213297	<5	-
MPE 3	MPE 3	Normal	11/12/2018	208061-3	208061	<5	11
MPE 3	MPE 3	Normal	13/02/2019	211519-9	211519	<5	-
MPE 3	MPE 3	Normal	19/02/2019	211841-6	211841	<5	-
MPE 3	MPE 3	Normal	26/02/2019	212355-8	212355	<5	-
MPE 3	MPE 3	Normal	6/03/2019	212985-1	212985	<5	-
MPE 3	MPE 3	Normal	12/03/2019	213382-8	213382	<5	-
MPE 4	MPE 4	Normal	13/02/2019	211519-6	211519	<5	-
MPE 4	MPE 4	Normal	19/02/2019	211841-4	211841	<5	-
MPE 4	MPE 4	Normal	26/02/2019	212355-6	212355	<5	-
MPE 4	MPE 4	Normal	6/03/2019	212782-8	212782	<5	-
MPE 4	MPE 4	Normal	12/03/2019	213382-7	213382	<5	-
MPE 5	MPE 5	Normal	11/12/2018	208061-7	208061	<5	63
MPE 5	MPE 5	Normal	13/02/2019	211519-5	211519	<5	-
MPE 5	MPE 5	Normal	19/02/2019	211841-12	211841	<5	-
MPE 5	MPE 5	Normal	26/02/2019	212355-1	212355	<5	-
MPE 5	MPE 5	Normal	6/03/2019	212782-4	212782	<5	-
MPE 5	MPE 5	Normal	11/03/2019	213297-18	213297	<5	-
MPE 5A	MPE 5A	Normal	11/12/2018	208061-5	208061	<5	10
MPE 5A	MPE 5A	Normal	13/02/2019	211519-6	211519	<5	-
MPE 5A	MPE 5A	Normal	19/02/2019	211841-2	211841	<5	-
MPE 5A	MPE 5A	Normal	26/02/2019	212355-3	212355	<5	-
MPE 5A	MPE 5A	Normal	6/03/2019	212782-6	212782	<5	-
MPE 5A	MPE 5A	Normal	12/03/2019	213382-4	213382	<5	-
MPE 6	MPE 6	Normal	11/12/2018	208061-8	208061	<5	37
MPE 6	MPE 6	Normal	13/02/2019	211519-2	211519	<5	-
MPE 6	MPE 6	Normal	18/02/2019	211785-14	211785	<5	-
MPE 6	MPE 6	Normal	25/02/2019	212251-14	212251	<5	-
MPE 6	MPE 6	Normal	5/03/2019	212782-1	212782	<5	-
MPE 6	MPE 6	Normal	11/03/2019	213297-14	213297	<5	-
MPE 6	GC1049	Field D	11/03/2019	213297-15	213297	<5	-
MPE 7	MPE 7	Normal	12/12/2018	208060-2	208060	<5	22
MPE 7	MPE 7	Normal	12/02/2019	211437-8	211437	<5	-
MPE 7	MPE 7	Normal	18/02/2019	211785-9	211785	<5	-
MPE 7	MPE 7	Normal	25/02/2019	212251-10	212251	<5	-
MPE 7	MPE 7	Normal	4/03/2019	212783-10	212783	<5	-
MPE 7	MPE 7	Normal	11/03/2019	213297-10	213297	<5	-
MPE 8	MPE 8	Normal	12/12/2018	208060-1	208060	<5	17
MPE 8	MPE 8	Normal	12/02/2019	211437-6	211437	<5	-
MPE 8	MPE 8	Normal	18/02/2019	211785-5	211785	<5	-
MPE 8	MPE 8	Normal	25/02/2019	212251-5	212251	<5	-
MPE 8	MPE 8	Normal	4/03/2019	212783-6	212783	<5	-
MPE 8	MPE 8	Normal	11/03/2019	213297-5	213297	<5	-
MPE 8	GC1046	Field D	25/02/2019	212355-6	212355	<5	-
MPE 9	MPE 9	Normal	12/12/2018	208060-5	208060	<5	29
MPE 9	MPE 9	Normal	12/02/2019	211437-4	211437	<5	-
MPE 9	MPE 9	Normal	18/02/2019	211785-4	211785	<5	-
MPE 9	MPE 9	Normal	25/02/2019	212251-4	212251	<5	-
MPE 9	MPE 9	Normal	4/03/2019	212783-5	212783	<5	-
MPE 9	MPE 9	Normal	11/03/2019	213297-4	213297	<5	-
MPI 10	MPI 10	Normal	11/12/2018	208061-6	208061	<5	35
MPI 10	MPI 10	Normal	13/02/2019	211519-4	211519	<5	-
MPI 10	MPI 10	Normal	19/02/2019	211841-11	211841	<5	-
MPI 10	MPI 10	Normal	26/02/2019	212355-2	212355	<5	-
MPI 10	MPI 10	Normal	6/03/2019	212782-5	212782	<5	-
MPI 10	MPI 10	Normal	11/03/2019	213297-19	213297	<5	-
MPI 12	MPI 12	Normal	11/12/2018	208061-9	208061	<5	19
MPI 12	MPI 12	Normal	13/02/2019	211519-1	211519	<5	-
MPI 12	MPI 12	Normal	18/02/2019	211785-13	211785	<5	-
MPI 12	MPI 12	Normal	28/02/2019	212520-3	212520	<5	-
MPI 12	MPI 12	Normal	5/03/2019	212782-2	212782	<5	-
MPI 12	MPI 12	Normal	11/03/2019	213297-13	213297	<5	-
MPI 12	GC1047	Field D	11/12/2018	208061-10	208061	<5	21
MPI 13	MPI 13	Normal	11/12/2018	208061-12	208061	<5	35
MPI 13	MPI 13	Normal	12/02/2019	211437-11	211437	<5	-
MPI 13	MPI 13	Normal	18/02/2019	211785-12	211785	<5	-
MPI 13	MPI 13	Normal	28/02/2019	212520-2	212520	<5	-
MPI 13	MPI 13	Normal	4/03/2019	212783-11	212783	<5	-
MPI 13	MPI 13	Normal	11/03/2019	213297-12	213297	<5	-
MPI 13	GC2043	Interlab D	18/02/2019	ES1906388001	ES1906388	-	-
MPI 13	GC2045	Interlab D	28/02/2019	ES1906314001	ES1906314	-	-
MPI 14	MPI 14	Normal	12/12/2018	208060-3	208060	<5	45
MPI 14	MPI 14	Normal	12/02/2019	211437-9	211437	<5	-
MPI 14	MPI 14	Normal	18/02/2019	211785-10	211785	<5	-
MPI 14	MPI 14	Normal	25/02/2019	212251-9	212251	<5	-
MPI 14	MPI 14	Normal	4/03/2019	212783-9	212783	<5	-
MPI 14	MPI 14	Normal	11/03/2019	213297-9	213297	<5	-
MPI 14	GC2041	Interlab D	12/02/2019	ES1904928001	ES1904928	-	-
MPI 15	MPI 15	Normal	18/02/2019	211785-7	211785	<5	-
MPI 15	MPI 15	Normal	12/12/2018	208060-13	208060	<5	34
MPI 15	MPI 15	Normal	12/02/2019	211437-7	211437	<5	-
MPI 15	MPI 15	Normal	25/02/2019	212251-8	212251	<5	-
MPI 15	MPI 15	Normal	4/03/2019	212783-8	212783	<5	-
MPI 15	MPI 15	Normal	11/03/2019	213297-7	213297	<5	-
MPI 15	GC1046	Field D	18/02/2019	211785-8	211785	<5	-
MPI 15	OC2044B	Interlab D	25/02/2019	ES1906049001	ES1906049	-	-
MPI 16	MPI 16	Normal	12/12/2018	208060-4	208060	<5	130
MPI 16	MPI 16	Normal	12/02/2019	211437-5	211437	<5	-
MPI 16	MPI 16	Normal	18/02/2019	211785-6	211785	<5	-
MPI 16	MPI 16	Normal	25/02/2019	212251-7	212251	<5	-
MPI 16	MPI 16	Normal	4/03/2019	212783-7	212783	<5	-
MPI 16	MPI 16	Normal	11/03/2019	213297-6	213297	<5	-
MPI 17	MPI 17	Normal	12/02/2019	211437-2	211437	<5	-
MPI 17	MPI 17	Normal	18/02/2019	211785-3	211785	<5	-
MPI 17	MPI 17	Normal	25/02/2019	212251-2	212251	<5	-
MPI 17	MPI 17	Normal	4/03/2019	212783-2	212783	<5	-
MPI 17	MPI 17	Normal	11/03/2019	213297-2	213297	<5	-
MPI 17	GC1044	Field D	12/02/2019	211437-12	211437	<5	-
MPI 17	GC1047	Field D	4/03/2019	212783-4	212783	<5	-
MPI 18	MPI 18	Normal	13/12/2018	208046-2	208046	<5	40
MPI 18	MPI 18	Normal	12/02/2019	211437-3	211437	<5	-
MPI 18	MPI 18	Normal	13/02/2019	211519-16	211519	<5	-
MPI 18	MPI 18	Normal	18/02/2019	211785-2	211785	<5	-
MPI 18	MPI 18	Normal	25/02/2019	212251-3	212251	<5	-
MPI 18	MPI 18	Normal	4/03/2019	212783-3	212783	<5	-
MPI 18	MPI 18	Normal	11/03/2019	213297-3	213297	<5	-
MPI 18	GC2046	Interlab D	4/03/2019	ES1906814001	ES1906814	-	-
MPI 2	MPI 2	Normal	13/12/2018	208048-1	208048	<5	180
MPI 2	MPI 2	Normal	13/02/2019	211519-14	211519	<5	-
MPI 2	MPI 2	Normal	19/02/2019	211841-10	211841	<5	-
MPI 2	MPI 2	Normal	26/02/2019	212355-12	212355	<5	-
MPI 2	MPI 2	Normal	6/03/2019	212985-5	212985	<5	-
MPI 2	MPI 2	Normal	12/03/2019	213382-12	213382	<5	-
MPI 2	GC1048	Field D	6/03/2019	212985-7	212985	<5	-
MPI 20	MPE 20	Normal	11/03/2019	213297-1	213297	<5	-
MPI 20	MPI 20	Normal	12/12/2018	208060-10	208060	<5	44
MPI 20	MPI 20	Normal	18/02/2019	211785-1	211785	<5	-
MPI 20	MPI 20	Normal	25/02/2019	212251-1	212251	<5	-
MPI 20	MPI 20	Normal	4/03/2019	212783-1	212783	<5	-
MPI 20	MPI 20	Normal	12/02/2019	211437-1	211437	<5	-
MPI 3A	MPI 3A	Normal	11/12/2018	208061-1	208061	<5	44
MPI 3A	MPI 3A	Normal	13/02/2019	211519-15	211519	<5	-
MPI 3A	MPI 3A	Normal	19/02/2019	211841-9	211841	<5	-
MPI 3A	MPI 3A	Normal	26/02/2019	212355-9	212355	<5	-

Table B3\_Groundwater Analytical Data - Airport (Environmental Protection) Regulations Vapour Intrusion

EOL	Organic Matter		Physico-Chemical Parameters			Resistivity (Saturated Paste)
	Carbonate	Total Organic Carbon	Total Dissolved Solids	pH (Lab)	Total Suspended Solids	Resistivity at 25°C
	mg/L	mg/L	mg/L	pH Units	mg/L	ohm cm
	5	1	5	0.01	5	1
Commonwealth 1997 - Airports (Environmental Protection) Regulations Fresh Water						
Commonwealth 1997 - Airports (Environmental Protection) Regulations Marine Water						
NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Sand						
<b>2-4m</b>						
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	
MPI 3A	MPI 3A	Normal	6/03/2019	212985-4	212985	<5
MPI 3A	MPI 3A	Normal	12/03/2019	213382-10	213382	<5
MPI 4	MPI 4	Normal	12/12/2018	208060-8	208060	<5
MPI 4	MPI 4	Normal	13/02/2019	211519-12	211519	<5
MPI 4	MPI 4	Normal	19/02/2019	211841-8	211841	<5
MPI 4	MPI 4	Normal	26/02/2019	212355-11	212355	<5
MPI 4	MPI 4	Normal	6/03/2019	212985-6	212985	<5
MPI 4	MPI 4	Normal	12/03/2019	213382-9	213382	<5
MPI 4A	MPI 4A	Normal	11/12/2018	208061-4	208061	<5
MPI 4A	MPI 4A	Normal	13/02/2019	211519-7	211519	<5
MPI 4A	MPI 4A	Normal	19/02/2019	211841-1	211841	<5
MPI 4A	MPI 4A	Normal	26/02/2019	212355-4	212355	<5
MPI 4A	MPI 4A	Normal	5/03/2019	212782-7	212782	<5
MPI 4A	MPI 4A	Normal	12/03/2019	213382-5	213382	<5
MPI 5	MPI 5	Normal	12/12/2018	208060-7	208060	<5
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	<5
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841	<5
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	<5
MPI 6A	MPI 6A	Normal	5/03/2019	212782-9	212782	<5
MPI 6A	MPI 6A	Normal	12/03/2019	213382-6	213382	<5
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	<5
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	<5
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	-
WCX GTY BH 002	WCX GTY BH	Normal	19/12/2018	208565-1	208565	-
WCX GTY BH 002	WCX GTY BH	Normal	28/02/2019	212520-5	212520	-
WCX GTY BH 002	WCX GTY BH	Normal	15/03/2019	213632-2	213632	-
WCX GTY BH 002	WCX GTY BH	Normal	11/04/2019	215594-7	215594	-
WCX GTY BH 003	WCX GTY BH	Normal	8/03/2019	213103-2	213103	-
WCX GTY BH 004	GC2052	Interlab D	15/03/2019	ES190799001	ES1907999	-
WCX GTY BH 004	WCX GTY BH	Normal	28/02/2019	212520-6	212520	-
WCX GTY BH 004	WCX GTY BH	Normal	15/03/2019	213632-3	213632	-
WCX GTY BH 004	WCX GTY BH	Normal	17/04/2019	215939-1	215939	-
WCX GTY BH 009d	WCX GTY BH	Normal	17/12/2018	208319-2	208319	-
WCX GTY BH 009d	WCX GTY BH	Normal	13/02/2019	211510-2	211510	-
WCX GTY BH 009d	WCX GTY BH	Normal	13/02/2019	211510-3	211510	-
WCX GTY BH 009d	WCX GTY BH	Normal	15/03/2019	213632-1	213632	-
WCX GTY BH 009d	WCX GTY BH	Normal	11/04/2019	215594-10	215594	-
WCX GTY BH 009s	WCX GTY BH	Normal	17/12/2018	208319-1	208319	-
WCX GTY BH 009s	WCX GTY BH	Normal	13/02/2019	211510-2	211510	-
WCX GTY BH 009s	WCX GTY BH	Normal	6/03/2019	212985-9	212985	-
WCX GTY BH 009s	WCX GTY BH	Normal	11/04/2019	215594-9	215594	-
WCX GTY BH 027	GC1046	Field D	22/02/2019	212103-3	212103	-
WCX GTY BH 027	WCX GTY BH	Normal	17/01/2019	209762-4	209762	-
WCX GTY BH 027	WCX GTY BH	Normal	22/02/2019	212103-2	212103	-
WCX GTY BH 027	WCX GTY BH	Normal	16/04/2019	215834-6	215834	-
WCX GTY BH 033	GC1054	Field D	11/04/2019	215594-2	215594	-
WCX GTY BH 033	GC2031	Interlab D	19/12/2018	ES1838735001	ES1838735	-
WCX GTY BH 033	WCX GTY BH	Normal	19/12/2018	208565-2	208565	-
WCX GTY BH 033	WCX GTY BH	Normal	13/02/2019	211510-4	211510	-
WCX GTY BH 033	WCX GTY BH	Normal	11/04/2019	215594-6	215594	-

Statistical Summary						
Number of Results	218	86	217	74	144	4
Number of Detects	1	86	217	74	140	4
Minimum Concentration	<5	3	120	5.6	<5	71
Minimum Detect	170	3	120	5.6	6	71
Maximum Concentration	170	1100	41000	12	1200	6450
Maximum Detect	170	1100	41000	12	1200	6450
Average Concentration	3.3	64	9846	6.9	77	2698
Median Concentration	2.5	23.5	3400	6.9	36.5	2135
Standard Deviation	11	138	10794	0.91	131	2814
Number of Guideline Exceedances	0	0	97	29	0	0
Number of Guideline Exceedances (Detects Only)	0	0	97	29	0	0

Table B4\_Groundwater\_PFAS\_PRE TOPA

EQL	PFAS NEMP FW 80% Species Protection	PFAS NEMP FW 95% Species Protection	PFAS NEMP Human Health Recreational Water	PFAS NEMP Marine 80% Species Protection	PFAS NEMP Marine 95% Species Protection	Perfluorooctanoic acid (PFOA)	Perfluorooctane sulfonic acid (PFOS)	Perfluorohexane sulfonate (PFHxS)	Sum (PFHxS + PFOS)	Sum of PFAS (WA DER List)	Sum of US EPA PFAS (PFOS + PFOA)*	Perfluorobutanoic acid	PFBS	PFPeS	PFHpS	Perfluorodecane sulfonic acid (PFDS)	Perfluoro-n-hexadecanoic acid	PFPeA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	N-Me-FOSA	MeFOSAA	EtFOSAA	N-Me-FOSE	FOSA	PFTeDA	PFTrDA	N-Et-FOSA	PFDoA	PFHpA	PFHwA	N-Et-FOSE	PFDoA	PFNA	PFUnA		
						ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
1824	31	220	0.13	5.6	1824	31																																	
0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.002	0.005	0.002	0.001	0.001	0.001	0.001	0.001	0.005	0.002	0.002	0.005	0.01	0.05	0.01	0.01	0.002	0.001	0.001	0.05	0.005	0.001	0.002	
34 TL3	34 TL3	Normal	13/02/2019	211519-11	211519	0.3	0.26	0.43	1.7	-	0.47	0.098	0.15	0.11	0.012	<0.002	-	0.12	<0.001	0.039	<0.001	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.5	<0.1	<0.1	<0.02	0.11	0.35	<0.5	<0.05	0.014	<0.02		
34 TL3	34 TL3	Normal	19/02/2019	211841-5	211841	0.33	0.35	0.52	2	-	0.5	0.12	0.17	0.11	0.013	<0.002	-	0.16	<0.001	0.009	<0.001	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.5	<0.1	<0.1	<0.02	0.12	0.38	<0.5	<0.05	0.016	<0.02		
34 TL3	34 TL3	Normal	26/02/2019	212355-7	212355	0.34	0.37	0.55	1.9	-	0.52	0.11	0.14	0.076	0.013	<0.002	-	0.14	<0.001	0.009	<0.001	<0.001	<0.01	<0.04	<0.04	<0.05	<0.1	<0.5	<0.1	<0.02	0.14	0.34	<0.5	<0.05	0.018	<0.02			
GW100s	GW100s	Normal	12/03/2019	213382-13	213382	0.31	0.34	0.55	1.9	-	0.52	0.098	0.071	0.11	0.01	0	-	0.14	<0.002	0.021	<0.002	<0.002	<0.05	<0.02	<0.02	<0.05	<0.1	<0.5	<0.1	<0.1	<0.02	0.15	0.38	<0.5	<0.05	0.025	<0.02		
GW100s	GW100s	Normal	21/02/2019	212109-3	212109	0.028	0.016	0.226	0.41	-	0.24	0.008	0.003	0.002	0.001	<0.002	-	0.021	<0.001	0.002	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	0.02	0.015	0.018	<0.05	<0.005	0.073	<0.002			
GW100s	GW100s	Normal	8/03/2019	213103-3	213103	0.027	0.071	0.013	0.084	0.21	-	0.097	0.007	0.003	0.002	0.001	<0.002	-	0.02	<0.001	0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	0.013	0.018	<0.05	<0.005	0.031	<0.002			
GW100s	GW100s	Normal	11/04/2019	215594-8	215594	0.029	0.016	0.076	0.11	-	0.73	0.009	0.002	0.002	0.003	<0.002	-	0.021	<0.001	0.002	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	0.013	0.021	<0.05	<0.005	0.22	<0.002			
GW101	GW101	Normal	8/01/2019	209135-1	209135	0.009	0.005	0.019	0.024	0.093	-	0.013	0.01	0.004	0.002	<0.001	<0.002	-	0.02	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	0.01	0.014	<0.05	<0.005	<0.001	<0.002			
GW101	GW101	Normal	11/02/2019	211335-4	211335	0.008	0.005	0.019	0.024	0.11	-	0.014	0.01	0.005	0.002	<0.001	<0.002	-	0.02	<0.001	0.016	<0.001	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	<0.002	0.01	0.014	<0.05	<0.005	<0.001	<0.002		
GW101	GW101	Normal	8/03/2019	213103-1	213103	0.009	0.005	0.017	0.022	0.14	-	0.014	0.01	0.004	0.002	<0.001	<0.002	-	0.02	<0.001	0.043	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	0.01	0.017	<0.05	<0.005	<0.001	<0.002		
GW101	GW101	Normal	15/04/2019	215789-5	215789	0.01	0.006	0.019	0.025	0.1	-	0.016	0.01	0.004	0.002	<0.001	<0.002	-	0.022	<0.001	0.001	<0.001	<0.001	<0.01	<0.002	<0.002	<0.01	<0.05	<0.01	<0.002	0.01	0.017	<0.05	<0.005	<0.001	<0.002			
GW101	QC2039	Interlab D	11/02/2019	ES1904415001	ES1904415	0.009	0.004	0.021	0.025	0.106	106	-	<0.01	<0.002	<0.002	<0.002	<0.002	<0.005	0.024	<0.001	0.013	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.002	<0.005	<0.002	0.013	0.022	<0.005	<0.002	<0.002	<0.002			
GW102	GW102	Normal	8/01/2019	209135-2	209135	0.002	0.02	0.053	0.073	0.084	-	0.022	<0.002	0.002	0.002	<0.001	<0.002	-	0.024	<0.001	0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	0.001	0.003	<0.05	<0.005	<0.001	<0.002		
GW102	GW102	Normal	11/02/2019	211335-6	211335	0.003	0.036	0.074	0.11	0.14	-	0.04	0.002	0.003	0.003	0.001	<0.002	-	0.002	<0.001	0.007	<0.001	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	<0.002	0.002	0.004	<0.5	<0.005	<0.001	<0.002		
GW102	GW102	Normal	8/03/2019	213103-5	213103	0.004	0.052	0.081	0.133	0.16	-	0.057	0.003	0.003	0.003	0.002	<0.002	-	0.002	<0.001	0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	0.006	<0.05	<0.005	<0.001	<0.002			
GW102	GW102	Normal	17/04/2019	215939-8	215939	0.002	0.035	0.032	0.067	0.074	-	0.037	<0.002	0.002	0.002	<0.001	<0.002	-	0.002	<0.001	0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	0.001	0.002	<0.05	<0.005	<0.001	<0.002		
GW102	QC2051	Interlab D	8/03/2019	ES1907278001	ES1907278	0.005	0.051	0.091	0.142	0.163	0.16	-	<0.01	0.004	0.003	<0.002	<0.002	<0.005	0.002	<0.001	0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.002	<0.005	<0.002	0.002	0.007	<0.005	<0.002	<0.002	<0.002			
GW103	GW103	Normal	21/02/2019	212109-4	212109	0.018	0.05	0.021	0.071	0.14	-	0.068	0.009	0.004	0.002	0.002	<0.002	-	0.01	<0.001	0.007	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	0.008	0.01	<0.05	<0.005	0.001	<0.002		
GW103	GW103	Normal	8/03/2019	213103-4	213103	0.02	0.058	0.02	0.078	0.14	-	0.077	0.008	0.003	0.002	0.002	<0.002	-	0.008	<0.001	0.002	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	0.007	0.01	<0.05	<0.005	0.002	<0.002		
GW103	QC1055	Field D	17/04/2019	215939-6	215939	0.021	0.068	0.047	0.115	0.2	-	0.089	0.009	0.003	0.003	0.003	<0.002	-	0.02	<0.001	0.002	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	0.012	0.017	<0.05	<0.005	0.001	<0.002		
GW104	GW104	Normal	20/12/2018	208653-2	208653	0.084	0.93	5.43	6.4	-	4.6	0.14	0.089	0.11	0.062	<0.002	-	0.13	<0.001	0.014	0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	0.076	0.22	<0.05	<0.005	0.007	<0.002			
GW104	GW104	Normal	7/02/2019	211141-7	211141	0.092	0.96	5.46	6.5	-	4.6	0.15	0.1	0.15	0.11	<0.002	-	0.13	<0.001	0.015	0.002	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	0.096	0.22	<0.5	<0.005	0.007	<0.002			
GW104	GW104	Normal	10/04/2019	215496-4	215496	0.096	1.2	7.3	8.4	-	6.2	0.15	0.11	0.14	0.13	<0.002	-	0.11	<0.001	0.016	0.002	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	0.079	0.23	<0.05	<0.005	0.006	<0.002			
GW10s	GW10s	Normal	10/01/2019	209274-1	209274	0.1	0.15	0.42	0.91	-	0.37	0.049	0.031	0.017	0.013	<0.002	-	0.11	<0.001	0.004	0.007	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	0.045	0.099	<0.05	<0.005	0.007	<0.002			
GW10s	GW10s	Normal	14/02/2019	211612-1	211612	0.081	0.16	0.43	0.88	-	0.35	0.044	0.029	0.019	0.015	<0.002	-	0.092	<0.001	0.029	0.009	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	0.044	0.082							

Table B4 Groundwater PFAS PRE TOPA

	Perfluorooctanoic acid (PFOA)	Perfluorooctane sulfonic acid (PFOS)	Perfluorohexane sulfonate (PFHxS)	Sum (PFHxS + PFOS)	Sum of PFAS	Sum of PFAS (WA DER List)	Sum of US EPA PFAS (PFOS + PFOA)*	Perfluorobutanoic acid	PFBS	PFPeS	PFHpS	Perfluorodecane sulfonic acid (PFDS)	Perfluoro-n-hexadecanoic acid	PFPeA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	N-Me-FOSA	MeFOSAA	EtFOSAA	N-Me-FOSE	FOSA	PFTeDA	PFTDA	N-Et-FOSA	PFDoA	PFHpA	PFHxA	N-Et-FOSE	PFDoA	PFNA	PFUnA		
EQL	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.002	0.005	0.002	0.001	0.001	0.001	0.001	0.005	0.002	0.002	0.005	0.01	0.05	0.01	0.01	0.002	0.001	0.001	0.05	0.005	0.001	0.002		
PFAS NEMP FW 80% Species Protection	1824	31																																	
PFAS NEMP FW 95% Species Protection	220	0.13																																	
PFAS NEMP Human Health Recreational Water	5.6			0.7																															
PFAS NEMP Marine 80% Species Protection	1824	31																																	
PFAS NEMP Marine 95% Species Protection	220	0.13																																	

Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	0.009	0.012	0.031	0.074	-	0.028	0.006	0.002	0.001	<0.001	<0.002	-	0.008	<0.001	0.003	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.004	0.011	<0.05	<0.005	<0.001	<0.002	
GW203	GW203	Normal	11/03/2019	213240-4	213240	0.009	0.012	0.031	0.074	-	0.028	0.006	0.002	0.001	<0.001	<0.002	-	0.008	<0.001	0.003	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.004	0.011	<0.05	<0.005	<0.001	<0.002	
GW203	GW203	Normal	17/04/2019	215939-7	215939	0.008	0.012	0.009	0.029	0.069	-	0.028	0.006	<0.001	<0.001	<0.002	-	0.009	<0.001	0.003	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.004	0.012	<0.05	<0.005	<0.001	<0.002	
GW204	GW204	Normal	24/01/2019	210277-5	210277	0.013	0.012	0.028	0.04	0.085	-	0.025	0.006	0.002	0.002	0.004	<0.002	-	0.003	<0.001	0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.004	0.011	<0.05	<0.005	<0.001	<0.002
GW204	QC1037	Field D	24/01/2019	210277-2	210277	0.014	0.011	0.03	0.041	0.089	-	0.026	0.006	0.002	0.002	0.004	<0.002	-	0.003	<0.001	0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.004	0.011	<0.05	<0.005	<0.001	<0.002
GW205	GW205	Normal	24/01/2019	210277-6	210277	0.006	0.012	0.005	0.017	0.043	-	0.018	0.003	<0.001	<0.001	<0.002	-	0.005	<0.001	0.005	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.002	0.006	<0.05	<0.005	<0.001	<0.002	
GW22s	GW22s	Normal	9/04/2019	215423-8	215423	<0.001	0.003	0.002	0.005	0.042	-	0.003	<0.002	0.004	<0.001	<0.001	<0.002	-	<0.002	<0.01	0.012	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.004	0.016	<0.05	<0.005	<0.001	<0.002
GW23d	GW23d	Normal	17/01/2019	209762-2	209762	0.086	0.063	0.034	0.097	0.36	-	0.15	0.03	0.014	0.018	0.012	<0.002	-	0.02	<0.001	<0.001	<0.001	<0.005	<0.002	0.005	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.015	0.049	<0.05	<0.005	0.01	<0.002	
GW23d	GW23d	Normal	12/02/2019	211435-3	211435	0.061	0.053	0.034	0.087	0.37	-	0.13	0.028	0.01	0.008	0.003	<0.002	-	0.02	<0.001	0.055	<0.001	<0.001	<0.005	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.02	0.052	<0.05	<0.005	0.009	<0.002	
GW23d	GW23d	Normal	9/04/2019	215423-1	215423	0.04	0.032	0.023	0.055	0.18	-	0.071	<0.002	0.006	0.004	0.001	<0.002	-	<0.02	<0.01	0.041	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.01	0.049	<0.05	<0.005	0.009	<0.002
GW24s	GW24s	Normal	13/03/2019	213502-5	213502	0.009	0.11	0.02	0.12	0.18	-	0.11	0.01	0.003	<0.001	<0.001	<0.002	-	0.01	<0.001	0.004	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.008	0.011	<0.05	<0.005	<0.001	<0.002
GW24s	GW24s	Normal	12/04/2019	215657-1	215657	0.014	0.058	0.028	0.13	0.3	-	0.16	0.02	0.002	0.004	0.003	<0.002	-	0.024	<0.001	0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.011	0.02	<0.05	<0.005	<0.001	<0.002	
GW25e	GW25e	Normal	9/01/2019	209210-1	209210	<0.001	<0.001	<0.001	<0.002	0.01	-	<0.001	<0.002	<0.001	<0.001	<0.001	<0.002	-	0.002	<0.001	0.003	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.004	0.016	<0.05	<0.005	<0.001	<0.002
GW25e	GW25e	Normal	14/02/2019	211612-2	211612	<0.001	<0.001	<0.001	<0.002	0.022	-	<0.001	0.003	0.002	<0.001	<0.001	<0.002	-	0.003	<0.001	0.007	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.001	0.006	<0.05	<0.005	<0.001	<0.002
GW25e	GW25e	Normal	6/03/2019	212985-8	212985	<0.001	0.002	<0.001	0.002	0.018	-	0.002	<0.01	<0.001	0.001	<0.001	<0.002	-	<0.01	<0.001	0.009	<0.001	<0.001	<0.01	<0.002	<0.002	<0.01	<0.05	<0.01	<0.01	<0.002	0.006	0.005	<0.05	<0.005	<0.001	<0.002	
GW25e	GW25e	Normal	17/04/2019	215939-9	215939	<0.001	0.002	<0.001	0.002	0.019	-	0.002	0.004	<0.001	<0.001	<0.001	<0.002	-	0.002	<0.001	0.004	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.007	0.005	<0.05	<0.005	<0.001	<0.002
GW25e	QC2026	Interlab D	9/01/2019	ES1900712001	ES1900712	<0.002	<0.002	<0.002	<0.002	0.006	0.006	-	<0.01	<0.002	<0.002	<0.002	<0.002	<0.005	-	0.002	<0.005	0.006	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.002	<0.005	<0.002	0.002	0.005	<0.002	<0.002	<0.002	<0.002	<0.002
GW27s	GW27s	Normal	17/01/2019	209762-3	209762	0.001	0.001	0.011	0.012	0.034	-	0.003	0.004	0.001	0.002	<0.001	<0.002	-	0.004	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.002	0.007	<0.05	<0.005	<0.001	<0.002	
GW27s	GW27s	Normal	22/02/2019	212103-1	212103	<0.001	<0.001	0.027	0.027	0.061	-	<0.001	<0.002	0.003	0.004	<0.001	<0.002	-	<0.02	<0.001	0.006	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.004	0.016	<0.05	<0.005	<0.001	<0.002
GW27s	GW27s	Normal	16/04/2019	215934-5	215934	0.001	0.002	0.031	0.033	0.065	-	0.003	<0.02	0.002	0.004	<0.001	<0.002	-	<0.02	<0.001	0.007	<0.001	<0.001	<0.05	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.005	0.013	<0.05	<0.005	<0.001	<0.002
GW27s	QC2044	Interlab D	22/02/2019	ES1905703001	ES1905703	<0.002	<0.002	0.022	0.022	0.04	0.037	-	<0.01	<0.002	0.003	<0.002	<0.002	<0.005	-	0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.002	<0.005	<0.002	0.005	0.012	<0.005	<0.002	<0.002	<0.002	<0.002	
GW28A	GW28A	Normal	16/04/2019	215934-1	215934	0.46	0.26	0.54	1.9	-	0.74	0.082	0.1	0.064	0.018	<0.002	-	0.075	<0.001	0.009	<0.001	<0.001	<0.005	0.034	0.11	<0.05	<0.01	<0.05	<0.01	<0.01	<0.002	0.16	0.22	<0.05	<0.02	0.15	<0.02	
GW2s	GW2s	Normal	11/02/2019	211335-1	211335	0.1	0.063	0.19	0.253	0.9	-	0.16	0.06	0.045	0.032	0.011	<0.002	-	0.068	<0.001	0.038	<0.001	<0.001	<0.05	<0.02	<0.02	<0.05	<0.01	<0.05	<0.01	<0.01	<0.002						

Table B4 Groundwater PFAS PRE TOPA

	Perfluoroacetic acid (PFOA)	Perfluorooctane sulfonic acid (PFOS)	Perfluorohexane sulfonate (PFHxS)	Sum (PFHxS + PFOS)	Sum of PFAS	Sum of PFAS (WA DER List)	Sum of US EPA PFAS (PFOS + PFOA)	Perfluorobutanoic acid	PFBS	PFPeS	PFHpS	Perfluorodecane sulfonic acid (PFDS)	Perfluoro-n-hexadecanoic acid	PFPeA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	N-Me-FOSA	MeFOSAA	EFOsAA	N-Me-FOSE	FOSA	PFTeDA	PFTDA	N-Et-FOSA	PFDoA	PFHpA	PFHxA	N-Et-FOSE	PFDoA	PFNA	PFUnA
EQI	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.002	0.005	0.002	0.001	0.001	0.001	0.001	0.005	0.002	0.002	0.005	0.01	0.05	0.01	0.01	0.002	0.001	0.001	0.05	0.005	0.001	0.002
PFAS NEMP FW 80% Species Protection	1824	31																															
PFAS NEMP FW 95% Species Protection	220	0.13																															
PFAS NEMP Human Health Recreational Water	5.6			0.7																													
PFAS NEMP Marine 80% Species Protection	1824	31																															
PFAS NEMP Marine 95% Species Protection	220	0.13																															

Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	0.011	0.01	0.007	0.017	0.093	-	0.021	0.005	0.006	0.003	<0.001	<0.002	-	0.01	<0.001	0.018	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.05	<0.05	<0.01	<0.01	<0.002	0.007	0.015	<0.05	<0.005	<0.001	<0.002
MPE 3	MPE 3	Normal	6/03/2019	212985-1	212985	0.011	0.01	0.007	0.017	0.093	-	0.021	0.005	0.006	0.003	<0.001	<0.002	-	0.01	<0.001	0.018	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.05	<0.05	<0.01	<0.01	<0.002	0.007	0.015	<0.05	<0.005	<0.001	<0.002
MPE 3	MPE 3	Normal	12/03/2019	213382-8	213382	0.011	0.009	0.006	0.015	0.077	-	0.02	0.006	0.004	0.002	<0.001	<0.002	-	0.009	<0.001	0.007	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.006	0.016	<0.05	<0.005	<0.001	<0.002
MPE 4	MPE 4	Normal	13/02/2019	211519-8	211519	0.088		0.11	0.29	0.68	-	0.27	0.036	0.029	0.027	0.008	<0.002	-	0.078	<0.001	0.002	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.049	0.063	<0.05	<0.005	0.008	<0.002
MPE 4	MPE 4	Normal	19/02/2019	211841-4	211841	0.098		0.14	0.37	0.82	-	0.32	0.046	0.034	0.031	0.009	<0.002	-	0.086	<0.001	0.018	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.06	0.067	<0.05	<0.005	0.009	<0.002
MPE 4	MPE 4	Normal	26/02/2019	212355-6	212355	0.1		0.12	0.35	0.79	-	0.33	0.038	0.031	0.023	0.01	<0.002	-	0.085	<0.001	0.014	<0.001	<0.001	<0.001	<0.004	<0.004	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.056	0.07	<0.05	<0.005	0.009	<0.002
MPE 4	MPE 4	Normal	5/03/2019	212782-8	212782	0.08		0.11	0.29	0.67	-	0.26	0.039	0.027	0.025	0.007	<0.002	-	0.08	<0.001	0.015	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.052	0.06	<0.05	<0.005	0.006	<0.002
MPE 4	MPE 4	Normal	12/03/2019	213382-7	213382	0.099		0.11	0.34	0.89	-	0.32	0.033	0.036	0.019	0.008	<0.002	-	0.082	<0.001	0.12	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.06	0.085	<0.05	<0.005	0.012	<0.002
MPE 5	MPE 5	Normal	11/12/2018	208061-7	208061	0.044	0.011	0.026	0.037	0.24	-	0.056	0.02	0.024	0.01	0.002	<0.002	-	0.029	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.06	0.085	<0.05	<0.005	0.012	<0.002
MPE 5	MPE 5	Normal	19/02/2019	211841-12	211841	0.045	0.011	0.034	0.045	0.23	-	0.056	0.023	0.017	0.011	<0.001	<0.002	-	0.028	<0.001	0.009	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.017	0.04	<0.05	<0.005	0.012	<0.002
MPE 5	MPE 5	Normal	26/02/2019	212355-1	212355	0.041	0.014	0.026	0.04	0.27	-	0.055	0.022	0.018	0.008	<0.001	<0.002	-	0.03	<0.001	0.039	<0.001	<0.001	<0.001	<0.001	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.024	0.044	<0.05	<0.005	0.012	<0.002
MPE 5	MPE 5	Normal	5/03/2019	212782-4	212782	0.041	0.01	0.028	0.038	0.2	-	0.051	<0.02	0.014	0.009	<0.001	<0.002	-	0.027	<0.001	0.016	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.023	0.034	<0.05	<0.005	0.012	<0.002
MPE 5	MPE 5	Normal	11/03/2019	213297-18	213297	0.043	0.013	0.034	0.047	0.22	-	0.056	0.02	0.008	0.006	0.001	<0.002	-	0.021	<0.001	0.01	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.022	0.043	<0.05	<0.005	0.012	<0.002
MPE 5A	MPE 5A	Normal	11/12/2018	208061-5	208061	0.031	0.069	0.03	0.099	0.35	-	0.1	0.032	0.008	0.006	0.003	<0.002	-	0.087	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.032	0.05	<0.05	<0.005	0.002	<0.002
MPE 5A	MPE 5A	Normal	19/02/2019	211841-2	211841	0.014	0.045	0.028	0.073	0.26	-	0.058	0.024	0.009	0.005	0.002	<0.002	-	0.04	<0.001	0.056	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.017	0.022	<0.05	<0.005	0.012	<0.002
MPE 5A	MPE 5A	Normal	26/02/2019	212355-3	212355	0.029	0.046	0.031	0.077	0.31	-	0.075	0.029	0.007	0.005	0.002	<0.002	-	0.074	<0.001	0.005	<0.001	<0.001	<0.001	<0.001	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.036	0.048	<0.05	<0.005	0.002	<0.002
MPE 5A	MPE 5A	Normal	5/03/2019	212782-6	212782	0.05	0.042	0.043	0.085	0.48	-	0.092	0.039	0.011	0.008	0.002	<0.002	-	0.13	<0.001	0.009	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.06	0.084	<0.05	<0.005	0.002	<0.002
MPE 5A	MPE 5A	Normal	12/03/2019	213382-4	213382	0.015	0.06	0.016	0.076	0.21	-	0.075	0.02	0.002	0.003	0.001	<0.002	-	0.027	<0.001	0.043	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.012	0.018	<0.05	<0.005	0.002	<0.002
MPE 6	MPE 6	Normal	11/12/2018	208061-8	208061	0.029	0.021	0.021	0.042	0.15	-	0.05	0.008	0.011	0.006	0.002	<0.002	-	0.02	<0.001	0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.011	0.016	<0.05	<0.005	0.001	<0.002
MPE 6	MPE 6	Normal	18/02/2019	211785-14	211785	0.025	0.018	0.024	0.042	0.14	-	0.043	0.002	0.006	0.004	0.001	<0.002	-	0.01	<0.001	0.02	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.01	0.012	<0.05	<0.005	0.001	<0.002
MPE 6	MPE 6	Normal	25/02/2019	212251-14	212251	0.018	0.014	0.017	0.031	0.094	-	0.032	0.003	0.006	0.004	0.001	<0.002	-	0.01	<0.001	0.002	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.007	0.01	<0.05	<0.005	0.001	<0.002
MPE 6	MPE 6	Normal	5/03/2019	212782-1	212782	0.012	0.007	0.011	0.018	0.066	-	0.019	<0.002	0.003	0.002	<0.001	<0.002	-	0.005	<0.001	0.012	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.005	0.008	<0.05	<0.005	0.001	<0.002
MPE 6	MPE 6	Normal	11/03/2019	213297-14	213297	0.019	0.013	0.017	0.03	0.09	-	0.032	0.005	0.003	0.002	<0.001	<0.002	-	0.008	<0.001	0.005	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.007	0.011	<0.05	<0.005	0.001	<0.002
MPE 6	QC1049	Field D	11/03/2019	213297-15	213																																	

Table B4 Groundwater PFAS PRE TOPA

	Perfluorooctanoic acid (PFOA)	Perfluorooctane sulfonic acid (PFOS)	Perfluorohexane sulfonate (PFHxS)	Sum (PFHxS + PFOS)	Sum of PFAS	Sum of PFAS (WA DER List)	Sum of US EPA PFAS (PFOS + PFOA)*	Perfluorobutanoic acid	PFBS	PFPeA	PFHpA	Perfluorodecane sulfonic acid (PFDS)	Perfluoro-n-hexadecanoic acid	PFPeA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	N-Me-FOSA	MeFOSAA	EiFOSAA	N-Me-FOSE	FOSA	PFTeDA	PFTDA	N-Et-FOSA	PFDoA	PFHpA	PFHxA	N-Et-FOSE	PFDoA	PFNA	PFUnA					
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L					
EQL	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.002	0.005	0.002	0.001	0.001	0.001	0.001	0.005	0.002	0.002	0.005	0.01	0.05	0.01	0.01	0.002	0.001	0.001	0.05	0.005	0.001	0.002					
PFAS NEMP FW 80% Species Protection	1824	31																																				
PFAS NEMP FW 95% Species Protection	220	0.13																																				
PFAS NEMP Human Health Recreational Water	5.6			0.7																																		
PFAS NEMP Marine 80% Species Protection	1824	31																																				
PFAS NEMP Marine 95% Species Protection	220	0.13																																				
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	0.051	0.03	0.029	0.059	0.21	-	0.081	0.01	0.004	0.007	0.002	<0.002	-	0.01	<0.001	0.012	<0.001	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	<0.1	<0.002	0.014	0.03	<0.5	<0.005	0.001	<0.002
MPI 14	MPI 14	Normal	11/03/2019	213297-9	213297	0.069	0.064	0.041	0.105	0.29	-	0.13	0.02	0.012	0.011	0.004	<0.002	-	0.02	<0.001	0.005	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.019	0.028	<0.05	<0.005	0.003	<0.002
MPI 15	MPI 15	Normal	18/02/2019	211785-7	211785	0.055	0.055	0.033	0.088	0.28	-	0.11	0.024	0.016	0.012	0.004	<0.002	-	0.02	<0.001	0.016	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.018	0.032	<0.05	<0.005	0.002	<0.002
MPI 15	MPI 15	Normal	12/12/2018	208060-13	208060	0.046	0.048	0.032	0.08	0.23	-	0.094	0.01	0.011	0.001	0.002	<0.002	-	0.02	<0.001	0.006	<0.001	<0.001	<0.05	<0.002	<0.002	<0.005	<0.1	<0.05	<0.01	<0.01	<0.002	0.015	0.025	<0.05	<0.005	0.002	<0.002
MPI 15	MPI 15	Normal	25/02/2019	212251-8	212251	0.061	0.055	0.036	0.091	0.25	-	0.12	0.02	0.012	0.009	0.003	<0.002	-	0.01	<0.001	0.003	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.1	<0.05	<0.01	<0.01	<0.002	0.016	0.026	<0.05	<0.005	0.002	<0.002
MPI 15	MPI 15	Normal	4/03/2019	212783-8	212783	0.057	0.064	0.036	0.1	0.29	-	0.12	0.02	0.008	0.008	0.003	<0.002	-	0.01	<0.001	0.019	<0.001	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	<0.01	<0.002	0.02	0.032	<0.5	<0.005	0.002	<0.002
MPI 15	MPI 15	Normal	11/03/2019	213297-7	213297	0.07	0.07	0.041	0.111	0.3	-	0.14	0.023	0.012	0.012	0.005	<0.002	-	0.02	<0.001	0.005	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.1	<0.05	<0.01	<0.01	<0.002	0.019	0.028	<0.05	<0.005	0.003	<0.002
MPI 15	QC1046	Field D	18/02/2019	211785-8	211785	0.05	0.054	0.037	0.091	0.235	0.217	-	<0.01	0.027	0.015	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.003	<0.002	<0.002	<0.005	<0.002	<0.005	<0.002	<0.005	<0.002	0.015	0.034	<0.005	<0.005	0.003	<0.002
MPI 16	MPI 16	Normal	12/12/2018	208060-4	208060	0.037	0.013	0.016	0.025	0.19	-	0.05	<0.04	0.019	0.009	<0.001	<0.002	-	0.021	<0.001	0.003	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.02	0.053	<0.05	<0.005	<0.001	<0.002
MPI 16	MPI 16	Normal	18/02/2019	211785-6	211785	0.007	0.003	0.003	0.006	0.044	-	0.01	<0.02	0.005	0.002	<0.001	<0.002	-	<0.02	<0.001	0.004	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.004	0.017	<0.05	<0.005	<0.001	<0.002
MPI 16	MPI 16	Normal	25/02/2019	212251-7	212251	0.036	0.01	0.015	0.025	0.22	-	0.046	<0.04	0.019	0.011	<0.001	<0.002	-	0.034	<0.001	0.002	<0.001	<0.001	<0.05	<0.002	<0.002	<0.005	<0.1	<0.05	<0.01	<0.01	<0.002	0.022	0.072	<0.05	<0.005	0.002	<0.002
MPI 16	MPI 16	Normal	4/03/2019	212783-7	212783	0.066	0.022	0.032	0.054	0.4	-	0.088	0.01	0.035	0.023	0.002	<0.002	-	0.045	<0.001	0.004	<0.001	<0.001	<0.05	<0.02	<0.002	<0.005	<0.1	<0.5	<0.01	<0.01	<0.002	0.04	0.12	<0.05	<0.005	<0.001	<0.002
MPI 16	MPI 16	Normal	11/03/2019	213297-6	213297	0.062	0.03	0.038	0.068	0.44	-	0.092	0.036	0.022	0.015	0.002	<0.002	-	0.037	<0.001	0.021	<0.001	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	<0.01	<0.002	0.038	0.14	<0.5	<0.005	<0.001	<0.002
MPI 17	MPI 17	Normal	18/02/2019	211785-3	211785	0.18	0.074	0.12	0.194	0.73	-	0.25	0.042	0.045	0.044	0.009	<0.002	-	0.041	<0.001	0.002	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.062	0.11	<0.05	<0.005	0.002	<0.002
MPI 17	MPI 17	Normal	25/02/2019	212251-2	212251	0.18	0.07	0.12	0.19	0.8	-	0.25	0.048	0.045	0.043	0.008	<0.002	-	0.043	<0.001	0.06	<0.001	<0.001	<0.05	<0.002	<0.002	<0.005	<0.1	<0.05	<0.01	<0.01	<0.002	0.063	0.12	<0.05	<0.005	0.002	<0.002
MPI 17	MPI 17	Normal	4/03/2019	212783-2	212783	0.17	0.066	0.11	0.176	0.84	-	0.24	0.054	0.046	0.043	0.006	<0.002	-	0.042	<0.001	0.13	<0.001	<0.001	<0.05	<0.002	<0.002	<0.005	<0.1	<0.05	<0.01	<0.01	<0.002	0.066	0.1	<0.05	<0.005	0.002	<0.002
MPI 17	MPI 17	Normal	11/03/2019	213297-2	213297	0.2	0.083	0.12	0.203	1.1	-	0.28	0.043	0.023	0.039	0.008	<0.002	-	0.032	<0.001	0.31	0.001	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	<0.01	<0.002	0.073	0.12	<0.5	<0.005	0.003	<0.002
MPI 17	QC1047	Field D	4/03/2019	212783-4	212783	0.17	0.064	0.11	0.174	0.84	-	0.23	0.053	0.042	0.042	0.006	<0.002	-	0.039	<0.001	0.15	<0.001	<0.001	<0.05	<0.02	<0.002	<0.005	<0.1	<0.05	<0.01	<0.01	<0.002	0.062	0.1	<0.05	<0.005	0.002	<0.002
MPI 18	MPI 18	Normal	13/12/2018	208046-2	208046	0.21	0.06	0.1	0.16	0.7	-	0.27	0.02	0.04	0.04	0.011	<0.002	-	0.047	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.063	0.11	<0.05	<0.005	0.003	<0.002

Table B4 Groundwater PFAS PRE TOPA

	Perfluorooctanoic acid (PFOA)	Perfluorooctane sulfonic acid (PFOS)	Perfluorohexane sulfonate (PFHxS)	Sum (PFHxS + PFOS)	Sum of PFAS	Sum of PFAS (WA DER List)	Sum of US EPA PFAS (PFOS + PFOA)	Perfluorobutanoic acid	PFBS	PFPeS	PFHpS	Perfluorodecane sulfonic acid (PFDS)	Perfluoro-n-hexadecanoic acid	PFPeA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	N-Me-FOSA	MeFOSAA	EFOsAA	N-Me-FOSE	FOSA	PFTeDA	PFTDA	N-Et-FOSA	PFDoA	PFHpA	PFHxA	N-Et-FOSE	PFDoA	PFNA	PFUnA		
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L		
EQL	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0.002	0.005	0.002	0.001	0.001	0.001	0.001	0.005	0.002	0.002	0.005	0.01	0.05	0.01	0.01	0.002	0.001	0.001	0.05	0.005	0.001	0.002		
PFAS NEMP FW 80% Species Protection	1824	31																																	
PFAS NEMP FW 95% Species Protection	220	0.13																																	
PFAS NEMP Human Health Recreational Water	5.6		0.7																																
PFAS NEMP Marine 80% Species Protection	1824	31																																	
PFAS NEMP Marine 95% Species Protection	220	0.13																																	

Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	0.2	0.057	0.12	0.177	0.91	-	0.26	0.041	0.049	0.046	0.008	<0.002	-	0.036	<0.001	0.15	<0.001	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	<0.1	<0.002	0.054	0.13	<0.5	<0.005	0.002	<0.002
MPI 18	MPI 18	Normal	13/02/2019	211519-16	211519	0.2	0.057	0.12	0.177	0.91	-	0.26	0.041	0.049	0.046	0.008	<0.002	-	0.036	<0.001	0.15	<0.001	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	<0.1	<0.002	0.054	0.13	<0.5	<0.005	0.002	<0.002
MPI 18	MPI 18	Normal	18/02/2019	211785-2	211785	0.21	0.054	0.14	0.194	0.84	-	0.26	0.045	0.048	0.053	0.008	<0.002	-	0.055	<0.001	0.051	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.058	0.12	<0.05	<0.005	0.002	<0.002
MPI 18	MPI 18	Normal	25/02/2019	212251-3	212251	0.2	0.053	0.13	0.183	0.8	-	0.25	0.046	0.048	0.046	0.008	<0.002	-	0.048	<0.001	0.031	<0.001	<0.001	<0.05	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.067	0.12	<0.05	<0.005	0.002	<0.002
MPI 18	MPI 18	Normal	4/03/2019	212783-3	212783	0.19	0.048	0.12	0.168	0.73	-	0.24	0.052	0.045	0.046	0.006	<0.002	-	0.042	<0.001	0.004	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.068	0.11	<0.05	<0.005	0.002	<0.002
MPI 18	MPI 18	Normal	11/03/2019	213297-3	213297	0.22	0.06	0.15	0.21	0.82	-	0.28	0.048	0.035	0.045	0.007	<0.002	-	0.051	<0.001	0.023	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.073	0.11	<0.05	<0.005	0.002	<0.002
MPI 18	QC2046	Interlab D	4/03/2019	ES1906814001	ES1906814	0.168	0.04	0.115	0.155	0.699	0.637	-	<0.01	0.049	0.058	0.004	<0.002	<0.005	0.06	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.072	0.133	<0.05	<0.005	0.002	<0.002
MPI 2	MPI 2	Normal	13/12/2018	209046-1	209046	0.5		0.38	0.66	2.1	-	0.78	0.03	0.13	0.088	0.023	<0.002	-	0.16	<0.001	0.006	<0.001	<0.001	<0.005	<0.002	0.02	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.14	0.26	<0.05	<0.005	0.057	<0.002
MPI 2	MPI 2	Normal	13/02/2019	211519-14	211519	0.53		0.32	0.62	2.1	-	0.83	0.098	0.14	0.12	0.016	<0.002	-	0.11	<0.001	0.008	<0.001	<0.001	<0.005	<0.002	<0.02	<0.05	<0.1	<0.05	<0.01	<0.01	<0.002	0.13	0.3	<0.5	<0.005	0.052	<0.002
MPI 2	MPI 2	Normal	19/02/2019	211841-10	211841	0.52		0.38	0.61	2.4	-	0.86	0.067	0.16	0.11	0.017	<0.002	-	0.14	<0.001	0.013	<0.001	<0.001	<0.005	<0.002	<0.02	<0.05	<0.1	<0.05	<0.01	<0.01	<0.002	0.13	0.31	<0.5	<0.005	0.064	<0.002
MPI 2	MPI 2	Normal	26/02/2019	212355-12	212355	0.52		0.37	0.69	2.2	-	0.84	0.062	0.14	0.09	0.03	<0.002	-	0.12	<0.001	0.044	<0.001	<0.001	<0.01	<0.04	<0.04	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.14	0.28	<0.05	<0.005	0.051	<0.002
MPI 2	MPI 2	Normal	6/03/2019	212985-5	212985	0.47		0.36	0.61	2	-	0.72	0.061	0.15	0.11	0.017	<0.002	-	0.14	<0.001	0.006	<0.001	<0.001	<0.01	<0.02	<0.01	<0.05	<0.05	<0.01	<0.01	<0.002	0.13	0.26	<0.05	<0.005	0.042	<0.002	
MPI 2	MPI 2	Normal	12/03/2019	213382-12	213382	0.59		0.41	0.79	2.3	-	0.96	0.092	0.059	0.11	0.018	<0.002	-	0.12	<0.001	0.028	<0.001	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.5	<0.1	<0.01	<0.02	0.15	0.34	<0.5	<0.05	0.063	<0.002
MPI 2	QC1048	Field D	6/03/2019	212985-7	212985	0.47		0.38	0.65	2.1	-	0.74	0.069	0.16	0.11	0.016	<0.002	-	0.14	<0.001	0.008	<0.001	<0.001	<0.01	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	<0.01	<0.002	0.13	0.27	<0.05	<0.005	0.039	<0.002
MPI 20	MPE 20	Normal	11/03/2019	213297-1	213297	0.15	0.013	0.11	0.123	0.78	-	0.16	0.04	0.033	0.05	0.002	<0.002	-	0.05	<0.001	0.065	<0.001	<0.001	<0.005	<0.02	<0.02	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.089	0.18	<0.05	<0.005	0.001	<0.002
MPI 20	MPI 20	Normal	12/12/2018	208060-10	208060	0.15	0.01	0.089	0.093	0.7	-	0.17	0.053	0.044	0.047	0.004	<0.002	-	0.063	<0.001	0.011	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.085	0.14	<0.05	<0.005	0.001	<0.002
MPI 20	MPI 20	Normal	18/02/2019	211785-1	211785	0.15	0.01	0.11	0.11	0.72	-	0.16	0.05	0.049	0.054	0.003	<0.002	-	0.063	<0.001	0.006	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.077	0.16	<0.05	<0.005	0.001	<0.002
MPI 20	MPI 20	Normal	25/02/2019	212251-1	212251	0.15	0.011	0.091	0.102	0.75	-	0.16	0.047	0.041	0.045	0.003	<0.002	-	0.06	<0.001	0.094	<0.001	<0.001	<0.05	<0.002	<0.002	<0.005	<0.1	<0.05	<0.01	<0.01	<0.002	0.076	0.14	<0.05	<0.005	0.001	<0.002
MPI 20	MPI 20	Normal	4/03/2019	212783-1	212783	0.14	0.009	0.091	0.11	0.72	-	0.15	0.041	0.046	0.046	0.003	<0.002	-	0.061	<0.001	0.066	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.084	0.14	<0.05	<0.005	0.001	<0.002
MPI 3A	MPI 3A	Normal	11/12/2018	208061-1	208061	0.11	0.062	0.075	0.137	0.49	-	0.17	0.022	0.036	0.026	0.005	<0.002	-	0.034	<0.001	0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.035	0.081	<0.05	<0.005	0.003	<0.002
MPI 3A	MPI 3A	Normal	13/02/2019	211519-15	211519	0.14	0.11	0.13	0.24	0.69	-	0.25	0.027	0.05	0.037	0.007	<0.002	-	0.038	<0.001	0.007	<0.001	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	<0.01	<0.002	0.042	0.09	<0.5	<0.005	0.005	<0.002
MPI 3A	MPI 3A	Normal	19/02/2019	211841-9	211841	0.1	0.065	0.11	0.175	0.54	-	0.17	0.025	0.045	0.031	0.004	<0.002	-	0.038	<0.001	0.002	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.036	0.082	<0.05	<0.005	0.003	<0.002
MPI 3A	MPI 3A	Normal	26/02/2019	212355-9	212355	0.24		0.24	0.45	1.2	-	0.45	0.052	0.074	0.057	0.016	<0.002	-	0.068	<0.001	0.004	<0.001	<0.001	<0.01	<0.04	<0.04	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.064					

Table B4 Groundwater PFAS PRE TOPA

	Perfluorooctanoic acid (PFOA)	Perfluorooctane sulfonic acid (PFOS)	Perfluorohexane sulfonate (PFHxS)	Sum (PFHxS + PFOS)	Sum of PFAS	Sum of PFAS (WA DER List)	Sum of US EPA PFAS (PFOS + PFOA)*	Perfluorobutanoic acid	PFBS	PFPeS	PFHpS	Perfluorodecane sulfonic acid (PFDS)	Perfluoro-n-hexadecanoic acid	PFPeA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	N-Me-FOSA	MeFOSAA	EiFOSAA	N-Me-FOSE	FOSA	PFTeDA	PFTDA	N-Et-FOSA	PFDoA	PFHpA	PFHxA	N-Et-FOSE	PFDoA	PFNA	PFUnA			
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L			
EQL	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.002	0.005	0.002	0.001	0.001	0.001	0.001	0.005	0.002	0.002	0.005	0.01	0.05	0.01	0.01	0.002	0.001	0.001	0.05	0.005	0.001	0.002			
PFAS NEMP FW 80% Species Protection	1824	31																																		
PFAS NEMP FW 95% Species Protection	220	0.13																																		
PFAS NEMP Human Health Recreational Water	5.6			0.7																																
PFAS NEMP Marine 80% Species Protection	1824	31																																		
PFAS NEMP Marine 95% Species Protection	220	0.13																																		

Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	0.07	0.38	0.64	1.7	-	0.33	0.068	0.041	0.059	0.014	<0.002	-	0.18	<0.001	0.037	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.12	0.29	<0.05	<0.005	0.22	<0.002	
WCX GTY BH 027	QC1046	Field D	22/02/2019	212103-3	212103	0.075	0.41	0.56	1.9	-	0.23	0.082	0.046	0.067	0.01	<0.002	-	0.24	<0.001	0.015	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	0.14	0.44	<0.05	<0.005	0.19	<0.002		
WCX GTY BH 027	WCX GTY BH	Normal	17/01/2019	209762-4	209762	0.067	0.39	0.65	1.7	-	0.33	0.07	0.043	0.061	0.014	<0.002	-	0.18	<0.001	0.036	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	0.12	0.29	<0.05	<0.005	0.22	<0.002		
WCX GTY BH 027	WCX GTY BH	Normal	16/04/2019	215934-6	215934	0.057	0.4	0.6	1.6	-	0.26	0.074	0.041	0.044	0.011	<0.002	-	0.19	<0.001	0.014	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	0.1	0.3	<0.05	<0.005	0.13	<0.002		
WCX GTY BH 033	QC1054	Field D	11/04/2019	215594-2	215594	0.001	0.005	<0.001	0.005	0.05	-	0.007	<0.002	<0.001	<0.001	<0.001	<0.002	-	<0.002	<0.001	0.043	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	<0.001	<0.001	<0.05	<0.005	<0.001	<0.002	
WCX GTY BH 033	QC2031	Interlab D	19/12/2018	ES1838735001	ES1838735	0.002	0.004	0.002	0.006	0.008	0.008	-	<0.01	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.002	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002	<0.002
WCX GTY BH 033	WCX GTY BH	Normal	19/12/2018	208565-2	208565	0.003	0.003	0.002	0.005	0.015	-	0.006	<0.002	0.001	<0.001	<0.001	<0.002	-	<0.002	<0.001	0.002	<0.001	<0.001	<0.003	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	0.002	0.002	<0.05	<0.005	<0.001	<0.002	
WCX GTY BH 033	WCX GTY BH	Normal	13/02/2019	211510-4	211510	0.001	0.007	0.001	0.008	0.3	-	0.008	<0.002	<0.001	<0.001	<0.001	<0.002	-	<0.002	<0.001	0.29	<0.001	<0.001	<0.003	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	<0.001	0.002	<0.05	<0.005	<0.001	<0.002	
WCX GTY BH 033	WCX GTY BH	Normal	11/04/2019	215594-6	215594	0.002	0.004	<0.001	0.004	0.024	-	0.006	<0.002	<0.001	<0.001	<0.001	<0.002	-	<0.002	<0.001	0.017	<0.001	<0.001	<0.003	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	<0.001	0.001	<0.05	<0.005	<0.001	<0.002	

Statistical Summary	270	270	270	270	270	11	259	270	270	270	270	270	11	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270		
Number of Results	270	270	270	270	270	11	259	270	270	270	270	270	11	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270		
Number of Detects	250	251	256	262	269	11	249	216	243	231	169	1	0	229	2	228	17	0	0	1	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.001	<0.001	<0.001	0.001	<0.001	0.006	<0.001	<0.002	<0.001	<0.001	<0.001	0	<0.005	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.002	<0.005	<0.002	<0.002	<0.001	<0.001	<0.005	<0.002	<0.001	<0.002	
Minimum Detect	0.001	0.001	0.001	0.001	0.004	0.006	0.001	0.002	0.001	0.001	0.001	0.001	ND	ND	0.002	0.001	0.001	0.001	ND	ND	0.034	0.005	0.009	ND	ND	ND	ND	0.002	0.001	0.001	0.001	0.001	0.001	ND	ND	0.001	ND
Maximum Concentration	0.59	6.1	1.2	7.3	8.4	1.21	6.2	0.21	0.17	0.15	0.13	<0.002	<0.005	0.24	<0.01	2.9	0.023	<0.1	<0.04	0.11	<0.05	<0.1	<0.5	<0.1	<0.1	<0.1	0.044	0.16	0.44	0.16	0.44	<0.5	<0.05	0.22	<0.02		
Maximum Detect	0.59	6.1	1.2	7.3	8.4	1.21	6.2	0.21	0.17	0.15	0.13	ND	ND	0.24	0.002	2.9	0.023	ND	ND	0.034	0.11	0.009	ND	ND	ND	ND	0.044	0.16	0.44	0.16	0.44	ND	ND	0.22	ND		
Average Concentration	0.07	0.15	0.087	0.24	0.54	0.32	0.23	0.024	0.021	0.019	0.006	0.001	0.003	0.033	6E-04	0.034	0.001	6E-04	0.009	0.004	0.004	0.007	0.019	0.036	0.007	0.016	0.002	0.029	0.058	0.064	0.004	0.009	0.001	0.002			
Median Concentration	0.041	0.03	0.03	0.064	0.21	0.16	0.071	0.01	0.008	0.007	0.002	0.001	0.003	0.02	5E-04	0.006	5E-04	5E-04	0.003	0.001	0.001	0.003	0.005	0.025	0.005	0.005	0.001	0.015	0.024	0.025	0.003	0.001	0.001	0.001			
Standard Deviation	0.1	0.59	0.15	0.73	0.95	0.41	0.63	0.029	0.032	0.028	0.013	6E-05	0	0.041	6E-04	0.19	0.002	5E-04	0.01	0.005	0.009	0.009	0.021	0.05	0.01	0.019	0.003	0.035	0.081	0.087	0.005	0.029	0.002	0.002			
Number of Guideline Exceedances	0	55	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of Guideline Exceedances(Detects Only)	0	55	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Table B5\_Groundwater Analytical Data against Discharge Criteria

Location Code	Field ID	Sample Type	Sampled Date	Sample Code	Lab Report	Metals													
						Aluminium (Filtered)	Asenic (Filtered)	Barium	Barium (Filtered)	Boron	Calcium (Filtered)	Chromium (Filtered)	Cobalt (Filtered)	Copper (Filtered)	Iron	Lead (Filtered)	Manganese (Filtered)	Mercury (Filtered)	Nickel (Filtered)
						ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
<b>EQOL</b>						10	1	1	1	50	0.1	1	1	10	1	5	0.05	1	
<b>Discharge criteria (WSP, 2019)</b>						27	30			36	85	150	8	489.8	12	20.26	0.4	560	
<b>Sydney Water Industrial Trade Waste Acceptance Standard (2019)</b>						100,000	1,000	5000	5000	100,000	3000	5000	5000	50,000	2000	10,000	30	3000	
34_TL3	34_TL3	Normal	13/02/2019	21159-11	211519	-	-	48	-	-	-	-	-	2300	-	-	-	-	
34_TL3	34_TL3	Normal	19/02/2019	21184-5	211841	-	-	44	-	-	-	-	-	8300	-	-	-	-	
34_TL3	34_TL3	Normal	28/02/2019	21235-7	212355	-	-	47	-	-	-	-	-	5900	-	-	-	-	
34_TL3	34_TL3	Normal	6/03/2019	212985-2	212985	20	4	-	22	-	ND	11	8	ND	-	39	ND	8	
34_TL3	34_TL3	Normal	12/03/2019	213382-13	213382	-	-	60	-	-	-	-	-	3400	-	-	-	-	
34_TL3	34_TL3	Normal	16/04/2019	215934-2	215934	40	4	-	45	-	ND	13	7	ND	-	46	ND	7	
34_TL3	QC2054	Interlab D	16/04/2019	ES191221001	ES1912221	28	6.3	-	50.1	-	ND	15	6.1	ND	-	47.6	ND	10.2	
GW100a	GW100a	Normal	21/02/2019	212109-3	212109	60	8	-	16	-	ND	ND	ND	ND	-	21	ND	ND	
GW100a	GW100a	Normal	8/03/2019	213103-3	213103	70	9	-	23	-	ND	ND	ND	ND	-	13	ND	ND	
GW100a	GW100a	Normal	11/04/2019	215994-8	215994	80	8	-	18	-	ND	ND	ND	ND	-	22	ND	ND	
GW101	GW101	Normal	8/01/2019	209135-1	209135	40	ND	-	16	-	0.2	ND	ND	ND	-	630	ND	ND	
GW101	GW101	Normal	11/02/2019	211335-4	211335	40	ND	-	15	-	ND	ND	ND	ND	-	550	ND	ND	
GW101	GW101	Normal	8/03/2019	213103-1	213103	70	ND	-	16	-	ND	ND	ND	ND	-	590	ND	ND	
GW101	GW101	Normal	15/04/2019	215789-5	215789	40	ND	-	14	-	ND	ND	ND	ND	-	590	ND	ND	
GW101	QC2039	Interlab D	11/02/2019	ES1904415001	ES1904415	40	0.5	-	16.4	-	ND	0.8	0.4	ND	-	527	ND	ND	
GW102	GW102	Normal	8/01/2019	209135-2	209135	650	1	-	11	-	ND	ND	ND	ND	-	1	6	ND	
GW102	GW102	Normal	11/02/2019	211335-6	211335	530	3	-	10	-	ND	ND	ND	ND	-	ND	ND	7	
GW102	GW102	Normal	8/03/2019	213103-5	213103	560	2	-	11	-	ND	ND	ND	ND	-	5	ND	ND	
GW102	GW102	Normal	17/04/2019	215939-8	215939	730	1	-	9	-	ND	ND	ND	ND	-	2	5	ND	
GW102	QC2051	Interlab D	8/03/2019	ES1907278001	ES1907278	590	2.6	-	11.8	-	ND	0.4	0.4	ND	-	1	5.6	ND	
GW103	GW103	Normal	21/02/2019	213103-2	213103	220	2	-	19	-	ND	ND	ND	ND	-	ND	ND	ND	
GW103	GW103	Normal	8/03/2019	213103-4	213103	310	5	-	16	-	ND	ND	ND	ND	-	6	ND	ND	
GW103	GW103	Normal	17/04/2019	215939-6	215939	80	8	-	40	-	ND	ND	ND	ND	-	9	ND	ND	
GW103	QC1055	Field D	17/04/2019	215939-4	215939	80	7	-	40	-	ND	ND	ND	ND	-	9	ND	ND	
GW104	GW104	Normal	23/12/2019	208653-5	208653	80	1	-	11	-	ND	ND	ND	ND	-	2	ND	2	
GW104	GW104	Normal	7/02/2019	211141-7	211141	180	ND	-	28	-	ND	1	ND	ND	-	99	ND	2	
GW104	GW104	Normal	10/04/2019	215496-4	215496	210	ND	-	27	-	ND	1	ND	ND	-	84	ND	2	
GW10s	GW10s	Normal	10/01/2019	209274-1	209274	-	10	-	-	-	ND	ND	-	ND	-	ND	-	3	
GW10s	GW10s	Normal	14/02/2019	211612-1	211612	-	14	-	-	-	ND	ND	-	ND	-	ND	-	2	
GW10s	GW10s	Normal	8/03/2019	213103-7	213103	-	2	-	-	-	ND	ND	-	ND	-	ND	-	2	
GW10s	GW10s	Normal	9/04/2019	215423-2	215423	-	8	-	-	-	ND	2	-	ND	-	ND	-	ND	
GW10s	QC2053	Interlab D	9/04/2019	ES1911607001	ES1911607	-	8	-	-	-	ND	0.8	-	ND	-	ND	-	1.5	
GW11d	GW11d	Normal	1/03/2019	212548-1	212548	-	ND	-	-	-	ND	ND	-	89	-	ND	-	46	
GW11d	GW11d	Normal	16/04/2019	215934-8	215934	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	130	
GW11s	GW11s	Normal	24/01/2018	210231-1	210231	40	ND	-	45	-	ND	ND	ND	ND	-	240	ND	ND	
GW11s	GW11s	Normal	11/02/2019	211335-2	211335	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	ND	
GW11s	GW11s	Normal	13/03/2019	213502-6	213502	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	ND	
GW11s	GW11s	Normal	15/04/2019	215934-7	215934	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	ND	
GW11s	QC1042	Field D	11/02/2019	211335-3	211335	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	ND	
GW12s	GW12s	Normal	24/01/2019	210277-3	210277	-	21	-	-	-	ND	18	-	ND	-	ND	-	7	
GW13d	GW13d	Normal	20/12/2018	208653-2	208653	-	5	-	-	-	ND	ND	-	ND	-	ND	-	ND	
GW13d	GW13d	Normal	8/02/2019	211141-8	211141	-	4	-	-	-	ND	ND	-	ND	-	ND	-	ND	
GW13d	GW13d	Normal	11/04/2019	215934-5	215934	-	4	-	-	-	ND	ND	-	ND	-	ND	-	ND	
GW13s	GW13s	Normal	20/12/2018	208653-1	208653	-	ND	-	-	-	ND	1	-	ND	-	ND	-	ND	
GW13s	GW13s	Normal	8/02/2019	211141-8	211141	-	ND	-	-	-	ND	1	-	ND	-	ND	-	ND	
GW13s	GW13s	Normal	11/04/2019	215934-4	215934	-	ND	-	-	-	ND	2	-	ND	-	ND	-	ND	
GW14d	GW14d	Normal	20/12/2018	208653-6	208653	-	1	-	-	-	ND	ND	-	ND	-	ND	-	19	
GW14d	GW14d	Normal	7/02/2019	211141-5	211141	-	1	-	-	-	ND	ND	-	ND	-	ND	-	17	
GW14d	GW14d	Normal	10/04/2019	215496-6	215496	-	1	-	-	-	ND	ND	-	ND	-	ND	-	8	
GW14d	QC1032	Field D	20/12/2018	208653-7	208653	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	ND	
GW14s	GW14s	Normal	10/01/2019	209274-2	209274	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	7	
GW14s	GW14s	Normal	21/11/2013	211141-3	211141	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	7	
GW14s	GW14s	Normal	10/04/2019	215496-5	215496	-	ND	-	-	-	ND	1	-	ND	-	ND	-	ND	
GW14s	QC1040	Field D	7/02/2019	211141-4	211141	-	ND	-	-	-	ND	1	-	ND	-	ND	-	ND	
GW14s	QC1053	Field D	10/04/2019	215496-1	215496	-	ND	-	-	-	0.1	1	-	ND	-	ND	-	2	
GW15d	GW15d	Normal	11/04/2019	211141-2	211141	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	ND	
GW15d	GW15d	Normal	10/04/2019	215496-8	215496	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	ND	
GW15s	GW15s	Normal	20/12/2018	208653-3	208653	-	ND	-	-	-	0.2	ND	-	ND	-	ND	-	8	
GW15s	GW15s	Normal	7/02/2019	211141-1	211141	-	ND	-	-	-	0.2	ND	-	ND	-	ND	-	6	
GW15s	GW15s	Normal	10/04/2019	215496-7	215496	-	ND	-	-	-	ND	1	-	2	-	1	-	10	
GW17d	GW17d	Normal	28/03/2019	214591-1	214591	3	10	3	360	-	ND	6	2	ND	-	210	1	1	
GW17d	GW17d	Normal	15/04/2019	215789-4	215789	ND	6	3	640	-	ND	3	2	ND	-	200	ND	2	
GW200 - SG_BH059	GW200 - SG_BH059	Normal	17/01/2019	209761-1	209761	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	ND	
GW201	GW201	Normal	24/01/2019	210277-4	210277	-	1	-	-	-	ND	ND	-	ND	-	ND	-	ND	
GW203	GW203	Normal	9/01/2019	209210-2	209210	30	ND	-	31	-	ND	ND	-	ND	-	ND	-	ND	
GW203	GW203	Normal	13/02/2019	211510-1	211510	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	ND	
GW203	GW203	Normal	11/03/2019	213240-4	213240	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	ND	
GW203	GW203	Normal	17/04/2019	215939-7	215939	-	ND	-	-	-	ND	ND	-	2	-	ND	-	ND	
GW204	GW204	Normal	24/01/2019	210277-5	210277	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	ND	
GW204	QC1037	Field D	24/01/2019	210277-2	210277	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	ND	
GW205	GW205	Normal	24/01/2019	210277-6	210277	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	ND	
GW22s	GW22s	Normal	9/04/2019	215423-8	215423	20	ND	-	30	-	ND	ND	12	2	-	ND	-	490	
GW23d	GW23d	Normal	17/01/2019	209762-2	209762	ND	3	-	520	-	ND	24	5	ND	-	ND	-	300	
GW23d	GW23d	Normal	11/02/2019	211435-9	211435	ND	6	38	410	-	ND	13	4	ND	-	120	ND	9	
GW23d	GW23d	Normal	9/04/2019	215423-1	215423	280	18	-	340	-	0.2	92	9	30	-	120	42	ND	
GW24s	GW24s	Normal	13/03/2019	213502-5	213502	40	2	-	190	-	ND	ND	ND	ND	-	180	ND	ND	
GW24s	GW24s	Normal	12/04/2019	215657-1	215657	220	ND	-	220	-	ND	2	ND	ND	-	250	ND	ND	
GW25s	GW25s	Normal	9/01/2019	209210-1	209210	20	3	-	200	-	ND	2	ND	-	ND	-	1200	ND	
GW25s	GW25s	Normal	1																



Table B5\_Groundwater Analytical Data against Discharge Criteria

							Metals																
							Aluminum (Filtered)	Arsenic (Filtered)	Barium	Barium (Filtered)	Boron	Cadmium (Filtered)	Chromium (Filtered)	Cobalt (Filtered)	Copper (Filtered)	Iron	Lead (Filtered)	Manganese (Filtered)	Mercury (Filtered)	Nickel (Filtered)			
							ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L		
<b>EQL</b>							10	1	1	1	50	0.1	1	1	1	10	1	5	0.05	1			
<b>Discharge criteria (WSP, 2019)</b>							27	30				36	85	150	8	489.8	12	20.26	0.4	660			
<b>Sydney Water Industrial Trade Waste Acceptance Standard (2019)</b>							100,000	1,000	5000	5000	100,000	1000	3000	5000	5000	50,000	2000	10,000	30	3000			
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report																		
MPI 5	MPI 5	Normal	12/12/2018	208060-7	208060	30	5	-	64	-	ND	11	6	ND	-	ND	47	ND	6				
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	-	-	82	-	-	-	-	-	-	6400	-	-	-	-				
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841	-	-	85	-	-	-	-	-	-	7100	-	-	-	-				
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	-	-	86	-	-	-	-	-	-	5100	-	-	-	-				
MPI 6A	MPI 6A	Normal	5/03/2019	212762-9	212762	-	-	96	-	-	-	-	-	-	5300	-	-	-	-				
MPI 6A	MPI 6A	Normal	12/03/2019	213382-6	213382	-	-	110	-	-	-	-	-	-	4500	-	-	-	-				
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	190	9	-	280	-	0.1	16	8	5	-	12	210	ND	15				
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	ND	1	-	770	-	ND	5	4	ND	-	ND	68	ND	4				
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	-	11	-	-	-	ND	4	-	ND	-	ND	-	ND	2				
WCX_GTY_BH_002	WCX_GTY_BH	Normal	19/12/2018	208565-1	208565	-	ND	-	-	-	ND	1	-	2	-	1	-	ND	ND				
WCX_GTY_BH_002	WCX_GTY_BH	Normal	28/02/2019	212520-5	212520	-	ND	-	-	-	ND	1	-	2	-	ND	-	ND	ND				
WCX_GTY_BH_002	WCX_GTY_BH	Normal	15/03/2019	213632-2	213632	-	ND	-	-	-	ND	2	-	2	-	ND	-	ND	ND				
WCX_GTY_BH_002	WCX_GTY_BH	Normal	11/04/2019	215594-7	215594	-	ND	-	-	-	ND	2	-	1	-	ND	-	ND	1				
WCX_GTY_BH_003	WCX_GTY_BH	Normal	8/03/2019	213103-2	213103	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	ND	3				
WCX_GTY_BH_004	QC2052	Interlab D	15/03/2019	ES1907999001	ES1907999	-	0.7	-	-	-	ND	0.8	-	ND	-	ND	-	ND	ND				
WCX_GTY_BH_004	WCX_GTY_BH	Normal	28/02/2019	212520-6	212520	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	ND	ND				
WCX_GTY_BH_004	WCX_GTY_BH	Normal	15/03/2019	213632-3	213632	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	ND	ND				
WCX_GTY_BH_004	WCX_GTY_BH	Normal	17/04/2019	215939-1	215939	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	ND	ND				
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	17/12/2018	208319-2	208319	-	18	-	-	-	ND	ND	-	ND	-	ND	-	ND	ND				
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	13/02/2019	211510-3	211510	-	2	-	-	-	ND	3	-	ND	-	ND	-	ND	5				
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	15/03/2019	213632-1	213632	-	2	-	-	-	ND	4	-	ND	-	ND	-	ND	1				
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	11/04/2019	215594-10	215594	-	16	-	-	-	ND	ND	-	ND	-	ND	-	ND	ND				
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	17/12/2018	208319-1	208319	-	1	-	-	-	ND	ND	-	ND	-	ND	-	ND	ND				
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	13/02/2019	211510-2	211510	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	ND	ND				
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	6/03/2019	212985-9	212985	-	1	-	-	-	ND	1	-	ND	-	ND	-	ND	ND				
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	11/04/2019	215594-9	215594	-	2	-	-	-	ND	1	-	ND	-	ND	-	ND	ND				
WCX_GTY_BH_027	QC1046	Field D	22/02/2019	212103-3	212103	-	4	-	-	-	ND	ND	-	ND	-	ND	-	ND	2				
WCX_GTY_BH_027	WCX_GTY_BH	Normal	17/01/2019	209762-4	209762	-	5	-	-	-	ND	ND	-	ND	-	ND	-	ND	2				
WCX_GTY_BH_027	WCX_GTY_BH	Normal	22/02/2019	212103-2	212103	-	4	-	-	-	ND	ND	-	ND	-	ND	-	ND	2				
WCX_GTY_BH_027	WCX_GTY_BH	Normal	16/04/2019	215934-6	215934	-	8	-	-	-	ND	ND	-	ND	-	ND	-	ND	1				
WCX_GTY_BH_033	QC1054	Field D	11/04/2019	215594-2	215594	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	ND	2				
WCX_GTY_BH_033	QC2031	Interlab D	19/12/2018	ES1838735001	ES1838735	-	0.7	-	-	-	ND	0.3	-	ND	-	ND	-	ND	ND				
WCX_GTY_BH_033	WCX_GTY_BH	Normal	19/12/2018	208565-2	208565	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	ND	ND				
WCX_GTY_BH_033	WCX_GTY_BH	Normal	13/02/2019	211510-4	211510	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	ND	12				
WCX_GTY_BH_033	WCX_GTY_BH	Normal	11/04/2019	215594-6	215594	-	ND	-	-	-	ND	ND	-	ND	-	ND	-	ND	2				

Statistical Summary																						
Number of Results	87	161	138	86	4	161	161	86	161	142	161	86	161	161								
Number of Detects	72	101	138	86	4	10	82	51	20	142	20	83	3	89								
Minimum Concentration	0	0	22	9	1990	0	0	0	0	400	0	0	0	0								
Minimum Detect	10	0.5	22	9	1990	0.1	0.3	0.4	1	400	1	5	0.2	1								
Maximum Concentration	730	1100	1800	1000	4490	4.6	92	53	200	120	9900	0.5	130									
Maximum Detect	730	1100	1800	1000	4490	4.6	92	53	200	190000	120	9900	0.5	130								
Average Concentration	80	11	436	251	2755	0.044	3	3.6	4.2	16541	1.2	584	0.01	5.4								
Median Concentration	30	2	325	140	2270	0	0.4	1	0	9150	0	150	0	1								
Standard Deviation	147	87	379	265	1171	0.38	9.8	9	23	24938	9.7	1743	0.05	14								
Number of Guideline Exceedances	71	100	0	0	4	10	82	0	20	142	20	83	3	89								
Number of Guideline Exceedances (Detects Only)	71	100	0	0	4	10	161	0	20	142	20	83	3	89								

\* Separate discharge criteria have been developed by WSP for m-Xylene and p-Xylene. As the existing data is for m&p-Xylene combined, the lower criterion for m-Xylene (75 ug/L) is adopted in this table. The criterion for p-Xylene is 200 ug/L.

Table B5\_Groundwater Analytical Data against Discharge Criteria

EOL	Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	Total Petroleum Hydrocarbons					Total Recoverable Hydrocarbons					
							µg/L (Filterate)					µg/L (minus BTEXMF)					
							C6-C9 fraction	C10-C14 fraction	C15-C28 fraction	ΣC6-C28 fraction	ΣC10-C28 fraction (sum)	BTEXMF	C10-C16 fraction	C17-C18 fraction	C19-C24 fraction	C25-C34 fraction	ΣC10-C34 fraction (sum)
1	10	50	100	50	100	50	100	50	100	50	100	50	100	50	100		
<b>Discharge criteria (WSP, 2019)</b>							<b>403</b>										
<b>Sydney Water Industrial Trade Waste Acceptance Standard (2019)</b>							<b>50</b>										
34	TL3	34_TL3	Normal	13/02/2019	211519-11	211519	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	
34	TL3	34_TL3	Normal	18/02/2019	21184-5	21184	-	ND	ND	150	ND	300	ND	ND	69	120	
34	TL3	34_TL3	Normal	26/02/2019	21295-7	21295	-	ND	180	550	ND	830	ND	ND	290	400	
34	TL3	34_TL3	Normal	6/03/2019	21298-2	21298	5	ND	83	490	ND	673	ND	ND	190	390	
34	TL3	34_TL3	Normal	12/03/2019	213382-13	213382	-	ND	63	580	180	823	ND	ND	140	640	
34	TL3	34_TL3	Normal	16/04/2019	215934-2	215934	3	ND	ND	170	ND	-	ND	ND	54	150	
34	TL3	QC2054	Interlab D	16/04/2019	ES191221001	ES191221	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW100s	GW100s	Normal	21/02/2019	212109-3	212109	3	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW100s	GW100s	Normal	8/03/2019	213103-3	213103	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW100s	GW100s	Normal	11/04/2019	215594-8	215594	6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW101	GW101	Normal	8/01/2019	209135-1	209135	6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW101	GW101	Normal	11/02/2019	211335-4	211335	6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW101	GW101	Normal	8/03/2019	213103-1	213103	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW101	GW101	Normal	15/04/2019	215789-5	215789	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW101	QC2039	Interlab D	11/02/2019	ES1904415001	ES1904415	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW102	GW102	Normal	8/01/2019	209135-2	209135	17	27	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW102	GW102	Normal	11/02/2019	211335-6	211335	22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW102	GW102	Normal	8/03/2019	213103-5	213103	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW102	GW102	Normal	17/04/2019	215939-6	215939	29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW102	QC2051	Interlab D	8/03/2019	ES1907278001	ES1907278	24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW103	GW103	Normal	21/02/2019	212109-4	212109	17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW103	GW103	Normal	8/03/2019	213103-4	213103	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW103	GW103	Normal	17/04/2019	215939-6	215939	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW103	QC1055	Field D	17/04/2019	215939-4	215939	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW104	GW104	Normal	20/12/2018	208653-5	208653	170	27	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW104	GW104	Normal	7/02/2019	211141-7	211141	170	ND	ND	270	ND	420	ND	ND	280	280	ND	
GW104	GW104	Normal	10/04/2019	215496-4	215496	48	22	ND	ND	ND	ND	23	23	ND	ND	ND	
GW10s	GW10s	Normal	10/01/2019	209274-1	209274	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW10s	GW10s	Normal	14/02/2019	211612-1	211612	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW10s	GW10s	Normal	8/03/2019	213103-7	213103	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW10s	GW10s	Normal	9/04/2019	215423-2	215423	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW10s	QC2053	Interlab D	9/04/2019	ES1911607001	ES1911607	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW11d	GW11d	Normal	16/03/2019	212548-1	212548	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW11d	GW11d	Normal	16/04/2019	215934-8	215934	17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW11s	GW11s	Normal	24/01/2018	210231-1	210231	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW11s	GW11s	Normal	11/02/2019	213355-2	213355	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW11s	GW11s	Normal	13/03/2019	213502-6	213502	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW11s	GW11s	Normal	16/04/2019	215934-7	215934	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW11s	QC1042	Field D	11/02/2019	213355-3	213355	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW12s	GW12s	Normal	24/01/2019	210277-3	210277	4	ND	ND	ND	ND	ND	ND	ND	57	57	ND	
GW13d	GW13d	Normal	20/12/2018	208653-2	208653	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW13d	GW13d	Normal	8/02/2019	211141-9	211141	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW13d	GW13d	Normal	11/04/2019	215934-5	215934	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW13s	GW13s	Normal	20/12/2018	208653-1	208653	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW13s	GW13s	Normal	8/02/2019	211141-8	211141	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW13s	GW13s	Normal	11/04/2019	215934-4	215934	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW14d	GW14d	Normal	20/12/2018	208653-6	208653	14	ND	ND	ND	ND	ND	ND	ND	73	73	ND	
GW14d	GW14d	Normal	7/02/2019	211141-5	211141	9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW14d	GW14d	Normal	10/04/2019	215496-6	215496	8	ND	210	500	240	950	ND	ND	520	520	340	
GW14d	QC1032	Field D	20/12/2018	208653-7	208653	6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW14s	GW14s	Normal	10/01/2019	209274-2	209274	2200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW14s	GW14s	Normal	7/02/2019	211141-3	211141	290	ND	ND	ND	ND	ND	ND	ND	110	110	ND	
GW14s	GW14s	Normal	10/04/2019	215496-5	215496	2400	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW14s	QC1040	Field D	10/04/2019	211141-4	211141	2100	ND	ND	410	130	590	ND	ND	310	310	210	
GW14s	QC1053	Field D	10/04/2019	215496-1	215496	2900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW15d	GW15d	Normal	7/02/2019	211141-2	211141	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW15d	GW15d	Normal	10/04/2019	215496-6	215496	6	ND	ND	190	ND	340	ND	ND	140	140	ND	
GW15s	GW15s	Normal	20/12/2018	208653-3	208653	1000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW15s	GW15s	Normal	7/02/2019	211141-1	211141	500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW15s	GW15s	Normal	10/04/2019	215496-7	215496	1000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW17d	GW17d	Normal	28/03/2019	214591-1	214591	4	ND	ND	360	ND	510	ND	ND	150	150	ND	
GW17d	GW17d	Normal	15/04/2019	215789-4	215789	3	ND	110	340	ND	550	ND	ND	190	190	270	
GW200 - SG_BH059	GW200 - SG_BH059	Normal	17/01/2019	209761-1	209761	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW201	GW201	Normal	24/01/2019	210277-4	210277	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW203	GW203	Normal	9/01/2019	209210-2	209210	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW203	GW203	Normal	13/02/2019	211510-1	211510	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW203	GW203	Normal	11/03/2019	213240-4	213240	4	ND	ND	180	ND	330	ND	ND	99	99	100	
GW203	GW203	Normal	17/04/2019	215939-7	215939	6	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	
GW204	GW204	Normal	24/01/2019	210277-5	210277	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW204	QC1037	Field D	24/01/2019	210277-2	210277	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW205	GW205	Normal	24/01/2019	210277-6	210277	11	ND	ND	ND	ND	ND	ND	ND	51	51	ND	
GW22s	GW22s	Normal	9/04/2019	215423-8	215423	23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW23d	GW23d	Normal	17/01/2019	209762-2	209762	3	20	350	3300	ND	3750	37	36	400	390	3300	
GW23d	GW23d	Normal	12/02/2019	211435-3	211435	11	19	140	3300	160	3600	33	31	200	190	3400	
GW23d	GW23d	Normal	9/0														



Table B5\_Groundwater Analytical Data against Discharge Criteria

Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	Total Petroleum Hydrocarbons						Total Recoverable Hydrocarbons								
						Zinc (Filtered)	C6-C9 fraction	C10-C14 fraction	C15-C28 fraction	C29-C36 fraction	C10-C36 fraction (sum)	C6-C10 fraction	C6-C10 fraction (minus BTEX)(F)	C10-C16 fraction	C10-C16 (minus Naphthalene)(F)	C16-C34 fraction	C34-C40 fraction	C10-C40 fraction (sum)		
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
EOL						43	10	50	100	100	50	10	10	50	50	100	100	100	100	100
Discharge criteria (WSP, 2019)						5000														
Sydney Water Industrial Trade Waste Acceptance Standard (2019)																				
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report															
MPI 5	MPI 5	Normal	12/12/2018	208960-7	208960	17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
MPI 6A	MPI 6A	Normal	18/02/2019	211841-3	211841	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
MPI 6A	MPI 6A	Normal	5/03/2019	212782-9	212782	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
MPI 6A	MPI 6A	Normal	12/03/2019	213382-6	213382	-	ND	180	300	200	680	ND	ND	240	240	370	170	-	-	
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	32	ND	260	630	140	-	17	16	360	290	620	ND	-		
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	7	ND	220	440	ND	760	34	34	310	310	350	ND	-		
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	9	ND	82	ND	ND	282	ND	65	65	ND	ND	-	-		
WCX_GTY_BH_002	WCX_GTY_BH	Normal	19/12/2018	208565-1	208565	9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-		
WCX_GTY_BH_002	WCX_GTY_BH	Normal	28/02/2019	212520-5	212520	8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-		
WCX_GTY_BH_002	WCX_GTY_BH	Normal	15/03/2019	213632-2	213632	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-		
WCX_GTY_BH_002	WCX_GTY_BH	Normal	11/04/2019	215594-7	215594	13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-		
WCX_GTY_BH_003	WCX_GTY_BH	Normal	8/03/2019	213103-2	213103	6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-		
WCX_GTY_BH_004	QC2052	Interlab_D	15/03/2019	ES190799001	ES1907999	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-		
WCX_GTY_BH_004	WCX_GTY_BH	Normal	28/02/2019	212520-6	212520	11	ND	86	480	ND	666	ND	240	240	320	ND	-			
WCX_GTY_BH_004	WCX_GTY_BH	Normal	15/03/2019	213632-3	213632	4	ND	ND	150	ND	300	ND	ND	150	ND	-				
WCX_GTY_BH_004	WCX_GTY_BH	Normal	17/04/2019	215939-1	215939	5	ND	ND	ND	ND	-	ND	ND	ND	ND	-				
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	17/12/2018	208319-2	208319	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-			
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	13/02/2019	211510-3	211510	6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-			
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	15/03/2019	213632-1	213632	6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-			
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	11/04/2019	215594-10	215594	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-			
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	17/12/2018	208319-1	208319	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-			
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	13/02/2019	211510-2	211510	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-			
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	6/03/2019	212985-9	212985	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-			
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	11/04/2019	215594-9	215594	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-			
WCX_GTY_BH_027	QC1046	Field_D	22/02/2019	212103-3	212103	31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-			
WCX_GTY_BH_027	WCX_GTY_BH	Normal	17/01/2019	209762-4	209762	11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-			
WCX_GTY_BH_027	WCX_GTY_BH	Normal	22/02/2019	212103-2	212103	18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-			
WCX_GTY_BH_027	WCX_GTY_BH	Normal	16/04/2019	215934-6	215934	9	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	-			
WCX_GTY_BH_033	QC1054	Field_D	11/04/2019	215594-2	215594	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-			
WCX_GTY_BH_033	QC2051	Interlab_D	19/12/2018	ES1838735001	ES1838735	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-			
WCX_GTY_BH_033	WCX_GTY_BH	Normal	19/12/2018	208565-2	208565	6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-			
WCX_GTY_BH_033	WCX_GTY_BH	Normal	13/02/2019	211510-4	211510	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-			
WCX_GTY_BH_033	WCX_GTY_BH	Normal	11/04/2019	215594-6	215594	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-			
Statistical Summary																				
Number of Results						161	283	283	283	283	267	283	283	283	283	283	12			
Number of Detects						156	9	40	52	13	63	21	21	65	65	42	9	0		
Minimum Concentration						0	0	0	0	0	0	0	0	0	0	0	0			
Minimum Detect						1	11	50	100	120	60	10	10	51	51	100	110	ND		
Maximum Concentration						10000	1400	1300	3300	6500	7500	2400	1500	1400	1400	4300	8500	0		
Maximum Detect						10000	1400	1300	3300	6500	7500	2400	1500	1400	1400	4300	8500	0		
Average Concentration						246	5.7	24	80	40	173	11	7.9	39	39	89	45	0		
Median Concentration						6	0	0	0	0	0	0	0	0	0	0	0			
Standard Deviation						1239	83	97	322	401	620	143	90	115	115	414	519	0		
Number of Guideline Exceedances						156	9	0	0	0	63	0	0	1	283	6	4	0		
Number of Guideline Exceedances (Detects Only)						156	9	0	0	0	63	0	0	1	283	6	4	0		

\* Separate discharge criteria have been developed by WSP for m-Xylene and p-Xylene. As the existing data is for m&p-Xylene combined, the lower criterion for m-Xylene (75 µg/L) is adopted in this table. The criterion for p-Xylene is 200 µg/L.





Table B5\_Groundwater Analytical Data against Discharge Criteria

		BTEX										Naphthalene		Monocyclic Aromatic Hydrocarbons									
		Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene	Total Xylenes	Total BTEX	Naphthalene	Naphthalene (VOC)	Styrene	Isopropylbenzene	p-tolylbenzene	p-propylbenzene	p-isopropyltoluene	sec-butylbenzene	tert-butylbenzene	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene				
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L				
EOL		1	1	1	2	1	2	1	1	120	5	1	1	1	1	1	1	1	1				
Discharge criteria (WSP, 2019)																							
Sydney Water Industrial Trade Waste Acceptance Standard (2019)		100	500	1000			1000																
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
MPI 5	MPI 5	Normal	12/12/2018	208660-7	208660	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
MPI 6A	MPI 6A	Normal	3/03/2019	212782-9	212782	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
MPI 6A	MPI 6A	Normal	12/03/2019	213382-6	213382	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	1	ND	ND	ND	ND	-	68-80	ND	6	1	9	ND	2	ND				
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_002	WCX_GTY_BH	Normal	19/12/2018	208565-1	208565	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_002	WCX_GTY_BH	Normal	28/02/2019	212520-5	212520	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_002	WCX_GTY_BH	Normal	15/03/2019	213632-2	213632	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_002	WCX_GTY_BH	Normal	11/04/2019	215594-7	215594	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_003	WCX_GTY_BH	Normal	9/03/2019	213103-2	213103	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_004	QC2052	Interlab_D	15/03/2019	ES1907999001	ES1907999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_004	WCX_GTY_BH	Normal	28/02/2019	212520-6	212520	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_004	WCX_GTY_BH	Normal	15/03/2019	213632-3	213632	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_004	WCX_GTY_BH	Normal	17/04/2019	215939-1	215939	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	17/12/2018	208519-2	208519	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	13/02/2019	211510-3	211510	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	15/03/2019	213632-1	213632	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	11/04/2019	215594-10	215594	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	17/12/2018	208519-1	208519	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	13/02/2019	211510-2	211510	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	6/03/2019	212985-9	212985	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	11/04/2019	215594-9	215594	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_027	QC1046	Field_D	22/02/2019	212103-3	212103	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_027	WCX_GTY_BH	Normal	17/01/2019	209762-4	209762	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_027	WCX_GTY_BH	Normal	22/02/2019	212103-2	212103	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_027	WCX_GTY_BH	Normal	16/04/2019	215934-6	215934	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_033	QC1054	Field_D	11/04/2019	215594-2	215594	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_033	QC2031	Interlab_D	19/12/2018	ES1838735001	ES1838735	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_033	WCX_GTY_BH	Normal	19/12/2018	208565-2	208565	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_033	WCX_GTY_BH	Normal	13/02/2019	211510-4	211510	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
WCX_GTY_BH_033	WCX_GTY_BH	Normal	11/04/2019	215594-6	215594	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
Statistical Summary																							
Number of Results		283	283	283	283	283	267	267	279	12	161	161	161	161	161	161	161	161	161				
Number of Detects		3	2	2	2	2	2	4	5	0	0	7	3	5	2	2	0	4	2				
Minimum Concentration		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Minimum Detect		1	4	5	23	14	37	4	2	ND	ND	1	1	1	7	1	ND	1	2				
Maximum Concentration		2	75	93	450	270	720	169	80	0	10	4	16	13	2	0	170	49					
Maximum Detect		2	75	93	450	270	720	169	80	ND	ND	10	4	16	13	2	ND	170	49				
Average Concentration		0.018	0.28	0.35	1.7	1	2.8	0.7	0.31	0	0	0.2	0.043	0.27	0.12	0.019	0	1.1	0.32				
Median Concentration		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Standard Deviation		0.18	4.5	5.5	27	16	44	10	4.5	0	1.2	0.36	1.7	1.2	0.18	0	13	3.9					
Number of Guideline Exceedances		3	1	2	0	1	1	0	5	12	0	0	0	0	0	0	0	0	0				
Number of Guideline Exceedances (Detects Only)		3	1	2	0	1	1	0	5	12	0	0	0	0	0	0	0	0	0				

\* Separate discharge criteria have been developed by WSP for m-Xylene and p-Xylene. As the existing data is for m&p-Xylene combined, the lower criterion for m-Xylene (75 µg/L) is adopted in this table. The criterion for p-Xylene is 200 µg/L.

Table B5\_Groundwater Analytical Data against Discharge Criteria

						Polynuclear Aromatic Hydrocarbons																				
						Acenaphthylene	Acenaphthene	Anthracene	Fluorene	Phenanthrene	Fluoranthene	Benzo(a)anthracene	Benzo(k)fluoranthene	Benzo(b)fluoranthene	Benzo(e)pyrene	Benzo(a)pyrene	Benzo(a)anthracene	Chrysene	Pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(e)pyrene	Benzo(a)anthracene	Indeno(1,2,3-cd)pyrene	Sum of PAHs	
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
EQL						1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.5
Discharge criteria (WSP, 2019)																										
Sydney Water Industrial Trade Waste Acceptance Standard (2019)																										5000
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
34 TL3	34 TL3	Normal	13/02/2019	21159-11	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
34 TL3	34 TL3	Normal	19/02/2019	21184-5	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
34 TL3	34 TL3	Normal	26/02/2019	21235-7	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
34 TL3	34 TL3	Normal	6/03/2019	21295-2	212985	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
34 TL3	34 TL3	Normal	12/03/2019	21382-13	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
34 TL3	34 TL3	Normal	16/04/2019	21593-2	215934	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
34 TL3	QC2054	Interlab D	16/04/2019	ES1912221001	ES1912221	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW100s	GW100s	Normal	21/02/2019	21209-3	212109	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW100s	GW100s	Normal	8/03/2019	21303-3	213103	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW100s	GW100s	Normal	11/04/2019	21594-8	215994	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW101	GW101	Normal	8/01/2019	209135-1	209135	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW101	GW101	Normal	11/02/2019	21335-4	213335	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW101	GW101	Normal	8/03/2019	21303-1	213103	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW101	GW101	Normal	15/04/2019	215789-5	215789	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW101	QC2039	Interlab D	11/02/2019	ES1904415001	ES1904415	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW102	GW102	Normal	11/02/2019	21335-6	213335	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW102	GW102	Normal	8/03/2019	21303-5	213103	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW102	GW102	Normal	17/04/2019	215939-8	215939	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW102	QC2051	Interlab D	8/03/2019	ES1907278001	ES1907278	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW103	GW103	Normal	23/02/2019	21209-4	212109	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW103	GW103	Normal	8/03/2019	21303-4	213103	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW103	GW103	Normal	17/04/2019	215939-6	215939	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW103	QC1055	Field D	17/04/2019	215939-4	215939	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW104	GW104	Normal	20/12/2018	208653-5	208653	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW104	GW104	Normal	7/02/2019	21141-7	211411	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW104	GW104	Normal	10/04/2019	215496-4	215496	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW10s	GW10s	Normal	10/01/2019	209274-1	209274	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW10s	GW10s	Normal	14/02/2019	211612-1	211612	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW10s	GW10s	Normal	8/03/2019	21303-7	213103	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW10s	GW10s	Normal	9/04/2019	215423-2	215423	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW10s	QC2053	Interlab D	9/04/2019	ES1911607001	ES1911607	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW11d	GW11d	Normal	16/03/2019	212548-1	212548	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW11d	GW11d	Normal	16/04/2019	215934-8	215934	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW11s	GW11s	Normal	24/01/2018	210231-1	210231	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW11s	GW11s	Normal	11/02/2019	21335-2	213335	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW11s	GW11s	Normal	13/03/2019	213502-6	213502	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW11s	GW11s	Normal	16/04/2019	215934-7	215934	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW11s	QC1042	Field D	11/02/2019	21335-3	213335	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW12s	GW12s	Normal	24/01/2019	210277-3	210277	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW13d	GW13d	Normal	20/12/2018	208653-2	208653	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW13d	GW13d	Normal	8/02/2019	211141-9	211141	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW13d	GW13d	Normal	11/04/2019	215944-5	215944	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW13s	GW13s	Normal	20/12/2018	208653-1	208653	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW13s	GW13s	Normal	8/02/2019	211141-8	211141	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW13s	GW13s	Normal	11/04/2019	215944-4	215944	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW14d	GW14d	Normal	20/12/2018	208653-6	208653	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW14d	GW14d	Normal	7/02/2019	21141-5	211411	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW14d	GW14d	Normal	10/04/2019	215496-6	215496	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW14d	QC1032	Field D	20/12/2018	208653-7	208653	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW14s	GW14s	Normal	10/01/2019	209274-2	209274	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW14s	GW14s	Normal	7/02/2019	211414-3	211441	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW14s	GW14s	Normal	10/04/2019	215496-5	215496	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW14s	QC1040	Field D	7/02/2019	211414-4	211441	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW14s	QC1053	Field D	10/04/2019	215496-1	215496	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW15d	GW15d	Normal	7/02/2019	211414-2	211441	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW15d	GW15d	Normal	10/04/2019	215496-8	215496	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW15s	GW15s	Normal	20/12/2018	208653-3	208653	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
GW15s	GW15s	Normal																								



Table B5\_Groundwater Analytical Data against Discharge Criteria

				Polynuclear Aromatic Hydrocarbons																	
				Acenaphthylene	Acenaphthene	Anthracene	Fluorene	Phenanthrene	Fluoranthene	Benz(a)anthracene	Benz(k)fluoranthene	Benz(b)fluoranthene	Benz(a)pyrene	Benz(e)pyrene	Chrysene	Pyrene	Benz(a,h)perylene	Dibenz(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Sum of PAHs	
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
EOL				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.5
Discharge criteria (WSP, 2019)																					
Sydney Water Industrial Trade Waste Acceptance Standard (2019)																					5000
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MPI 5	MPI 5	Normal	12/12/2018	20860-7	20860	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND
MPI 6A	MPI 6A	Normal	5/03/2019	212782-9	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND
MPI 6A	MPI 6A	Normal	12/03/2019	213382-6	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	ND	3	ND	2	2	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_002	WCX_GTY_BH	Normal	19/12/2018	208565-1	208565	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_002	WCX_GTY_BH	Normal	28/02/2019	212520-5	212520	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_002	WCX_GTY_BH	Normal	15/03/2019	213632-2	213632	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_002	WCX_GTY_BH	Normal	11/04/2019	215594-7	215594	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_003	WCX_GTY_BH	Normal	8/03/2019	213103-2	213103	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_004	QC2052	Interlab D	15/03/2019	ES190799001	ES1907999	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_004	WCX_GTY_BH	Normal	28/02/2019	212520-6	212520	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_004	WCX_GTY_BH	Normal	15/03/2019	213632-3	213632	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_004	WCX_GTY_BH	Normal	17/04/2019	215939-1	215939	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	17/12/2018	208319-2	208319	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	13/02/2019	211510-3	211510	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	15/03/2019	213632-1	213632	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	11/04/2019	215594-10	215594	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	17/12/2018	208319-1	208319	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	13/02/2019	211510-2	211510	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	6/03/2019	212985-9	212985	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	11/04/2019	215594-9	215594	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_027	QC1046	Field D	22/02/2019	212103-3	212103	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_027	WCX_GTY_BH	Normal	17/01/2019	209782-4	209782	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_027	WCX_GTY_BH	Normal	22/02/2019	212103-2	212103	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_027	WCX_GTY_BH	Normal	16/04/2019	215934-6	215934	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_033	QC1054	Field D	11/04/2019	215594-2	215594	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_033	QC2031	Interlab D	19/12/2018	ES1838735001	ES1838735	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_033	WCX_GTY_BH	Normal	19/12/2018	208565-2	208565	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_033	WCX_GTY_BH	Normal	13/02/2019	211510-4	211510	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND
WCX_GTY_BH_033	WCX_GTY_BH	Normal	11/04/2019	215594-6	215594	ND	ND	ND	ND	ND	ND	-	-	ND	ND	ND	ND	ND	ND	ND	ND

Statistical Summary

Number of Results	161	161	161	161	161	161	161	8	8	153	161	153	161	161	161	161	161	161	161	263	
Number of Detects	0	7	0	2	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
Minimum Concentration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Detect	ND	1	ND	1	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14
Maximum Concentration	0	18	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31
Maximum Detect	ND	18	ND	2	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	31
Average Concentration	0	0.25	0	0.019	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.77
Median Concentration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Standard Deviation	0	1.9	0	0.18	0.27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.9
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
Number of Guideline Exceedances (Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11

\* Separate discharge criteria have been developed by WSP for m-Xylene and p-Xylene. As the existing data is for m&p-Xylene combined, the lower criterion for m-Xylene (75 µg/L) is adopted in this table. The criterion for p-Xylene is 200 µg/L.



Table B5\_Groundwater Analytical Data against Discharge Criteria

							Phenolic Compounds															
							Phenol	2-Chlorophenol	2-Methylphenol (o-Cresol)	3,4-Methylphenol (m,p-Cresol)	2-Nitrophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dichlorophenol	4-Chloro-3-methylphenol	2,4,6-Trichlorophenol	2,4,5-Trichlorophenol	Pentachlorophenol	Sum of Phenols (tagemated)	Sum of Phenols (non-tagemated)	Sum of Phenols	
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
							1	1	1	2	1	1	1	1	1	1	2	2	2	2	50	
EOL																						
Discharge criteria (WSP, 2019)																						
Sydney Water Industrial Trade Waste Acceptance Standard (2019)																						
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report																	
MPE_3	MPE_3	Normal	19/02/2019	21184-1-6	21184-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_3	MPE_3	Normal	26/02/2019	212355-8	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_3	MPE_3	Normal	6/03/2019	212985-1	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_3	MPE_3	Normal	12/03/2019	213382-8	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_4	MPE_4	Normal	13/02/2019	211519-8	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_4	MPE_4	Normal	19/02/2019	211841-4	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_4	MPE_4	Normal	26/02/2019	212355-6	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_4	MPE_4	Normal	5/03/2019	212782-8	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_4	MPE_4	Normal	12/03/2019	213382-7	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_5	MPE_5	Normal	11/12/2018	208061-1	208061	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND		
MPE_5	MPE_5	Normal	13/02/2019	211519-5	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_5	MPE_5	Normal	19/02/2019	211841-12	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_5	MPE_5	Normal	26/02/2019	212355-1	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_5	MPE_5	Normal	5/03/2019	212782-4	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_5	MPE_5	Normal	11/03/2019	213297-18	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_5A	MPE_5A	Normal	11/12/2018	208061-5	208061	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND		
MPE_5A	MPE_5A	Normal	13/02/2019	211519-6	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_5A	MPE_5A	Normal	19/02/2019	211841-2	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_5A	MPE_5A	Normal	26/02/2019	212355-3	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_5A	MPE_5A	Normal	5/03/2019	212782-6	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_5A	MPE_5A	Normal	12/03/2019	213382-4	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_6	MPE_6	Normal	11/12/2018	208061-8	208061	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND		
MPE_6	MPE_6	Normal	13/02/2019	211519-2	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_6	MPE_6	Normal	18/02/2019	211785-14	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_6	MPE_6	Normal	25/02/2019	212251-14	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_6	MPE_6	Normal	5/03/2019	212782-1	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_6	MPE_6	Normal	11/03/2019	213297-14	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_7	QC1049	Field D	11/03/2019	213297-15	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_7	MPE_7	Normal	12/12/2018	208060-2	208060	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND		
MPE_7	MPE_7	Normal	12/02/2019	211437-8	211437	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_7	MPE_7	Normal	18/02/2019	211785-9	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_7	MPE_7	Normal	25/02/2019	212251-10	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_7	MPE_7	Normal	4/03/2019	212783-10	212783	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_7	MPE_7	Normal	11/03/2019	213297-10	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_8	MPE_8	Normal	12/12/2018	208060-1	208060	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND		
MPE_8	MPE_8	Normal	12/02/2019	211437-6	211437	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_8	MPE_8	Normal	18/02/2019	211785-5	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_8	MPE_8	Normal	25/02/2019	212251-5	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_8	MPE_8	Normal	4/03/2019	212783-6	212783	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_8	MPE_8	Normal	11/03/2019	213297-5	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_8	QC1046	Field D	25/02/2019	212251-6	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_9	MPE_9	Normal	12/12/2018	208060-5	208060	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND		
MPE_9	MPE_9	Normal	12/02/2019	211437-4	211437	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_9	MPE_9	Normal	18/02/2019	211785-4	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_9	MPE_9	Normal	25/02/2019	212251-4	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_9	MPE_9	Normal	4/03/2019	212783-5	212783	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPE_9	MPE_9	Normal	11/03/2019	213297-4	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI_10	MPI_10	Normal	11/12/2018	208061-6	208061	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND		
MPI_10	MPI_10	Normal	13/02/2019	211519-4	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI_10	MPI_10	Normal	19/02/2019	211841-11	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI_10	MPI_10	Normal	26/02/2019	212355-2	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI_10	MPI_10	Normal	5/03/2019	212782-5	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI_10	MPI_10	Normal	11/03/2019	213297-19	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI_12	MPI_12	Normal	11/12/2018	208061-9	208061	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND		
MPI_12	MPI_12	Normal	13/02/2019	211519-3	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI_12	MPI_12	Normal	18/02/2019	211785-13	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI_12	MPI_12	Normal	28/02/2019	212520-3	212520	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI_12	MPI_12	Normal	5/03/2019	212782-2	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI_12	MPI_12	Normal	11/03/2019	213297-13	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI_12	QC1023	Field D	11/12/2018	208061-10	208061	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND		
MPI_13	MPI_13	Normal	11/12/2018	208061-12	208061	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND		
MPI_13	MPI_13	Normal	12/02/2019	211437-11	211437	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI_13	MPI_13	Normal	18/02/2019	211785-12	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI_13	MPI_13	Normal	28/02/2019	212520-2	212520	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI_13	MPI_13	Normal	4/03/2019	212783-11	212783	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI_13	MPI_13	Normal	11/03/2019	213297-12	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI_13	QC2043	Interlab_D	18/02/2019	ES1905388001	ES1905388	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI_13	QC2045	Interlab_D	28/02/2019	ES1905314001	ES1905314	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
MPI_14	MPI_14	Normal	12/12/2018	208060-3	208060	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND		
MPI_14	MPI_14	Normal	12/02/2019	2114																		

Table B5\_Groundwater Analytical Data against Discharge Criteria

							Phenolic Compounds															
							Phenol	2-Chlorophenol	2-Methylphenol (o-Cresol)	3,4-Methylphenol (m&p-Cresol)	2-Nitrophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,6-Dichlorophenol	4-Chloro-3-methylphenol	2,4,6-Trichlorophenol	2,4,5-Trichlorophenol	Pentachlorophenol	Sum of Phenols (Integrated)	Sum of Phenols (non-halogenated)	Sum of Phenols	
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
EOL							1	1	1	2	1	1	1	1	1	1	1	2				50
Discharge criteria (WSP, 2019)																						
Sydney Water Industrial Trade Waste Acceptance Standard (2019)																						
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report																	
MPI_5	MPI_5	Normal	12/12/2018	208060-7	208060	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI_6A	MPI_6A	Normal	13/02/2019	211519-10	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI_6A	MPI_6A	Normal	19/02/2019	211841-3	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI_6A	MPI_6A	Normal	26/02/2019	212355-5	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI_6A	MPI_6A	Normal	5/03/2019	212762-9	212762	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI_6A	MPI_6A	Normal	12/03/2019	213382-6	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_002	WCX_GTY_BH	Normal	19/12/2018	208565-1	208565	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_002	WCX_GTY_BH	Normal	28/02/2019	212520-5	212520	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_002	WCX_GTY_BH	Normal	15/03/2019	213632-2	213632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_002	WCX_GTY_BH	Normal	11/04/2019	215594-7	215594	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_003	WCX_GTY_BH	Normal	8/03/2019	213103-2	213103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_004	QC2052	Interlab D	15/03/2019	ES1907999001	ES1907999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX_GTY_BH_004	WCX_GTY_BH	Normal	28/02/2019	212520-6	212520	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_004	WCX_GTY_BH	Normal	15/03/2019	213632-3	213632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_004	WCX_GTY_BH	Normal	17/04/2019	215939-1	215939	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	17/12/2018	208319-2	208319	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	13/02/2019	211510-3	211510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	15/03/2019	213632-1	213632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	11/04/2019	215594-10	215594	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	17/12/2018	208319-1	208319	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	13/02/2019	211510-2	211510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	6/03/2019	212985-9	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	11/04/2019	215594-9	215594	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_027	QC1046	Field D	22/02/2019	212103-3	212103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_027	WCX_GTY_BH	Normal	17/12/2018	208762-4	208762	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_027	WCX_GTY_BH	Normal	22/02/2019	212103-2	212103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_027	WCX_GTY_BH	Normal	16/04/2019	215934-6	215934	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_033	QC1054	Field D	11/04/2019	215594-2	215594	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_033	QC2031	Interlab D	19/12/2018	ES1538735001	ES1538735	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX_GTY_BH_033	WCX_GTY_BH	Normal	19/12/2018	208565-2	208565	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_033	WCX_GTY_BH	Normal	13/02/2019	211510-4	211510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	
WCX_GTY_BH_033	WCX_GTY_BH	Normal	11/04/2019	215594-6	215594	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	

Statistical Summary		8	8	8	8	8	8	8	8	8	8	8	8	6	6	154
Number of Results		0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Number of Detects		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration		ND	70													
Maximum Concentration		0	0	0	0	0	0	0	0	0	0	0	0	0	0	200
Maximum Detect		ND	200													
Average Concentration		0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.4
Median Concentration		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Standard Deviation		0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
Number of Guideline Exceedances		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances (Detects Only)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Separate discharge criteria have been developed by WSP for m-Xylene and p-Xylene. As the existing data is for m&p-Xylene combined, the lower criterion for m-Xylene (75 µg/L) is adopted in this table. The criterion for p-Xylene is 200 µg/L.





Table B5\_Groundwater Analytical Data against Discharge Criteria

		Halogenated Aromatic Compounds														Other Compounds													
		Bromobenzene	Chlorobenzene	2-Chlorobenzene	4-Chlorobenzene	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	Bromochloromethane	Dichlorodifluoromethane (Freon 12)	Chloromethane	Vinyl chloride	Bromomethane	Chloroethane	Trichlorofluoromethane (Freon 11)	1,1-Dichloroethane	Iodomethane	1,1-Dichloroethane	cis-1,2-Dichloroethane	trans-1,2-Dichloroethane							
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L							
EQL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1							
Discharge criteria (WSP, 2019)		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1							
Sydney Water Industrial Trade Waste Acceptance Standard (2019)		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1							
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
MPI 5	MPI 5	Normal	12/12/2018	208060-7	208060	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
MPI 6A	MPI 6A	Normal	5/03/2019	212782-9	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
MPI 6A	MPI 6A	Normal	12/03/2019	213382-6	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	ND	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	ND	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_002	WCX_GTY_BH	Normal	19/12/2019	208565-1	208565	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_002	WCX_GTY_BH	Normal	28/02/2019	212520-5	212520	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_002	WCX_GTY_BH	Normal	15/03/2019	213632-2	213632	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_002	WCX_GTY_BH	Normal	11/04/2019	215594-7	215594	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_003	WCX_GTY_BH	Normal	8/03/2019	213103-2	213103	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_004	QC2052	Interlab_D	15/03/2019	ES1907999001	ES1907999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_004	WCX_GTY_BH	Normal	28/02/2019	212520-6	212520	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_004	WCX_GTY_BH	Normal	15/03/2019	213632-3	213632	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_004	WCX_GTY_BH	Normal	17/04/2019	215939-1	215939	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	17/12/2018	208319-2	208319	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	13/02/2019	211510-3	211510	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	15/03/2019	213632-1	213632	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	11/04/2019	215594-10	215594	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	17/12/2019	208319-1	208319	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	13/02/2019	211510-2	211510	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	6/03/2019	212985-9	212985	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	11/04/2019	215594-9	215594	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_027	QC1046	Field_D	22/02/2019	212103-3	212103	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_027	WCX_GTY_BH	Normal	17/01/2019	209762-4	209762	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_027	WCX_GTY_BH	Normal	22/02/2019	212103-2	212103	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_027	WCX_GTY_BH	Normal	16/04/2019	215934-6	215934	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_033	QC1054	Field_D	11/04/2019	215594-2	215594	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_033	QC2031	Interlab_D	19/12/2019	ES1838735001	ES1838735	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_033	WCX_GTY_BH	Normal	19/12/2018	208565-2	208565	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_033	WCX_GTY_BH	Normal	13/02/2019	211510-4	211510	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
WCX_GTY_BH_033	WCX_GTY_BH	Normal	11/04/2019	215594-6	215594	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							

\* Separate discharge criteria have been developed by WSP for m-Xylene and p-Xylene. As the existing data is for m&p-Xylene combined, the lower criterion for m-Xylene (75 µg/L) is adopted in this table. The criterion for p-Xylene is 200 µg/L





Table B5\_Groundwater Analytical Data against Discharge Criteria

						Halogenated Aliphatic Compounds																Fumigants					
						1,1,1-Trichloroethane	1,1-Dichloropropane	Carbon Tetrachloride	1,2-Dichloroethane	Trichloroethane	Dibromomethane	1,1,2-Trichloroethane	1,3-Dichloropropane	Tetrachloroethane	1,1,1,2-Tetrachloroethane	trans-1,4-Dichloro-2-butene	cis-1,4-Dichloro-2-butene	1,1,2,2-Tetrachloroethane	1,2,3-Trichloropropane	Pentachloroethane	1,2-Dibromo-3-chloropropane	Hexachlorobutadiene	1,2-Dichloroethane (EDB)	1,2-Dichloropropane	2,2-Dichloropropane	cis-1,3-Dichloropropane	trans-1,3-Dichloropropane
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
CGL						1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Discharge criteria (WSP, 2019)						1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sydney Water Industrial Trade Waste Acceptance Standard (2019)						100																					
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
MPI 5	MPI 5	Normal	12/12/2018	208060-7	208060	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 6A	MPI 6A	Normal	5/03/2019	212782-9	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MPI 6A	MPI 6A	Normal	12/03/2019	213382-6	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 002	WCX GTY BH	Normal	19/12/2018	208565-1	208565	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 002	WCX GTY BH	Normal	28/02/2019	212520-5	212520	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 002	WCX GTY BH	Normal	15/03/2019	213632-2	213632	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 002	WCX GTY BH	Normal	11/04/2019	215594-7	215594	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 003	WCX GTY BH	Normal	8/03/2019	213103-2	213103	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 004	QC2052	Interlab D	15/03/2019	ES1907998001	ES1907999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 004	WCX GTY BH	Normal	28/02/2019	212520-6	212520	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 004	WCX GTY BH	Normal	15/03/2019	213632-3	213632	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 004	WCX GTY BH	Normal	17/04/2019	215939-1	215939	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 009d	WCX GTY BH	Normal	17/12/2018	208319-2	208319	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 009d	WCX GTY BH	Normal	13/02/2019	211510-3	211510	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 009d	WCX GTY BH	Normal	15/03/2019	213632-1	213632	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 009d	WCX GTY BH	Normal	11/04/2019	215594-10	215594	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 009e	WCX GTY BH	Normal	17/12/2018	208319-1	208319	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 009e	WCX GTY BH	Normal	13/02/2019	211510-2	211510	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 009e	WCX GTY BH	Normal	6/03/2019	212985-9	212985	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 009e	WCX GTY BH	Normal	11/04/2019	215594-9	215594	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 027	QC1046	Field D	22/02/2019	212103-3	212103	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 027	WCX GTY BH	Normal	17/01/2019	209782-4	209782	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 027	WCX GTY BH	Normal	22/02/2019	212103-2	212103	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 027	WCX GTY BH	Normal	16/04/2019	215934-6	215934	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 033	QC1054	Field D	11/04/2019	215594-2	215594	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 033	QC2031	Interlab D	19/12/2018	ES1838735001	ES1838735	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 033	WCX GTY BH	Normal	19/12/2018	208565-2	208565	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 033	WCX GTY BH	Normal	13/02/2019	211510-4	211510	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
WCX GTY BH 033	WCX GTY BH	Normal	11/04/2019	215594-6	215594	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

Statistical Summary

	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161
Number of Results	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161	161
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Detect	ND	ND	ND	ND	1	ND																				
Maximum Concentration	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Detect	ND	ND	ND	ND	7	ND																				
Average Concentration	0	0	0	0	0.11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Median Concentration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Standard Deviation	0	0	0	0	0.65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances (Detects Only)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

\* Separate discharge criteria have been developed by WSP for m-Xylene and p-Xylene. As the existing data is for m&p-Xylene combined, the lower criterion for m-Xylene (75 µg/L) is adopted in this table. The criterion for p-Xylene is 200 µg/L.

Table B5\_Groundwater Analytical Data against Discharge Criteria

EOL	Discharge criteria (WSP, 2019)	Sydney Water Industrial Trade Waste Acceptance Standard (2019)	Trihalomethanes			Polychlorinated Biphenyls						Oxygenated Compounds			Sulfonated Compounds					
			Bromochloromethane	Dibromochloromethane	Chloroform	Bromochloromethane	Polychlorinated Biphenyls	Kocohor 1016	Kocohor 1221	Kocohor 1232	Kocohor 1242	Kocohor 1248	Kocohor 1254	Kocohor 1260	Nonyl acetate	2-Butanone (MEK)	2-Pentanone (MBK)	4-Methyl-2-pentanone (MIBK)	Carbon disulfide	
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
1	1	1	1	1	1	2	2	2	2	2	2	2	2	50	50	50	50	5		
			100														100,000			
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34_TL3	34_TL3	Normal	13/02/2019	211519-11	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34_TL3	34_TL3	Normal	18/02/2019	211841-5	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34_TL3	34_TL3	Normal	28/02/2019	212355-7	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34_TL3	34_TL3	Normal	03/03/2019	212985-2	212985	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
34_TL3	34_TL3	Normal	12/03/2019	213382-13	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34_TL3	QC2054	Interlab D	16/04/2019	ES1907221001	ES1912221	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW100a	GW100a	Normal	21/02/2019	212109-3	212109	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW100a	GW100a	Normal	03/03/2019	213103-3	213103	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW100a	GW100a	Normal	11/04/2019	215594-8	215594	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW101	GW101	Normal	06/01/2019	209135-1	209135	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW101	GW101	Normal	11/02/2019	211335-4	211335	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW101	GW101	Normal	03/03/2019	213103-1	213103	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW101	GW101	Normal	15/04/2019	215789-5	215789	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW101	QC2039	Interlab D	11/02/2019	ES1904415001	ES1904415	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW102	GW102	Normal	03/01/2019	209135-2	209135	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW102	GW102	Normal	11/02/2019	211335-6	211335	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW102	GW102	Normal	03/03/2019	213103-5	213103	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW102	GW102	Normal	17/04/2019	215939-6	215939	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW103	QC2051	Interlab D	03/03/2019	ES1907278001	ES1907278	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW103	GW103	Normal	21/02/2019	214109-4	214109	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW103	GW103	Normal	03/03/2019	213103-4	213103	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW103	GW103	Normal	17/04/2019	215939-6	215939	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW103	QC1055	Field D	17/04/2019	215939-4	215939	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW104	GW104	Normal	20/12/2018	208653-5	208653	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW104	GW104	Normal	7/02/2019	211141-7	211141	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW104	GW104	Normal	10/04/2019	215496-4	215496	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW105	GW105	Normal	10/01/2019	209274-1	209274	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW105	GW105	Normal	14/02/2019	211612-1	211612	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW105	GW105	Normal	03/03/2019	213103-7	213103	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW105	GW105	Normal	09/04/2019	215423-2	215423	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW105	QC2053	Interlab D	09/04/2019	ES1911607001	ES1911607	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW11d	GW11d	Normal	10/03/2019	212548-1	212548	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW11d	GW11d	Normal	15/04/2019	215934-8	215934	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW11s	GW11s	Normal	24/01/2018	210231-1	210231	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW11s	GW11s	Normal	11/02/2019	211335-2	211335	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW11s	GW11s	Normal	13/03/2019	213502-6	213502	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW11s	GW11s	Normal	16/04/2019	215934-7	215934	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW11s	QC1042	Field D	11/02/2019	213353-3	213353	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW12S	GW12S	Normal	24/01/2019	210277-3	210277	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW13d	GW13d	Normal	20/12/2018	208653-2	208653	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW13d	GW13d	Normal	03/02/2019	211141-9	211141	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW13d	GW13d	Normal	11/04/2019	215934-5	215934	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW13s	GW13s	Normal	20/12/2018	208653-1	208653	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW13s	GW13s	Normal	03/02/2019	211141-8	211141	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW13s	GW13s	Normal	11/04/2019	215934-4	215934	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW14d	GW14d	Normal	20/12/2018	208653-6	208653	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW14d	GW14d	Normal	7/02/2019	211141-5	211141	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW14d	QC1042	Field D	10/04/2019	215496-6	215496	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW14d	QC1032	Field D	20/12/2018	208653-7	208653	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW14s	GW14s	Normal	10/01/2019	209274-2	209274	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW14s	GW14s	Normal	7/02/2019	211141-3	211141	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW14s	GW14s	Normal	10/04/2019	215496-5	215496	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW14s	QC1040	Field D	7/02/2019	211141-4	211141	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW14s	QC1053	Field D	10/04/2019	215496-1	215496	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW15d	GW15d	Normal	7/02/2019	211141-2	211141	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW15d	GW15d	Normal	10/04/2019	215496-6	215496	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW15s	GW15s	Normal	20/12/2018	208653-3	208653	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW15s	GW15s	Normal	7/02/2019	211141-1	211141	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW15s	GW15s	Normal	10/04/2019	215496-7	215496	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW17d	GW17d	Normal	28/03/2019	214591-1	214591	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW17d	GW17d	Normal	15/04/2019	215789-4	215789	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW200 - SG_BH059	GW200 - SG_BH059	Normal	17/01/2019	209761-1	209761	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW201	GW201	Normal	24/01/2019	210277-4	210277	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW203	GW203	Normal	09/01/2019	209210-2	209210	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW203	GW203	Normal	13/02/2019	211510-1	211510	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW203	GW203	Normal	11/03/2019	213240-4	213240	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW203	GW203	Normal	17/04/2019	215939-7	215939	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GW204	GW204	Normal	24/01/2019	210277-5	210277	ND	ND	ND	ND	ND	ND									



Table B5\_Groundwater Analytical Data against Discharge Criteria

							Trihalomethanes			Polychlorinated Biphenyls								Oxygenated Compounds				Sulfonated Compounds						
							Bromochloromethane	Bromofom	Chlorofom	Dibromochloromethane	Polychlorinated Biphenyls		Arachlor 1016	Arachlor 1221	Arachlor 1232	Arachlor 1242	Arachlor 1248	Arachlor 1254	Arachlor 1260	Vinyl acetate	2-Butanone (MEK)	2-Hexanone (MBK)	4-Methyl-2-pentanone (MIBK)	Carbon disulfide				
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L					
EOL							1	1	1	1	1	2	2	2	2	2	2	2	50	50	50	50	5					
Discharge criteria (WSP, 2019)							1	1	1	1	1	2	2	2	2	2	2	2	50	50	50	50	5					
Sydney Water Industrial Trade Waste Acceptance Standard (2019)							100													100,000								
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
MPL 5	MPL 5	Normal	12/12/2018	208060-7	208060		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
MPI 6A	MPI 6A	Normal	5/03/2019	212782-9	212782		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
MPI 6A	MPI 6A	Normal	12/03/2019	213382-6	213382		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
Unknown	Unknown	Normal	19/12/2018	208565-3	208565		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_002	WCX_GTY_BH	Normal	19/12/2018	208565-1	208565		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_002	WCX_GTY_BH	Normal	28/02/2019	212520-5	212520		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_002	WCX_GTY_BH	Normal	15/03/2019	213632-2	213632		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_002	WCX_GTY_BH	Normal	11/04/2019	215594-7	215594		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_003	WCX_GTY_BH	Normal	8/03/2019	213103-2	213103		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_004	QC2052	Interlab_D	15/03/2019	ES1907999001	ES1907999		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_004	WCX_GTY_BH	Normal	28/02/2019	212520-6	212520		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_004	WCX_GTY_BH	Normal	15/03/2019	213632-3	213632		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_004	WCX_GTY_BH	Normal	17/04/2019	215939-1	215939		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	17/12/2018	208519-2	208519		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	13/02/2019	211510-3	211510		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	15/03/2019	213632-1	213632		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	11/04/2019	215594-10	215594		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	17/12/2018	208319-1	208319		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	13/02/2019	211510-2	211510		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	6/03/2019	212985-9	212985		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	11/04/2019	215594-9	215594		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_027	QC1046	Field_D	22/02/2019	212103-3	212103		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_027	WCX_GTY_BH	Normal	17/01/2019	209762-4	209762		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_027	WCX_GTY_BH	Normal	22/02/2019	212103-2	212103		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_027	WCX_GTY_BH	Normal	16/04/2019	215934-6	215934		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_033	QC1054	Field_D	11/04/2019	215594-2	215594		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_033	QC2051	Interlab_D	19/12/2018	ES1838735001	ES1838735		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_033	WCX_GTY_BH	Normal	19/12/2018	208565-2	208565		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_033	WCX_GTY_BH	Normal	13/02/2019	211510-4	211510		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
WCX_GTY_BH_033	WCX_GTY_BH	Normal	11/04/2019	215594-6	215594		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
Statistical Summary							161	161	161	161	8	153	153	153	153	153	153	8	8	8	8	8	8					
Number of Results							0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1				
Number of Detects							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Minimum Concentration							0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Minimum Detect							ND	ND	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Maximum Concentration							0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	
Maximum Detect							ND	ND	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	16
Average Concentration							0	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
Median Concentration							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Standard Deviation							0	0	0.11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.7	
Number of Guideline Exceedances							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Number of Guideline Exceedances (Detects Only)							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

\* Separate discharge criteria have been developed by WSP for m-Xylene and p-Xylene. As the existing data is for m&p-Xylene combined, the lower criterion for m-Xylene (75 µg/L) is adopted in this table. The criterion for p-Xylene is 200 µg/L.









Table B5\_Groundwater Analytical Data against Discharge Criteria

EQL	Discharge criteria (WSP, 2019)	Sydney Water Industrial Trade Waste Acceptance Standard (2019)	Organophosphorus Pesticides (OP)																				Solvents	
			Methoxychlor	Azinphos Methyl	Bromophos-ethyl	Carbofenthothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Dimethion-S-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenitrothion	Fenitrothion	Malathion	Monocrotophos	Parathion	Parathion-ethyl	Phospho-ethyl	Prathofos	Romel	Cyclohexane
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
0.2	0.2	0.2	0.5	0.5	0.2	0.2	0.5	0.2	0.2	0.2	0.2	0.2	0.5	0.2	0.5	0.2	0.2	0.2	0.2	0.5	0.5	0.2	1	
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_3	MPE_3	Normal	19/02/2019	21184-L6	21184L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_3	MPE_3	Normal	26/02/2019	212355-8	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_3	MPE_3	Normal	03/03/2019	212985-1	212985	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_3	MPE_3	Normal	12/03/2019	213382-8	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_4	MPE_4	Normal	13/02/2019	211519-8	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_4	MPE_4	Normal	19/02/2019	211841-4	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_4	MPE_4	Normal	26/02/2019	212355-6	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_4	MPE_4	Normal	03/03/2019	212782-8	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_4	MPE_4	Normal	12/03/2019	213382-7	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_5	MPE_5	Normal	11/12/2018	208061-7	208061	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-
MPE_5	MPE_5	Normal	13/02/2019	211519-5	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_5	MPE_5	Normal	19/02/2019	211841-12	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_5	MPE_5	Normal	26/02/2019	212355-1	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_5	MPE_5	Normal	03/03/2019	212782-4	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_5	MPE_5	Normal	11/03/2019	213297-18	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_5A	MPE_5A	Normal	11/12/2018	208061-5	208061	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-
MPE_5A	MPE_5A	Normal	13/02/2019	211519-6	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_5A	MPE_5A	Normal	19/02/2019	211841-2	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_5A	MPE_5A	Normal	26/02/2019	212355-3	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_5A	MPE_5A	Normal	03/03/2019	212782-6	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_5A	MPE_5A	Normal	12/03/2019	213382-4	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_6	MPE_6	Normal	11/12/2018	208061-8	208061	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-
MPE_6	MPE_6	Normal	13/02/2019	211519-2	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_6	MPE_6	Normal	19/02/2019	211785-14	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_6	MPE_6	Normal	18/02/2019	211785-14	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_6	MPE_6	Normal	25/02/2019	212251-14	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_6	MPE_6	Normal	03/03/2019	212782-1	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_6	MPE_6	Normal	11/03/2019	213297-14	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_6	QC1046	Field_D	11/03/2019	213297-15	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_7	MPE_7	Normal	12/12/2018	208060-2	208060	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-
MPE_7	MPE_7	Normal	12/02/2019	211437-8	211437	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_7	MPE_7	Normal	18/02/2019	211785-9	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_7	MPE_7	Normal	25/02/2019	212251-10	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_7	MPE_7	Normal	03/03/2019	212783-10	212783	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_7	MPE_7	Normal	11/03/2019	213297-10	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_8	MPE_8	Normal	12/12/2018	208060-1	208060	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-
MPE_8	MPE_8	Normal	12/02/2019	211437-6	211437	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_8	MPE_8	Normal	18/02/2019	211785-5	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_8	MPE_8	Normal	25/02/2019	212251-5	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_8	MPE_8	Normal	03/03/2019	212783-6	212783	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_8	MPE_8	Normal	11/03/2019	213297-5	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_8	QC1046	Field_D	25/02/2019	212251-6	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_9	MPE_9	Normal	12/12/2018	208060-5	208060	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-
MPE_9	MPE_9	Normal	12/02/2019	211437-4	211437	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_9	MPE_9	Normal	18/02/2019	211785-4	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_9	MPE_9	Normal	25/02/2019	212251-4	212251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_9	MPE_9	Normal	03/03/2019	212783-5	212783	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPE_9	MPE_9	Normal	11/03/2019	213297-4	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI_10	MPI_10	Normal	11/12/2018	208061-6	208061	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-
MPI_10	MPI_10	Normal	13/02/2019	211519-4	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI_10	MPI_10	Normal	19/02/2019	211841-11	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI_10	MPI_10	Normal	26/02/2019	212355-2	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI_10	MPI_10	Normal	03/03/2019	212782-5	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI_10	MPI_10	Normal	11/03/2019	213297-19	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI_12	MPI_12	Normal	11/12/2018	208061-9	208061	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-
MPI_12	MPI_12	Normal	13/02/2019	211519-1	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI_12	MPI_12	Normal	18/02/2019	211785-13	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI_12	MPI_12	Normal	28/02/2019	212520-3	212520	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI_12	MPI_12	Normal	03/03/2019	212782-2	212782	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI_12	MPI_12	Normal	11/03/2019	213297-13	213297	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI_12	QC1023	Field_D	11/12/2018	208061-10	208061	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-
MPI_13	MPI_13	Normal	11/12/2018	208061-12	208061	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	ND	-
MPI_13	MPI_13	Normal	12/02/2019	211437-11	211437	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI_13	MPI_13	Normal	18/02/2019	211785-2	211785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI_13	MPI_13	Normal	28/02/2019	212520-2	212520	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI_13	MPI_13	Normal	03/03/2019	212783-																				

Table B5\_Groundwater Analytical Data against Discharge Criteria

		Organophosphorus Pesticides (OP)																				Solvents			
		Methoxychlor	Azinphos Methyl	Bromophos-ethyl	Carbophenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Dimeton-S-methyl	Diazinon	Disulfoton	Dimethoate	Ethion	Fenamiphos	Fenitrothion	Fenitrothion	Malathion	Monocrotophos	Parathion	Parathion-methyl	Phosphamidon	Prothiofos	Romel	Cyclohexane	
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
EQL		0.2	0.2	0.2	0.5	0.5	0.2	0.2	0.5	0.2	0.2	0.2	0.2	0.5	0.2	0.5	0.2	2	0.2	2	0.5	0.5	0.2	1	
Discharge criteria (WSP, 2019)																									
Sydney Water Industrial Trade Waste Acceptance Standard (2019)																									
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
MPI 5	MPI 5	Normal	12/12/2018	208060-7	208060	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI 6A	MPI 6A	Normal	5/03/2019	212762-9	212762	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MPI 6A	MPI 6A	Normal	12/03/2019	213382-6	213382	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_002	WCX_GTY_BH	Normal	19/12/2018	208565-1	208565	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_002	WCX_GTY_BH	Normal	28/02/2019	212520-5	212520	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_002	WCX_GTY_BH	Normal	15/03/2019	213632-2	213632	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_002	WCX_GTY_BH	Normal	11/04/2019	215594-7	215594	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_003	WCX_GTY_BH	Normal	8/03/2019	213103-2	213103	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_004	QC2052	Interlab_D	15/03/2019	ES1907999001	ES1907999	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_004	WCX_GTY_BH	Normal	28/02/2019	212520-6	212520	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_004	WCX_GTY_BH	Normal	15/03/2019	213632-3	213632	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_004	WCX_GTY_BH	Normal	17/04/2019	215939-1	215939	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	17/12/2018	208319-2	208319	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	13/02/2019	211510-3	211510	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	15/03/2019	213632-1	213632	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	11/04/2019	215594-10	215594	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	17/12/2018	208319-1	208319	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	13/02/2019	211510-2	211510	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	6/03/2019	212985-9	212985	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	11/04/2019	215594-9	215594	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_027	QC1046	Field_D	22/02/2019	212103-3	212103	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_027	WCX_GTY_BH	Normal	17/01/2019	209762-4	209762	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_027	WCX_GTY_BH	Normal	22/02/2019	212103-2	212103	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_027	WCX_GTY_BH	Normal	16/04/2019	215934-6	215934	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_033	QC1054	Field_D	11/04/2019	215594-2	215594	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_033	QC2031	Interlab_D	19/12/2018	ES1838735001	ES1838735	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_033	WCX_GTY_BH	Normal	19/12/2018	208565-2	208565	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_033	WCX_GTY_BH	Normal	13/02/2019	211510-4	211510	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND
WCX_GTY_BH_033	WCX_GTY_BH	Normal	11/04/2019	215594-6	215594	ND	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	ND	-	ND	-	-	-	ND	ND

Statistical Summary

Number of Results	161	161	161	8	8	161	161	8	161	161	161	161	161	8	152	8	161	8	161	8	8	8	153	153
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Median Concentration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances (Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

\* Separate discharge criteria have been developed by WSP for m-Xylene and p-Xylene. As the existing data is for m&p-Xylene combined, the lower criterion for m-Xylene (75 µg/L) is adopted in this table. The criterion for p-Xylene is 200 µg/L.





Table B5\_Groundwater Analytical Data against Discharge Criteria

BOD/COD	Alkalinity										Major Ions																		
	Biological Oxygen Demand	Chemical Oxygen Demand	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Hydroxide Alkalinity as CaCO3	Total Alkalinity as CaCO3	Hardness as CaCO3 (Filtered)	Nitrate (as N)	Nitrite (as N)	Ammonia (as N)	Total Kjeldahl Nitrogen	Nitrate & Nitrite (as N)	Nitrite + Nitrate as N	Total Nitrogen (as N)	Reactive Phosphorus (as P)	Total Phosphorus	Chloride	Calcium	Fluoride	Magnesium	Potassium	Sodium	Sulfate as SO4	Total Anions	Total Cations	Sulfate (as SO4-) (Filtered)			
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
EOL																													
Discharge criteria (WSP, 2019)																													
Sydney Water Industrial Trade Waste Acceptance Standard (2019)																													
100	5	10	5	1	5	5	1	10	0.035	0.025	0.005	0.1	0.01	10	0.1	0.01	0.05	1	0.5	0.1	0.5	0.5	0.5	1	0.01	0.01	1	2000	
Location Code																													
Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	16	3200	ND	3200	0.58	ND	79	130	6.1	2600	85	1	120	210	2300	3	1	120	210	2300	3	1	120	210	
MPL 5	MPL 5	Normal	12/12/2018	208660-7	208660	ND	1500	ND	1500	ND	46	ND	1000	74	1.1	58	130	860	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MPL 6A	MPL 6A	Normal	13/02/2019	211519-10	211519	ND	1400	ND	1400	ND	39	ND	1000	72	1.1	57	140	1300	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MPL 6A	MPL 6A	Normal	19/02/2019	211841-3	211841	ND	1400	ND	1400	ND	41	ND	870	68	1.1	52	94	880	3	1	120	210	2300	3	1	120	210	2300	
MPL 6A	MPL 6A	Normal	26/02/2019	212355-5	212355	ND	1400	ND	1400	ND	40	ND	970	71	1.1	54	140	1200	7	1	120	210	2300	3	1	120	210	2300	
MPL 6A	MPL 6A	Normal	5/03/2019	212782-9	212782	ND	1400	ND	1400	ND	40	ND	780	67	1.3	46	140	870	3	1	120	210	2300	3	1	120	210	2300	
MPL 6A	MPL 6A	Normal	12/03/2019	213382-6	213382	ND	1400	ND	1400	ND	40	ND	350	3	300	27	0.2	23	200	460	2	1	120	210	2300	3	1	120	210
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	7	2200	ND	2200	ND	119	ND	220	1.5	140	55	0.1	32	85	210	ND	ND	ND	ND	ND	ND	ND	ND	
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	9	1400	ND	1400	ND	119	ND	220	1.5	140	55	0.1	32	85	210	ND	ND	ND	ND	ND	ND	ND	ND	
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_002	WCX_GTY_BH	Normal	19/12/2018	208565-1	208565	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_002	WCX_GTY_BH	Normal	28/02/2019	212520-5	212520	-	-	-	-	-	0.037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_002	WCX_GTY_BH	Normal	15/03/2019	213632-2	213632	-	-	-	-	-	0.029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_002	WCX_GTY_BH	Normal	11/04/2019	215594-7	215594	-	-	-	-	-	0.094	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_003	WCX_GTY_BH	Normal	9/03/2019	213103-2	213103	-	-	-	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_004	QC2052	Interlab D	15/03/2019	ES1907999001	ES1907999	-	-	-	-	-	0.24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_004	WCX_GTY_BH	Normal	28/02/2019	212520-6	212520	-	-	-	-	-	0.26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_004	WCX_GTY_BH	Normal	15/03/2019	213632-3	213632	-	-	-	-	-	0.27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_004	WCX_GTY_BH	Normal	17/04/2019	215939-1	215939	-	-	-	-	-	0.44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	17/12/2018	208319-2	208319	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	13/02/2019	211510-3	211510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	15/03/2019	213632-1	213632	-	-	-	-	-	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	11/04/2019	215594-10	215594	-	-	-	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	17/12/2018	208319-1	208319	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	13/02/2019	211510-2	211510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	6/03/2019	212985-9	212985	-	-	-	-	-	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	11/04/2019	215594-9	215594	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_027	QC1046	Field D	22/02/2019	212103-3	212103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_027	WCX_GTY_BH	Normal	17/01/2019	209762-4	209762	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_027	WCX_GTY_BH	Normal	22/02/2019	212103-2	212103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_027	WCX_GTY_BH	Normal	16/04/2019	215934-6	215934	-	-	-	-	-	3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_033	QC1054	Field D	11/04/2019	215594-2	215594	-	-	-	-	-	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_033	QC2031	Interlab D	19/12/2018	ES1838735001	ES1838735	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_033	WCX_GTY_BH	Normal	19/12/2018	208565-2	208565	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_033	WCX_GTY_BH	Normal	13/02/2019	211510-4	211510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCX_GTY_BH_033	WCX_GTY_BH	Normal	11/04/2019	215594-6	215594	-	-	-	-	-	0.63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Statistical Summary																													
Number of Results	228	4	228	10	228	228	5	86	86	263	5	3	2	86	5	86	263	228	216	263	228	228	252	10	10	11			
Number of Detects	116	4	228	1	228	5	18	13	260	5	2	0	86	4	70	263	228	196	262	228	228	214	10	10	8				
Minimum Concentration	0	44	8	0	8	27	0	0	0	0.3	0	0	0.2	0	19	5.5	0	1.8	12	0	1.8	12	0	1.35	1.46	0			
Minimum Detect	4	44	8	372	ND	8	27	0.005	0.006	0.009	0.3	0.03	ND	0.2	0.16	0.09	19	5.5	0.1	1.7	1.8	12	1	1.35	1.46	4			
Maximum Concentration	650	276	5000	372	ND	5000	3610	4.6	0.036	310	107	0.07	ND	400	6.23	22	20000	1000	3	2200	450	13000	2500	334	341	1450			
Maximum Detect	650	276	5000	372	ND	5000	3610	4.6	0.036	310	107	0.07	ND	400	6.23	22	20000	1000	3	2200	450	13000	2500	334	341	1450			
Average Concentration	24	128	1220	37	0	1222	1629	0.15	0.0022	44	30	0.03	60	1.9	1.8	3601	183	0.5	253	156	3046	396	119	119	233				
Median Concentration	6	95	1000	0	0	1000	614	0	0	39	14.8	0.03	0	33	0.89	1.05	700	98	0.4	49	160	1050	37	53	45.3	18			
Standard Deviation	54	102	961	118	0	864	1820	0.65	0.0062	43	44	0.04	77	2.6	3	4850	197	0.36	351	104	3429	639	129	136	453				
Number of Guideline Exceedances	8	0	213	0	0	0	0	0	0	260	0	0	77	0	70	96	0	0	0	0	0	101	2	0	0	0			
Number of Guideline Exceedances (Detects Only)	8	0	213	0	0	0	0	0	0	260	0	0	77	0	70	96	0	0	0	0	0	101	2	0	0	0			

\* Separate discharge criteria have been developed by WSP for m-Xylene and p-Xylene. As the existing data is for m&p- Xylene combined, the lower criterion for m-Xylene (75 µg/L) is adopted in this table. The criterion for p-Xylene is 200 µg/L.



Table B5\_Groundwater Analytical Data against Discharge Criteria

Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	Organic Matter			Physio-Chemical Parameters			Resistivity (Saturated Paste)	
						Ionic Balance	Carbonate	Total Organic Carbon	Total Dissolved Solids	pH (Lab)	Total Suspended Solids	Resistivity at 25°C	ohm cm
EOL						0.01	5	1	5	0.01	1	1	1
Discharge criteria (WSP, 2019)										7-8.5	15.2		
Sydney Water Industrial Trade Waste Acceptance Standard (2019)									10,000	7-10	600		
MPE 3	MPE 3	Normal	19/02/2019	21184-6	211841	-	<5	-	35000	-	20	-	-
MPE 3	MPE 3	Normal	26/02/2019	212355-8	212355	-	<5	-	32000	-	45	-	-
MPE 3	MPE 3	Normal	03/03/2019	212985-1	212985	-	<5	-	30000	-	19	-	-
MPE 3	MPE 3	Normal	12/03/2019	213382-8	213382	-	<5	-	35000	-	16	-	-
MPE 4	MPE 4	Normal	13/02/2019	211519-8	211519	-	<5	-	18000	-	46	-	-
MPE 4	MPE 4	Normal	19/02/2019	211841-4	211841	-	<5	-	14000	-	36	-	-
MPE 4	MPE 4	Normal	26/02/2019	212355-6	212355	-	<5	-	14000	-	41	-	-
MPE 4	MPE 4	Normal	03/03/2019	212782-8	212782	-	<5	-	16000	-	36	-	-
MPE 4	MPE 4	Normal	12/03/2019	213382-7	213382	-	<5	-	14000	-	10	-	-
MPE 5	MPE 5	Normal	11/12/2018	208061-7	208061	-	<5	63	12000	-	22	-	-
MPE 5	MPE 5	Normal	13/02/2019	211519-5	211519	-	<5	-	14000	-	27	-	-
MPE 5	MPE 5	Normal	19/02/2019	211841-12	211841	-	<5	-	13000	-	53	-	-
MPE 5	MPE 5	Normal	26/02/2019	212355-1	212355	-	<5	-	12000	-	30	-	-
MPE 5	MPE 5	Normal	03/03/2019	212782-4	212782	-	<5	-	13000	-	22	-	-
MPE 5	MPE 5	Normal	11/03/2019	213297-18	213297	-	<5	-	13000	-	13	-	-
MPE 5A	MPE 5A	Normal	11/12/2018	208061-5	208061	-	<5	10	25000	-	-	-	-
MPE 5A	MPE 5A	Normal	13/02/2019	211519-6	211519	-	<5	-	27000	-	33	-	-
MPE 5A	MPE 5A	Normal	19/02/2019	211841-2	211841	-	<5	-	34000	-	92	-	-
MPE 5A	MPE 5A	Normal	26/02/2019	212355-3	212355	-	<5	-	30000	-	13	-	-
MPE 5A	MPE 5A	Normal	03/03/2019	212782-6	212782	-	<5	-	27000	-	20	-	-
MPE 5A	MPE 5A	Normal	12/03/2019	213382-4	213382	-	<5	-	31000	-	410	-	-
MPE 6	MPE 6	Normal	11/12/2018	208061-8	208061	-	<5	37	11000	-	-	-	-
MPE 6	MPE 6	Normal	13/02/2019	211519-2	211519	-	<5	-	24000	-	200	-	-
MPE 6	MPE 6	Normal	18/02/2019	211785-14	211785	-	<5	-	14000	-	16	-	-
MPE 6	MPE 6	Normal	25/02/2019	212251-14	212251	-	<5	-	16000	-	16	-	-
MPE 6	MPE 6	Normal	03/03/2019	212782-1	212782	-	<5	-	22000	-	21	-	-
MPE 6	MPE 6	Normal	11/03/2019	213297-14	213297	-	<5	-	20000	-	7	-	-
MPE 6	QC1049	Field_D	11/03/2019	208060-2	208060	-	<5	22	17000	-	8	-	-
MPE 7	MPE 7	Normal	12/12/2018	208060-2	208060	-	<5	22	17000	-	8	-	-
MPE 7	MPE 7	Normal	12/02/2019	211437-8	211437	-	<5	-	20000	-	80	-	-
MPE 7	MPE 7	Normal	18/02/2019	211785-9	211785	-	<5	-	19000	-	82	-	-
MPE 7	MPE 7	Normal	25/02/2019	212251-10	212251	-	<5	-	16000	-	100	-	-
MPE 7	MPE 7	Normal	03/03/2019	212783-10	212783	-	<5	-	28000	-	120	-	-
MPE 7	MPE 7	Normal	11/03/2019	213297-10	213297	-	<5	-	12000	-	41	-	-
MPE 8	MPE 8	Normal	12/12/2018	208060-1	208060	-	<5	17	26000	-	-	-	-
MPE 8	MPE 8	Normal	12/02/2019	211437-6	211437	-	<5	-	27000	-	110	-	-
MPE 8	MPE 8	Normal	18/02/2019	211785-5	211785	-	<5	-	27000	-	82	-	-
MPE 8	MPE 8	Normal	25/02/2019	212251-5	212251	-	<5	-	25000	-	49	-	-
MPE 8	MPE 8	Normal	03/03/2019	212783-6	212783	-	<5	-	15000	-	41	-	-
MPE 8	MPE 8	Normal	11/03/2019	213297-5	213297	-	<5	-	23000	-	52	-	-
MPE 8	QC1046	Field_D	25/02/2019	212251-6	212251	-	<5	-	24000	-	40	-	-
MPE 9	MPE 9	Normal	12/12/2018	208060-5	208060	-	<5	29	8400	-	-	-	-
MPE 9	MPE 9	Normal	12/02/2019	211437-4	211437	-	<5	-	16000	-	280	-	-
MPE 9	MPE 9	Normal	18/02/2019	211785-4	211785	-	<5	-	14000	-	130	-	-
MPE 9	MPE 9	Normal	25/02/2019	212251-4	212251	-	<5	-	16000	-	89	-	-
MPE 9	MPE 9	Normal	03/03/2019	212783-5	212783	-	<5	-	18000	-	82	-	-
MPE 9	MPE 9	Normal	11/03/2019	213297-4	213297	-	<5	-	21000	-	69	-	-
MPI 10	MPI 10	Normal	11/12/2018	208061-6	208061	-	<5	35	2000	-	-	-	-
MPI 10	MPI 10	Normal	13/02/2019	211519-4	211519	-	<5	-	1400	-	32	-	-
MPI 10	MPI 10	Normal	19/02/2019	211841-11	211841	-	<5	-	13000	-	60	-	-
MPI 10	MPI 10	Normal	26/02/2019	212355-2	212355	-	<5	-	1200	-	57	-	-
MPI 10	MPI 10	Normal	03/03/2019	212782-5	212782	-	<5	-	1300	-	28	-	-
MPI 10	MPI 10	Normal	11/03/2019	213297-19	213297	-	<5	-	1300	-	52	-	-
MPI 12	MPI 12	Normal	11/12/2018	208061-9	208061	-	<5	19	800	-	-	-	-
MPI 12	MPI 12	Normal	13/02/2019	211519-1	211519	-	<5	-	870	-	23	-	-
MPI 12	MPI 12	Normal	18/02/2019	211785-13	211785	-	<5	-	750	-	27	-	-
MPI 12	MPI 12	Normal	28/02/2019	212520-3	212520	-	<5	-	920	-	73	-	-
MPI 12	MPI 12	Normal	03/03/2019	212782-2	212782	-	<5	-	800	-	11	-	-
MPI 12	MPI 12	Normal	11/03/2019	213297-13	213297	-	<5	-	910	-	7	-	-
MPI 12	QC1023	Field_D	11/12/2018	208061-10	208061	-	<5	21	800	-	-	-	-
MPI 13	MPI 13	Normal	11/12/2018	208061-12	208061	-	<5	35	1000	-	-	-	-
MPI 13	MPI 13	Normal	12/02/2019	211437-11	211437	-	<5	-	1400	-	16	-	-
MPI 13	MPI 13	Normal	18/02/2019	211785-12	211785	-	<5	-	1100	-	46	-	-
MPI 13	MPI 13	Normal	28/02/2019	212520-2	212520	-	<5	-	1300	-	46	-	-
MPI 13	MPI 13	Normal	03/03/2019	212783-11	212783	-	<5	-	1300	-	31	-	-
MPI 13	MPI 13	Normal	11/03/2019	213297-12	213297	-	<5	-	1200	-	22	-	-
MPI 13	QC2043	Interlab_D	18/02/2019	ES1905388001	ES1905388	1.31	-	-	-	-	105	-	-
MPI 13	QC2045	Interlab_D	28/02/2019	ES1906314001	ES1906314	0.29	-	-	-	-	42	-	-
MPI 14	MPI 14	Normal	12/12/2018	208060-3	208060	-	<5	45	1800	-	-	-	-
MPI 14	MPI 14	Normal	12/02/2019	211437-9	211437	-	<5	-	1900	-	34	-	-
MPI 14	MPI 14	Normal	18/02/2019	211785-10	211785	-	<5	-	1600	-	22	-	-
MPI 14	MPI 14	Normal	25/02/2019	212251-9	212251	-	<5	-	1700	-	12	-	-
MPI 14	MPI 14	Normal	03/03/2019	212783-9	212783	-	<5	-	1900	-	35	-	-
MPI 14	MPI 14	Normal	11/03/2019	213297-9	213297	-	<5	-	1600	-	6	-	-
MPI 14	QC2041	Interlab_D	12/02/2019	ES1904928001	ES1904928	7.89	-	-	-	-	193	-	-
MPI 15	MPI 15	Normal	18/02/2019	211785-7	211785	-	<5	-	1200	-	10	-	-
MPI 15	MPI 15	Normal	12/12/2018	208060-13	208060	-	<5	34	1400	-	-	-	-
MPI 15	MPI 15	Normal	12/02/2019	211437-7	211437	-	<5	-	1400	-	22	-	-
MPI 15	MPI 15	Normal	25/02/2019	212251-8	212251	-	<5	-	1300	-	24	-	-
MPI 15	MPI 15	Normal	03/03/2019	212783-8	212783	-	<5	-	1200	-	20	-	-
MPI 15	MPI 15	Normal	11/03/2019	213297-7	213297	-	<5	-	1400	-	20	-	-
MPI 15	QC1046	Field_D	18/02/2019	211785-8	211785	-	<5	-	1200	-	8	-	-
MPI 15	QC2044B	Interlab_D	25/02/2019	ES1906049001	ES1906049	8.88	-	-	-	-	33	-	-
MPI 16	MPI 16	Normal	12/12/2018	208060-4	208060	-	<5	130	29000	-	-	-	-
MPI 16	MPI 16	Normal	12/02/2019	211437-5	211437	-	<5	-	11000	-	103	-	-
MPI 16	MPI 16	Normal	18/02/2019	211785-6	211785	-	<5	-	3600	-	240	-	-
MPI 16	MPI 16	Normal	25/02/2019	212251-7	212251	-	<5	-	39000	-	140	-	-
MPI 16	MPI 16	Normal	03/03/2019	212783-7	212783	-	<5	-					

Table B5\_Groundwater Analytical Data against Discharge Criteria

	Organic Matter			Physio-Chemical Parameters			Resistivity (Saturated Paste)
	Ionic Balance	Carbonate	Total Organic Carbon	Total Dissolved Solids	pH (Lab)	Total Suspended Solids	Resistivity at 25°C
	%	mg/L	mg/L	mg/L	pH Units	mg/L	ohm cm
EOL	0.01	5	1	5	0.01	5	1
Discharge criteria (WSP, 2019)					7-8.5	15.2	
Sydney Water Industrial Trade Waste Acceptance Standard (2019)			10,000		7-10	600	
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report		
MPI 5	MPI 5	Normal	12/12/2018	208060-7	208060	-	<5
MPI 6A	MPI 6A	Normal	13/02/2019	211519-10	211519	-	<5
MPI 6A	MPI 6A	Normal	19/02/2019	211841-3	211841	-	<5
MPI 6A	MPI 6A	Normal	26/02/2019	212355-5	212355	-	<5
MPI 6A	MPI 6A	Normal	5/03/2019	212769-9	212762	-	<5
MPI 6A	MPI 6A	Normal	12/03/2019	213382-6	213382	-	<5
SG-BHTT-03	SG-BHTT-03	Normal	17/04/2019	215939-5	215939	-	<5
SG-BHTT-04	SG-BHTT-04	Normal	15/04/2019	215789-3	215789	-	<5
Unknown	Unknown	Normal	19/12/2018	208565-3	208565	-	<5
WCX_GTY_BH_002	WCX_GTY_BH	Normal	19/12/2018	208565-1	208565	-	<5
WCX_GTY_BH_002	WCX_GTY_BH	Normal	28/02/2019	212520-5	212520	-	<5
WCX_GTY_BH_002	WCX_GTY_BH	Normal	15/03/2019	213632-2	213632	-	<5
WCX_GTY_BH_002	WCX_GTY_BH	Normal	11/04/2019	215594-7	215594	-	<5
WCX_GTY_BH_003	WCX_GTY_BH	Normal	8/03/2019	213103-2	213103	-	<5
WCX_GTY_BH_004	QC2052	Interlab_D	15/03/2019	ES1907999001	ES1907999	-	<5
WCX_GTY_BH_004	WCX_GTY_BH	Normal	28/02/2019	212520-6	212520	-	<5
WCX_GTY_BH_004	WCX_GTY_BH	Normal	15/03/2019	213632-3	213632	-	<5
WCX_GTY_BH_004	WCX_GTY_BH	Normal	17/04/2019	215939-1	215939	-	<5
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	17/12/2018	208319-2	208319	-	<5
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	13/02/2019	211510-3	211510	-	<5
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	15/03/2019	213632-1	213632	-	<5
WCX_GTY_BH_009d	WCX_GTY_BH	Normal	11/04/2019	215594-10	215594	-	<5
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	17/12/2018	208319-1	208319	-	<5
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	13/02/2019	211510-2	211510	-	<5
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	6/03/2019	212985-9	212985	-	<5
WCX_GTY_BH_009s	WCX_GTY_BH	Normal	11/04/2019	215594-9	215594	-	<5
WCX_GTY_BH_027	QC1046	Field_D	22/02/2019	212103-3	212103	-	<5
WCX_GTY_BH_027	WCX_GTY_BH	Normal	17/01/2019	209762-4	209762	-	<5
WCX_GTY_BH_027	WCX_GTY_BH	Normal	22/02/2019	212103-2	212103	-	<5
WCX_GTY_BH_027	WCX_GTY_BH	Normal	16/04/2019	215934-6	215934	-	<5
WCX_GTY_BH_033	QC1054	Field_D	11/04/2019	215594-2	215594	-	<5
WCX_GTY_BH_033	QC2031	Interlab_D	19/12/2018	ES1838735001	ES1838735	-	<5
WCX_GTY_BH_033	WCX_GTY_BH	Normal	19/12/2018	208565-2	208565	-	<5
WCX_GTY_BH_033	WCX_GTY_BH	Normal	13/02/2019	211510-4	211510	-	<5
WCX_GTY_BH_033	WCX_GTY_BH	Normal	11/04/2019	215594-6	215594	-	<5
Statistical Summary							
Number of Results	9	218	86	217	74	144	4
Number of Detects	9	1	86	217	74	140	4
Minimum Concentration	0.29	<5	3	120	5.6	<5	71
Minimum Detect	0.29	170	3	120	5.6	6	71
Maximum Concentration	10.3	170	1100	41000	12	1200	6450
Maximum Detect	10.3	170	1100	41000	12	1200	6450
Average Concentration	5.4	3.3	64	9846	6.9	77	2698
Median Concentration	7.67	2.5	23.5	3400	6.9	36.5	2135
Standard Deviation	3.8	11	138	10794	0.91	111	2814
Number of Guideline Exceedances	0	0	0	97	43	123	0
Number of Guideline Exceedances (Detects Only)	0	0	0	97	43	123	0

\* Separate discharge criteria have been developed by WSP for m-Xylene and p-Xylene. As the existing data is for m&p-Xylene combined, the lower criterion for m-Xylene (75 µg/L) is adopted in this table. The criterion for p-Xylene is 200 µg/L.

Table B6\_Groundwater\_PFAS\_PRE TOPA against Discharge Criteria

							Perfluorooctanoic acid (PFOA)	Perfluorooctane sulfonic acid (PFOS)	Perfluorohexane sulfonate (PFHxS)	Sum (PFHxS + PFOS)	Sum of PFAS	Sum of PFAS (WA DER List)	Sum of US EPA PFAS (PFOS + PFOA)*	Perfluorobutanoic acid	PFBS	PFPA	PFHpS	Perfluorodecane sulfonic acid (PFDS)	Perfluoro-n-hexadecanoic acid	PFPeA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	N-Me-FOSA	M-FOSAA	E-FOSAA	N-Me-FOSE	FOSA	PFTeDA	PFTrDA	N-Et-FOSA	PFDeA	PFHpA	PFHxA	N-Et-FOSE	PFDoA	PFNA	PFUnA				
							ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L		
EOL							0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0.002	0.005	0.002	0.001	0.001	0.001	0.001	0.001	0.005	0.002	0.002	0.005	0.01	0.05	0.01	0.01	0.002	0.001	0.001	0.05	0.005	0.001	0.002		
Discharge Criteria (WSP, 2019)							220	0.13																																			
Sydney Water Industrial Trade Waste Acceptance Standard (2019)																																											
Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report																																						
34 TL3	34 TL3	Normal	13/02/2019	211519-11	211519	0.3	0.17	0.26	0.43	1.7	-	0.47	0.098	0.15	0.11	0.012	<0.002	-	0.12	<0.001	0.039	<0.001	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.5	<0.1	<0.1	<0.02	0.11	0.35	<0.5	<0.05	0.014	<0.02					
34 TL3	34 TL3	Normal	19/02/2019	211841-5	211841	0.33	0.17	0.35	0.52	2	-	0.5	0.12	0.17	0.11	0.013	<0.002	-	0.16	<0.001	0.009	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	<0.1	<0.002	0.12	0.38	<0.5	<0.005	0.016	<0.002						
34 TL3	34 TL3	Normal	26/02/2019	212355-7	212355	0.34	0.18	0.37	0.55	1.9	-	0.52	0.11	0.14	0.076	0.013	<0.002	-	0.14	<0.001	0.009	<0.001	<0.01	<0.04	<0.04	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.14	0.38	<0.05	<0.005	0.018	<0.002						
34 TL3	34 TL3	Normal	12/03/2019	213382-13	213382	0.31	0.21	0.34	0.55	1.9	-	0.52	0.096	0.071	0.11	0.01	0	-	0.14	<0.002	0.021	<0.002	<0.002	<0.05	<0.02	<0.02	<0.05	<0.1	<0.5	<0.1	<0.02	0.15	0.38	<0.5	<0.05	0.025	<0.02						
GW100s	GW100s	Normal	21/02/2019	212109-3	212109	0.028	0.21	0.016	0.226	0.41	-	0.24	0.008	0.003	0.002	0.001	<0.002	-	0.021	<0.001	0.002	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	0.02	0.015	0.018	<0.05	<0.005	0.073	<0.002					
GW100s	GW100s	Normal	8/03/2019	213103-3	213103	0.027	0.071	0.013	0.084	0.21	-	0.097	0.007	0.003	0.002	0.001	<0.002	-	0.02	<0.001	0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.013	0.018	<0.05	<0.005	0.031	<0.002					
GW100s	GW100s	Normal	11/04/2019	215594-8	215594	0.029	0.07	0.016	0.176	1.1	-	0.73	0.009	0.002	0.002	0.003	<0.002	-	0.021	<0.001	0.002	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	0.044	0.013	0.021	<0.05	<0.005	0.22	<0.002					
GW101	GW101	Normal	8/01/2019	209135-1	209135	0.009	0.005	0.019	0.024	0.093	-	0.013	0.01	0.004	0.002	0.001	<0.002	-	0.02	<0.001	0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.01	0.014	<0.05	<0.005	0.001	<0.002					
GW101	GW101	Normal	11/02/2019	211335-4	211335	0.008	0.005	0.019	0.024	0.11	-	0.014	0.01	0.005	0.002	<0.001	<0.002	-	0.02	<0.001	0.016	<0.001	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	<0.1	<0.002	0.01	0.014	<0.5	<0.005	<0.001	<0.002					
GW101	GW101	Normal	8/03/2019	213103-1	213103	0.009	0.005	0.017	0.022	0.14	-	0.014	0.01	0.004	0.002	<0.001	<0.002	-	0.02	<0.001	0.043	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.01	0.017	<0.05	<0.005	<0.001	<0.002					
GW101	GW101	Normal	15/04/2019	215789-5	215789	0.01	0.006	0.019	0.025	0.1	-	0.016	0.01	0.004	0.002	<0.001	<0.002	-	0.022	<0.001	0.001	<0.001	<0.001	<0.01	<0.002	<0.002	<0.01	<0.01	<0.05	<0.01	<0.01	<0.002	0.01	0.017	<0.05	<0.005	<0.001	<0.002					
GW101	QC2039	Interlab D	11/02/2019	ES1904415001	ES1904415	0.009	0.004	0.021	0.025	0.106	0.106	-	<0.01	<0.002	<0.002	<0.002	<0.002	<0.005	<0.024	<0.005	0.013	<0.005	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.013	0.022	<0.005	<0.002	<0.002	<0.002	<0.002					
GW102	GW102	Normal	8/01/2019	209135-2	209135	0.002	0.02	0.053	0.073	0.084	-	0.022	<0.002	0.002	0.002	<0.001	<0.002	-	<0.002	<0.001	0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.1	<0.002	0.001	0.003	<0.05	<0.005	<0.001	<0.002					
GW102	GW102	Normal	11/02/2019	211335-6	211335	0.003	0.036	0.074	0.11	0.14	-	0.04	0.002	0.003	0.003	0.001	<0.002	-	0.002	<0.001	0.007	<0.001	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	<0.1	<0.002	0.002	0.004	<0.5	<0.005	<0.001	<0.002					
GW102	GW102	Normal	8/03/2019	213103-5	213103	0.004	0.052	0.081	0.133	0.16	-	0.057	0.003	0.003	0.003	0.002	<0.002	-	0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.002	0.006	<0.05	<0.005	<0.001	<0.002					
GW102	GW102	Normal	17/04/2019	215939-8	215939	0.002	0.035	0.032	0.067	0.074	-	0.037	<0.002	0.002	0.002	<0.001	<0.002	-	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.001	0.002	<0.05	<0.005	<0.001	<0.002					
GW102	QC2051	Interlab D	8/03/2019	ES1907278001	ES1907278	0.005	0.051	0.091	0.142	0.163	0.16	-	<0.01	0.004	0.003	<0.002	<0.002	<0.005	<0.002	<0.005	0.009	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.002	0.007	<0.005	<0.002	<0.002	<0.002					
GW103	GW103	Normal	21/02/2019	212109-4	212109	0.018	0.05	0.021	0.071	0.14	-	0.068	0.009	0.004	0.002	0.002	<0.002	-	0.01	<0.001	0.007	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.008	0.01	<0.05	<0.005	0.002	<0.002					
GW103	GW103	Normal	8/03/2019	213103-4	213103	0.02	0.058	0.02	0.078	0.14	-	0.077	0.008	0.003	0.002	0.002	<0.002	-	0.008	<0.001	0.002	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.007	0.01	<0.05	<0.005	0.002	<0.002					
GW103	GW103	Normal	17/04/2019	215939-6	215939	0.021	0.068	0.047	0.115	0.2	-	0.089	0.009	0.003	0.003	0.003	<0.002	-	0.02	<0.001	0.002	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.012	0.017	<0.05	<0.005	0.001	<0.002					
GW103	QC1055	Field D	17/04/2019	215939-4	215939	0.022	0.074	0.047	0.121	0.21	-	0.096	0.009	0.004	0.003	0.004	<0.002	-	0.02	<0.001	0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.011	0.016	<0.05	<0.005	0.002	<0.002					
GW104	GW104	Normal	20/12/2018	208653-5	208653	0.084	4.5	0.93	5.43	6.4	-	4.6	0.14	0.089	0.11	0.062	<0.002	-	0.13	<0.001	0.014	0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.076	0.22	<0.05	<0.005	0.007	<0.002					
GW104	GW104	Normal	7/02/2019	211441-7	211441	0.092	4.5	0.96	5.46	6.5	-	4.6	0.15	0.1	0.15	0.11	<0.002	-	0.13	<0.001	0.015	0.002	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	<0.1	<0.002	0.096	0.22	<0.5	<0.005	0.007	<0.002					
GW104	GW104	Normal	10/04/2019	215496-4	215496	0.096	6.1	1.2	7.3	8.4	-																																

Table B6 Groundwater PFAS PRE TOPA against Discharge Criteria

EOL	Discharge Criteria (WSP, 2019)	Sydney Water Industrial Trade Waste Acceptance Standard (2019)	Perfluorooctanoic acid (PFOA)	Perfluorooctane sulfonic acid (PFOS)	Perfluorohexane sulfonate (PFHS)	Sum (PFHS + PFOS)	Sum of PFAS	Sum of PFAS (WA DER List)	Sum of US EPA PFAS (PFOS + PFOA)	Perfluorobutanoic acid	PFBS	PFPeS	PFHpS	Perfluorodecane sulfonic acid (PFDS)	Perfluoro-n-hexadecanoic acid	PFPeA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	N-Me-FOSA	MeFOSAA	EtFOSAA	N-Me-FOSE	FOSA	PFTtDA	PFTnDA	N-Et-FOSA	PFDCa	PFHpA	PFHxA	N-Et-FOSE	PFDoA	PFNA	PFUnA	
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.002	0.005	0.002	0.001	0.001	0.001	0.001	0.005	0.002	0.002	0.005	0.01	0.05	0.01	0.01	0.01	0.002	0.001	0.001	0.05	0.005	0.001	0.002
			220	0.13																																

Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	0.006	0.012	0.005	0.017	0.043	-	0.018	0.003	<0.001	<0.001	<0.001	<0.002	-	0.005	<0.001	0.005	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.002	0.006	<0.05	<0.005	<0.001	<0.002	
GW205	GW205	Normal	24/01/2019	210277-6	210277	0.006	0.012	0.005	0.017	0.043	-	0.018	0.003	<0.001	<0.001	<0.001	<0.002	-	0.005	<0.001	0.005	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.002	0.006	<0.05	<0.005	<0.001	<0.002	
GW22s	GW22s	Normal	9/04/2019	215423-8	215423	<0.001	0.003	0.002	0.005	0.042	-	0.003	<0.02	0.004	0.001	<0.001	<0.002	-	<0.02	<0.01	0.012	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.004	0.016	<0.05	<0.005	<0.001	<0.002	
GW23d	GW23d	Normal	17/10/2019	209762-2	209762	0.086	0.063	0.034	0.097	0.36	-	0.15	0.03	0.014	0.018	0.012	<0.002	-	0.02	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.015	0.049	<0.05	<0.005	0.01	<0.002	
GW23d	GW23d	Normal	12/02/2019	211435-3	211435	0.081	0.053	0.034	0.087	0.37	-	0.13	0.028	0.01	0.008	0.003	<0.002	-	0.02	<0.001	0.055	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.02	0.052	<0.05	<0.005	0.009	<0.002	
GW23d	GW23d	Normal	9/04/2019	215423-1	215423	0.04	0.032	0.023	0.055	0.18	-	0.071	<0.02	0.006	0.004	0.001	<0.002	-	<0.02	<0.01	0.041	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.01	0.021	<0.05	<0.005	0.01	<0.002	
GW24s	GW24s	Normal	13/03/2019	213502-5	213502	0.009	0.1	0.02	0.12	0.18	-	0.11	0.01	0.003	<0.001	0.001	<0.002	-	0.01	<0.001	0.004	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.008	0.011	<0.05	<0.005	<0.001	<0.002	
GW24s	GW24s	Normal	12/04/2019	215657-1	215657	0.014	0.15	0.058	0.208	0.3	-	0.16	0.02	0.002	0.004	0.003	<0.002	-	0.024	<0.001	0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.011	0.012	<0.05	<0.005	<0.001	<0.002	
GW25s	GW25s	Normal	9/01/2019	209210-1	209210	<0.001	<0.001	<0.001	<0.002	0.01	-	<0.001	<0.002	<0.001	<0.001	<0.001	<0.002	-	0.002	<0.001	0.003	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	<0.001	0.004	<0.05	<0.005	<0.001	<0.002	
GW25s	GW25s	Normal	14/02/2019	211612-2	211612	<0.001	<0.001	<0.001	<0.002	0.022	-	<0.001	0.003	<0.002	<0.001	<0.001	<0.002	-	0.003	<0.001	0.007	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	<0.001	0.006	<0.05	<0.005	<0.001	<0.002	
GW25s	GW25s	Normal	6/03/2019	212985-8	212985	<0.001	0.002	<0.001	0.002	0.018	-	0.002	<0.01	<0.001	0.001	<0.001	<0.002	-	<0.01	<0.001	0.009	<0.001	<0.001	<0.005	<0.002	<0.002	<0.01	<0.05	<0.01	<0.01	<0.002	<0.001	0.006	<0.05	<0.005	<0.001	<0.002		
GW25s	GW25s	Normal	17/04/2019	215939-9	215939	<0.001	0.002	<0.001	0.002	0.019	-	0.002	0.004	<0.001	<0.001	<0.001	<0.002	-	0.002	<0.001	0.004	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	<0.001	0.007	<0.05	<0.005	<0.001	<0.002	
GW25s	QC2026	Interlab D	9/01/2019	ES1900712001	ES1900712	<0.002	<0.002	<0.002	<0.002	0.006	0.006	-	<0.01	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	0.006	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	<0.005	<0.002	<0.002	<0.005	<0.002	<0.002	<0.002	<0.002
GW27s	GW27s	Normal	17/01/2019	209762-3	209762	0.001	0.001	0.011	0.012	0.034	-	0.003	0.004	0.001	0.002	<0.001	<0.002	-	0.004	<0.001	0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.002	0.007	<0.05	<0.005	<0.001	<0.002	
GW27s	GW27s	Normal	22/02/2019	212103-1	212103	<0.001	<0.001	0.027	0.027	0.064	-	<0.001	<0.02	0.003	0.004	<0.001	<0.002	-	<0.02	<0.001	0.006	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.004	0.016	<0.05	<0.005	<0.001	<0.002	
GW27s	GW27s	Normal	16/04/2019	215934-5	215934	<0.001	0.002	0.031	0.033	0.065	-	0.003	<0.02	0.002	0.004	<0.001	<0.002	-	<0.02	<0.001	0.007	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.005	0.013	<0.05	<0.005	<0.001	<0.002	
GW27s	QC2044	Interlab D	22/02/2019	ES1905703001	ES1905703	<0.002	<0.002	0.022	0.022	0.04	0.037	-	<0.01	<0.02	0.003	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.002	<0.005	<0.002	0.012	<0.05	<0.005	<0.002	<0.002	<0.002	
GW28A	GW28A	Normal	16/04/2019	215934-1	215934	0.46	0.28	0.26	0.54	1.9	-	0.74	0.082	0.1	0.064	0.018	<0.002	-	0.075	<0.001	0.009	<0.001	<0.001	<0.005	0.034	0.11	<0.05	<0.01	<0.05	<0.02	<0.1	<0.002	0.16	0.22	<0.5	<0.02	0.015	<0.02	
GW2s	GW2s	Normal	11/02/2019	211335-1	211335	0.1	0.063	0.19	0.253	0.9	-	0.16	0.06	0.045	0.032	0.011	<0.002	-	0.068	<0.001	0.038	<0.001	<0.001	<0.005	<0.02	<0.02	<0.05	<0.01	<0.05	<0.01	<0.01	<0.002	0.045	0.13	<0.5	<0.005	0.12	<0.02	
GW4d	GW4d	Normal	21/02/2019	212109-1	212109	0.006	0.002	0.004	0.006	0.062	-	0.008	<0.004	0.003	<0.001	<0.001	<0.002	-	<0.004	<0.001	0.039	<0.001	<0.001	<0.005	<0.002	<0.004	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.002	0.005	<0.05	<0.005	<0.001	<0.002	
GW4d	GW4d	Normal	13/03/2019	213502-4	213502	0.005	0.003	0.004	0.007	0.38	-	0.008	<0.02	0.004	<0.001	<0.001	<0.002	-	<0.02	0.001	0.35	<0.01	<0.01	<0.005	<0.02	<0.02	<0.05	<0.01	<0.05	<0.01	<0.1	<0.02	0.005	0.009	<0.5	<0.05	<0.01	<0.02	
GW4d	GW4d	Normal	15/04/2019	215789-2	215789	0.005	0.009	0.006	0.015	0.14	-	0.014	0.004	0.001	<0.001	<0.001	<0.002	-	<0.004	<0.001	0.11	<0.001	<0.001	<0.001	<0.002	<0.002	<0.01	<0.01	<0.05	<0.01	<0.01	<0.002	0.003	0.004	<0.05	<0.005	<0.001	<0.002	
GW4i	GW4i	Normal	21/02/2019	212109-2	212109	0.004	0.001	0.004	0.005	0.035	-	0.005	<0.01	0.004	<0.001	<0.001	<0.002	-	<0.01	<0.001	0.014	<0.001	<0.001	<0.005	<0.002	<0.004	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.003	0.006	<0.05	<0.005	<0.001	<0.002	
GW4i	GW4i	Normal	13/03/2019	213502-3	213502	0.003	<0.001	0.005	0.005	0.021	-	0.003	<0.02	0.002	<0.001	<0.001	<0.002	-	<0.02																				

Table B6 Groundwater PFAS PRE TOPA against Discharge Criteria

EQL	Discharge Criteria (WSP, 2019)	Sydney Water Industrial Trade Waste Acceptance Standard (2019)	Perfluorooctanoic acid (PFOA)	Perfluorooctane sulfonic acid (PFOS)	Perfluorohexane sulfonate (PFHxS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorohexane sulfonate (PFHxS)	Sum (PFHxS + PFOS)	Sum of PFAS	Sum of PFAS (WA DER List)	Sum of US EPA PFAS (PFOS + PFOA)	Perfluorobutanoic acid	Perfluorodecane sulfonic acid (PFDS)	Perfluoro-n-hexadecanoic acid	PFPeA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	N-Me-FOSA	MeFOSAA	EtFOSAA	N-Me-FOSE	FOSA	PFTtDA	PFTnDA	N-Et-FOSA	PFDecA	PFHpA	PFHxA	N-Et-FOSE	PFDoA	PFNA	PFUnA
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.01	0.05	0.01	0.01	0.002	0.001	0.001	0.05	0.005	0.001	0.002

Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	0.045	0.011	0.034	0.045	0.23	-	0.056	0.023	0.017	0.011	<0.001	<0.002	-	0.026	<0.001	0.009	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.017	0.04	<0.05	<0.005	<0.001	<0.002
MPE 5	MPE 5	Normal	19/02/2019	211841-12	211841	0.045	0.011	0.034	0.045	0.23	-	0.056	0.023	0.017	0.011	<0.001	<0.002	-	0.026	<0.001	0.009	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.017	0.04	<0.05	<0.005	<0.001	<0.002
MPE 5	MPE 5	Normal	26/02/2019	212355-1	212355	0.041	0.014	0.028	0.04	0.27	-	0.055	0.022	0.018	0.008	<0.001	<0.002	-	0.03	<0.001	0.039	<0.001	<0.001	<0.01	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.024	0.044	<0.05	<0.005	<0.001	<0.002
MPE 5	MPE 5	Normal	5/03/2019	212782-4	212782	0.041	0.01	0.028	0.038	0.2	-	0.051	<0.02	0.014	0.009	<0.001	<0.002	-	0.027	<0.001	0.016	<0.001	<0.001	<0.05	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.023	0.034	<0.05	<0.02	<0.001	<0.002
MPE 5	MPE 5	Normal	11/03/2019	213297-18	213297	0.043	0.013	0.034	0.047	0.22	-	0.056	0.02	0.008	0.006	<0.001	<0.002	-	0.021	<0.001	0.01	<0.001	<0.001	<0.05	<0.02	<0.02	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.022	0.043	<0.05	<0.005	<0.001	<0.002
MPE 5A	MPE 5A	Normal	11/12/2018	208061-5	208061	0.031	0.009	0.03	0.099	0.35	-	0.1	0.032	0.008	0.006	0.003	<0.002	-	0.087	<0.001	0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.032	0.05	<0.05	<0.005	0.002	<0.002
MPE 5A	MPE 5A	Normal	19/02/2019	211841-2	211841	0.014	0.045	0.028	0.073	0.26	-	0.058	0.024	0.009	0.005	0.002	<0.002	-	0.04	<0.001	0.056	<0.001	<0.001	<0.05	<0.02	<0.02	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.017	0.022	<0.05	<0.005	<0.001	<0.002
MPE 5A	MPE 5A	Normal	26/02/2019	212355-3	212355	0.029	0.046	0.031	0.077	0.31	-	0.075	0.029	0.007	0.005	0.002	<0.002	-	0.074	<0.001	0.005	<0.001	<0.001	<0.01	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.038	0.048	<0.05	<0.005	0.002	<0.002
MPE 5A	MPE 5A	Normal	5/03/2019	212782-6	212782	0.05	0.042	0.043	0.085	0.48	-	0.052	0.039	0.011	0.009	0.002	<0.002	-	0.13	<0.001	0.009	<0.001	<0.005	<0.02	<0.02	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.06	0.084	<0.05	<0.005	0.002	<0.002	
MPE 5A	MPE 5A	Normal	12/03/2019	213382-4	213382	0.015	0.06	0.16	0.076	0.21	-	0.075	0.02	0.002	0.003	0.001	<0.002	-	0.027	<0.001	0.043	<0.001	<0.001	<0.005	<0.02	<0.02	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.012	0.018	<0.05	<0.005	0.002	<0.002
MPE 6	MPE 6	Normal	11/12/2018	208061-8	208061	0.029	0.021	0.021	0.042	0.15	-	0.05	0.008	0.011	0.006	0.002	<0.002	-	0.02	<0.001	0.001	<0.001	<0.001	<0.005	<0.002	<0.002	0.009	<0.01	<0.05	<0.01	<0.01	<0.002	0.011	0.016	<0.05	<0.005	0.001	<0.002
MPE 6	MPE 6	Normal	18/02/2019	211785-14	211785	0.025	0.018	0.024	0.042	0.14	-	0.043	0.002	0.006	0.004	0.001	<0.002	-	0.01	<0.001	0.02	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.01	0.012	<0.05	<0.005	<0.001	<0.002
MPE 6	MPE 6	Normal	25/02/2019	212251-14	212251	0.018	0.014	0.017	0.031	0.094	-	0.032	0.003	0.006	0.004	0.001	<0.002	-	0.01	<0.001	0.002	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.007	0.01	<0.05	<0.005	<0.001	<0.002
MPE 6	MPE 6	Normal	5/03/2019	212782-1	212782	0.012	0.007	0.011	0.018	0.066	-	0.019	<0.002	0.003	0.002	<0.001	<0.002	-	0.005	<0.001	0.012	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.005	0.008	<0.05	<0.005	<0.001	<0.002
MPE 6	MPE 6	Normal	11/03/2019	213297-14	213297	0.019	0.013	0.017	0.03	0.09	-	0.032	0.005	0.003	0.002	<0.001	<0.002	-	0.008	<0.001	0.005	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.007	0.011	<0.05	<0.005	<0.001	<0.002
MPE 6	QC1049	Field D	11/03/2019	213297-15	213297	0.018	0.012	0.015	0.027	0.085	-	0.03	0.005	0.003	0.002	<0.001	<0.002	-	0.008	<0.001	0.004	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.007	0.012	<0.05	<0.005	<0.001	<0.002
MPE 7	MPE 7	Normal	12/12/2018	208060-2	208060	0.023	0.02	0.013	0.033	0.11	-	0.042	0.007	0.006	0.003	0.002	<0.002	-	0.009	<0.001	0.005	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.006	0.01	<0.05	<0.005	<0.001	<0.002
MPE 7	MPE 7	Normal	18/02/2019	211785-9	211785	0.018	0.013	0.012	0.025	0.08	-	0.031	<0.002	0.004	0.003	0.001	<0.002	-	0.009	<0.001	0.003	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.006	0.01	<0.05	<0.005	<0.001	<0.002
MPE 7	MPE 7	Normal	25/02/2019	212251-10	212251	0.018	0.018	0.012	0.03	0.087	-	0.036	0.003	0.004	0.003	0.002	<0.002	-	0.009	<0.001	0.002	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.006	0.01	<0.05	<0.005	<0.001	<0.002
MPE 7	MPE 7	Normal	4/03/2019	212783-10	212783	0.009	0.005	0.006	0.011	0.043	-	0.014	<0.002	0.002	0.002	<0.001	<0.002	-	0.007	<0.001	0.002	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.004	0.007	<0.05	<0.005	<0.001	<0.002
MPE 7	MPE 7	Normal	11/03/2019	213297-10	213297	0.033	0.031	0.022	0.053	0.15	-	0.064	0.01	0.003	0.004	0.002	<0.002	-	0.01	<0.001	0.002	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.011	0.017	<0.05	<0.005	0.001	<0.002
MPE 8	MPE 8	Normal	12/12/2018	208060-1	208060	0.043	0.026	0.027	0.053	0.2	-	0.069	0.01	0.015	0.012	0.002	<0.002	-	0.01	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.016	0.033	<0.05	<0.005	<0.001	<0.002	
MPE 8	MPE 8	Normal	18/02/2019	211785-5	211785	0.032	0.017	0.023	0.04	0.15	-	0.049	<0.002	0.011	0.01	0.002	<0.002	-	0.01	<0.001	0.002	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.013	0.025	<0.05	<0.005	<0.001	<0.002
MPE 8	MPE 8	Normal	25/02/2019	212251-5	212251	0.043	0.028	0.03	0.058	0.21	-	0.071	0.008	0.014	0.013	0.003	<0.002	-	0.01	<0.001	0.003	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.017	0.032	<0.05	<0.005	<0.001	<0.002
MPE 8	MPE 8	Normal	4/03/2019	212783-6	212783	0.086	0.052	0.061	0.113	0.7	-	0.14	0.028	0.03	0.027	0.003	<0.002</																					

Table B6 Groundwater PFAS PRE TOPA against Discharge Criteria

EOL	Discharge Criteria (WSP, 2019)	Sydney Water Industrial Trade Waste Acceptance Standard (2019)	Perfluorooctanoic acid (PFOA)	Perfluorooctane sulfonic acid (PFOS)	Perfluorohexane sulfonate (PFHS)	Sum (PFHS + PFOS)	Sum of PFAS	Sum of PFAS (WA DER List)	Sum of US EPA PFAS (PFOS + PFOA)	Perfluorobutanoic acid	PFBS	PFPeS	PFHpS	Perfluorodecane sulfonic acid (PFDS)	Perfluoro-n-hexadecanoic acid	PFPeA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	N-Me-FOSA	MeFOSAA	EtFOSAA	N-Me-FOSE	FOSA	PFTdA	PFTDA	N-Et-FOSA	PFdCA	PFHpA	PFHxA	N-Et-FOSE	PFDoA	PFNA	PFUnA
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.002	0.005	0.002	0.001	0.001	0.001	0.001	0.005	0.002	0.002	0.005	0.01	0.05	0.01	0.01	0.002	0.001	0.001	0.05	0.005	0.001	0.002

Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	0.062	0.03	0.038	0.068	0.44	-	0.092	0.036	0.022	0.015	0.002	<0.002	-	0.037	<0.001	0.021	<0.001	<0.001	<0.05	<0.02	<0.05	<0.1	<0.05	<0.01	<0.1	<0.002	0.038	0.14	<0.5	<0.005	<0.001	<0.002	
MPI 16	MPI 16	Normal	11/03/2019	213297-6	213297	0.18	0.074	0.12	0.194	0.73	-	0.25	0.042	0.045	0.044	0.009	<0.002	-	0.041	<0.001	0.002	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.1	<0.002	0.062	0.11	<0.05	<0.005	0.002	<0.002
MPI 17	MPI 17	Normal	18/02/2019	211785-3	211785	0.18	0.074	0.12	0.194	0.73	-	0.25	0.048	0.045	0.043	0.008	<0.002	-	0.043	<0.001	0.006	<0.001	<0.001	<0.05	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.1	<0.002	0.062	0.11	<0.05	<0.005	0.002	<0.002
MPI 17	MPI 17	Normal	25/02/2019	212251-2	212251	0.17	0.066	0.11	0.176	0.84	-	0.24	0.054	0.046	0.043	0.006	<0.002	-	0.042	<0.001	0.13	<0.001	<0.001	<0.05	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.1	<0.002	0.066	0.1	<0.05	<0.005	0.002	<0.002
MPI 17	MPI 17	Normal	4/03/2019	212783-2	212783	0.17	0.066	0.11	0.176	0.84	-	0.24	0.054	0.046	0.043	0.006	<0.002	-	0.042	<0.001	0.13	<0.001	<0.001	<0.05	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.1	<0.002	0.066	0.1	<0.05	<0.005	0.002	<0.002
MPI 17	MPI 17	Normal	11/03/2019	213297-2	213297	0.2	0.083	0.12	0.203	1.1	-	0.28	0.043	0.023	0.039	0.008	<0.002	-	0.032	<0.001	0.31	0.001	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	<0.1	<0.002	0.073	0.12	<0.05	<0.005	0.003	<0.002
MPI 17	QC1047	Field D	4/03/2019	212783-4	212783	0.17	0.064	0.11	0.174	0.84	-	0.23	0.053	0.042	0.042	0.006	<0.002	-	0.039	<0.001	0.15	<0.001	<0.001	<0.05	<0.02	<0.002	<0.005	<0.01	<0.05	<0.01	<0.1	<0.002	0.062	0.1	<0.05	<0.005	0.002	<0.002
MPI 18	MPI 18	Normal	13/12/2018	208046-2	208046	0.21	0.06	0.1	0.16	0.7	-	0.26	0.041	0.049	0.046	0.008	<0.002	-	0.036	<0.001	0.15	<0.001	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	<0.1	<0.002	0.063	0.11	<0.05	<0.005	0.003	<0.002
MPI 18	MPI 18	Normal	13/02/2019	211519-6	211519	0.2	0.057	0.12	0.177	0.91	-	0.26	0.041	0.049	0.046	0.008	<0.002	-	0.036	<0.001	0.15	<0.001	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	<0.1	<0.002	0.064	0.13	<0.05	<0.005	0.002	<0.002
MPI 18	MPI 18	Normal	18/02/2019	211785-2	211785	0.21	0.054	0.14	0.194	0.84	-	0.26	0.045	0.048	0.053	0.008	<0.002	-	0.055	<0.001	0.051	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.1	<0.002	0.058	0.12	<0.05	<0.005	0.002	<0.002
MPI 18	MPI 18	Normal	25/02/2019	212251-3	212251	0.2	0.053	0.13	0.183	0.8	-	0.25	0.046	0.048	0.046	0.008	<0.002	-	0.046	<0.001	0.031	<0.001	<0.001	<0.05	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.1	<0.002	0.067	0.12	<0.05	<0.005	0.002	<0.002
MPI 18	MPI 18	Normal	4/03/2019	212783-3	212783	0.19	0.048	0.12	0.168	0.73	-	0.24	0.052	0.045	0.046	0.006	<0.002	-	0.042	<0.001	0.044	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.1	<0.002	0.068	0.11	<0.05	<0.005	0.002	<0.002
MPI 18	MPI 18	Normal	11/03/2019	213297-3	213297	0.22	0.06	0.15	0.21	0.82	-	0.28	0.048	0.035	0.045	0.007	<0.002	-	0.051	<0.001	0.023	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.1	<0.002	0.073	0.11	<0.05	<0.005	0.002	<0.002
MPI 18	QC2046	Interlab D	4/03/2019	ES1906814001	ES1906814	0.168	0.04	0.115	0.155	0.699	0.637	-	<0.01	0.049	0.058	0.004	<0.002	<0.005	0.06	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.002	<0.005	<0.002	<0.005	<0.002	0.072	0.133	<0.005	<0.002	<0.002	<0.002	
MPI 2	MPI 2	Normal	13/12/2018	208046-1	208046	0.5	0.28	0.38	0.66	2.1	-	0.78	0.03	0.13	0.088	0.023	<0.002	-	0.16	<0.001	0.006	<0.001	<0.001	<0.005	<0.002	<0.02	<0.005	<0.01	<0.05	<0.01	<0.1	<0.002	0.14	0.26	<0.05	<0.005	0.057	<0.002
MPI 2	MPI 2	Normal	13/02/2019	211519-14	211519	0.53	0.3	0.32	0.62	2.1	-	0.83	0.098	0.14	0.12	0.016	<0.002	-	0.11	<0.001	0.008	<0.001	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	<0.1	<0.002	0.13	0.3	<0.05	<0.005	0.052	<0.002
MPI 2	MPI 2	Normal	19/02/2019	211841-10	211841	0.52	0.43	0.38	0.81	2.4	-	0.95	0.087	0.16	0.13	0.017	<0.002	-	0.14	<0.001	0.013	<0.001	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	<0.1	<0.002	0.13	0.31	<0.05	<0.005	0.064	<0.002
MPI 2	MPI 2	Normal	26/02/2019	212355-12	212355	0.52	0.32	0.37	0.69	2.2	-	0.84	0.092	0.14	0.09	0.03	<0.002	-	0.12	<0.001	0.044	<0.001	<0.001	<0.01	<0.04	<0.04	<0.005	<0.01	<0.05	<0.01	<0.1	<0.002	0.14	0.28	<0.05	<0.005	0.051	<0.002
MPI 2	MPI 2	Normal	6/03/2019	212985-5	212985	0.47	0.25	0.36	0.61	2	-	0.72	0.061	0.15	0.11	0.017	<0.002	-	0.14	<0.001	0.006	<0.001	<0.001	<0.01	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	<0.1	<0.002	0.13	0.26	<0.05	<0.005	0.042	<0.002
MPI 2	MPI 2	Normal	12/03/2019	213382-12	213382	0.59	0.37	0.41	0.78	2.3	-	0.96	0.092	0.159	0.11	0.018	<0.002	-	0.12	<0.001	0.028	<0.001	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	<0.1	<0.002	0.15	0.34	<0.05	<0.005	0.063	<0.02
MPI 2	QC1048	Field D	6/03/2019	212985-7	212985	0.47	0.27	0.38	0.65	2.1	-	0.74	0.069	0.16	0.11	0.016	<0.002	-	0.14	<0.001	0.008	<0.001	<0.001	<0.05	<0.02	<0.02	<0.05	<0.1	<0.05	<0.01	<0.1	<0.002	0.13	0.27	<0.05	<0.005	0.039	<0.002
MPI 20	MPE 20	Normal	11/03/2019	213297-1	213297	0.15	0.013	0.11	0.123	0.78	-	0.16	0.04	0.033	0.05	0.002	<0.002	-	0.05	<0.001	0.065	<0.001	<0.001	<0.005	<0.02	<0.02	<0.005	<0.01	<0.05	<0.01	<0.1	<0.002	0.089	0.18	<0.05	<0.005	0.001	<0.002
MPI 20	MPI 20	Normal	12/12/2018	208060-10	208060	0.15	0.01	0.089	0.099	0.7	-	0.17	0.053	0.044	0.047	0.004	<0.002	-	0.063	<0.001	0.011	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.1	<0.002	0.085	0.14	<0.05	<0.005	0.001	<0.002
MPI 20	MPI 20	Normal	18/02/2019	211785-1	211785	0.15	0.01	0.11	0.11	0.72	-	0.16	0.05	0.049	0.054	0.003	<0.002	-	0.063	<0.001	0.006	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.1	<0.002	0.077	0.16	<0.05	<0.005	0.001	<0.002
MPI 20	MPI 20	Normal	25/02/2019	212251-1	212251	0.15	0.011	0.091	0.102	0.75	-	0.16	0.047	0.041	0.045	0.003	<0.002	-	0.06	<0.001	0.094	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.1	<0.002	0.076	0.14	<0.05	&		

Table B6 Groundwater PFAS PRE TOPA against Discharge Criteria

	Perfluorooctanoic acid (PFOA)	Perfluorooctane sulfonic acid (PFOS)	Perfluorohexane sulfonate (PFHS)	Sum (PFHS + PFOS)	Sum of PFAS	Sum of PFAS (WA DER List)	Sum of US EPA PFAS (PFOS + PFOA)	Perfluorobutanoic acid	PFBS	PFPeS	PFHpS	Perfluorodecane sulfonic acid (PFDS)	Perfluoro-n-hexadecanoic acid	PFPeA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	N-Me-FOSA	MeFOSAA	EtFOSAA	N-Me-FOSE	FOSA	PFTeDA	PFTIDA	N-Et-FOSA	PFDA	PFHpA	PFHxA	N-Et-FOSE	PFDoA	PFNA	PFUnA	
EOL	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.002	0.005	0.002	0.001	0.001	0.001	0.001	0.005	0.002	0.002	0.005	0.01	0.05	0.01	0.01	0.002	0.001	0.001	0.05	0.005	0.001	0.002	
Discharge Criteria (WSP, 2019)	220	0.13																																
Sydney Water Industrial Trade Waste Acceptance Standard (2019)																																		

Location Code	Field ID	Sample Type	Sampled Date	SampleCode	Lab Report	0.003	0.009	0.005	0.014	0.04	-	0.012	0.01	0.001	<0.001	<0.001	<0.002	-	0.003	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.002	0.003	0.004	<0.05	<0.005	<0.001	<0.002
WCX GTY BH 009s	WCX GTY BH	Normal	13/02/2019	211510-2	211510	0.003	0.009	0.005	0.014	0.04	-	0.012	0.01	0.001	<0.001	<0.001	<0.002	-	0.003	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.003	0.004	<0.05	<0.005	<0.001	<0.002	
WCX GTY BH 009s	WCX GTY BH	Normal	6/03/2019	212985-9	212985	0.003	0.01	0.006	0.016	0.046	-	0.012	0.01	0.003	0.001	<0.001	<0.002	-	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.003	0.004	<0.05	<0.005	<0.001	<0.002	
WCX GTY BH 009s	WCX GTY BH	Normal	11/04/2019	215594-9	215594	0.003	0.015	0.005	0.02	0.043	-	0.019	0.01	<0.001	<0.001	<0.001	<0.002	-	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.002	0.004	<0.05	<0.005	<0.001	<0.002	
WCX GTY BH 027	QC1046	Field D	22/02/2019	212103-3	212103	0.07	0.26	0.38	0.64	1.7	-	0.33	0.068	0.041	0.059	0.014	<0.002	-	0.18	<0.001	0.037	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.12	0.29	<0.05	<0.005	0.22	<0.002		
WCX GTY BH 027	WCX GTY BH	Normal	17/01/2019	209762-4	209762	0.075	0.15	0.41	0.56	1.9	-	0.23	0.082	0.046	0.067	0.01	<0.002	-	0.24	<0.001	0.015	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.14	0.44	<0.05	<0.005	0.19	<0.002			
WCX GTY BH 027	WCX GTY BH	Normal	22/02/2019	212103-2	212103	0.067	0.26	0.39	0.65	1.7	-	0.33	0.07	0.043	0.061	0.014	<0.002	-	0.18	<0.001	0.036	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.12	0.29	<0.05	<0.005	0.22	<0.002			
WCX GTY BH 027	WCX GTY BH	Normal	16/04/2019	215934-6	215934	0.057	0.2	0.4	0.6	1.6	-	0.26	0.074	0.041	0.044	0.011	<0.002	-	0.19	<0.001	0.014	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.1	0.3	<0.05	<0.005	0.13	<0.002			
WCX GTY BH 033	QC1054	Field D	11/04/2019	215594-2	215594	0.001	0.005	<0.001	0.005	0.05	-	<0.002	<0.001	<0.001	<0.001	<0.002	-	<0.002	<0.001	0.043	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	<0.001	<0.001	<0.05	<0.005	<0.001	<0.002				
WCX GTY BH 033	QC2031	Interlab D	19/12/2018	ES1838735001	ES1838735	0.002	0.004	0.002	0.006	0.008	0.008	<0.01	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.002	<0.005	<0.002	<0.002	<0.005	<0.002	<0.002	<0.005	<0.002	<0.002	<0.002			
WCX GTY BH 033	WCX GTY BH	Normal	19/12/2018	208565-2	208565	0.003	0.003	0.002	0.005	0.015	-	0.006	<0.002	0.001	<0.001	<0.001	<0.002	-	<0.002	<0.001	0.002	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	0.002	0.002	<0.05	<0.005	<0.001	<0.002			
WCX GTY BH 033	WCX GTY BH	Normal	13/02/2019	211510-4	211510	0.001	0.007	0.001	0.008	0.3	-	0.008	<0.002	<0.001	<0.001	<0.001	<0.002	-	<0.002	<0.001	0.29	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	<0.001	0.002	<0.05	<0.005	<0.001	<0.002			
WCX GTY BH 033	WCX GTY BH	Normal	11/04/2019	215594-6	215594	0.002	0.004	<0.001	0.004	0.024	-	0.006	<0.002	<0.001	<0.001	<0.001	<0.002	-	<0.002	<0.001	0.017	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.01	<0.05	<0.01	<0.01	<0.002	<0.001	0.001	<0.05	<0.005	<0.001	<0.002			

Statistical Summary	270	270	270	270	270	11	259	270	270	270	270	11	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270
Number of Results	270	270	270	270	270	11	259	270	270	270	270	11	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	
Number of Detects	250	251	256	262	269	11	249	216	243	231	169	1	0	229	2	228	17	0	0	1	5	1	0	0	0	4	244	254	0	0	132	0								
Minimum Concentration	<0.001	<0.001	<0.001	0.001	<0.001	0.006	<0.001	<0.002	<0.001	<0.001	<0.001	0	<0.005	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.002	<0.002	<0.005	<0.002	<0.005	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.002	<0.001	<0.001	<0.005	<0.002	<0.001	<0.002			
Minimum Detect	0.001	0.001	0.001	0.001	0.004	0.006	0.001	0.002	0.001	0.001	0.001	ND	ND	0.002	0.001	0.001	ND	ND	0.034	0.005	0.009	ND	ND	ND	ND	0.002	0.001	0.001	ND	ND	0.001	ND	ND	0.001	ND	ND	0.001	ND		
Maximum Concentration	0.59	6.1	1.2	7.3	8.4	1.21	6.2	0.21	0.17	0.15	0.13	<0.002	<0.005	0.24	<0.01	2.9	0.023	<0.01	<0.1	<0.04	0.11	<0.05	<0.1	<0.5	<0.1	<0.1	0.044	0.16	0.44	<0.5	<0.05	0.22	<0.02							
Maximum Detect	0.59	6.1	1.2	7.3	8.4	1.21	6.2	0.21	0.17	0.15	0.13	ND	ND	0.24	0.002	2.9	0.023	ND	ND	0.034	0.11	0.009	ND	ND	ND	0.002	0.001	0.001	ND	ND	0.001	ND	ND	0.001	ND	ND	0.001	ND		
Average Concentration	0.07	0.15	0.087	0.24	0.54	0.32	0.23	0.024	0.021	0.019	0.006	0.001	0.003	0.033	6E-04	0.034	0.001	6E-04	0.009	0.004	0.004	0.007	0.019	0.036	0.007	0.016	0.002	0.029	0.058	0.064	0.004	0.009	0.002							
Median Concentration	0.041	0.03	0.03	0.064	0.21	0.16	0.071	0.01	0.008	0.007	0.002	0.001	0.003	0.02	5E-04	0.006	5E-04	5E-04	0.003	0.001	0.001	0.003	0.005	0.025	0.005	0.001	0.015	0.024	0.025	0.003	0.001	0.001								
Standard Deviation	0.1	0.59	0.15	0.73	0.95	0.41	0.63	0.029	0.032	0.028	0.013	6E-05	0	0.041	6E-04	0.19	0.002	5E-04	0.01	0.005	0.009	0.009	0.021	0.05	0.01	0.019	0.003	0.035	0.081	0.087	0.005	0.029	0.002							
Number of Guideline Exceedances	0	55	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Number of Guideline Exceedances (Detects Only)	0	55	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

A Health-based guidance values for recreation water Based on Australian Government Department of Health 2017

Table B7\_Analytical Data - Acid Sulfate Soils

pH <sub>KCL</sub>	s-TAA	TAA	CRS	a-CRS	S <sub>HCL</sub>	S <sub>KCL</sub>	S <sub>NAS</sub>	ANC <sub>BT</sub>	a-ANC
0.1	0.01	5	0.005	3	0.005	0.005	0.005	0.05	10
LOR									
ASSMAC (1998) Action Criteria >1000 tonnes Coarse to Fine Texture									
ASSMAC (1998) Action Criteria 1-1000 tonnes Coarse Texture									
ASSMAC (1998) Action Criteria 1-1000 tonnes Medium Texture									
ASSMAC (1998) Action Criteria 1-1000 tonnes Fine Texture									

Location Code	Field ID	Sample Depth	Sample Type	SampleCode	Lab Report	pH <sub>KCL</sub>	s-TAA	TAA	CRS	a-CRS	S <sub>HCL</sub>	S <sub>KCL</sub>	S <sub>NAS</sub>	ANC <sub>BT</sub>	a-ANC
GW12s	GW12s 2.0-2.1	2-2.1	Normal	207605-12	207605	8.2	<0.01	<5	0.36	220	<0.005	0.051	<0.005	0.96	-
GW12s	GW12s 4.0-4.1	4-4.1	Normal	207605-14	207605	8.8	<0.01	<5	0.32	200	<0.005	0.052	<0.005	0.71	-
GW12s	GW12s 6.0-6.1	6-6.1	Normal	207605-16	207605	8.4	<0.01	<5	0.2	120	<0.005	0.036	<0.005	0.08	-
GW14d	GW14d 0.5	0.5	Normal	204762-5	204762	6.3	<0.01	<5	<0.005	<3	<0.005	0.007	<0.005	<0.05	-
GW14d	GW14d 2.5	2.5	Normal	204762-8	204762	5.8	<0.01	<5	<0.005	<3	<0.005	0.005	<0.005	<0.05	-
GW14d	GW14d 5.5	5.5	Normal	204762-11	204762	5.1	<0.01	<5	<0.005	<3	<0.005	0.011	<0.005	<0.05	-
GW23d	GW23d 0.5	0.5	Normal	207583-2	207583	8.8	<0.01	<5	0.02	11	<0.005	0.009	<0.005	1.1	-
GW23d	GW23d 1.5	1.5	Normal	207583-4	207583	7.8	<0.01	<5	0.02	10	<0.005	0.007	<0.005	0.35	-
GW23d	GW23d 2.5	2.5	Normal	207583-5	207583	11.4	<0.01	<5	0.02	15	<0.005	0.12	<0.005	5.4	-
GW23d	GW23d 4.0	4	Normal	207583-7	207583	8.8	<0.01	<5	0.01	7	<0.005	0.008	<0.005	0.76	-
GW23d	QC1019	1.5	Field D	207583-8	207583	7.5	<0.01	<5	<0.005	<3	<0.005	0.005	<0.005	0.56	-
GW25s	GW25s 0.5-0.6	0.5-0.6	Normal	205509-2	205509	7.9	<0.01	<5	0.008	5	<0.005	0.008	<0.005	0.05	-
GW25s	GW25s 1.5-1.6	1.5-1.6	Normal	205509-4	205509	6.3	<0.01	<5	0.16	100	<0.005	0.041	<0.005	<0.05	-
GW25s	GW25s 2.5-2.6	2.5-2.6	Normal	205509-5	205509	8.4	<0.01	<5	0.46	290	<0.005	0.046	<0.005	1	-
GW25s	GW25s 3.5-3.6	3.5-3.6	Normal	205509-6	205509	8.6	<0.01	<5	0.36	220	<0.005	0.052	<0.005	0.61	-
GW25s	GW25s 5.5-5.6	5.5-5.6	Normal	205509-8	205509	8.9	<0.01	<5	0.56	350	<0.005	0.044	<0.005	<0.05	-
GW28a	GW28a 16.5-18.0	16.5-18	Normal	214100-6	214100	6.9	<0.01	<5	0.1	63	<0.005	0.023	<0.005	<0.05	-
SG-BH-101	QC1007	9.5	Field D	205272-2	205272	9.1	<0.01	<5	0.23	150	<0.005	0.036	<0.005	1.1	-
SG-BH-101	QC2007	7.5	Interlab D	ES1834375001	ES1834375	9	<0.02	<2	0.407	254	-	-	-	5.62	1120
SG-BH-101	SG-BH-101 0.05	0.05	Normal	205272-4	205272	9.3	<0.01	<5	<0.005	<3	<0.005	0.012	<0.005	9.7	-
SG-BH-101	SG-BH-101 0.5	0.5	Normal	205272-5	205272	11.2	<0.01	<5	0.01	7	<0.005	0.06	<0.005	8.6	-
SG-BH-101	SG-BH-101 1.0	1	Normal	205272-6	205272	10.1	<0.01	<5	0.05	31	<0.005	0.036	<0.005	2.6	-
SG-BH-101	SG-BH-101 1.5	1.5	Normal	205272-7	205272	9.2	<0.01	<5	0.2	130	<0.005	0.033	<0.005	2.1	-
SG-BH-101	SG-BH-101 2.5	2.5	Normal	205272-8	205272	9.1	<0.01	<5	0.24	150	<0.005	0.037	<0.005	1.7	-
SG-BH-101	SG-BH-101 3.5	3.5	Normal	205272-9	205272	9.1	<0.01	<5	0.27	170	<0.005	0.037	<0.005	1.2	-
SG-BH-101	SG-BH-101 4.5	4.5	Normal	205272-10	205272	9.2	<0.01	<5	0.16	100	<0.005	0.029	<0.005	0.86	-
SG-BH-101	SG-BH-101 5.5	5.5	Normal	205272-11	205272	9.1	<0.01	<5	0.16	97	<0.005	0.033	<0.005	0.98	-
SG-BH-101	SG-BH-101 6.5	6.5	Normal	205272-12	205272	9.2	<0.01	<5	0.29	180	<0.005	0.043	<0.005	0.98	-
SG-BH-101	SG-BH-101 7.5	7.5	Normal	205272-13	205272	9.2	<0.01	<5	0.35	220	<0.005	0.059	<0.005	0.91	-
SG-BH-101	SG-BH-101 8.5	8.5	Normal	205272-14	205272	7.4	<0.01	<5	<0.005	<3	<0.005	0.026	<0.005	0.25	-
SG-BH-101	SG-BH-101 9.5	9.5	Normal	205272-15	205272	7.3	<0.01	<5	<0.005	<3	<0.005	0.027	<0.005	0.45	-
SG-BH-107	SG-BH-107 1.5-1.6	1.5-1.6	Normal	211842-1	211842	6.6	<0.01	<5	0.26	160	<0.005	0.031	<0.005	1.2	-
SG-BH-107	SG-BH-107 2.5-2.6	2.5-2.6	Normal	211842-2	211842	9.2	<0.01	<5	0.15	96	<0.005	0.011	<0.005	1	-
SG-BH-107	SG-BH-107 3.5-3.6	3.5-3.6	Normal	211842-3	211842	8.3	<0.01	<5	0.31	190	<0.005	0.021	<0.005	0.56	-
SG-BH-109	SG-BH-109 2.5-2.6	2.5-2.6	Normal	207610-11	207610	8.6	<0.01	<5	0.34	210	<0.005	0.032	<0.005	0.5	-
SG-BH-109	SG-BH-109 3.5-3.6	3.5-3.6	Normal	207610-12	207610	8.9	<0.01	<5	0.45	280	<0.005	0.044	<0.005	1.1	-
SG-BH-109	SG-BH-109 4.0-4.1	4-4.1	Normal	207610-13	207610	8	<0.01	<5	0.93	580	<0.005	0.034	<0.005	0.35	-
SG-BH-111	SG-BH-111 0.2-0.3	0.2-0.3	Normal	207482-1	207482	10.8	<0.01	<5	0.02	10	<0.005	0.14	<0.005	12	-
SG-BH-111	SG-BH-111 1.0-1.1	1-1.1	Normal	207482-3	207482	6.3	<0.01	<5	0.58	360	<0.005	0.06	<0.005	<0.05	-
SG-BH-111	SG-BH-111 2.5-2.6	2.5-2.6	Normal	207482-5	207482	8.4	<0.01	<5	1.7	1000	<0.005	0.18	<0.005	2.7	-
SG-BH-111	SG-BH-111 3.5-3.6	3.5-3.6	Normal	207482-6	207482	9	<0.01	<5	0.35	220	<0.005	0.089	<0.005	0.58	-
SG-BH-113	SG-BH-113 3.9-4.0	3.9-4	Normal	211170-7	211170	-	<0.01	<5	1.3	800	<0.005	0.076	<0.005	1.3	-
SG-BH-113	SG-BH113 5.5-5.6	5.5-5.6	Normal	211253-2	211253	7.6	<0.01	<5	0.14	89	<0.005	0.015	<0.005	<0.05	-
SG-BH-113	SG-BH113 7.5-7.6	7.5-7.6	Normal	211253-4	211253	6.7	<0.01	<5	0.01	7	<0.005	<0.005	<0.005	<0.05	-
SG-BH-118	SG-BH-118 11.5-11.6	11.5-11.6	Normal	210983-B-56	210983-B	5.7	<0.01	<5	0.2	120	<0.005	0.092	<0.005	<0.05	-
SG-BH-118	SG-BH-118 4.5-4.6	4.5-4.6	Normal	210983-B-49	210983-B	8	<0.01	<5	0.99	620	<0.005	0.15	<0.005	2.5	-
SG-BH-118	SG-BH-118 8.5-8.6	8.5-8.6	Normal	210983-B-53	210983-B	6.8	<0.01	<5	0.05	33	<0.005	0.008	<0.005	<0.05	-
SG-BH-129	SG-BH-129 1.0-1.2	1-1.2	Normal	211442-3	211442	8	<0.01	<5	<0.005	<3	<0.005	<0.005	<0.005	<0.05	-
SG-BH-129	SG-BH-129 1.5-1.7	1.5-1.7	Normal	211442-4	211442	6.5	<0.01	<5	0.02	10	<0.005	<0.005	<0.005	<0.05	-
SG-BH-129	SG-BH-129 3.0-3.2	3-3.2	Normal	211442-6	211442	5.6	<0.01	<5	0.24	150	<0.005	0.019	<0.005	<0.05	-
SG-BH-131	QC1000	1	Field D	204652-7	204652	8.8	<0.01	<5	<0.005	<3	<0.005	0.21	<0.005	3.3	-
SG-BH-131	QC2000	2.5	Interlab D	ES1832808001	ES1832808	8.8	<0.02	<2	0.008	<10	-	-	-	1.43	286
SG-BH-131	SG-BH-131 1.0	1	Normal	204652-3	204652	8.9	<0.01	<5	<0.005	<3	<0.005	0.15	<0.005	3.7	-
SG-BH-131	SG-BH-131 1.5	1.5	Normal	204652-4	204652	9	<0.01	<5	<0.005	<3	<0.005	0.006	<0.005	0.58	-
SG-BH-131	SG-BH-131 2.5	2.5	Normal	204652-5	204652	8.8	<0.01	<5	<0.005	<3	<0.005	0.12	<0.005	1.2	-
SG-BH-132	QC2004	1.5	Interlab D	ES1832946001	ES1832946	5.3	0.05	31	0.022	14	-	-	-	-	-
SG-BH-132	SG-BH-132 0.5	0.5	Normal	204865-4	204865	8.2	<0.01	<5	<0.005	<3	<0.005	0.006	<0.005	<0.05	-
SG-BH-132	SG-BH-132 1.5	1.5	Normal	204865-6	204865	5.3	0.01	9	<0.005	<3	<0.005	0.017	<0.005	<0.05	-
SG-BH-132	SG-BH-132 3.0	3	Normal	204865-8	204865	4.8	0.02	14	0.02	10	<0.005	0.007	<0.005	<0.05	-
SG-BH-133	SG-BH-133 0.1-0.2	0.1-0.2	Normal	209805-1	209805	7.9	<0.01	<5	0.008	5	<0.005	<0.005	<0.005	2	-
SG-BH-133	SG-BH-133 1.0-1.1	1-1.1	Normal	209805-3	209805	6.9	<0.01	<5	<0.005	<3	<0.005	0.006	<0.005	0.08	-
SG-BH-133	SG-BH-133 2.5-2.6	2.5-2.6	Normal	209805-5	209805	6.4	<0.01	<5	<0.005	<3	<0.005	0.005	<0.005	<0.05	-
SG-BH-147	SG-BH-147 0.05	0.05	Normal	205506-1	205506	8.6	<0.01	<5	0.007	4	<0.005	0.007	<0.005	3.1	-
SG-BH-147	SG-BH-147 1.5	1.5	Normal	205506-2	205506	7.8	<0.01	<5	0.12	77	<0.005	0.086	<0.005	0.73	-
SG-BH-147	SG-BH-147 10.5	10.5	Normal	205506-11	205506	6.5	<0.01	<5	0.008	5	<0.005	0.014	<0.005	<0.05	-
SG-BH-147	SG-BH-147 12.5	12.5	Normal	205506-13	205506	6.3	<0.01	<5	0.01	9	<0.005	0.034	<0.005	<0.05	-
SG-BH-147	SG-BH-147 14.5	14.5	Normal	205506-15	205506	5.7	<0.01	<5	0.06	40	<0.005	0.03	<0.005	<0.05	-
SG-BH-147	SG-BH-147 16.5	16.5	Normal	205599-4	205599	6.4	<0.01	<5	<0.005	<3	<0.005	0.023	<0.005	<0.05	-
SG-BH-147	SG-BH-147 18.0	18	Normal	205599-6	205599	6.2	<0.01	<5	<0.005	<3	<0.005	0.024	<0.005	<0.05	-
SG-BH-147	SG-BH-147 2.5	2.5	Normal	205506-3	205506	7.7	<0.01	<5							

Table B7\_Analytical Data - Acid Sulfate Soils

LOR	s-ANCP <sub>BT</sub>	s-Net Acidity	a-Net Acidity	Liming Rate	a-Net Acidity without ANCE	Liming rate without ANCE	s-Net Acidity without ANCE	Field Test	
	Sulfidic-Acid Neutral	Net Acidity (sulfur units)	Net Acidity (acidity units)	Liming Rate	Net Acidity (excluding ANCE)	Liming Rate (excluding ANCE)	s-Net Acidity without ANCE	Reaction Rate	pH (Field)
								Unit	pH Units
ASSMAC (1998) Action Criteria >1000 tonnes Coarse to Fine Texture	0.05	0.005	5	0.75	5	0.75	0.005	1	0.1
ASSMAC (1998) Action Criteria 1-1000 tonnes Coarse Texture		0.03	18						
ASSMAC (1998) Action Criteria 1-1000 tonnes Medium Texture		0.06	36						
ASSMAC (1998) Action Criteria 1-1000 tonnes Fine Texture		0.1	62						

Location Code	Field ID	Sample Depth	Sample Type	SampleCode	Lab Report	s-ANCP <sub>BT</sub>	s-Net Acidity	a-Net Acidity	Liming Rate	a-Net Acidity without ANCE	Liming rate without ANCE	s-Net Acidity without ANCE	Reaction Rate	pH (Field)	pH-H2O2
GW12s	GW12s 2.0-2.1	2-2.1	Normal	207605-12	207605	0.31	0.15	94	7	220	17	0.36	3	8.4	4.5
GW12s	GW12s 4.0-4.1	4-4.1	Normal	207605-14	207605	0.23	0.16	110	7.7	200	15	0.32	3	7.8	7.2
GW12s	GW12s 6.0-6.1	6-6.1	Normal	207605-16	207605	<0.05	0.18	100	8.9	120	9.3	0.2	3	8	2.5
GW14d	GW14d 0.5	0.5	Normal	204762-5	204762	<0.05	<0.005	<5	<0.75	<5	<0.75	<0.005	1	6.8	6.3
GW14d	GW14d 2.5	2.5	Normal	204762-8	204762	<0.05	<0.005	<5	<0.75	<5	<0.75	<0.005	1	7.4	6.2
GW14d	GW14d 5.5	5.5	Normal	204762-11	204762	<0.05	<0.005	<5	<0.75	<5	<0.75	<0.005	1	5	4.2
GW23d	GW23d 0.5	0.5	Normal	207583-2	207583	0.36	<0.005	<5	<0.75	11	0.82	0.017	1	8.2	6
GW23d	GW23d 1.5	1.5	Normal	207583-4	207583	0.11	<0.005	<5	<0.75	9.7	<0.75	0.016	1	8	7.7
GW23d	GW23d 2.5	2.5	Normal	207583-5	207583	1.7	<0.005	<5	<0.75	15	1.2	0.025	4	11.7	11.1
GW23d	GW23d 4.0	4	Normal	207583-7	207583	0.24	<0.005	<5	<0.75	7.3	<0.75	0.012	2	8	7.5
GW23d	QC1019	1.5	Field D	207583-8	207583	0.18	<0.005	<5	<0.75	<5	<0.75	<0.005	2	8	8
GW25s	GW25s 0.5-0.6	0.5-0.6	Normal	205509-2	205509	<0.05	<0.005	<5	<0.75	5.2	<0.75	0.008	2	7.6	3.6
GW25s	GW25s 1.5-1.6	1.5-1.6	Normal	205509-4	205509	<0.05	0.16	100	7.5	100	7.5	0.16	2	7.3	2.7
GW25s	GW25s 2.5-2.6	2.5-2.6	Normal	205509-5	205509	0.32	0.25	160	12	290	22	0.46	4	7.7	4.4
GW25s	GW25s 3.5-3.6	3.5-3.6	Normal	205509-6	205509	0.19	0.23	140	11	220	17	0.36	4	8.3	2.8
GW25s	GW25s 5.5-5.6	5.5-5.6	Normal	205509-8	205509	<0.05	0.56	350	26	350	26	0.56	3	7.9	2.5
GW28A	GW28a 16.5-18.0	16.5-18	Normal	214100-6	214100	<0.05	0.1	63	4.7	63	4.7	0.1	3	7.7	2.9
SG-BH-101	QC1007	9.5	Field D	205272-2	205272	0.36	<0.005	<5	<0.75	150	11	0.23	2	7.7	3.6
SG-BH-101	QC2007	7.5	Interlab D	ES1834375001	ES1834375	1.8	<0.02	<10	<1	254	19	0.41	3	8.1	2.4
SG-BH-101	SG-BH-101 0.05	0.05	Normal	205272-4	205272	3.1	<0.005	<5	<0.75	<5	<0.75	<0.005	2	8.1	7.3
SG-BH-101	SG-BH-101 0.5	0.5	Normal	205272-5	205272	2.8	<0.005	<5	<0.75	7.5	<0.75	0.012	2	11	10
SG-BH-101	SG-BH-101 1.0	1	Normal	205272-6	205272	0.82	<0.005	<5	<0.75	31	2.3	0.05	2	10	8.4
SG-BH-101	SG-BH-101 1.5	1.5	Normal	205272-7	205272	0.66	<0.005	<5	<0.75	130	9.6	0.2	3	8.6	6.7
SG-BH-101	SG-BH-101 2.5	2.5	Normal	205272-8	205272	0.53	<0.005	<5	<0.75	150	11	0.24	3	8.2	6.3
SG-BH-101	SG-BH-101 3.5	3.5	Normal	205272-9	205272	0.39	0.011	6.7	<0.75	170	13	0.27	3	7.9	3.8
SG-BH-101	SG-BH-101 4.5	4.5	Normal	205272-10	205272	0.28	<0.005	<5	<0.75	100	7.6	0.16	2	7.4	3.6
SG-BH-101	SG-BH-101 5.5	5.5	Normal	205272-11	205272	0.31	<0.005	<5	<0.75	97	7.3	0.16	3	7.5	4.9
SG-BH-101	SG-BH-101 6.5	6.5	Normal	205272-12	205272	0.31	0.089	55	4.2	180	14	0.29	4	7.3	2.9
SG-BH-101	SG-BH-101 7.5	7.5	Normal	205272-13	205272	0.29	0.15	96	7.2	220	16	0.35	2	8.8	2.1
SG-BH-101	SG-BH-101 8.5	8.5	Normal	205272-14	205272	0.08	<0.005	<5	<0.75	<5	<0.75	<0.005	2	7.3	7.4
SG-BH-101	SG-BH-101 9.5	9.5	Normal	205272-15	205272	0.15	<0.005	<5	<0.75	<5	<0.75	<0.005	2	7.3	7.5
SG-BH-107	SG-BH-107 1.5-1.6	1.5-1.6	Normal	211842-1	211842	0.37	0.012	7.4	<0.75	160	12	0.26	3	8.3	3.1
SG-BH-107	SG-BH-107 2.5-2.6	2.5-2.6	Normal	211842-2	211842	0.32	<0.005	<5	<0.75	96	7.2	0.15	1	8.1	5.4
SG-BH-107	SG-BH-107 3.5-3.6	3.5-3.6	Normal	211842-3	211842	0.18	0.19	120	8.9	190	14	0.31	3	7.9	2.3
SG-BH-109	SG-BH-109 2.5-2.6	2.5-2.6	Normal	207610-11	207610	0.16	0.23	140	11	210	16	0.34	3	7.1	2.6
SG-BH-109	SG-BH-109 3.5-3.6	3.5-3.6	Normal	207610-12	207610	0.36	0.21	130	9.9	280	21	0.45	3	7.4	3.8
SG-BH-109	SG-BH-109 4.0-4.1	4-4.1	Normal	207610-13	207610	0.11	0.85	530	40	580	44	0.93	3	7.8	2.4
SG-BH-111	SG-BH-111 0.2-0.3	0.2-0.3	Normal	207482-1	207482	3.7	<0.005	<5	<0.75	10	0.79	0.017	4	10	9.4
SG-BH-111	SG-BH-111 1.0-1.1	1-1.1	Normal	207482-3	207482	<0.05	0.58	360	27	360	27	0.58	4	6.2	3.6
SG-BH-111	SG-BH-111 2.5-2.6	2.5-2.6	Normal	207482-5	207482	0.85	1.1	700	52	1000	79	1.7	4	8.1	4.5
SG-BH-111	SG-BH-111 3.5-3.6	3.5-3.6	Normal	207482-6	207482	0.19	0.22	140	11	220	16	0.35	3	8.5	3.1
SG-BH-113	SG-BH-113 3.9-4.0	3.9-4	Normal	211170-7	211170	0.43	0.99	620	46	800	60	1.3	4	8.4	3.3
SG-BH-113	SG-BH-113 5.5-5.6	5.5-5.6	Normal	211253-2	211253	<0.05	0.14	85	6.4	89	6.7	0.14	1	7.8	2.3
SG-BH-113	SG-BH-113 7.5-7.6	7.5-7.6	Normal	211253-4	211253	<0.05	0.012	7.2	<0.75	7.2	<0.75	0.012	1	8.6	6
SG-BH-118	SG-BH-118 11.5-11.6	11.5-11.6	Normal	210983-B-56	210983-B	<0.05	0.2	130	9.6	130	9.6	0.2	1	8.7	3.2
SG-BH-118	SG-BH-118 4.5-4.6	4.5-4.6	Normal	210983-B-49	210983-B	0.79	0.45	290	22	620	47	0.99	4	8.6	3.1
SG-BH-118	SG-BH-118 8.5-8.6	8.5-8.6	Normal	210983-B-53	210983-B	<0.05	0.053	33	2.5	33	2.5	0.053	3	8.1	2.4
SG-BH-129	SG-BH-129 1.0-1.2	1-1.2	Normal	211442-3	211442	<0.05	<0.005	<5	<0.75	<5	<0.75	<0.005	3	7.5	1.7
SG-BH-129	SG-BH-129 1.5-1.7	1.5-1.7	Normal	211442-4	211442	<0.05	0.015	9.6	<0.75	9.6	<0.75	0.015	1	7.4	4.1
SG-BH-129	SG-BH-129 3.0-3.2	3-3.2	Normal	211442-6	211442	<0.05	0.24	150	11	150	11	0.24	3	7.5	1.7
SG-BH-131	QC1000	1	Field D	204652-7	204652	1.1	<0.005	<5	<0.75	<5	<0.75	<0.005	2	7.6	7.2
SG-BH-131	QC2000	2.5	Interlab D	ES1832808001	ES1832808	0.46	<0.02	<10	<1	<10	<1	<0.02	2	7.8	6
SG-BH-131	SG-BH-131 1.0	1	Normal	204652-3	204652	1.2	<0.005	<5	<0.75	<5	<0.75	<0.005	2	7.7	6.6
SG-BH-131	SG-BH-131 1.5	1.5	Normal	204652-4	204652	0.19	<0.005	<5	<0.75	<5	<0.75	<0.005	1	8	6.5
SG-BH-131	SG-BH-131 2.5	2.5	Normal	204652-5	204652	0.39	<0.005	<5	<0.75	<5	<0.75	<0.005	2	7.7	7.3
SG-BH-132	QC2004	1.5	Interlab D	ES1832946001	ES1832946	-	0.07	44	3	44	3	0.07	2	5.6	4.1
SG-BH-132	SG-BH-132 0.5	0.5	Normal	204865-4	204865	<0.05	<0.005	<5	<0.75	<5	<0.75	<0.005	2	7.3	5.9
SG-BH-132	SG-BH-132 1.5	1.5	Normal	204865-6	204865	<0.05	0.017	10	0.78	10	0.78	0.017	2	5.4	2.7
SG-BH-132	SG-BH-132 3.0	3	Normal	204865-8	204865	<0.05	0.038	23	1.8	23	1.8	0.038	1	6	3.9
SG-BH-133	SG-BH-133 0.1-0.2	0.1-0.2	Normal	209805-1	209805	0.66	<0.005	<5	<0.75	5.2	<0.75	0.008	3	7.2	7.6
SG-BH-133	SG-BH-133 1.0-1.1	1-1.1	Normal	209805-3	209805	<0.05	<0.005	<5	<0.75	<5	<0.75	<0.005	1	6.9	4.9
SG-BH-133	SG-BH-133 2.5-2.6	2.5-2.6	Normal	209805-5	209805	<0.05	<0.005	<5	<0.75	<5	<0.75	<0.005	2	7	4.1
SG-BH-147	SG-BH-147 0.05	0.05	Normal	205506-1	205506	0.98	<0.005	<5	<0.75	<5	<0.75	0.007	2	7	6.2
SG-BH-147	SG-BH-147 1.5	1.5	Normal	205506-2	205506	0.24	<0.005	<5	<0.75	77	5.8	0.12	2	6.8	4.4
SG-BH-147	SG-BH-147 10.5	10.5	Normal	205506-11	205506	<0.05	0.008	<5	<0.75	<5	<0.75	0.008	1	7.7	4
SG-BH-147	SG-BH-147 12.5	12.5	Normal	205506-13	205506	<0.05	0.014	8.9	<0.75	8.9	<0.75	0.014	3	6.6	5.8
SG-BH-147	SG-BH-147 14.5	14.5	Normal	205506-15	205506	<0.05	0.071	44	3.3	44	3.3	0.071	2	5.9	4.4
SG-BH-147	SG-BH-147 16.5	16.5	Normal	205599-4	205599	<0.05	<0.005	<5	<0.75	<5	<0.75	<0.005	4	6.3	6.3
SG-BH-147	SG-BH-147 18.0	18	Normal	205599-6	205599	<0.05	<0.005	<5	<0.75	<5	<0.75	<0.005	4	6.2	5.5
SG-BH-147	SG-BH-147 2.5	2.5	Normal	205506-5	205506	0.26	0.23	180	13	280	21	0.46	4	7	4
SG-BH-147	SG-BH-147 3.5	3.5	Normal	205506-4	205506	0.97	<0.005	<5	<0.75	130	9.5	0.2	3	7.5	6
SG-BH-147	SG-BH-147 4.5	4.5	Normal	205506-5	205506	1.4	&								

Appendix B

Table B8 Groundwater aggressivity comparison table steel piles

Monitoring Well ID	sampling dates	Sulfate (mg/L)	pH	Chloride (mg/L)	Soil condition A high permeability soil (sand, gravel) that are in groundwater
34 TL3	13/02/2019	<1	7.17	2800	Mild
34 TL3	19/02/2019	2	7.22	2900	Mild
34 TL3	26/02/2019	<1	7.24	2600	Mild
34 TL3	6/03/2019	6	7.33	2700	Mild
34 TL3	12/03/2019	2	7.28	2400	Mild
34 TL3	16/04/2019	<1	7.21	2900	Mild
34 TL3	16/04/2019	-	7.21	3030	Mild
GW100s	21/02/2019	48	5.79	58	Non-aggressive
GW100s	8/03/2019	41	5.56	63	Non-aggressive
GW100s	11/04/2019	51	5.69	56	Non-aggressive
GW101	8/01/2019	37	6.52	32	Non-aggressive
GW101	11/02/2019	51	6.4	29	Non-aggressive
GW101	8/03/2019	43	6.01	27	Non-aggressive
GW101	15/04/2019	38	6.56	32	Non-aggressive
GW101	11/02/2019	-	6.4	34	Non-aggressive
GW102	8/01/2019	20	5.18	28	Non-aggressive
GW102	11/02/2019	18	5.09	26	Non-aggressive
GW102	8/03/2019	15	4.87	23	Mild
GW102	17/04/2019	16	5.16	23	Non-aggressive
GW102	8/03/2019	-	4.87	29	Mild
GW103	21/02/2019	19	5.51	220	Non-aggressive
GW103	8/03/2019	14	5.12	19	Non-aggressive
GW103	17/04/2019	21	5.97	23	Non-aggressive
GW103	17/04/2019	26	5.97	23	Non-aggressive
GW104	20/12/2018	-	6.25	86*	Non-aggressive
GW104	7/02/2019	53	6.08	86	Non-aggressive
GW104	10/04/2019	42	6.11	85	Non-aggressive
GW10s	10/01/2019	-	7.22	42	Non-aggressive
GW10s	14/02/2019	-	6.91	42*	Non-aggressive
GW10s	8/03/2019	48	7.05	37	Non-aggressive
GW10s	9/04/2019	55	7.03	42	Non-aggressive
GW10s	9/04/2019	54.1	7.03	40.2	Non-aggressive
GW11d	1/03/2019	2100	6.04	12000	Moderate
GW11d	16/04/2019	400	6.92	2500	Mild
GW11s	24/01/2018	18	7.35	48	Non-aggressive
GW11s	11/02/2019	-	7.25	48	Non-aggressive
GW11s	13/03/2019	3	7.22	41	Non-aggressive
GW11s	16/04/2019	2	7.42	42	Non-aggressive
GW11s	11/02/2019	-	7.4	48	Non-aggressive
GW13d	20/12/2018	-	7.19	120*	Non-aggressive
GW13d	8/02/2019	-	7.26	120*	Non-aggressive
GW13d	11/04/2019	35	7.2	120	Non-aggressive
GW13s	20/12/2018	-	6.28	39*	Non-aggressive
GW13s	8/02/2019	-	6.22	39*	Non-aggressive
GW13s	11/04/2019	7	6.31	39	Non-aggressive
GW14d	20/12/2018	-	12.3	170*	Non-aggressive
GW14d	7/02/2019	-	12.2	170*	Non-aggressive
GW14d	10/04/2019	62	12.36	170	Non-aggressive
GW14d	20/12/2018	-	12.3	170*	Non-aggressive
GW14s	10/01/2019	-	6.09	32*	Non-aggressive
GW14s	7/02/2019	-	6.17	32*	Non-aggressive
GW14s	10/04/2019	66	6.12	32	Non-aggressive
GW14s	7/02/2019	-	6.27	32*	Non-aggressive
GW14s	10/04/2019	67	6.2	32	Non-aggressive
GW15d	7/02/2019	-	6.23	390*	Non-aggressive
GW15d	10/04/2019	150	6.19	390	Non-aggressive
GW15s	20/12/2018	-	5.79	140*	Non-aggressive
GW15s	7/02/2019	-	5.7	140*	Non-aggressive
GW15s	10/04/2019	82	5.80	140	Non-aggressive
GW17d	28/03/2019	5	7.05	240	Non-aggressive
GW17d	15/04/2019	<1	6.98	180	Non-aggressive
GW201	24/01/2019	-	5.89	-	-
GW203	9/01/2019	24	5.92	43	Non-aggressive
GW203	13/02/2019	-	6.01	53*	Non-aggressive
GW203	11/03/2019	18	5.72	50	Non-aggressive
GW203	17/04/2019	20	5.82	53	Non-aggressive
GW204	24/01/2019	-	6.73	53*	Non-aggressive
GW204	24/01/2019	-	6.73	53*	Non-aggressive

GW205	24/01/2019	-	6.89	-	-
GW22s	9/04/2019	290	5.56	130	Non-aggressive
GW23d	17/01/2019	<1	7.52	360	Non-aggressive
GW23d	12/02/2019	2	7.52	310	Non-aggressive
GW23d	9/04/2019	7	7.5	380	Non-aggressive
GW24s	13/03/2019	1100	6.57	8700	Mild
GW24s	12/04/2019	540	6.40	4100	Mild
GW25s	9/01/2019	630	7.06	9600	Mild
GW25s	14/02/2019	280	7.05	8200	Mild
GW25s	6/03/2019	150	7.4	6500	Mild
GW25s	17/04/2019	180	7.02	7100	Mild
GW25s	9/01/2019	-	7.06	10400	Moderate
GW27s	17/01/2019	750	6.98	11000	Moderate
GW27s	22/02/2019	340	7.09	8300	Mild
GW27s	16/04/2019	220	6.95	7900	Mild
GW27s	22/02/2019	-	7.09	7460	Mild
GW28A	16/04/2019	2	6.6	1400	Mild
GW2d	11/03/2019	34	7.02	77	Non-aggressive
GW2d	9/04/2019	59	6.99	75	Non-aggressive
GW2s	17/01/2019	-	6.9	95*	Non-aggressive
GW2s	11/02/2019	-	6.91	95*	Non-aggressive
GW2s	8/03/2019	45	6.9	78	Non-aggressive
GW2s	9/04/2019	5	6.79	95	Non-aggressive
GW2s	17/01/2019	-	6.9	95*	Non-aggressive
GW4d	21/02/2019	71	7.04	130	Non-aggressive
GW4d	13/03/2019	55	7.31	110	Non-aggressive
GW4d	15/04/2019	53	6.96	130	Non-aggressive
GW4i	21/02/2019	17	7.2	210	Non-aggressive
GW4i	13/03/2019	2	7.26	170	Non-aggressive
GW4i	15/04/2019	3	7.19	220	Non-aggressive
GW5d	28/02/2019	1300	6.24	13000	Moderate
GW5d	12/03/2019	1300	6.46	13000	Moderate
GW5d	16/04/2019	1500	5.57	16000	Moderate
GW5s	8/01/2019	<1	7.34	110	Non-aggressive
GW5s	12/02/2019	2	7.37	120	Non-aggressive
GW5s	12/03/2019	2	7.1	110	Non-aggressive
GW5s	16/04/2019	<1	7.42	97	Non-aggressive
GW5s	8/01/2019	35	7.34	32	Non-aggressive
GW7	8/04/2019	3	8.43	640	Non-aggressive
GW8	28/02/2019	14	7.06	150	Non-aggressive
GW8	12/03/2019	3	7.06	150	Non-aggressive
GW9	18/04/2019	23	7.4	210	Non-aggressive
MPE 11	12/12/2018	3	7.1	1800	Mild
MPE 11	13/02/2019	5	7.18	2000	Mild
MPE 11	18/02/2019	2	7.1	2100	Mild
MPE 11	25/02/2019	25	7.1	2400	Mild
MPE 11	5/03/2019	4	7.13	2100	Mild
MPE 11	11/03/2019	14	7.09	2100	Mild
MPE 2	11/12/2018	1800	6.61	18000	Moderate
MPE 2	13/02/2019	1400	6.94	12000	Moderate
MPE 2	19/02/2019	1900	6.73	18000	Moderate
MPE 2	26/02/2019	1500	6.83	14000	Moderate
MPE 2	6/03/2019	1400	7.24	12000	Moderate
MPE 2	12/03/2019	1300	7.18	10000	Moderate
MPE 2	12/03/2019	1400	7.18	11000	Moderate
MPE 21	12/12/2018	4	6.93	200	Non-aggressive
MPE 21	12/02/2019	18	6.64	230	Non-aggressive
MPE 21	18/02/2019	63	6.74	640	Non-aggressive
MPE 21	25/02/2019	47	6.86	430	Non-aggressive
MPE 21	4/03/2019	14	6.8	270	Non-aggressive
MPE 21	11/03/2019	27	6.79	330	Non-aggressive
MPE 3	11/12/2018	2100	7.04	16000	Moderate
MPE 3	13/02/2019	2000	7.01	15000	Moderate
MPE 3	19/02/2019	2100	7.1	16000	Moderate
MPE 3	26/02/2019	2000	6.99	15000	Moderate
MPE 3	6/03/2019	2000	7.02	14000	Moderate
MPE 3	12/03/2019	1900	7.09	14000	Moderate
MPE 4	13/02/2019	840	6.89	7100	Mild
MPE 4	19/02/2019	720	6.97	6300	Mild
MPE 4	26/02/2019	770	6.99	6400	Mild
MPE 4	5/03/2019	810	6.88	7000	Mild
MPE 4	12/03/2019	660	7.28	5300	Mild
MPE 5	11/12/2018	430	7.22	6000	Mild
MPE 5	13/02/2019	340	7.05	5200	Mild
MPE 5	19/02/2019	380	7.12	5800	Mild
MPE 5	26/02/2019	290	7.16	4500	Mild

MPE 5	5/03/2019	350	7.21	5300	Mild
MPE 5	11/03/2019	410	7.24	5300	Mild
MPE 5A	11/12/2018	1500	6.66	13000	Moderate
MPE 5A	13/02/2019	1400	6.65	11000	Moderate
MPE 5A	19/02/2019	1900	6.49	15000	Moderate
MPE 5A	26/02/2019	1600	6.6	13000	Moderate
MPE 5A	5/03/2019	1500	6.74	13000	Moderate
MPE 5A	12/03/2019	1700	6.68	13000	Moderate
MPE 6	11/12/2018	460	7.49	5600	Mild
MPE 6	13/02/2019	860	7.04	10000	Moderate
MPE 6	18/02/2019	520	7.3	7200	Mild
MPE 6	25/02/2019	640	7.27	7800	Mild
MPE 6	5/03/2019	850	7.24	9700	Mild
MPE 6	11/03/2019	520	7.37	6800	Mild
MPE 6	11/03/2019	530	7.37	7000	Mild
MPE 7	12/12/2018	1200	6.78	8500	Mild
MPE 7	12/02/2019	1100	6.72	8100	Mild
MPE 7	18/02/2019	1200	6.75	8900	Mild
MPE 7	25/02/2019	970	6.76	7300	Mild
MPE 7	4/03/2019	1500	6.71	11000	Moderate
MPE 7	11/03/2019	660	6.94	4900	Mild
MPE 8	12/12/2018	1100	6.58	13000	Moderate
MPE 8	12/02/2019	940	6.7	11000	Moderate
MPE 8	18/02/2019	1300	6.62	14000	Moderate
MPE 8	25/02/2019	1100	6.68	12000	Moderate
MPE 8	4/03/2019	520	6.97	6700	Mild
MPE 8	11/03/2019	780	6.76	9500	Mild
MPE 8	25/02/2019	1100	6.68	12000	Moderate
MPE 9	12/12/2018	610	7.41	3800	Mild
MPE 9	12/02/2019	880	7.14	6400	Mild
MPE 9	18/02/2019	950	7.22	7100	Mild
MPE 9	25/02/2019	910	7.2	7100	Mild
MPE 9	4/03/2019	1100	7.23	8300	Mild
MPE 9	11/03/2019	1100	7.18	8500	Mild
MPI 10	11/12/2018	<1	6.96	280	Non-aggressive
MPI 10	13/02/2019	<1	6.85	200	Non-aggressive
MPI 10	19/02/2019	<1	6.83	200	Non-aggressive
MPI 10	26/02/2019	<1	6.99	190	Non-aggressive
MPI 10	5/03/2019	<1	6.89	190	Non-aggressive
MPI 10	11/03/2019	<1	6.89	180	Non-aggressive
MPI 12	11/12/2018	39	7.19	110	Non-aggressive
MPI 12	13/02/2019	26	7.11	110	Non-aggressive
MPI 12	18/02/2019	27	7.03	120	Non-aggressive
MPI 12	28/02/2019	22	7.06	110	Non-aggressive
MPI 12	5/03/2019	14	7.07	120	Non-aggressive
MPI 12	11/03/2019	12	6.73	120	Non-aggressive
MPI 12	11/12/2018	39	7.02	110	Non-aggressive
MPI 13	11/12/2018	<1	6.97	180	Non-aggressive
MPI 13	12/02/2019	<1	6.77	210	Non-aggressive
MPI 13	18/02/2019	<1	6.89	210	Non-aggressive
MPI 13	28/02/2019	10	6.93	190	Non-aggressive
MPI 13	4/03/2019	7	6.89	190	Non-aggressive
MPI 13	11/03/2019	1	6.97	170	Non-aggressive
MPI 13	18/02/2019	-	6.92	8980	Mild
MPI 13	28/02/2019	-	6.93	244	Non-aggressive
MPI 14	12/12/2018	<1	6.99	460	Non-aggressive
MPI 14	12/02/2019	<1	6.95	470	Non-aggressive
MPI 14	18/02/2019	<1	7.12	430	Non-aggressive
MPI 14	25/02/2019	<1	7.1	410	Non-aggressive
MPI 14	4/03/2019	<1	7.13	430	Non-aggressive
MPI 14	11/03/2019	<1	7.22	370	Non-aggressive
MPI 14	12/02/2019	-	6.95	777	Non-aggressive
MPI 15	18/02/2019	19	-	210	Non-aggressive
MPI 15	12/12/2018	31	7.22	260	Non-aggressive
MPI 15	12/02/2019	32	6.82	200	Non-aggressive
MPI 15	25/02/2019	25	7.02	190	Non-aggressive
MPI 15	4/03/2019	13	6.95	190	Non-aggressive
MPI 15	11/03/2019	11	7.02	180	Non-aggressive
MPI 15	18/02/2019	18	6.99	210	Non-aggressive
MPI 15	25/02/2019	-	7.02	262	Non-aggressive
MPI 16	12/12/2018	1300	6.77	14000	Moderate
MPI 16	12/02/2019	<1	7.1	4200	Mild
MPI 16	18/02/2019	1800	6.53	17000	Moderate
MPI 16	25/02/2019	1400	6.98	14000	Moderate
MPI 16	4/03/2019	210	7.2	5200	Mild
MPI 16	11/03/2019	32	7.31	4500	Mild

MPI 17	12/02/2019	1	7.2	660	Non-aggressive
MPI 17	18/02/2019	<1	7.32	700	Non-aggressive
MPI 17	25/02/2019	1	7.27	650	Non-aggressive
MPI 17	4/03/2019	8	7.28	650	Non-aggressive
MPI 17	11/03/2019	3	7.27	630	Non-aggressive
MPI 17	12/02/2019	<1	7.2	670	Non-aggressive
MPI 17	4/03/2019	8	7.28	670	Non-aggressive
MPI 18	13/12/2018	3	7.36	790	Non-aggressive
MPI 18	12/02/2019	1	-	720	Non-aggressive
MPI 18	13/02/2019	2	7.17	730	Non-aggressive
MPI 18	18/02/2019	2	7.29	760	Non-aggressive
MPI 18	25/02/2019	<1	7.38	710	Non-aggressive
MPI 18	4/03/2019	<1	7.27	700	Non-aggressive
MPI 18	11/03/2019	6	7.31	680	Non-aggressive
MPI 18	4/03/2019	-	7.27	907	Non-aggressive
MPI 2	13/12/2018	13	7.46	1500	Mild
MPI 2	13/02/2019	37	7.44	1600	Mild
MPI 2	19/02/2019	75	7.37	2200	Mild
MPI 2	26/02/2019	2	7.45	1200	Mild
MPI 2	6/03/2019	49	7.42	1800	Mild
MPI 2	12/03/2019	2	7.43	1200	Mild
MPI 2	6/03/2019	52	7.42	1800	Mild
MPI 20	11/03/2019	3	7.25	420	Non-aggressive
MPI 20	12/12/2018	<1	7.28	500	Non-aggressive
MPI 20	18/02/2019	<1	7.26	500	Non-aggressive
MPI 20	25/02/2019	<1	7.35	430	Non-aggressive
MPI 20	4/03/2019	<1	7.3	440	Non-aggressive
MPI 20	12/02/2019	1	7.33	480	Non-aggressive
MPI 3A	11/12/2018	1200	7.04	8600	Mild
MPI 3A	13/02/2019	810	7.09	6600	Mild
MPI 3A	19/02/2019	970	7.16	7800	Mild
MPI 3A	26/02/2019	82	7.43	980	Non-aggressive
MPI 3A	6/03/2019	160	7.45	1800	Mild
MPI 3A	12/03/2019	87	7.48	940	Non-aggressive
MPI 4	12/12/2018	2500	6.79	8600	Mild
MPI 4	13/02/2019	2300	6.84	7900	Mild
MPI 4	19/02/2019	2500	6.79	7500	Mild
MPI 4	26/02/2019	1900	6.82	1700	Mild
MPI 4	6/03/2019	2400	6.84	8400	Mild
MPI 4	12/03/2019	2300	6.88	9100	Mild
MPI 4A	11/12/2018	1	7.45	620	Non-aggressive
MPI 4A	13/02/2019	<1	7.44	570	Non-aggressive
MPI 4A	19/02/2019	3	7.51	610	Non-aggressive
MPI 4A	26/02/2019	<1	7.5	530	Non-aggressive
MPI 4A	5/03/2019	<1	7.53	570	Non-aggressive
MPI 4A	12/03/2019	<1	7.53	510	Non-aggressive
MPI 5	12/12/2018	3	7.22	2600	Mild
MPI 6A	13/02/2019	<1	7.27	1100	Mild
MPI 6A	19/02/2019	<1	7.24	1000	Mild
MPI 6A	26/02/2019	3	7.25	870	Non-aggressive
MPI 6A	5/03/2019	7	7.25	970	Non-aggressive
MPI 6A	12/03/2019	3	7.26	780	Non-aggressive
SG-BHHT-03	17/04/2019	2	6.95	300	Non-aggressive
SG-BHHT-04	15/04/2019	<1	6.68	140	Non-aggressive
WCX GTY BH 002	19/12/2018	-	5.79	99*	Non-aggressive
WCX GTY BH 002	28/02/2019	94	5.41	90	Non-aggressive
WCX GTY BH 002	15/03/2019	82	5.76	66	Non-aggressive
WCX GTY BH 002	11/04/2019	86	5.61	99	Non-aggressive
WCX GTY BH 003	8/03/2019	52	6.7	180	Non-aggressive
WCX GTY BH 004	15/03/2019	-	6.24	40	Non-aggressive
WCX GTY BH 004	28/02/2019	53	5.99	56	Non-aggressive
WCX GTY BH 004	15/03/2019	32	6.24	35	Non-aggressive
WCX GTY BH 004	17/04/2019	60	6.11	52	Non-aggressive
WCX GTY BH 009d	17/12/2018	-	6.26	20000*	Moderate
WCX GTY BH 009d	13/02/2019	-	6.75	20000*	Moderate
WCX GTY BH 009d	15/03/2019	32	6.75	3400	Mild
WCX GTY BH 009d	11/04/2019	1700	6.29	20000	Moderate
WCX GTY BH 009s	17/12/2018	-	6.64	1100*	Mild
WCX GTY BH 009s	13/02/2019	-	6.6	1100*	Mild
WCX GTY BH 009s	6/03/2019	10	6.68	1100	Mild
WCX GTY BH 009s	11/04/2019	1	6.59	1100	Mild
WCX GTY BH 027	22/02/2019	-	6.67	1100*	Mild
WCX GTY BH 027	17/01/2019	-	6.39	1100*	Mild
WCX GTY BH 027	22/02/2019	-	6.67	1100*	Mild
WCX GTY BH 027	16/04/2019	68	6.45	1100	Mild
WCX GTY BH 033	11/04/2019	53	6.1	190	Non-aggressive

WCX GTY BH 033	19/12/2018	-	5.75	210*	Non-aggressive
WCX GTY BH 033	19/12/2018	-	5.75	210*	Non-aggressive
WCX GTY BH 033	13/02/2019	-	6.29	210*	Non-aggressive
WCX GTY BH 033	11/04/2019	58	6.07	210	Non-aggressive

\*missing chloride values, replaced by the maximum values from the corresponding well

## Appendix B

Table B9 Groundwater aggressivity comparison table- concrete piles

Monitoring well ID	sampling dates	Sulfate (mg/L)	pH	Chloride (mg/L)	Soil Condition A high permeability soil (sand, gravel) that are in groundwater
34 TL3	13/02/2019	<1	7.17	2800	Mild
34 TL3	19/02/2019	2	7.22	2900	Mild
34 TL3	26/02/2019	<1	7.24	2600	Mild
34 TL3	6/03/2019	6	7.33	2700	Mild
34 TL3	12/03/2019	2	7.28	2400	Mild
34 TL3	16/04/2019	<1	7.21	2900	Mild
34 TL3	16/04/2019	-	7.21	3030	Mild
GW100s	21/02/2019	48	5.79	58	Mild
GW100s	8/03/2019	41	5.56	63	Mild
GW100s	11/04/2019	51	5.69	56	Mild
GW101	8/01/2019	37	6.52	32	Mild
GW101	11/02/2019	51	6.4	29	Mild
GW101	8/03/2019	43	6.01	27	Mild
GW101	15/04/2019	38	6.56	32	Mild
GW101	11/02/2019	-	6.4	34	Mild
GW102	8/01/2019	20	5.18	28	Moderate
GW102	11/02/2019	18	5.09	26	Moderate
GW102	8/03/2019	15	4.87	23	Moderate
GW102	17/04/2019	16	5.16	23	Moderate
GW102	8/03/2019	-	4.87	29	Moderate
GW103	21/02/2019	19	5.51	220	Mild
GW103	8/03/2019	14	5.12	19	Moderate
GW103	17/04/2019	21	5.97	23	Mild
GW103	17/04/2019	26	5.97	23	Mild
GW104	20/12/2018	-	6.25	86*	Mild
GW104	7/02/2019	53	6.08	86	Mild
GW104	10/04/2019	42	6.11	85	Mild
GW10s	10/01/2019	-	7.22	42	Mild
GW10s	14/02/2019	-	6.91	42*	Mild
GW10s	8/03/2019	48	7.05	37	Mild
GW10s	9/04/2019	55	7.03	42	Mild
GW10s	9/04/2019	54.1	7.03	40.2	Mild
GW11d	1/03/2019	2100	6.04	12000	Severe
GW11d	16/04/2019	400	6.92	2500	Mild
GW11s	24/01/2018	18	7.35	48	Mild
GW11s	11/02/2019	-	7.25	48	Mild
GW11s	13/03/2019	3	7.22	41	Mild
GW11s	16/04/2019	2	7.42	42	Mild
GW11s	11/02/2019	-	7.4	48	Mild
GW13d	20/12/2018	-	7.19	120*	Mild
GW13d	8/02/2019	-	7.26	120*	Mild
GW13d	11/04/2019	35	7.2	120	Mild
GW13s	20/12/2018	-	6.28	39*	Mild
GW13s	8/02/2019	-	6.22	39*	Mild
GW13s	11/04/2019	7	6.31	39	Mild
GW14d	20/12/2018	-	12.3	170*	Mild
GW14d	7/02/2019	-	12.2	170*	Mild
GW14d	10/04/2019	62	12.36	170	Mild
GW14d	20/12/2018	-	12.3	170*	Mild
GW14s	10/01/2019	-	6.09	32*	Mild
GW14s	7/02/2019	-	6.17	32*	Mild
GW14s	10/04/2019	66	6.12	32	Mild
GW14s	7/02/2019	-	6.27	32*	Mild
GW14s	10/04/2019	67	6.2	32	Mild
GW15d	7/02/2019	-	6.23	390*	Mild
GW15d	10/04/2019	150	6.19	390	Mild
GW15s	20/12/2018	-	5.79	140*	Mild
GW15s	7/02/2019	-	5.7	140*	Mild
GW15s	10/04/2019	82	5.80	140	Mild
GW17d	28/03/2019	5	7.05	240	Mild
GW17d	15/04/2019	<1	6.98	180	Mild
GW201	24/01/2019	-	5.89	-	Mild
GW203	9/01/2019	24	5.92	43	Mild
GW203	13/02/2019	-	6.01	53*	Mild
GW203	11/03/2019	18	5.72	50	Mild
GW203	17/04/2019	20	5.82	53	Mild
GW204	24/01/2019	-	6.73	53*	Mild
GW204	24/01/2019	-	6.73	53*	Mild

## Appendix B

Table B9 Groundwater aggressivity comparison table- concrete piles

Monitoring well ID	sampling dates	Sulfate (mg/L)	pH	Chloride (mg/L)	Soil Condition A high permeability soil (sand, gravel) that are in groundwater
GW205	24/01/2019	-	6.89	-	Mild
GW22s	9/04/2019	290	5.56	130	Mild
GW23d	17/01/2019	<1	7.52	360	Mild
GW23d	12/02/2019	2	7.52	310	Mild
GW23d	9/04/2019	7	7.5	380	Mild
GW24s	13/03/2019	1100	6.57	8700	Moderate
GW24s	12/04/2019	540	6.40	4100	Mild
GW25s	9/01/2019	630	7.06	9600	Moderate
GW25s	14/02/2019	280	7.05	8200	Moderate
GW25s	6/03/2019	150	7.4	6500	Moderate
GW25s	17/04/2019	180	7.02	7100	Moderate
GW25s	9/01/2019	-	7.06	10400	Moderate
GW27s	17/01/2019	750	6.98	11000	Moderate
GW27s	22/02/2019	340	7.09	8300	Moderate
GW27s	16/04/2019	220	6.95	7900	Moderate
GW27s	22/02/2019	-	7.09	7460	Moderate
GW28A	16/04/2019	2	6.6	1400	Mild
GW2d	11/03/2019	34	7.02	77	Mild
GW2d	9/04/2019	59	6.99	75	Mild
GW2s	17/01/2019	-	6.9	95*	Mild
GW2s	11/02/2019	-	6.91	95*	Mild
GW2s	8/03/2019	45	6.9	78	Mild
GW2s	9/04/2019	5	6.79	95	Mild
GW2s	17/01/2019	-	6.9	95*	Mild
GW4d	21/02/2019	71	7.04	130	Mild
GW4d	13/03/2019	55	7.31	110	Mild
GW4d	15/04/2019	53	6.96	130	Mild
GW4i	21/02/2019	17	7.2	210	Mild
GW4i	13/03/2019	2	7.26	170	Mild
GW4i	15/04/2019	3	7.19	220	Mild
GW5d	28/02/2019	1300	6.24	13000	Severe
GW5d	12/03/2019	1300	6.46	13000	Severe
GW5d	16/04/2019	1500	5.57	16000	Severe
GW5s	8/01/2019	<1	7.34	110	Mild
GW5s	12/02/2019	2	7.37	120	Mild
GW5s	12/03/2019	2	7.1	110	Mild
GW5s	16/04/2019	<1	7.42	97	Mild
GW5s	8/01/2019	35	7.34	32	Mild
GW7	8/04/2019	3	8.43	640	Mild
GW8	28/02/2019	14	7.06	150	Mild
GW8	12/03/2019	3	7.06	150	Mild
GW9	18/04/2019	23	7.4	210	Mild
MPE 11	12/12/2018	3	7.1	1800	Mild
MPE 11	13/02/2019	5	7.18	2000	Mild
MPE 11	18/02/2019	2	7.1	2100	Mild
MPE 11	25/02/2019	25	7.1	2400	Mild
MPE 11	5/03/2019	4	7.13	2100	Mild
MPE 11	11/03/2019	14	7.09	2100	Mild
MPE 2	11/12/2018	1800	6.61	18000	Severe
MPE 2	13/02/2019	1400	6.94	12000	Severe
MPE 2	19/02/2019	1900	6.73	18000	Severe
MPE 2	26/02/2019	1500	6.83	14000	Severe
MPE 2	6/03/2019	1400	7.24	12000	Severe
MPE 2	12/03/2019	1300	7.18	10000	Moderate
MPE 2	12/03/2019	1400	7.18	11000	Moderate
MPE 21	12/12/2018	4	6.93	200	Mild
MPE 21	12/02/2019	18	6.64	230	Mild
MPE 21	18/02/2019	63	6.74	640	Mild
MPE 21	25/02/2019	47	6.86	430	Mild
MPE 21	4/03/2019	14	6.8	270	Mild
MPE 21	11/03/2019	27	6.79	330	Mild
MPE 3	11/12/2018	2100	7.04	16000	Severe
MPE 3	13/02/2019	2000	7.01	15000	Severe
MPE 3	19/02/2019	2100	7.1	16000	Severe
MPE 3	26/02/2019	2000	6.99	15000	Severe
MPE 3	6/03/2019	2000	7.02	14000	Severe
MPE 3	12/03/2019	1900	7.09	14000	Severe
MPE 4	13/02/2019	840	6.89	7100	Moderate

## Appendix B

Table B9 Groundwater aggressivity comparison table- concrete piles

Monitoring well ID	sampling dates	Sulfate (mg/L)	pH	Chloride (mg/L)	Soil Condition A high permeability soil (sand, gravel) that are in groundwater
MPE 4	19/02/2019	720	6.97	6300	Moderate
MPE 4	26/02/2019	770	6.99	6400	Moderate
MPE 4	5/03/2019	810	6.88	7000	Moderate
MPE 4	12/03/2019	660	7.28	5300	Mild
MPE 5	11/12/2018	430	7.22	6000	Moderate
MPE 5	13/02/2019	340	7.05	5200	Mild
MPE 5	19/02/2019	380	7.12	5800	Mild
MPE 5	26/02/2019	290	7.16	4500	Mild
MPE 5	5/03/2019	350	7.21	5300	Mild
MPE 5	11/03/2019	410	7.24	5300	Mild
MPE 5A	11/12/2018	1500	6.66	13000	Severe
MPE 5A	13/02/2019	1400	6.65	11000	Moderate
MPE 5A	19/02/2019	1900	6.49	15000	Severe
MPE 5A	26/02/2019	1600	6.6	13000	Severe
MPE 5A	5/03/2019	1500	6.74	13000	Severe
MPE 5A	12/03/2019	1700	6.68	13000	Severe
MPE 6	11/12/2018	460	7.49	5600	Mild
MPE 6	13/02/2019	860	7.04	10000	Moderate
MPE 6	18/02/2019	520	7.3	7200	Moderate
MPE 6	25/02/2019	640	7.27	7800	Moderate
MPE 6	5/03/2019	850	7.24	9700	Moderate
MPE 6	11/03/2019	520	7.37	6800	Moderate
MPE 6	11/03/2019	530	7.37	7000	Moderate
MPE 7	12/12/2018	1200	6.78	8500	Moderate
MPE 7	12/02/2019	1100	6.72	8100	Moderate
MPE 7	18/02/2019	1200	6.75	8900	Moderate
MPE 7	25/02/2019	970	6.76	7300	Moderate
MPE 7	4/03/2019	1500	6.71	11000	Moderate
MPE 7	11/03/2019	660	6.94	4900	Mild
MPE 8	12/12/2018	1100	6.58	13000	Severe
MPE 8	12/02/2019	940	6.7	11000	Moderate
MPE 8	18/02/2019	1300	6.62	14000	Severe
MPE 8	25/02/2019	1100	6.68	12000	Severe
MPE 8	4/03/2019	520	6.97	6700	Moderate
MPE 8	11/03/2019	780	6.76	9500	Moderate
MPE 8	25/02/2019	1100	6.68	12000	Severe
MPE 9	12/12/2018	610	7.41	3800	Mild
MPE 9	12/02/2019	880	7.14	6400	Moderate
MPE 9	18/02/2019	950	7.22	7100	Moderate
MPE 9	25/02/2019	910	7.2	7100	Moderate
MPE 9	4/03/2019	1100	7.23	8300	Moderate
MPE 9	11/03/2019	1100	7.18	8500	Moderate
MPI 10	11/12/2018	<1	6.96	280	Mild
MPI 10	13/02/2019	<1	6.85	200	Mild
MPI 10	19/02/2019	<1	6.83	200	Mild
MPI 10	26/02/2019	<1	6.99	190	Mild
MPI 10	5/03/2019	<1	6.89	190	Mild
MPI 10	11/03/2019	<1	6.89	180	Mild
MPI 12	11/12/2018	39	7.19	110	Mild
MPI 12	13/02/2019	26	7.11	110	Mild
MPI 12	18/02/2019	27	7.03	120	Mild
MPI 12	28/02/2019	22	7.06	110	Mild
MPI 12	5/03/2019	14	7.07	120	Mild
MPI 12	11/03/2019	12	6.73	120	Mild
MPI 12	11/12/2018	39	7.02	110	Mild
MPI 13	11/12/2018	<1	6.97	180	Mild
MPI 13	12/02/2019	<1	6.77	210	Mild
MPI 13	18/02/2019	<1	6.89	210	Mild
MPI 13	28/02/2019	10	6.93	190	Mild
MPI 13	4/03/2019	7	6.89	190	Mild
MPI 13	11/03/2019	1	6.97	170	Mild
MPI 13	18/02/2019	-	6.92	8980	Moderate
MPI 13	28/02/2019	-	6.93	244	Mild
MPI 14	12/12/2018	<1	6.99	460	Mild
MPI 14	12/02/2019	<1	6.95	470	Mild
MPI 14	18/02/2019	<1	7.12	430	Mild
MPI 14	25/02/2019	<1	7.1	410	Mild
MPI 14	4/03/2019	<1	7.13	430	Mild

## Appendix B

Table B9 Groundwater aggressivity comparison table- concrete piles

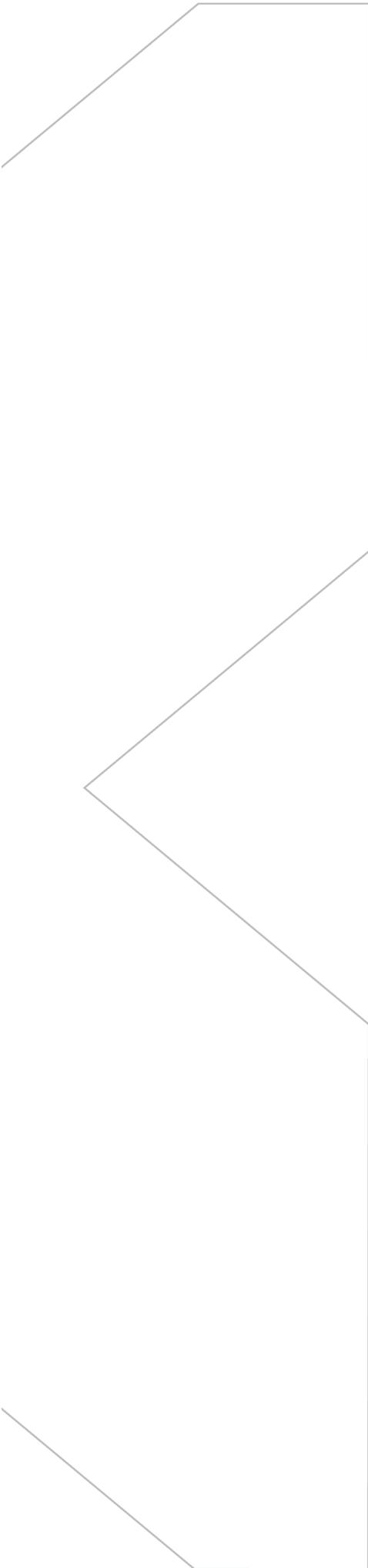
Monitoring well ID	sampling dates	Sulfate (mg/L)	pH	Chloride (mg/L)	Soil Condition A high permeability soil (sand, gravel) that are in groundwater
MPI 14	11/03/2019	<1	7.22	370	Mild
MPI 14	12/02/2019	-	6.95	777	Mild
MPI 15	18/02/2019	19	-	210	Mild
MPI 15	12/12/2018	31	7.22	260	Mild
MPI 15	12/02/2019	32	6.82	200	Mild
MPI 15	25/02/2019	25	7.02	190	Mild
MPI 15	4/03/2019	13	6.95	190	Mild
MPI 15	11/03/2019	11	7.02	180	Mild
MPI 15	18/02/2019	18	6.99	210	Mild
MPI 15	25/02/2019	-	7.02	262	Mild
MPI 16	12/12/2018	1300	6.77	14000	Severe
MPI 16	12/02/2019	<1	7.1	4200	Mild
MPI 16	18/02/2019	1800	6.53	17000	Severe
MPI 16	25/02/2019	1400	6.98	14000	Severe
MPI 16	4/03/2019	210	7.2	5200	Mild
MPI 16	11/03/2019	32	7.31	4500	Mild
MPI 17	12/02/2019	1	7.2	660	Mild
MPI 17	18/02/2019	<1	7.32	700	Mild
MPI 17	25/02/2019	1	7.27	650	Mild
MPI 17	4/03/2019	8	7.28	650	Mild
MPI 17	11/03/2019	3	7.27	630	Mild
MPI 17	12/02/2019	<1	7.2	670	Mild
MPI 17	4/03/2019	8	7.28	670	Mild
MPI 18	13/12/2018	3	7.36	790	Mild
MPI 18	12/02/2019	1	-	720	Mild
MPI 18	13/02/2019	2	7.17	730	Mild
MPI 18	18/02/2019	2	7.29	760	Mild
MPI 18	25/02/2019	<1	7.38	710	Mild
MPI 18	4/03/2019	<1	7.27	700	Mild
MPI 18	11/03/2019	6	7.31	680	Mild
MPI 18	4/03/2019	-	7.27	907	Mild
MPI 2	13/12/2018	10	7.46	1500	Mild
MPI 2	13/02/2019	37	7.44	1600	Mild
MPI 2	19/02/2019	75	7.37	2200	Mild
MPI 2	26/02/2019	2	7.45	1200	Mild
MPI 2	6/03/2019	49	7.42	1800	Mild
MPI 2	12/03/2019	2	7.43	1200	Mild
MPI 2	6/03/2019	52	7.42	1800	Mild
MPI 20	11/03/2019	3	7.25	420	Mild
MPI 20	12/12/2018	<1	7.28	500	Mild
MPI 20	18/02/2019	<1	7.26	500	Mild
MPI 20	25/02/2019	<1	7.35	430	Mild
MPI 20	4/03/2019	<1	7.3	440	Mild
MPI 20	12/02/2019	1	7.33	480	Mild
MPI 3A	11/12/2018	1200	7.04	8600	Moderate
MPI 3A	13/02/2019	810	7.09	6600	Moderate
MPI 3A	19/02/2019	970	7.16	7800	Moderate
MPI 3A	26/02/2019	82	7.43	980	Mild
MPI 3A	6/03/2019	160	7.45	1800	Mild
MPI 3A	12/03/2019	87	7.48	940	Mild
MPI 4	12/12/2018	2500	6.79	8600	Moderate
MPI 4	13/02/2019	2300	6.84	7900	Moderate
MPI 4	19/02/2019	2500	6.79	7500	Moderate
MPI 4	26/02/2019	1900	6.82	1700	Mild
MPI 4	6/03/2019	2400	6.84	8400	Moderate
MPI 4	12/03/2019	2300	6.88	9100	Moderate
MPI 4A	11/12/2018	1	7.45	620	Mild
MPI 4A	13/02/2019	<1	7.44	570	Mild
MPI 4A	19/02/2019	3	7.51	610	Mild
MPI 4A	26/02/2019	<1	7.5	530	Mild
MPI 4A	5/03/2019	<1	7.53	570	Mild
MPI 4A	12/03/2019	<1	7.53	510	Mild
MPI 5	12/12/2018	3	7.22	2600	Mild
MPI 6A	13/02/2019	<1	7.27	1100	Mild
MPI 6A	19/02/2019	<1	7.24	1000	Mild
MPI 6A	26/02/2019	3	7.25	870	Mild
MPI 6A	5/03/2019	7	7.25	970	Mild
MPI 6A	12/03/2019	3	7.26	780	Mild

Appendix B

Table B9 Groundwater aggressivity comparison table- concrete piles

Monitoring well ID	sampling dates	Sulfate (mg/L)	pH	Chloride (mg/L)	Soil Condition A high permeability soil (sand, gravel) that are in groundwater
SG-BHTT-03	17/04/2019	2	6.95	300	Mild
SG-BHTT-04	15/04/2019	<1	6.68	140	Mild
WCX GTY BH 002	19/12/2018	-	5.79	99*	Mild
WCX GTY BH 002	28/02/2019	94	5.41	90	Mild
WCX GTY BH 002	15/03/2019	82	5.76	66	Mild
WCX GTY BH 002	11/04/2019	86	5.61	99	Mild
WCX GTY BH 003	8/03/2019	52	6.7	180	Mild
WCX GTY BH 004	15/03/2019	-	6.24	40	Mild
WCX GTY BH 004	28/02/2019	53	5.99	56	Mild
WCX GTY BH 004	15/03/2019	32	6.24	35	Mild
WCX GTY BH 004	17/04/2019	60	6.11	52	Mild
WCX GTY BH 009d	17/12/2018	-	6.26	20000*	Severe
WCX GTY BH 009d	13/02/2019	-	6.75	20000*	Severe
WCX GTY BH 009d	15/03/2019	32	6.75	3400	Mild
WCX GTY BH 009d	11/04/2019	1700	6.29	20000	Severe
WCX GTY BH 009s	17/12/2018	-	6.64	1100*	Mild
WCX GTY BH 009s	13/02/2019	-	6.6	1100*	Mild
WCX GTY BH 009s	6/03/2019	10	6.68	1100	Mild
WCX GTY BH 009s	11/04/2019	1	6.59	1100	Mild
WCX GTY BH 027	22/02/2019	-	6.67	1100*	Mild
WCX GTY BH 027	17/01/2019	-	6.39	1100*	Mild
WCX GTY BH 027	22/02/2019	-	6.67	1100*	Mild
WCX GTY BH 027	16/04/2019	68	6.45	1100	Mild
WCX GTY BH 033	11/04/2019	53	6.1	190	Mild
WCX GTY BH 033	19/12/2018	-	5.75	210*	Mild
WCX GTY BH 033	19/12/2018	-	5.75	210*	Mild
WCX GTY BH 033	13/02/2019	-	6.29	210*	Mild
WCX GTY BH 033	11/04/2019	58	6.07	210	Mild

\*missing chloride values, replaced by the maximum values from the corresponding well



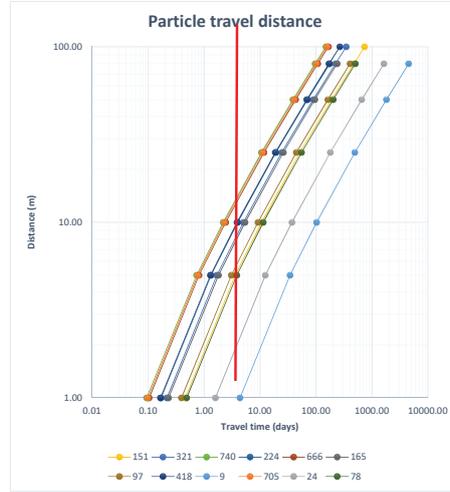
**Appendix C**  
Model calculations



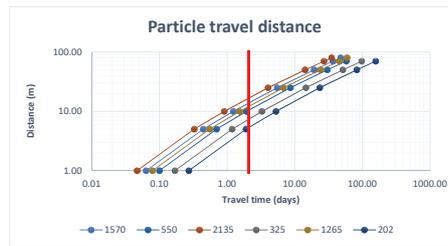
						Excavation Size 10x1		Utilities				
Effective radius (re)	1.78					Hydraulic conductivity		25				
l - length	10.00					Aquifer thickness		17 m				
w = width	1.00					Time		2 days				
Item				r(m)								
				0	1	5	10	25	50	80	85	100
				Discharge m <sup>3</sup> /day								
27 - West (Alexandra Canal)	26.3	0.2	17	50	0.072	0.06	0.05	0.04	0.02	0.01	0.00	0.00
Utilities 2	26.3	0.2	17	745	1.07	0.95	0.71	0.57	0.35	0.18	0.05	0.04
Utilities 2	10	0.11	17	58	0.21	0.18	0.14	0.11	0.06	0.03	0.00	--
Utilities 3	26.3	0.2	17	255	0.37	0.32	0.24	0.19	0.12	0.06	0.02	0.01
Utilities 4	26.3	0.2	17	255	0.37	0.32	0.24	0.19	0.12	0.06	0.02	0.01
Utilities 6	26.3	0.2	17	1025	1.47	1.31	0.98	0.78	0.48	0.24	0.07	0.05
Utilities 6	10	0.11	17	170	0.61	0.54	0.40	0.31	0.18	0.08	0.00	--
				Gradients								
				0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000								
				Percent distance to 11%								

						Excavation size 10x3		Stormwater Drainage				
Effective radius (re)	3.09					Hydraulic conductivity		25				
l - length	10.00					Aquifer thickness		17 m				
w = width	3.00					Time		2 days				
Item				r(m)								
				0	1	5	10	25	50	70	90	105
				Discharge m <sup>3</sup> /day								
1	26.3	0.2	17	1620	2.00	1.71	1.38	1.13	0.71	0.35	0.17	0.04
1	10	0.11	17	369	1.137	0.96	0.76	0.61	0.36	0.15	0.04	--
2	26.3	0.2	17	400	0.49	0.42	0.34	0.28	0.18	0.09	0.04	0.01
3	26.3	0.2	17	1520	1.88	1.60	1.29	1.06	0.67	0.33	0.16	0.03
3	10	0.11	17	330	1.02	0.86	0.68	0.55	0.32	0.13	0.04	--
13	26.3	0.2	17	1580	1.96	1.66	1.34	1.10	0.69	0.35	0.17	0.04
13	10	0.11	17	410	1.26	1.07	0.85	0.68	0.40	0.17	0.04	--
14	26.3	0.2	17	485	0.60	0.51	0.41	0.34	0.21	0.11	0.05	0.01
16	26.3	0.2	17	1090	1.35	1.15	0.93	0.76	0.48	0.24	0.12	0.02
16	10	0.11	17	157	0.48	0.41	0.32	0.26	0.15	0.06	0.02	--
18	26.3	0.2	17	1070	1.32	1.13	0.91	0.74	0.47	0.23	0.11	0.02
18	10	0.11	17	150	0.46	0.39	0.31	0.25	0.15	0.06	0.02	--
21	26.3	0.2	17	460	0.57	0.48	0.39	0.32	0.20	0.10	0.05	0.01
22	26.3	0.2	17	1500	1.86	1.58	1.28	1.04	0.66	0.33	0.16	0.03
22	10	0.11	17	320	0.99	0.83	0.66	0.53	0.31	0.13	0.04	--
23	26.3	0.2	17	1460	1.81	1.54	1.24	1.02	0.64	0.32	0.16	0.03
23	10	0.11	17	305	0.94	0.79	0.63	0.51	0.30	0.12	0.03	--
24	26.3	0.2	17	530	0.66	0.56	0.45	0.37	0.23	0.12	0.06	0.01
25	26.3	0.2	17	825	1.02	0.87	0.70	0.57	0.36	0.18	0.09	0.02
25	10	0.11	17	50	0.15	0.13	0.10	0.08	0.05	0.02	0.01	--
26	26.3	0.2	17	700	0.87	0.74	0.60	0.49	0.31	0.15	0.08	0.02
26	10	0.11	17	3	0.01	0.01	0.01	0.00	0.00	0.00	0.00	--
				Gradients								
				0.00069 0.00040 0.00024 0.00013 0.00007 0.00004 0.00001 0.00001								
				Percent distanc 10%								

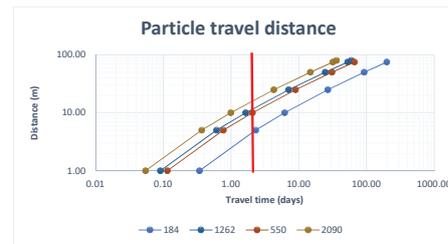
r (m)	1.00	5.00	10.00	25.00	50.00	80.00	100.00
<b>Time to r(m) - days</b>							
RW1 and RW2	0.46	3.59	10.71	51.72	189.58	472.75	734.50
RW3, RW4 and RW5	0.22	1.69	5.04	24.33	89.18	222.38	345.51
RW20	0.09	0.73	2.19	10.55	38.69	96.47	149.88
RW20	0.17	1.33	3.97	19.18	70.29	175.28	
RW21, RW22, RW23	0.09	0.73	2.19	10.55	38.69	96.47	149.88
RW21, RW22, RW23	0.23	1.81	5.39	26.03	95.42	237.95	
RW23 - west, RW24 - west, RW31	0.10	0.81	2.43	11.73	42.98	107.19	166.53
RW23 - west, RW24 - west, RW31	4.38	34.26	102.25	493.71	1809.77	4512.86	
RW26	0.10	0.77	2.29	11.08	40.61	101.26	157.32
RW26	1.59	12.42	37.07	178.97	656.04	1635.91	
RW32- RW34	0.09	0.73	2.19	10.55	38.69	96.47	149.88
RW32- RW34	0.49	3.82	11.40	55.07	201.86	503.36	
RW29	0.09	0.73	2.19	10.55	38.69	96.47	149.88
RW29	0.39	3.07	9.17	44.28	162.32	404.76	
Qantas Drive, near Ewan Street	0.17	1.30	3.87	18.68	68.49	170.78	265.33



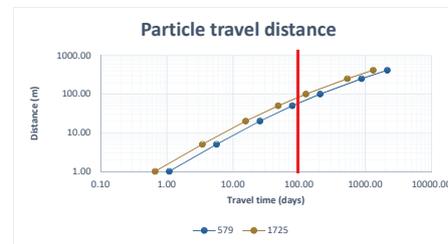
r (m)	1.00	5.00	10.00	25.00	50.00	70.00	80.00
<b>Time to r(m) - days</b>							
7	0.05	0.33	0.90	4.03	14.15	26.90	34.82
7	0.10	0.70	1.93	8.60	30.20	57.43	
8	0.06	0.44	1.23	5.48	19.24	36.58	47.35
8	0.17	1.18	3.26	14.55	51.11	97.19	
9	0.08	0.55	1.52	6.80	23.87	45.40	58.77
9	0.27	1.90	5.25	23.41	82.23	156.37	



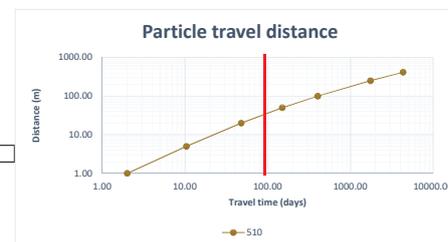
r (m)	1.00	5.00	10.00	25.00	50.00	75.00	80.00
<b>Time to r(m) - days</b>							
10	0.05	0.37	1.00	4.30	14.82	31.86	36.07
10	0.11	0.77	2.08	8.99	30.97	66.59	
11	0.09	0.61	1.65	7.12	24.54	52.76	59.74
11	0.34	2.32	6.22	26.86	92.59	199.04	
	#DIV/0!						



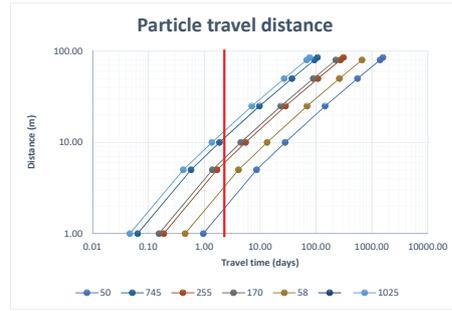
r (m)	1.00	5.00	20.00	50.00	100.00	250.00	415.00
<b>Time to r(m) - days</b>							
12	0.66	3.44	15.56	47.96	126.26	534.45	1310.80
12	1.09	5.63	25.49	78.58	206.89	875.74	2147.87



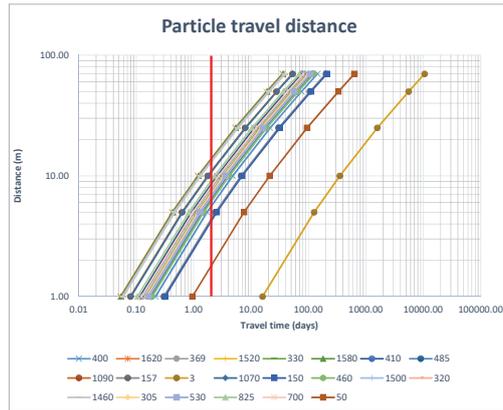
r (m)	1.00	5.00	20.00	50.00	100.00	250.00	415.00
<b>Time to r(m) - days</b>							
SB41	2.00	10.42	47.77	150.03	402.65	1745.57	4330.96

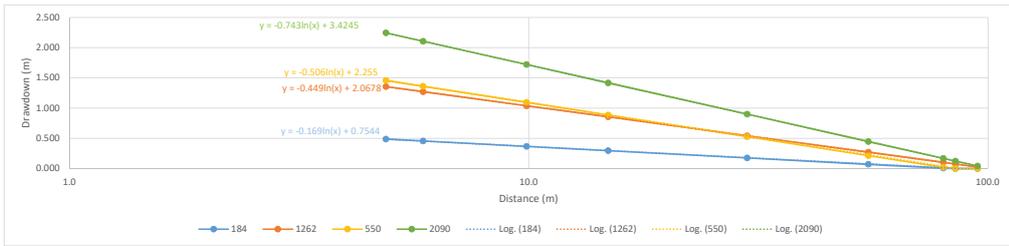
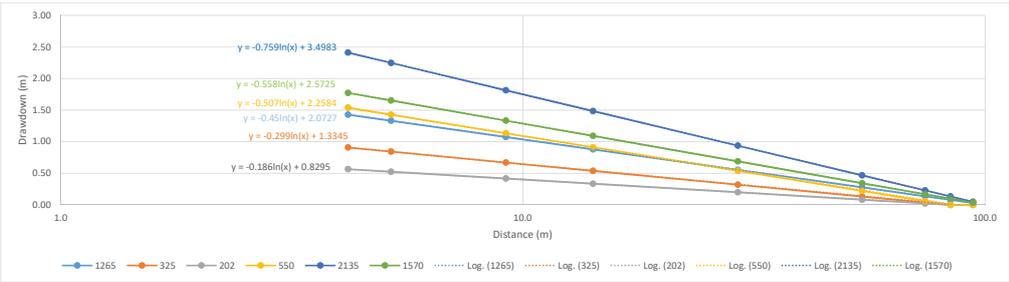
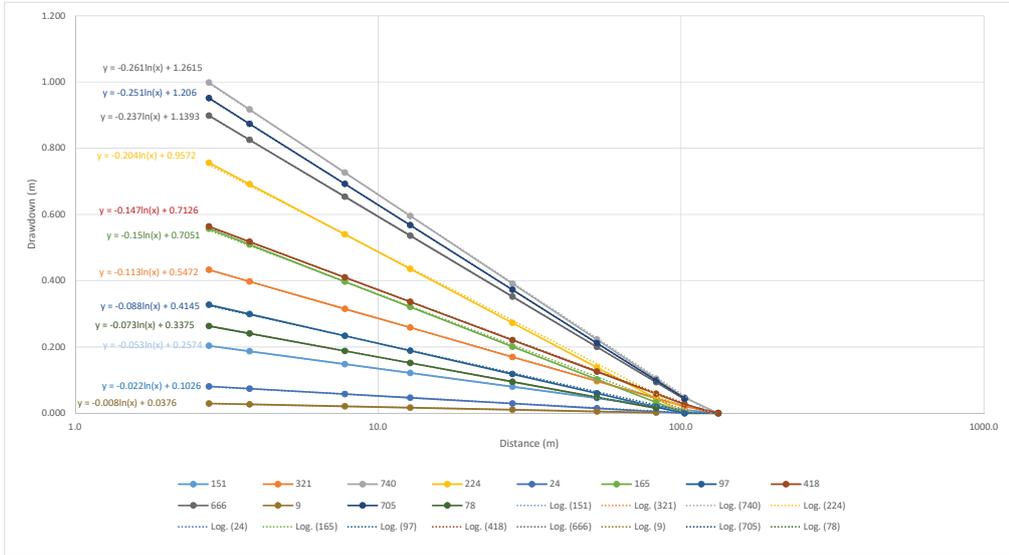


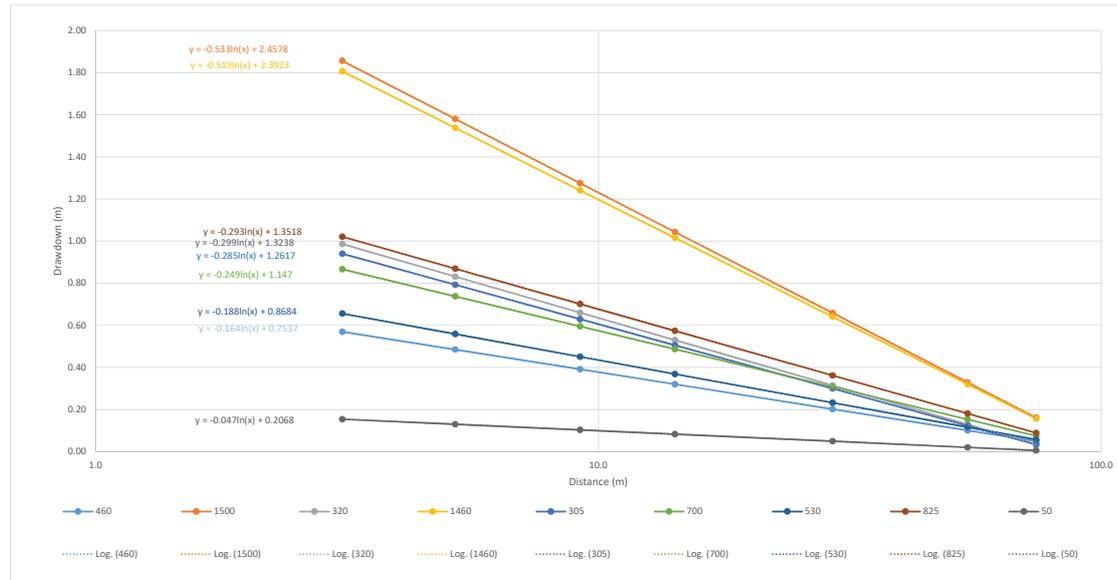
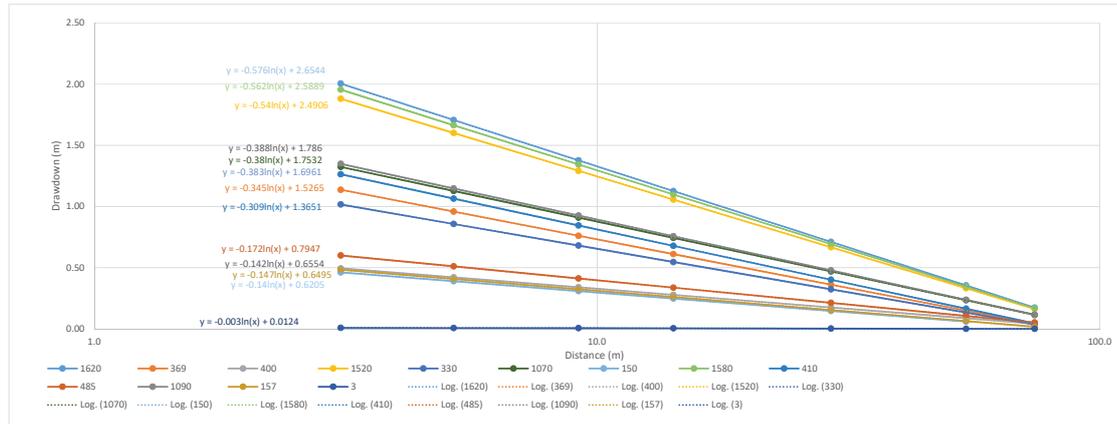
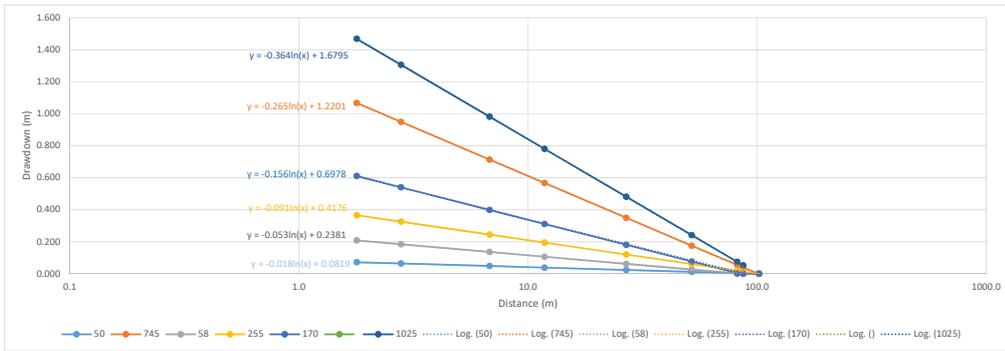
r (m)	1.00	5.00	10.00	25.00	50.00	80.00	85.00
27 - West (Alexandra Canal)	0.96	8.65	28.01	145.23	550.73	1393.10	1573.30
Utilities 2	0.06	0.58	1.88	9.75	36.96	93.50	105.59
Utilities 2	0.46	4.10	13.28	68.86	261.12	660.52	
Utilities 3	0.19	1.70	5.49	28.48	107.99	273.16	308.49
Utilities 4	0.19	1.70	5.49	28.48	107.99	273.16	308.49
Utilities 6	0.05	0.42	1.37	7.08	26.86	67.96	76.75
Utilities 6	0.16	1.40	4.53	23.49	89.09	225.35	



r (m)	1.00	5.00	10.00	25.00	50.00	70.00
1	0.05	0.42	1.18	5.30	18.63	35.44
1	0.13	1.02	2.85	12.80	44.99	85.58
2	0.22	1.71	4.79	21.46	75.47	143.54
3	0.06	0.45	1.26	5.65	19.86	37.77
3	0.14	1.14	3.19	14.31	50.31	95.70
13	0.05	0.43	1.21	5.43	19.11	36.34
13	0.12	0.92	2.57	11.52	40.49	77.02
14	0.18	1.41	3.95	17.70	62.24	118.39
16	0.08	0.63	1.76	7.88	27.69	52.68
16	0.30	2.40	6.71	30.07	105.75	201.14
18	0.08	0.64	1.79	8.02	28.21	53.66
18	0.32	2.51	7.02	31.48	110.69	210.53
21	0.19	1.49	4.16	18.66	65.62	124.82
22	0.06	0.46	1.28	5.72	20.12	38.28
22	0.15	1.18	3.29	14.75	51.88	98.69
23	0.06	0.47	1.31	5.88	20.68	39.33
23	0.16	1.24	3.45	15.48	54.44	103.54
24	0.16	1.29	3.61	16.20	56.96	108.33
25	0.10	0.83	2.32	10.41	36.59	69.60
25	0.95	7.53	21.07	94.43	332.06	631.59
26	0.12	0.98	2.74	12.26	43.12	82.02
26	15.87	125.57	351.09	1573.83	5534.28	10526.50







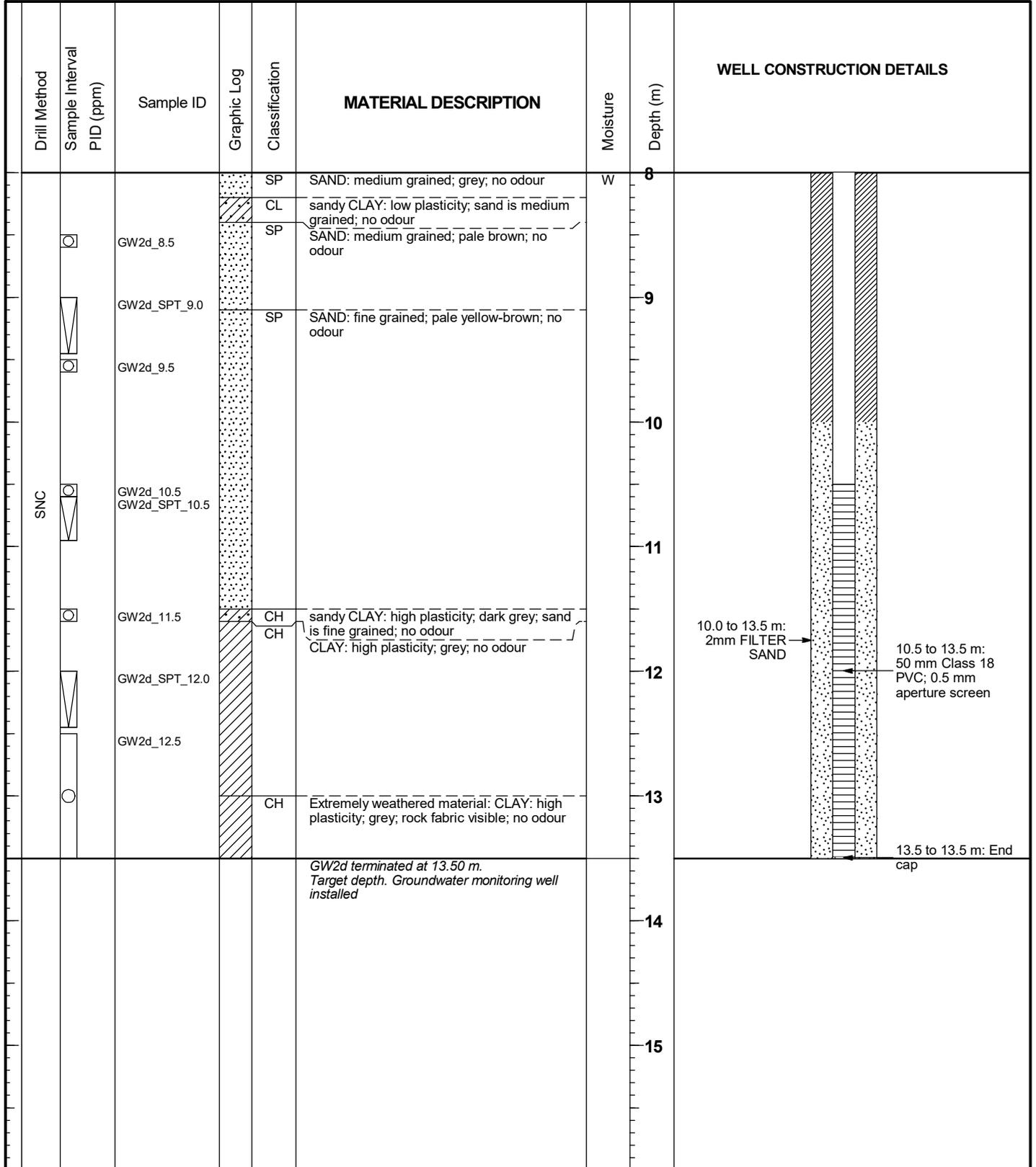


## **Appendix D** Bore and well installation logs



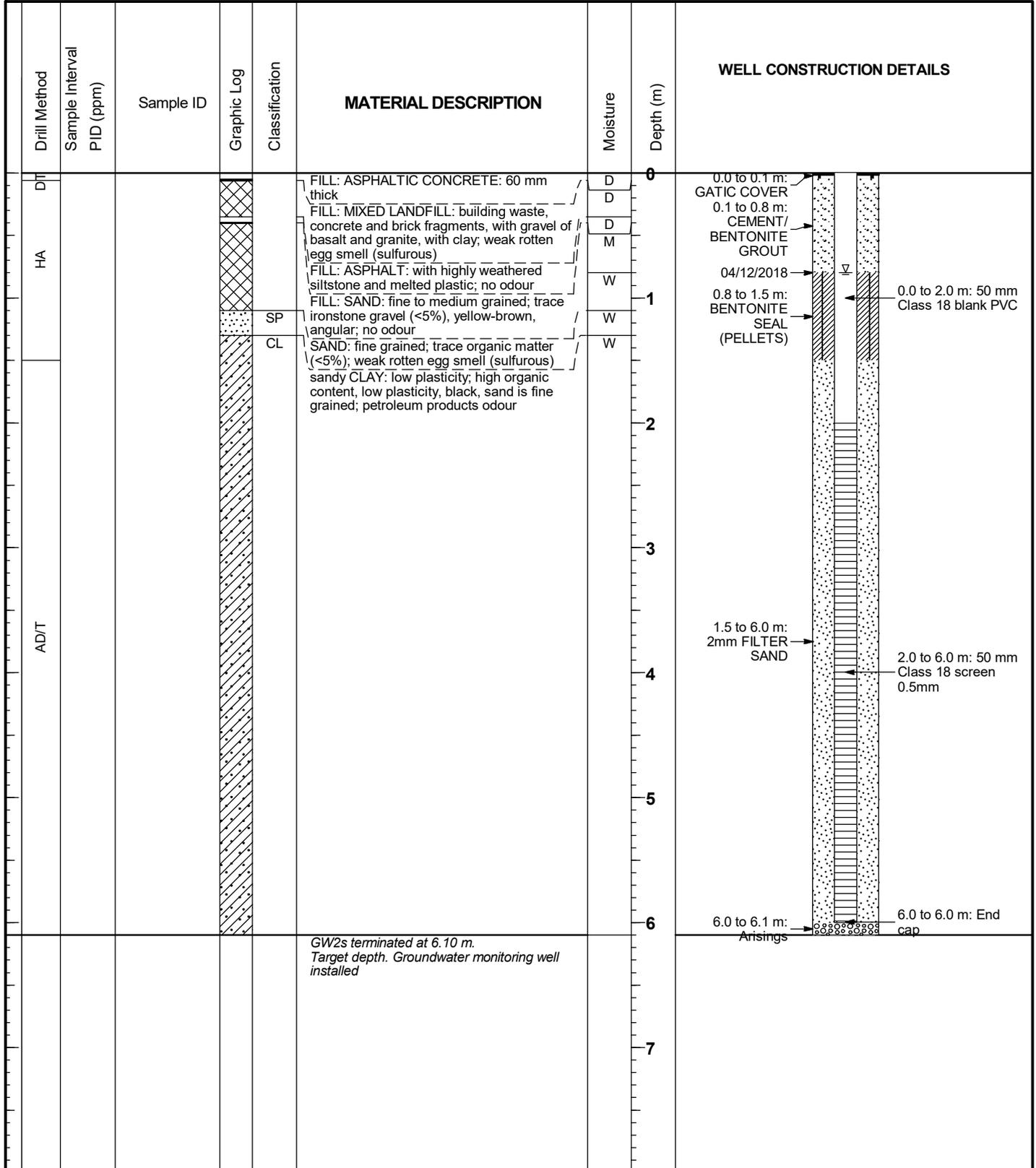
<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 21/02/2019
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 22/02/2019
<b>Location:</b> Mascot/ St Peters	<b>Checked by:</b> MC	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> 331131.6 m	<b>Top of Casing:</b>
<b>Drill Type:</b> diatube, non-destructive drilling, sonic drilling	<b>Northing:</b> 6245002.1 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 13.50 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 152-250 mm	<b>Surface:</b> Concrete
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -

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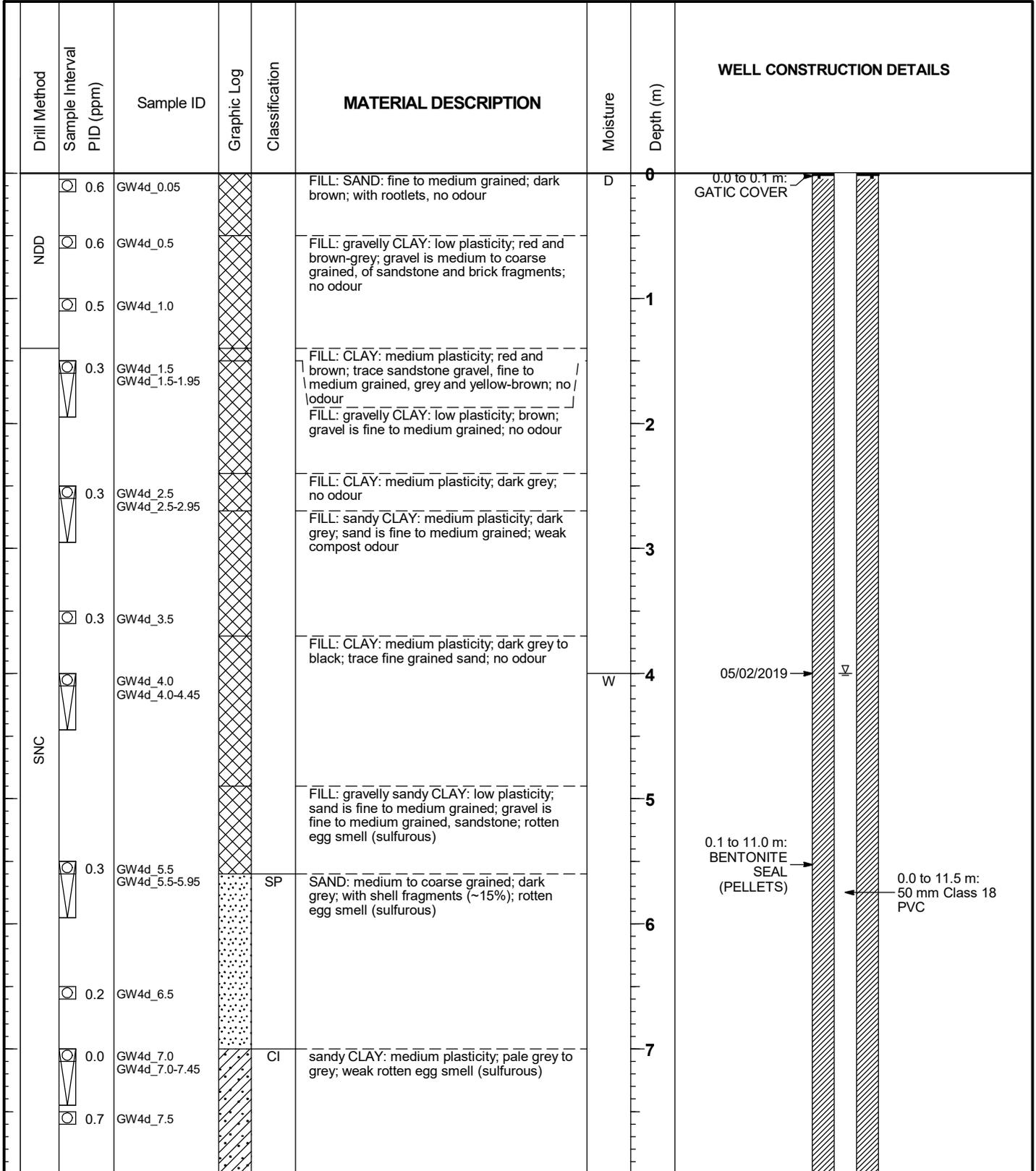
*GW2d terminated at 13.50 m. Target depth. Groundwater monitoring well installed*

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 04/12/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> AM/KW	<b>End Date:</b> 04/12/2018
<b>Location:</b> SACL Northern land, St Peters	<b>Checked by:</b> KM/AD	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Numac Drilling Services Australia Pty Ltd	<b>Easting:</b> 331131.6 m	<b>Top of Casing:</b> 2.0 m
<b>Drill Type:</b> diatube, Hand Auger, auger drilling with tc-bit	<b>Northing:</b> 6245001.3 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> GeoProbe	<b>Total Depth:</b> 6.10 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 80-250 mm	<b>Surface:</b> Pavement (asphalt)
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -



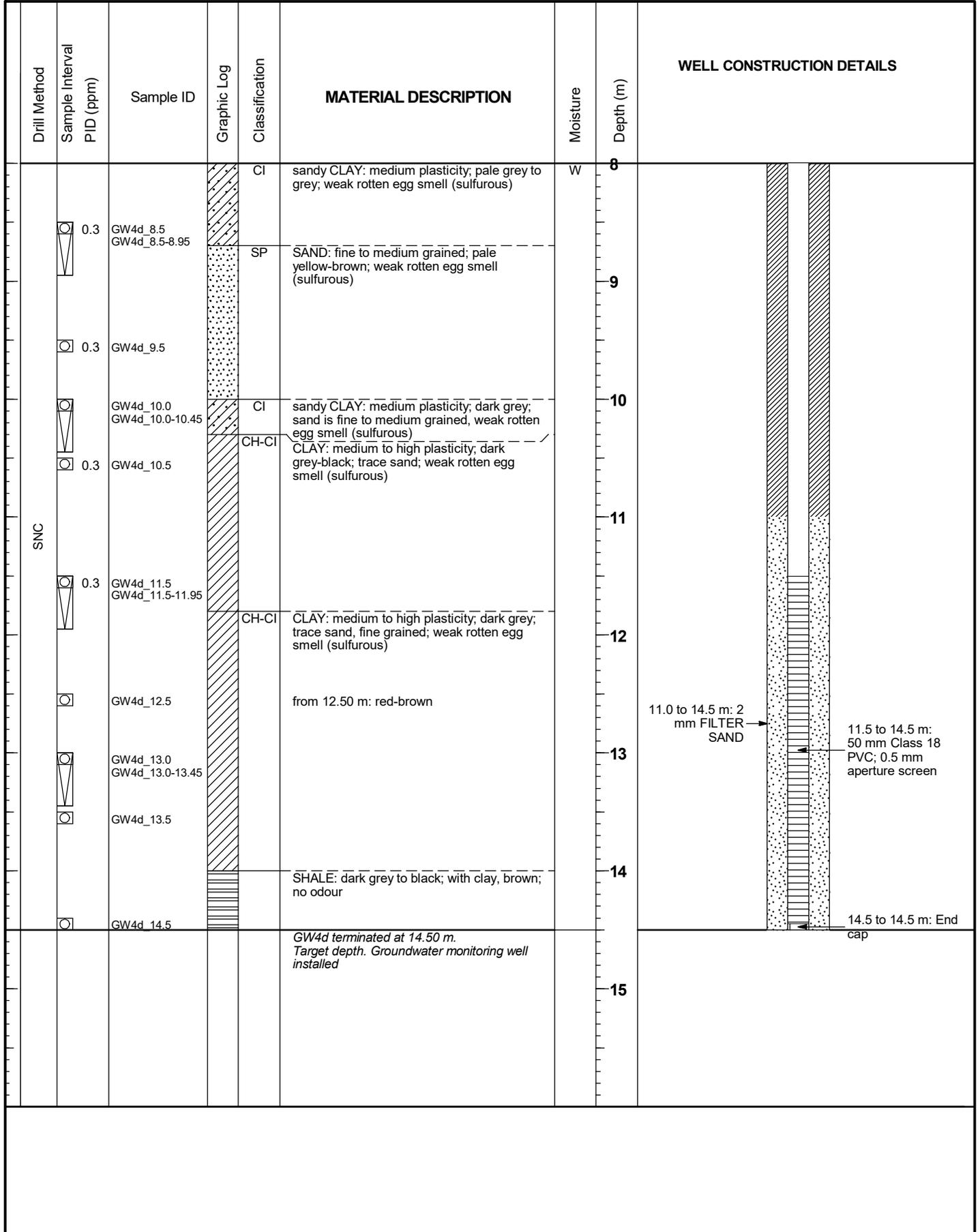
**Remarks:** 0.00-6.10 m: No environmental sampling - groundwater monitoring well installation only

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 05/02/2019
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 05/02/2019
<b>Location:</b> Maritime Container Services, St Peters	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd PF/SM/RA	<b>Easting:</b> 331446.9 m	<b>Top of Casing:</b> 6.2 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling	<b>Northing:</b> 6245409.5 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 14.50 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Pipe Dia.:</b> 50 mm
		<b>Permit No.:</b> -

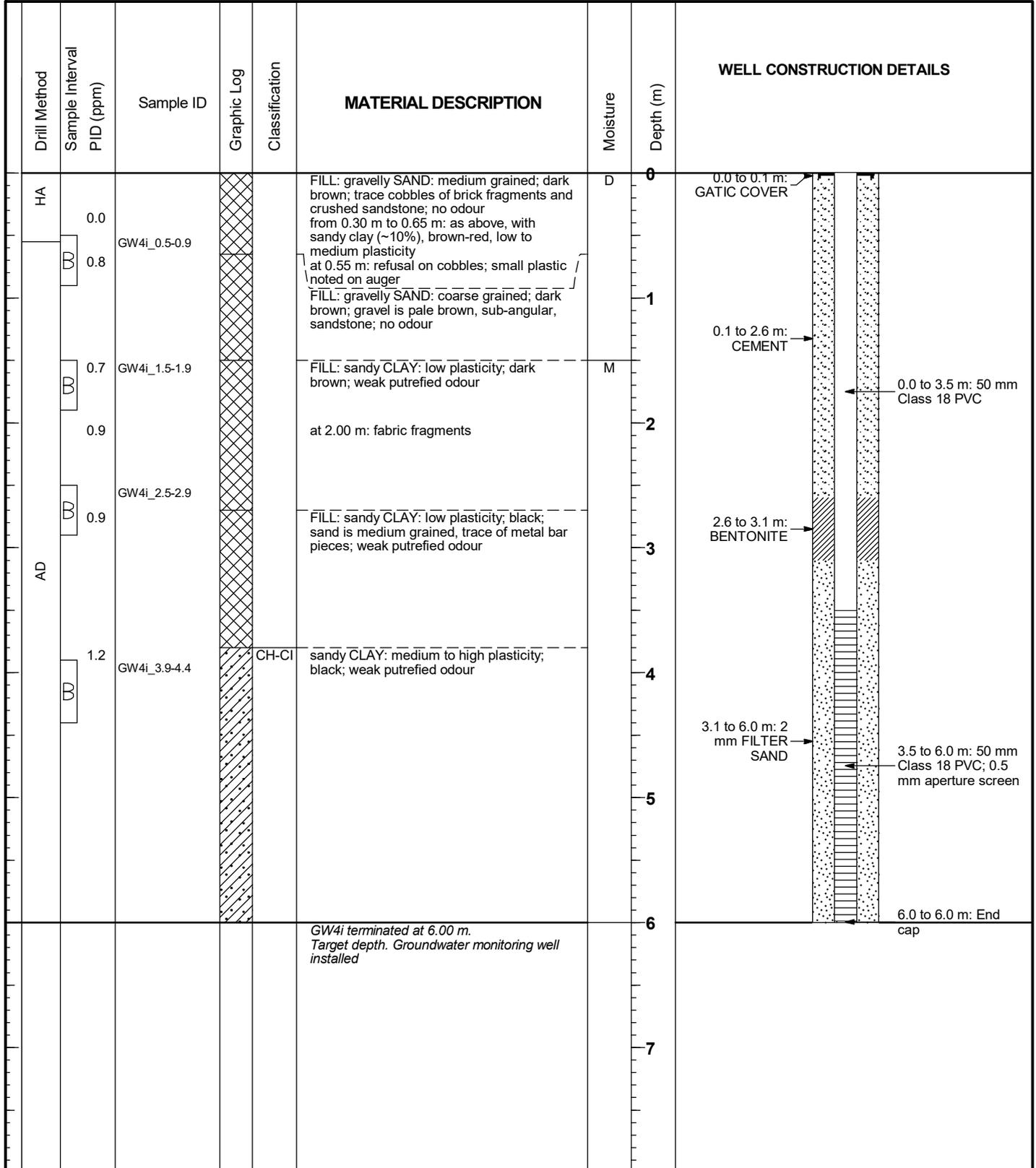


<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 05/02/2019
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 05/02/2019
<b>Location:</b> Maritime Container Services, St Peters	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd PF/SM/RA	<b>Easting:</b> 331446.9 m	<b>Top of Casing:</b> 6.2 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling	<b>Northing:</b> 6245409.5 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 14.50 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Surface:</b> Sand
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -

2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

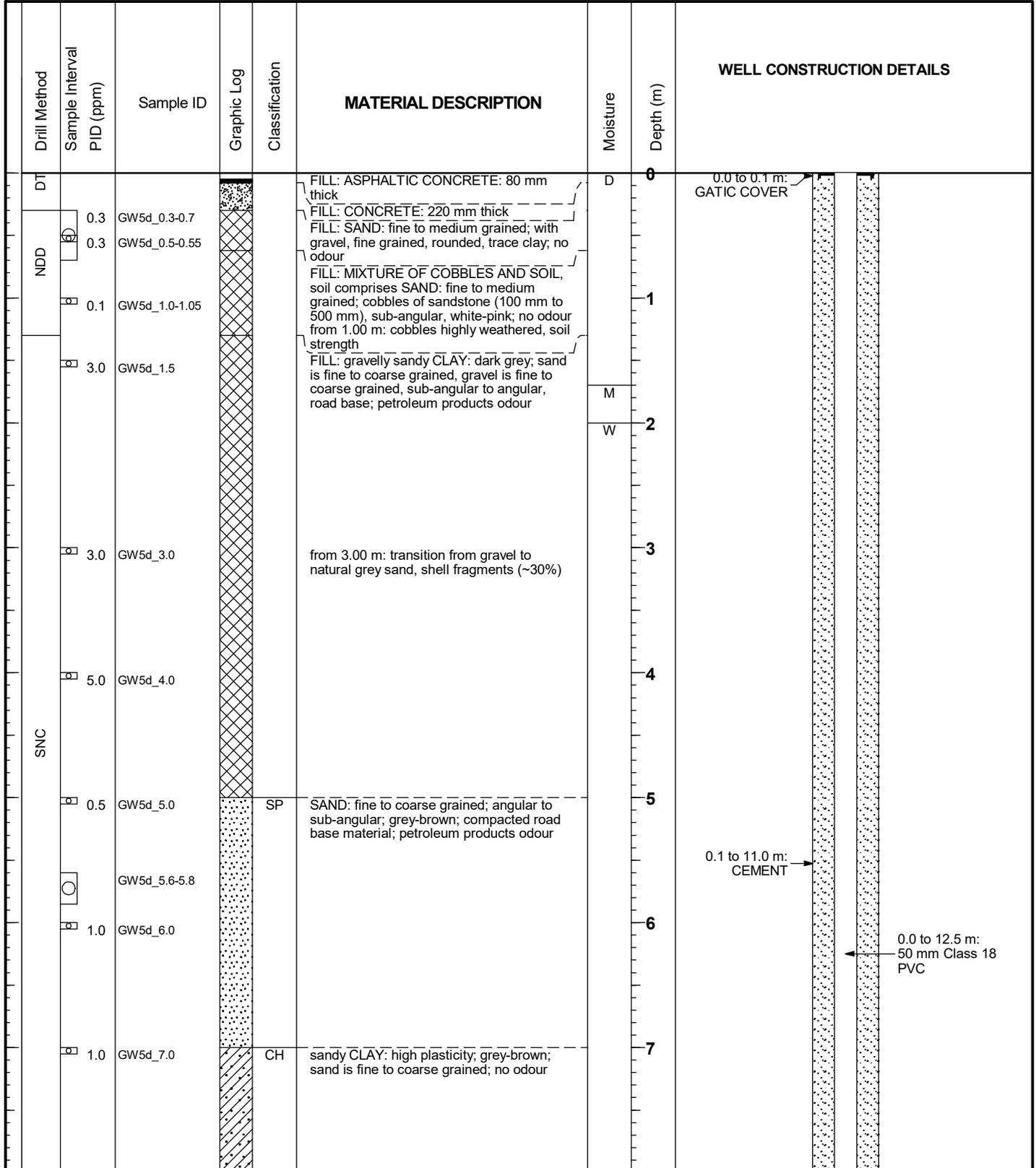


<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 01/02/2019
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> SR/ KW	<b>End Date:</b> 01/02/2019
<b>Location:</b> SACL	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS.0.1
<b>Driller:</b> Matrix Drilling Pty Ltd MB/IM	<b>Easting:</b> 331445.2 m	<b>Top of Casing:</b> 6.5 m
<b>Drill Type:</b> Hand Auger, auger drilling	<b>Northing:</b> 6245412.6 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> GeoProbe	<b>Total Depth:</b> 6.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 125 mm	<b>Surface:</b> Fill
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -



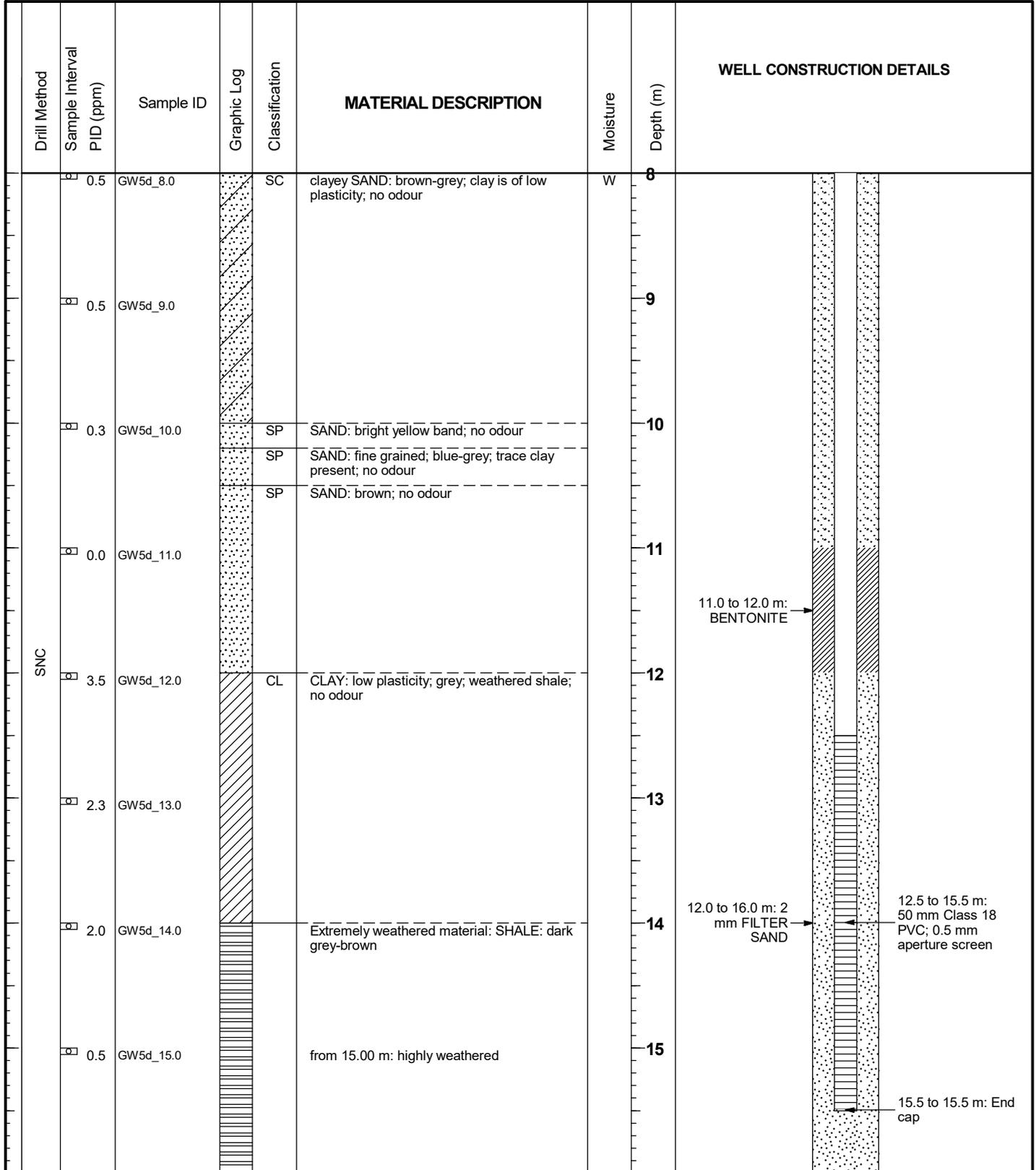
**Remarks:** 0.00-6.00 m: Well is of intermediate depth. Shallow and deep well also exist for this location

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 22/10/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD/ EG	<b>End Date:</b> 30/10/2018
<b>Location:</b> Northern Lands Car Park, Tempe	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> 330875.5 m	<b>Top of Casing:</b> 3.6 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling, diatube	<b>Northing:</b> 6244896.4 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 17.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Pipe Dia.:</b> 50 mm
		<b>Permit No.:</b> -



**Remarks:** 1.30 m: encountered slab; moved 2 m east

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 22/10/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD/ EG	<b>End Date:</b> 30/10/2018
<b>Location:</b> Northern Lands Car Park, Tempe	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> 330875.5 m	<b>Top of Casing:</b> 3.6 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling, diatube	<b>Northing:</b> 6244896.4 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 17.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Surface:</b> Pavement
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -

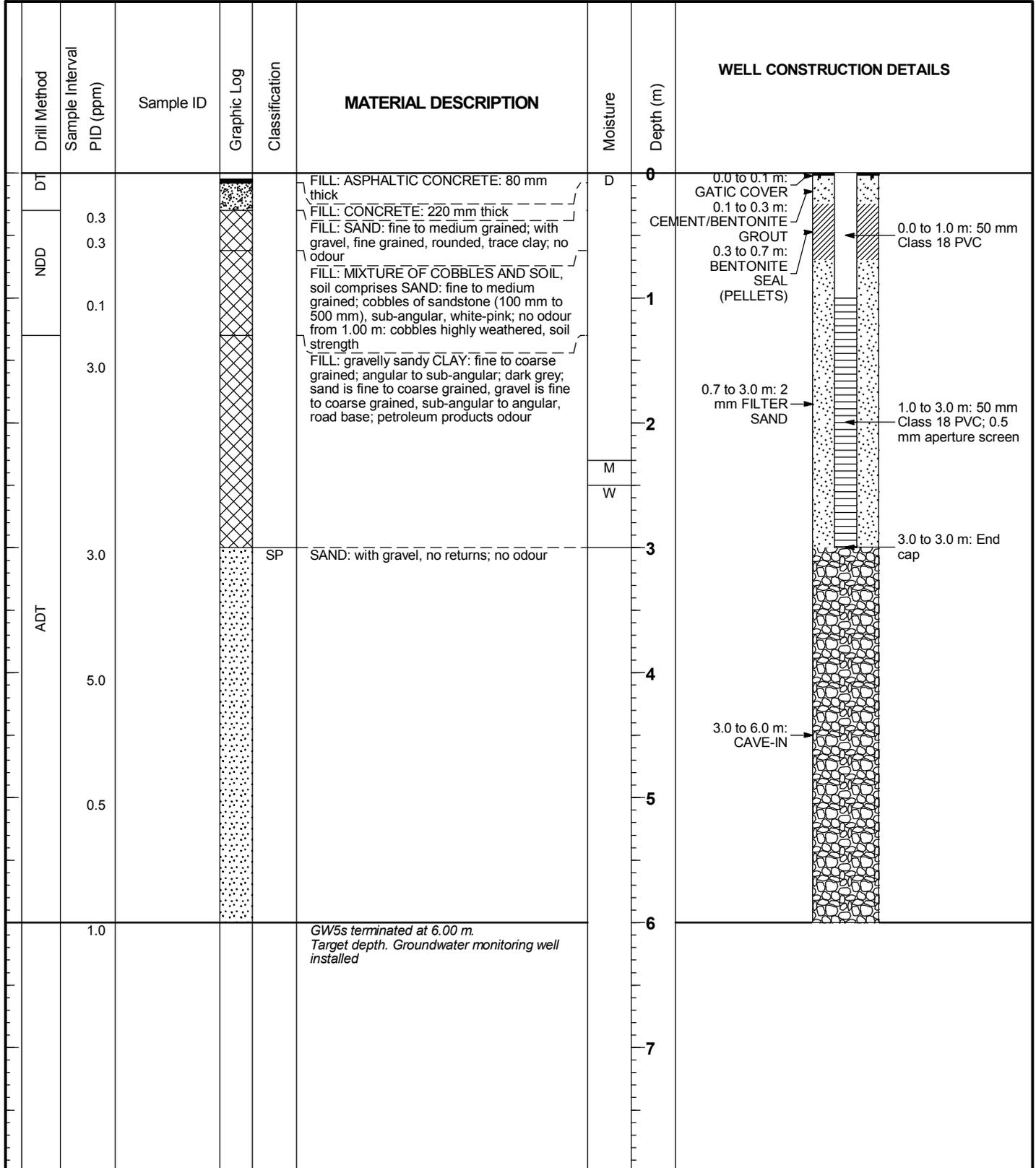


**Remarks:** 9.00-12.00 m: very little recovery, 1.5m of grey sand

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 22/10/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD/ EG	<b>End Date:</b> 30/10/2018
<b>Location:</b> Northern Lands Car Park, Tempe	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> 330875.5 m	<b>Top of Casing:</b> 3.6 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling, diatube	<b>Northing:</b> 6244896.4 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 17.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Surface:</b> Pavement
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -

Drill Method	Sample Interval PID (ppm)	Sample ID	Graphic Log	Classification	MATERIAL DESCRIPTION	Moisture	Depth (m)	WELL CONSTRUCTION DETAILS
SNC	0.1	GW5d_16.0			Extremely weathered material: SHALE: dark grey-brown	W	16	
					Extremely weathered material: SANDSTONE: grey		17	
	0.0	GW5d_17.0			GW5d terminated at 17.00 m. Target depth. Groundwater monitoring well installed		17	
							18	
							19	
							20	
							21	
							22	
							23	

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 23/10/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> AM/PD	<b>End Date:</b> 23/10/2018
<b>Location:</b> Northern Lands Car Park, Tempe	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd BW/RW	<b>Easting:</b> 330877.6 m	<b>Top of Casing:</b> 3.6 m
<b>Drill Type:</b> diatube, auger drilling, TC bit, non-destructive drilling	<b>Northing:</b> 6244896.9 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Comacchio 450	<b>Total Depth:</b> 6.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 96-250 mm	<b>Pipe Dia.:</b> 50 mm
		<b>Surface:</b> Pavement
		<b>Permit No.:</b> -



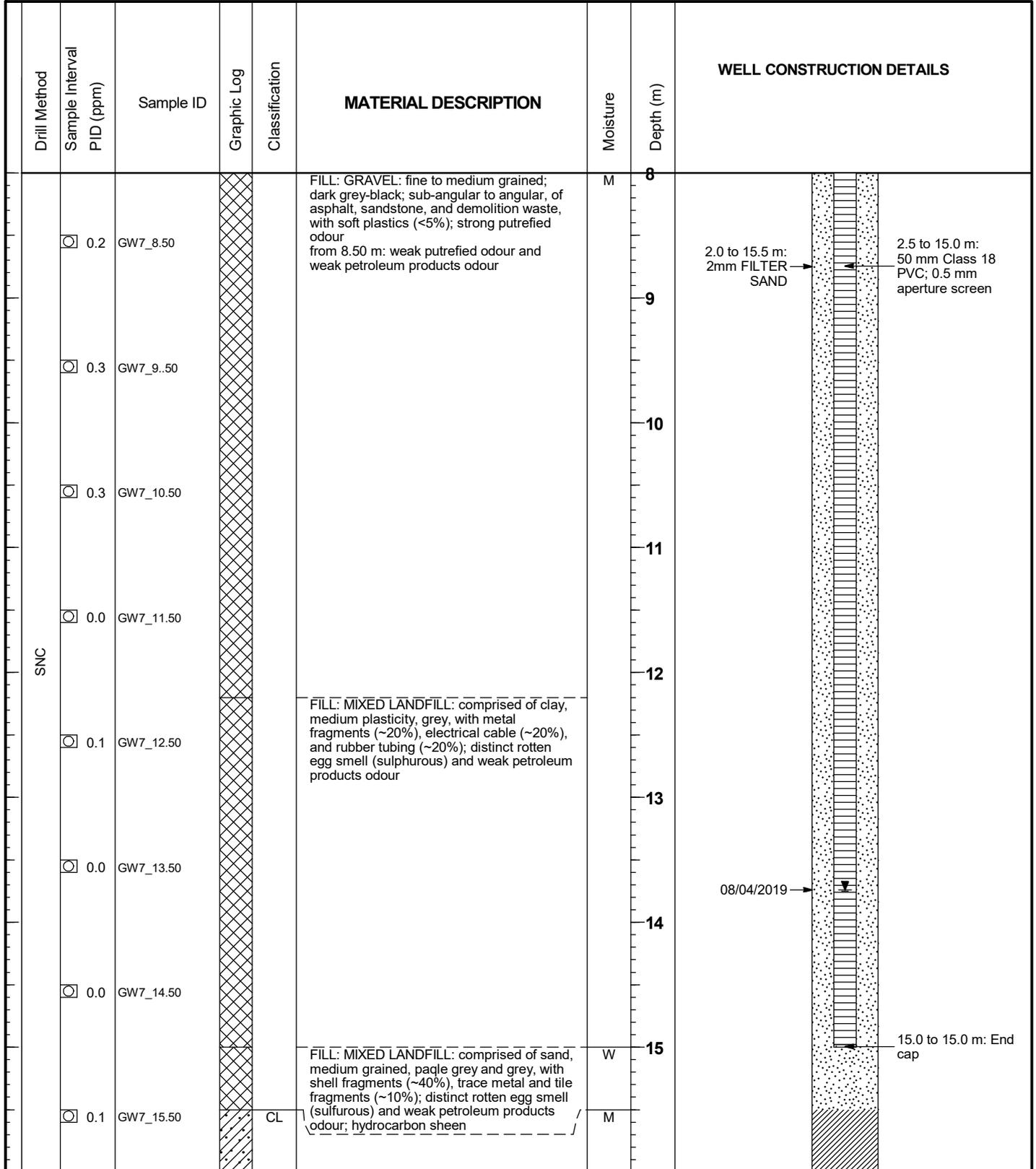
**Remarks:** 0.00-6.00 m: Environmental samples collected at borehole GW5d completed on 30/10/2018. Soil profile obtained from borehole GW5sv to 3.0 m.

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 21/03/2019
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 22/03/2019
<b>Location:</b> Tempe Recreation Reserve	<b>Checked by:</b> KM/PW	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> 330323.0 m	<b>Top of Casing:</b> 15.2 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling	<b>Northing:</b> 6244216.6 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 18.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98 mm	<b>Surface:</b> Grass
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -

Drill Method	Sample Interval P ID (ppm)	Sample ID	Graphic Log	Classification	MATERIAL DESCRIPTION	Moisture	Depth (m)	WELL CONSTRUCTION DETAILS		
NDD	0.0			D	FILL: sandy SILT: dark brown; and roots (~60%)	D	0	0.0 to 0.1 m: GATIC COVER		
	0.0	GW7_0.50			FILL: clayey SAND: medium grained; yellow-brown; clay is low plasticity; no odour		1	0.1 to 2.0 m: BENTONITE		
	0.1	GW7_1.00			FILL: gravelly clayey SAND: medium grained; red-brown; clay is low plasticity, gravel is fine to coarse, sub-angular, sandstone; no odour		2	0.0 to 2.5 m: 50 mm Class 18 PVC		
	0.0	GW7_1.50			FILL: sandy GRAVEL: fine to coarse grained; sub-angular; brown; sand is medium grained, trace plastic waste (<15%); no odour		3			
	SNC	0.0			GW7_2.50		M	FILL: sandy GRAVEL: fine to coarse grained; sub-angular; brown; sand is medium to coarse grained, with metal wire fragments, and plastic sheeting fragments (potential landfill cover or cap); no odour	4	
		0.0			GW7_3.50		FILL: MIXTURE OF COBBLES AND SOIL, soil comprises gravelly SAND (30%): fine to medium grained; brown; cobbles and gravels are of sandstone, medium to coarse grained gravel (potential capping layer); no odour	5		
		0.0			GW7_4.50		FILL: sandy GRAVEL: fine to coarse grained; sub-angular; brown-grey-yellow; sandstone, sand is medium grained; strong putrefied odour	6		
		0.0			GW7_5.50		FILL: SAND: medium to coarse grained; grey-dark brown; with putrescible waste, demolition waste, and plastics fragments; strong putrefied odour	7		
		0.1			GW7_4.50		FILL: SAND: medium grained; brown; strong putrefied odour from 2.70 m: with grey demolition waste (2 mm to 4 mm) of concrete and brick fragments; strong putrefied odour			
		0.3			GW7_5.50		FILL: MIXED LANDFILL: pale grey; comprised of sandstone cobbles, medium grained grey sand, and gravel of brick fragments (5 mm to 50 mm); strong putrefied odour			
0.0	GW7_6.50	FILL: sandy CLAY: dark grey-black; with putrescible waste, of soft plastic (~10%), metal wire fragments (~10%), and cloth pieces; strong putrefied odour								
0.0	GW7_7.50	FILL: MIXED LANDFILL: comprised of clay, high plasticity, dark grey, with demolition waste (~20%), of brick fragments and sandstone, with (~20%) cardboard, soft plastic, styrofoam, and aluminium; strong putrefied odour								
0.0	GW7_7.50	FILL: MIXED LANDFILL: comprised of clay, medium plasticity, dark brown, with soft plastic (~20%), and aluminium (~20%); strong putrefied odour								

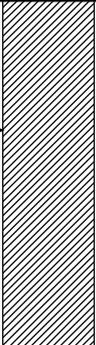
2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_60559345\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 21/03/2019
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 22/03/2019
<b>Location:</b> Tempe Recreation Reserve	<b>Checked by:</b> KM/PW	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> 330323.0 m	<b>Top of Casing:</b> 15.2 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling	<b>Northing:</b> 6244216.6 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 18.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98 mm	<b>Surface:</b> Grass
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -



2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 21/03/2019
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 22/03/2019
<b>Location:</b> Tempe Recreation Reserve	<b>Checked by:</b> KM/PW	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> 330323.0 m	<b>Top of Casing:</b> 15.2 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling	<b>Northing:</b> 6244216.6 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 18.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98 mm	<b>Surface:</b> Grass
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -

Drill Method	Sample Interval PID (ppm)	Sample ID	Graphic Log	Classification	MATERIAL DESCRIPTION	Moisture	Depth (m)	WELL CONSTRUCTION DETAILS
SNC	0.0	GW7_16.50		CL	sandy CLAY: low plasticity; dark grey; sand is fine to medium grained, with shell fragments (~20%); strong rotten egg smell (sulfurous)	M	16	
							17	
					GW7 terminated at 18.00 m. Target depth. Monitoring well installed		18	
							19	
							20	
							21	
							22	
							23	

2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_60559345\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 20/11/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> AC/PD	<b>End Date:</b> 11/01/2019
<b>Location:</b> Tempe Golf Range & Academy, Tempe	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> 330410.8 m	<b>Top of Casing:</b> 15.3 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling, sonic drilling	<b>Northing:</b> 6244430.2 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Comacchio 450P	<b>Total Depth:</b> 23.30 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Pipe Dia.:</b> 50 mm
		<b>Surface:</b> Grass
		<b>Permit No.:</b> -

Drill Method	Sample Interval PID (ppm)	Sample ID	Graphic Log	Classification	MATERIAL DESCRIPTION	Moisture	Depth (m)	WELL CONSTRUCTION DETAILS	
NDD	0.05	GW8_0.05			FILL: dark brown; sand is fine to coarse grained, with rootlets; no odour	M	0		0.0 to 0.5 m: GATIC COVER
	0.5	GW8_0.5			FILL: MIXTURE OF SOIL AND COBBLES				
	1.0	GW8_1.0			FILL: clayey SAND: fine to medium grained; dark brown; clay is low plasticity, trace gravel, medium to coarse grained, road base and asphaltic concrete; no odour				
	1.5	GW8_1.5			FILL: CLAY: medium plasticity; grey; no odour (bentonite capping layer) FILL: LANDFILL: comprised of construction waste, strong compost and putrefied odour				
SNC	2.5	GW8_2.5			FILL: LANDFILL: comprised of construction waste, rubble, tiles, plastic, styrofoam, fabric and metal; strong compost and putrefied odour		1 2 3 4 5 6 7		0.5 to 9.3 m: BENTONITE SEAL (PELLETS) 0.0 to 9.8 m: 50 mm Class 18 PVC
	3.5	GW8_3.5							
	4.5	GW8_4.5							
	5.5	GW8_5.5							
	6.5	0.1 GW8_6.5			FILL: CLAY: high plasticity; pale grey; trace (~5%) plastic waste, (~5%) timber waste; no odour				
	7.5	0.2 GW8_7.5			FILL: CLAY: high plasticity; brown-grey and red-brown; trace (~5%) ironstone gravel, angular to sub-angular; trace (~5%) aluminium waste, and (~1%) metal fragments; no odour				
					from 6.80 m: dark grey				

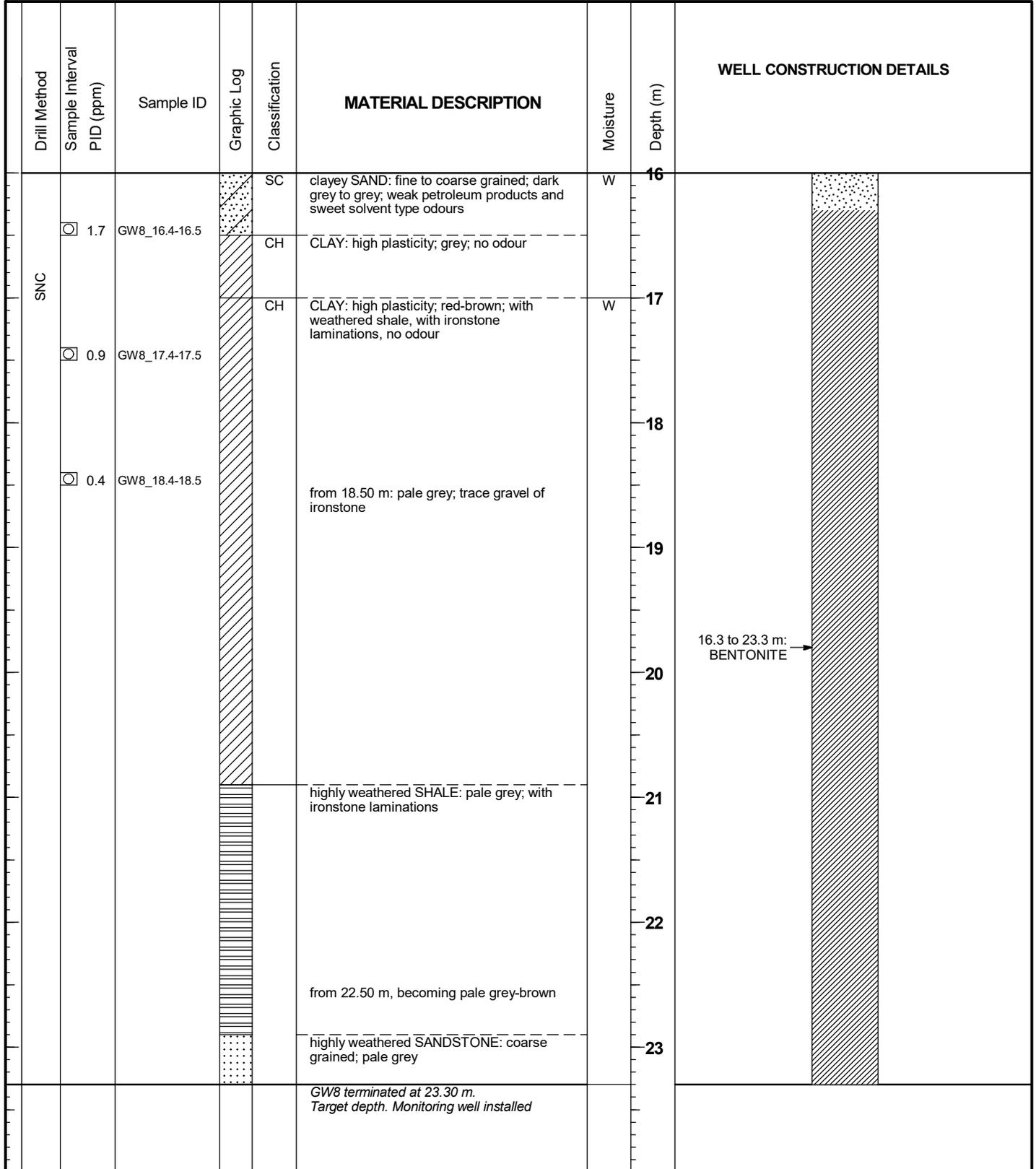
**Remarks:** 0.00-6.60 m: Location drilled from 0-6.6m on 19/11/2018 and abandoned due to high LEL. Bentonite plug installed.  
 6.00-8.00 m: Location re-drilled from 6.0-8.0m on 04/12/2018 and abandoned due to high methane. Bentonite plug installed.  
 8.00-23.30 m: Location re-drilled from 8.0-23.3m on 11/01/2019. Termination criteria reached. Combined groundwater and soil vapour well installation

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 20/11/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> AC/PD	<b>End Date:</b> 11/01/2019
<b>Location:</b> Tempe Golf Range & Academy, Tempe	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd PF/SM	<b>Easting:</b> 330410.8 m	<b>Top of Casing:</b> 15.3 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling, sonic drilling	<b>Northing:</b> 6244430.2 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Comacchio 450P	<b>Total Depth:</b> 23.30 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Surface:</b> Grass
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -

Drill Method	Sample Interval P ID (ppm)	Sample ID	Graphic Log	Classification	MATERIAL DESCRIPTION	Moisture	Depth (m)	WELL CONSTRUCTION DETAILS
SNC	0.8	GW8_8.4-8.5	[Cross-hatch pattern]		FILL: sandy GRAVEL: fine to coarse grained; sub-angular; dark grey; sand is coarse grained, dark grey, with clay, medium plasticity, trace (<5%) broken pottery, (<10%) plastic waste, of tapes, (<5%) metal fragments, of cans and wires, and (< 5%) timber fragments, no odour	M	8	<p>9.3 to 16.3 m: 2 mm FILTER SAND</p> <p>9.8 to 15.8 m: 50 mm Class 18 PVC; 0.5 mm aperture screen</p> <p>11/01/2019</p> <p>15.8 to 15.8 m: End cap</p>
	0.8	GW8_9.4-9.5	[Cross-hatch pattern]		FILL: gravelly SAND: fine to coarse grained; dark grey; gravel is fine grained, dark grey, angular, with <5% plastic, of tapes, <5% timber fragments; weak petroleum products odour		9	
	0.9	GW8_10.4-10.5	[Cross-hatch pattern]				10	
	0.9	GW8_11.4-11.5	[Cross-hatch pattern]		from 10.80 m to 11.20 m: clay band, high plasticity, pale grey		11	
	0.5	GW8_12.4-12.5	[Cross-hatch pattern]		FILL: CLAY: high plasticity; dark grey to red-brown; with mudstone gravel, coarse grained, angular; no odour	M-W	13	
	0.5	GW8_13.4-13.5	[Cross-hatch pattern]				14	
	0.6	GW8_14.4-14.5	[Cross-hatch pattern]		at 14.90 m: Cobbles of sandstone (>200 mm)		15	
	0.6	GW8_14.4-14.5	[Cross-hatch pattern]		FILL: gravelly SAND: fine to coarse grained; dark grey; gravel is fine grained, mudstone and ironstone, with clay, medium plasticity; distinct petroleum products odour	W	15	
			[Dotted pattern]	SC				

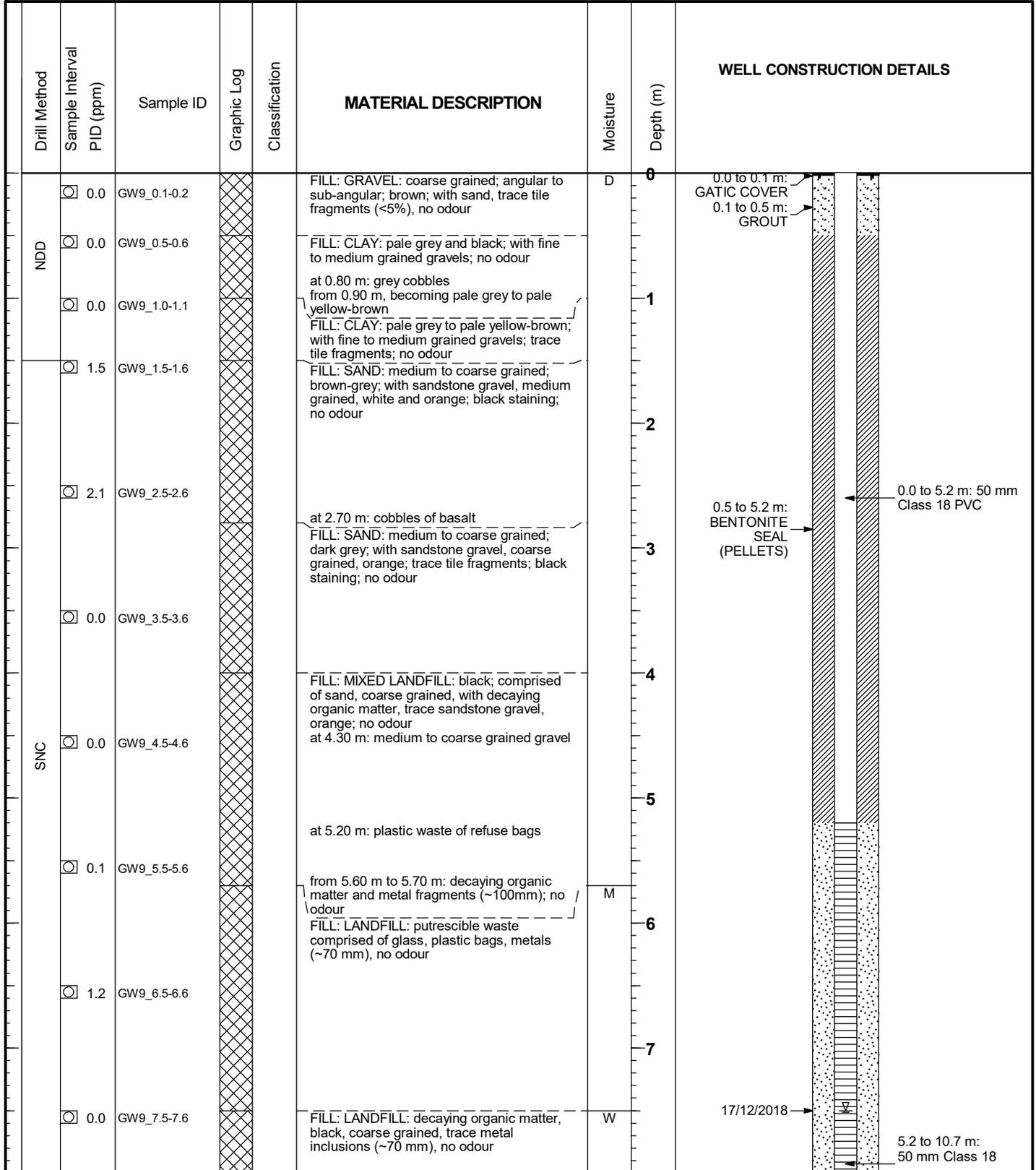
Remarks:

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 20/11/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> AC/PD	<b>End Date:</b> 11/01/2019
<b>Location:</b> Tempe Golf Range & Academy, Tempe	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> 330410.8 m	<b>Top of Casing:</b> 15.3 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling, sonic drilling	<b>Northing:</b> 6244430.2 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Comacchio 450P	<b>Total Depth:</b> 23.30 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Pipe Dia.:</b> 50 mm
		<b>Surface:</b> Grass
		<b>Permit No.:</b> -

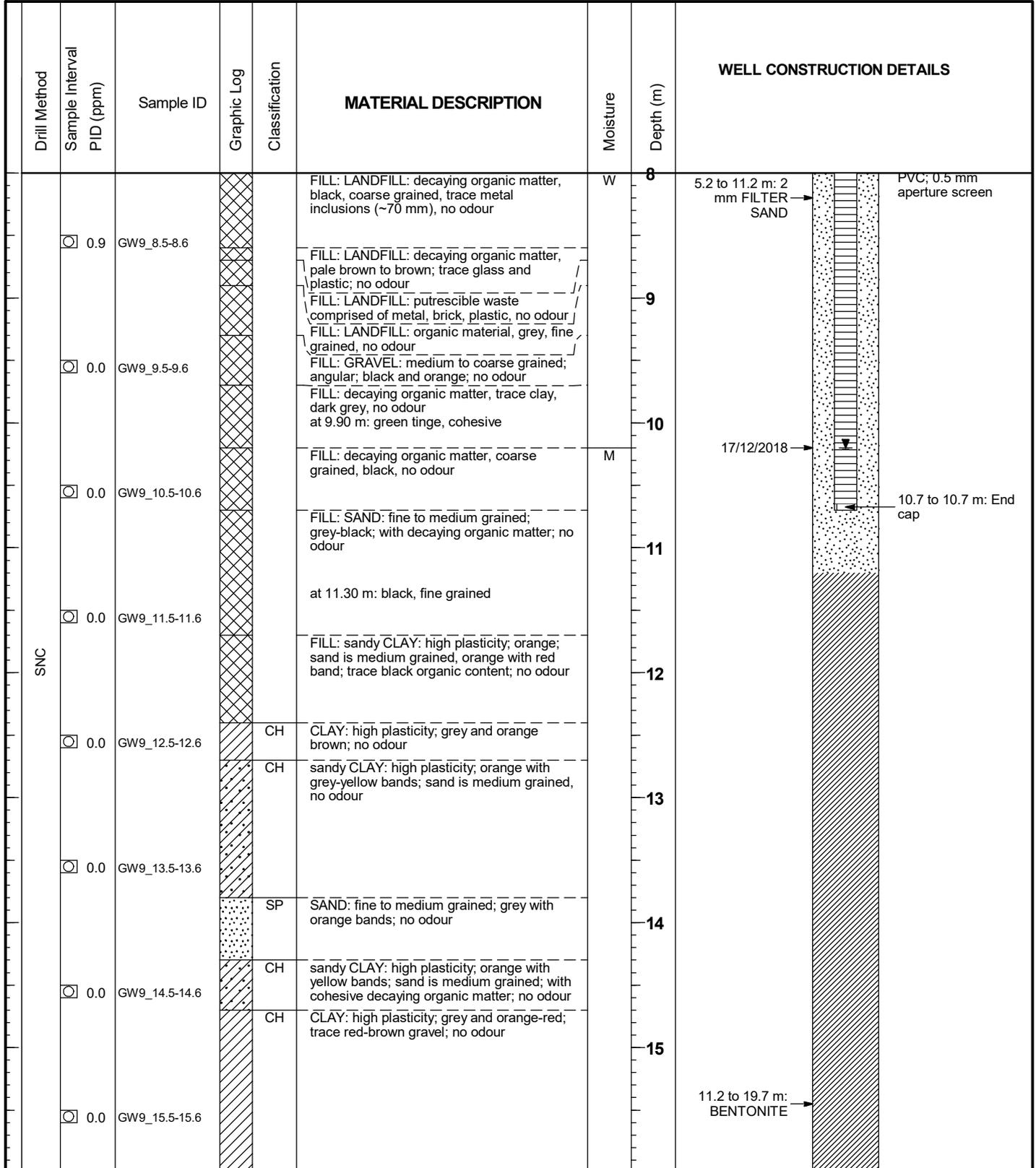


2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_60559345\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 17/12/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> RP	<b>End Date:</b> 18/12/2018
<b>Location:</b> Tyne Container, Tempe	<b>Checked by:</b> ES	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd PF/SM/NS	<b>Easting:</b> 330616.7 m	<b>Top of Casing:</b>
<b>Drill Type:</b> non-destructive drilling, sonic drilling	<b>Northing:</b> 6244767.6 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Comacchio 450	<b>Total Depth:</b> 19.70 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Surface:</b> Gravel
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -

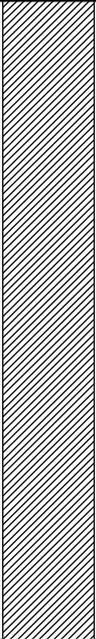


<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 17/12/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> RP	<b>End Date:</b> 18/12/2018
<b>Location:</b> Tyne Container, Tempe	<b>Checked by:</b> ES	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd PF/SM/NS	<b>Easting:</b> 330616.7 m	<b>Top of Casing:</b>
<b>Drill Type:</b> non-destructive drilling, sonic drilling	<b>Northing:</b> 6244767.6 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Comacchio 450	<b>Total Depth:</b> 19.70 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Pipe Dia.:</b> 50 mm
		<b>Surface:</b> Gravel
		<b>Permit No.:</b> -

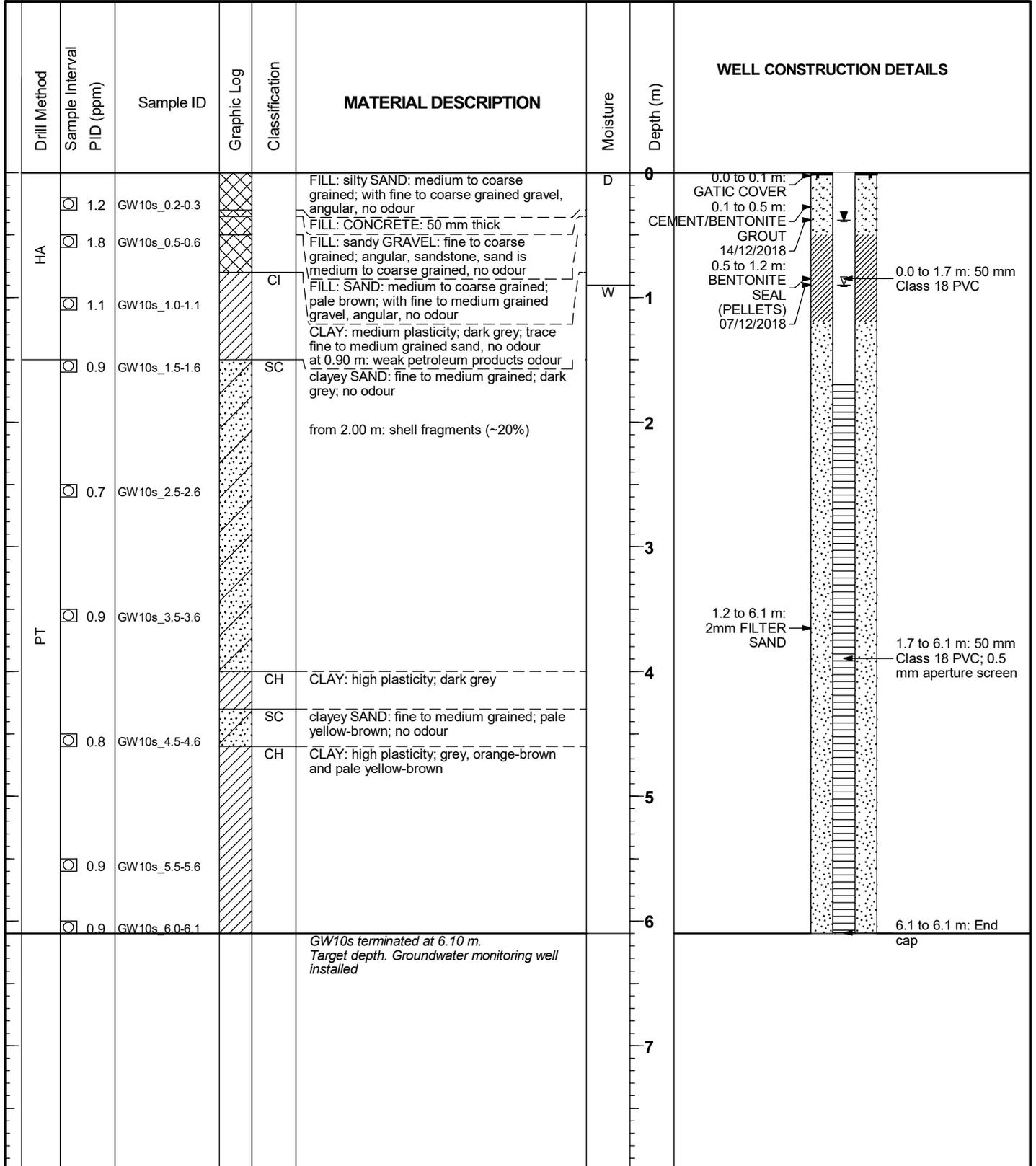


2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_60559345\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 17/12/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> RP	<b>End Date:</b> 18/12/2018
<b>Location:</b> Tyne Container, Tempe	<b>Checked by:</b> ES	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd PF/SM/NS	<b>Easting:</b> 330616.7 m	<b>Top of Casing:</b>
<b>Drill Type:</b> non-destructive drilling, sonic drilling	<b>Northing:</b> 6244767.6 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Comacchio 450	<b>Total Depth:</b> 19.70 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Surface:</b> Gravel
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -

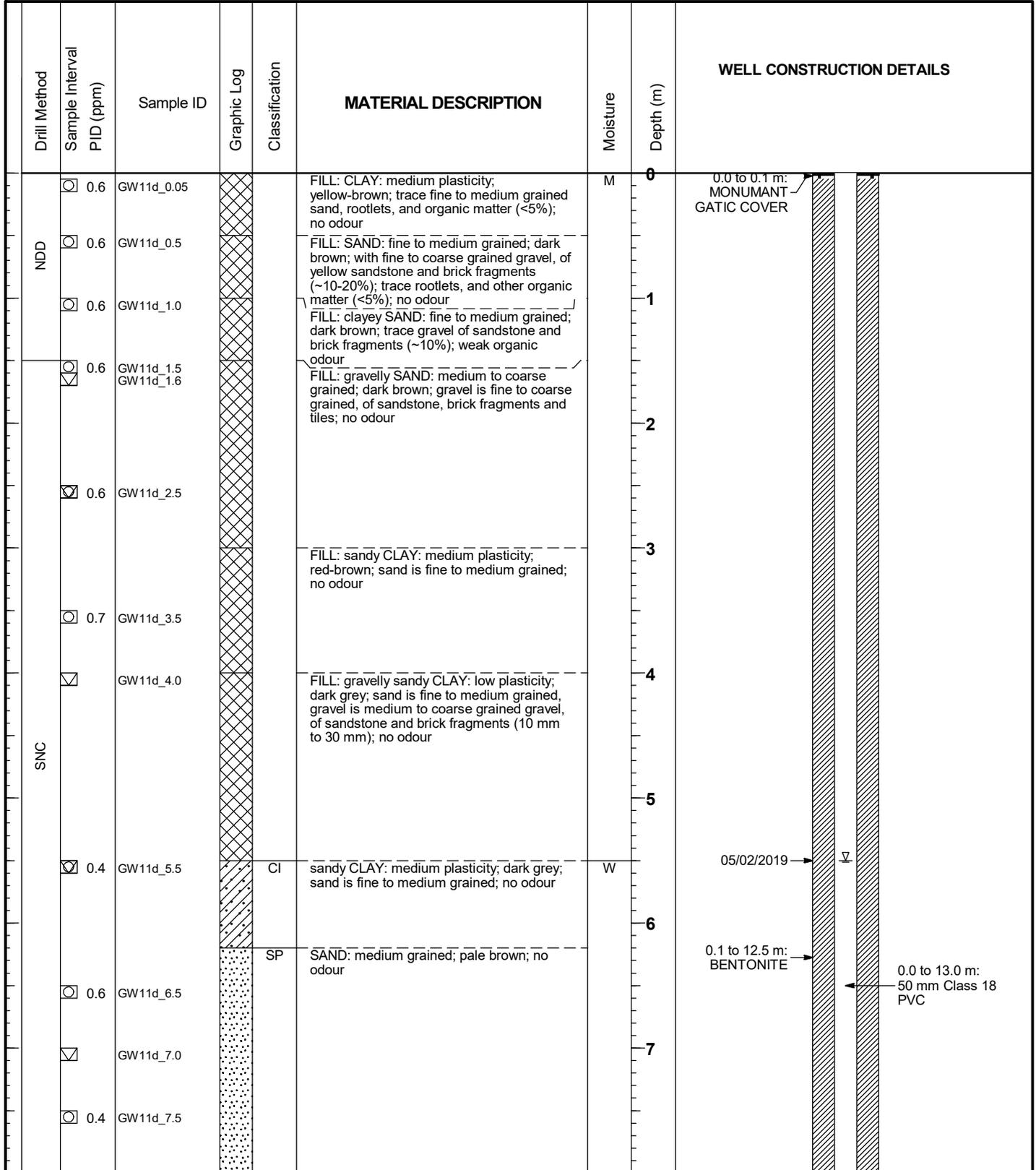
Drill Method	Sample Interval P ID (ppm)	Sample ID	Graphic Log	Classification	MATERIAL DESCRIPTION	Moisture	Depth (m)	WELL CONSTRUCTION DETAILS
SNC	0.0	GW9_16.5-16.6		CH	CLAY: high plasticity; grey and orange-red; trace red-brown gravel; no odour	M	16	
	0.0	GW9_17.5-17.6			SANDSTONE: pale yellow-brown and pale brown; no odour		17	
							18	
							19	
					GW9 terminated at 19.70 m. Target depth. Groundwater monitoring well installed		20	
							21	
							22	
							23	

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 07/12/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> KW	<b>End Date:</b> 07/12/2018
<b>Location:</b> Maritime Container Services, St Peters	<b>Checked by:</b> ES	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Matrix Drilling Pty Ltd SA/SS	<b>Easting:</b> 331005.0 m	<b>Top of Casing:</b> 1.9 m
<b>Drill Type:</b> Hand Auger, push tube	<b>Northing:</b> 6245031.7 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> GeoProbe	<b>Total Depth:</b> 6.10 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 80-84 mm	<b>Pipe Dia.:</b> 50 mm
		<b>Surface:</b> Sand
		<b>Permit No.:</b> -



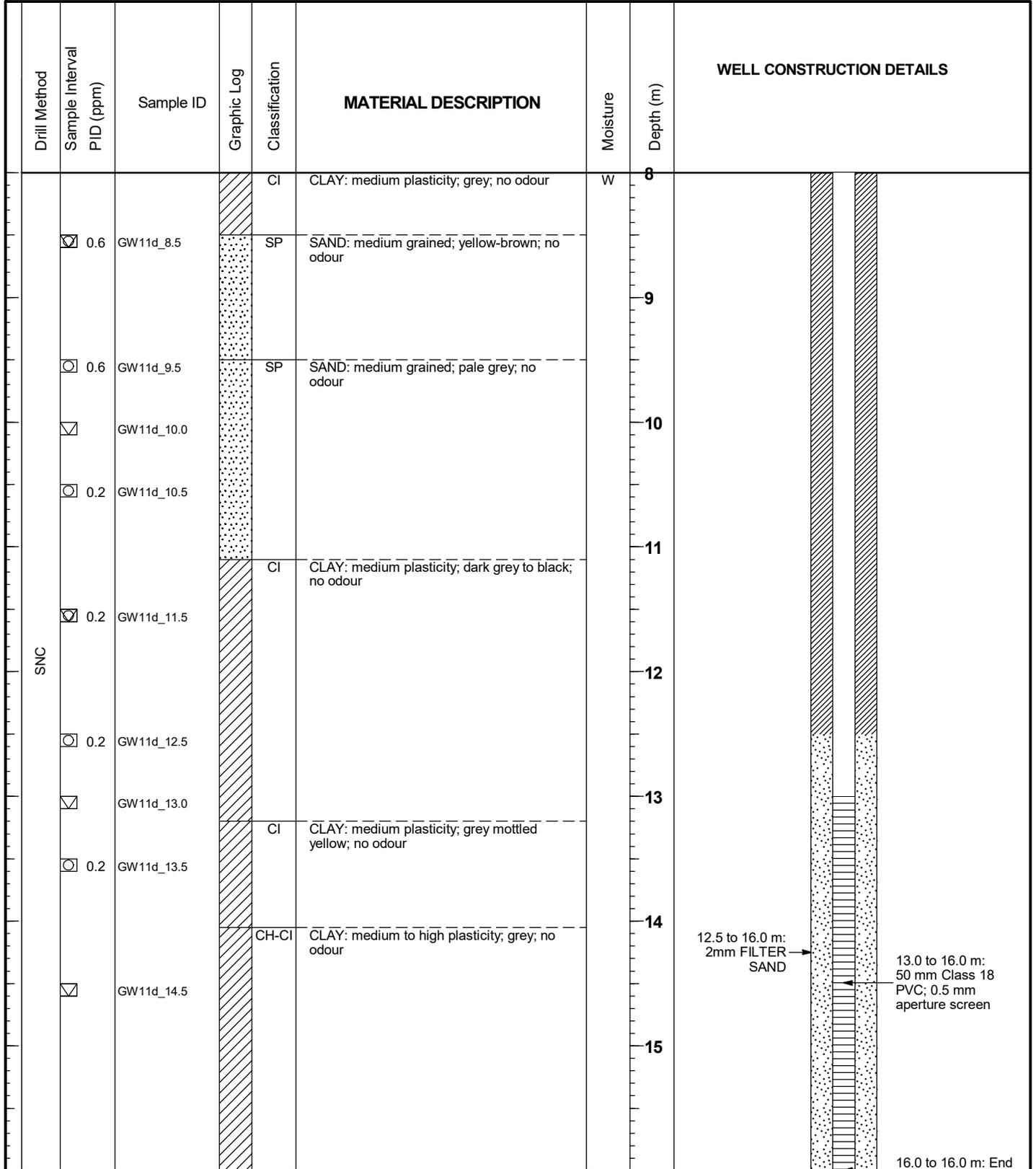
2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 04/02/2019
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 05/02/2019
<b>Location:</b> SACL Northern land, St Peters	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> 331246.1 m	<b>Top of Casing:</b> 6.5 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling	<b>Northing:</b> 6245245.7 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 16.45 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Pipe Dia.:</b> 50 mm
		<b>Permit No.:</b> -



2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 04/02/2019
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 05/02/2019
<b>Location:</b> SACL Northern land, St Peters	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> 331246.1 m	<b>Top of Casing:</b> 6.5 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling	<b>Northing:</b> 6245245.7 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 16.45 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Surface:</b> Soil
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -

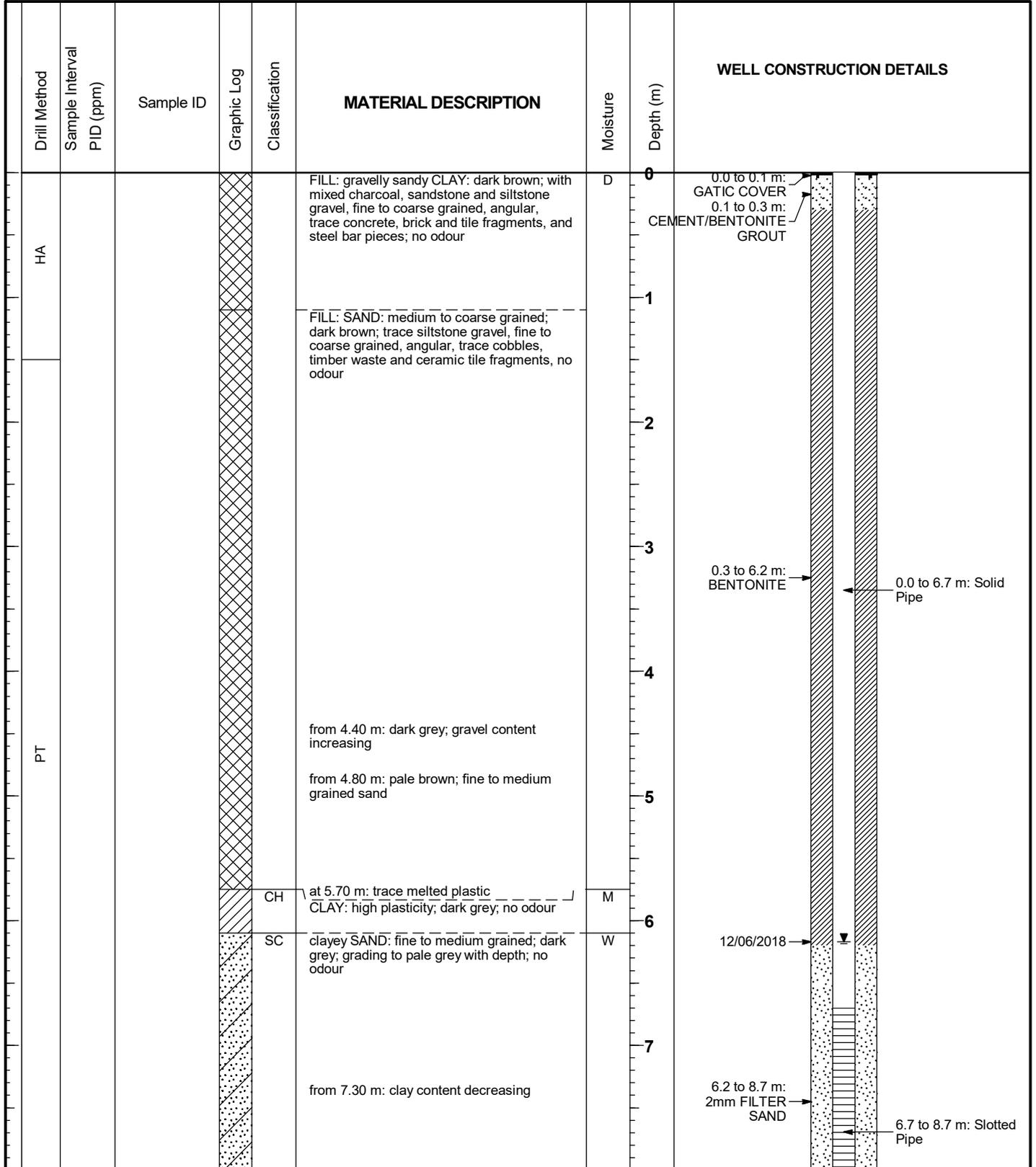


2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 04/02/2019
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 05/02/2019
<b>Location:</b> SACL Northern land, St Peters	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> 331246.1 m	<b>Top of Casing:</b> 6.5 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling	<b>Northing:</b> 6245245.7 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 16.45 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Surface:</b> Soil
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -

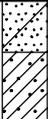
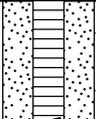
Drill Method	Sample Interval PID (ppm)	Sample ID	Graphic Log	Classification	MATERIAL DESCRIPTION	Moisture	Depth (m)	WELL CONSTRUCTION DETAILS
SNC	☑	GW11d_16.0		CH-CI	CLAY: medium to high plasticity, grey; no odour	W	16	16.0 to 16.5 m:  cap
							17	
							18	
							19	
							20	
							21	
							22	
							23	

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 06/12/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> AM/KW	<b>End Date:</b> 06/12/2018
<b>Location:</b> SACL Northern land, St Peters	<b>Checked by:</b> KM/AD	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Numac Drilling Services Australia Pty Ltd	<b>Easting:</b> 331243.5 m	<b>Top of Casing:</b> 6.6 m
<b>Drill Type:</b> Hand Auger, push tube	<b>Northing:</b> 6245245.3 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> GeoProbe	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H	<b>Surface:</b> Soil
<b>Drill Fluid:</b> -	<b>Total Depth:</b> 8.70 m	<b>Permit No.:</b> -
	<b>Bore Dia.:</b> 80-84 mm	

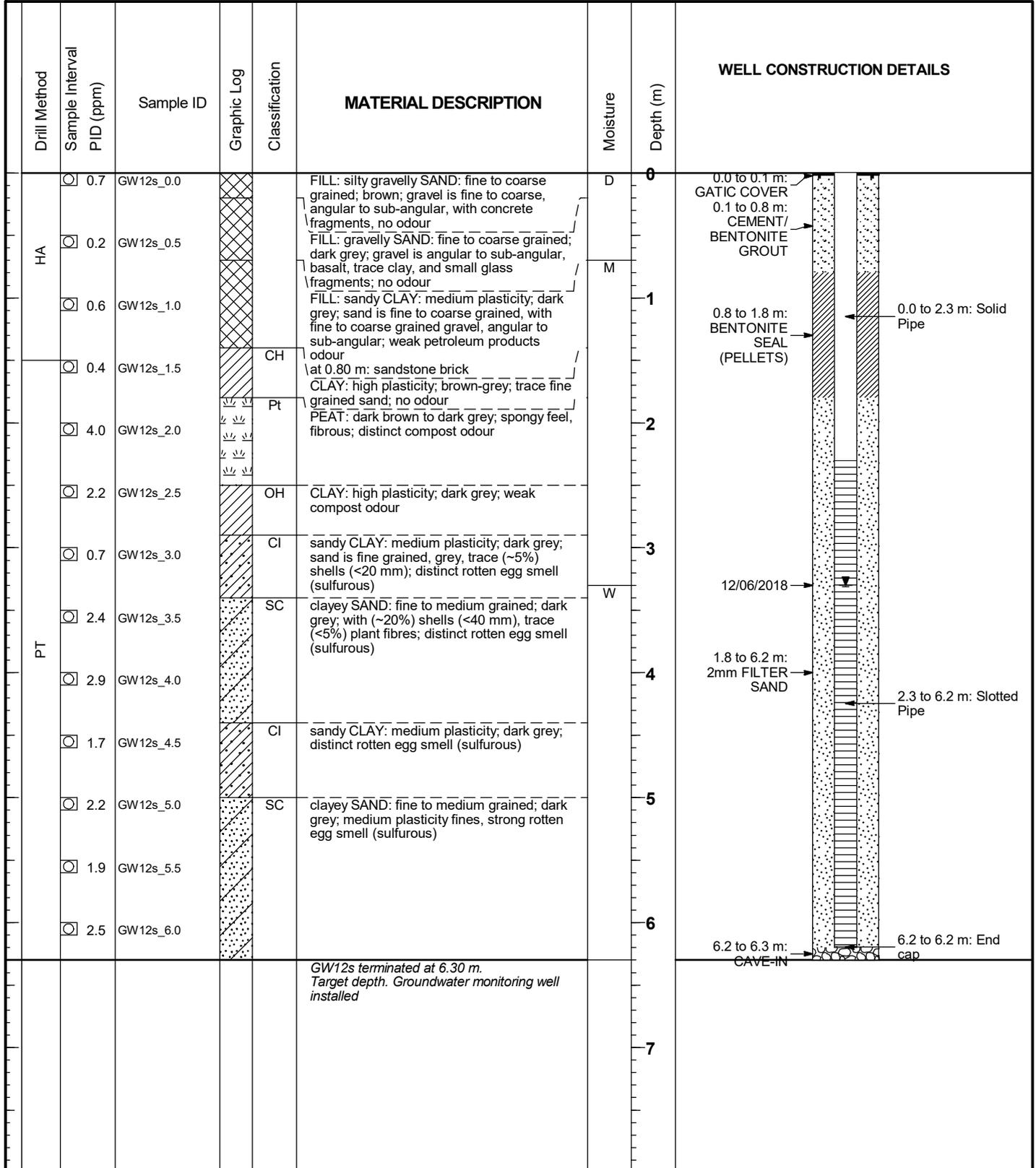


2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 06/12/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> AM/KW	<b>End Date:</b> 06/12/2018
<b>Location:</b> SACL Northern land, St Peters	<b>Checked by:</b> KM/AD	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Numac Drilling Services Australia Pty Ltd	<b>Easting:</b> 331243.5 m	<b>Top of Casing:</b> 6.6 m
<b>Drill Type:</b> Hand Auger, push tube	<b>Northing:</b> 6245245.3 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> GeoProbe	<b>Total Depth:</b> 8.70 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 80-84 mm	<b>Surface:</b> Soil
		<b>Permit No.:</b> -

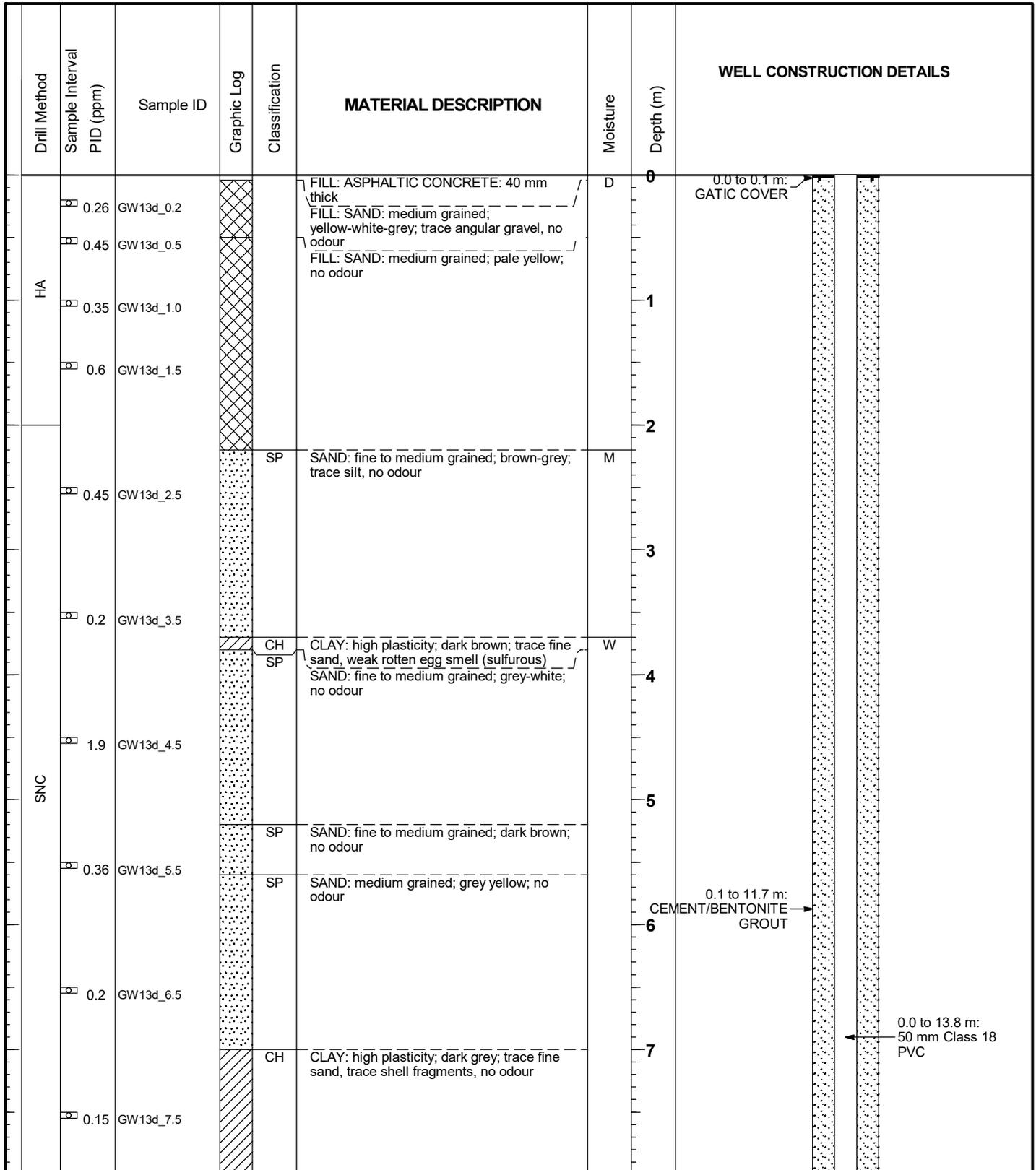
Drill Method	Sample Interval PID (ppm)	Sample ID	Graphic Log	Classification	MATERIAL DESCRIPTION	Moisture	Depth (m)	WELL CONSTRUCTION DETAILS
PT				SC	sandy CLAY: high plasticity; grey; sand is fine grained, no odour	W	8	 8.7 to 8.7 m: End cap
					GW11s terminated at 8.70 m. Target depth. Groundwater monitoring well installed		9	
							10	
							11	
							12	
							13	
							14	
							15	

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 07/12/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> MC	<b>End Date:</b> 07/12/2018
<b>Location:</b> 273A Coward St, Mascot (ARTC)	<b>Checked by:</b> KM/AD	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Numac Drilling Services Australia Pty Ltd	<b>Easting:</b> 331586.5 m	<b>Top of Casing:</b> 2.0 m
<b>Drill Type:</b> Hand Auger, push tube	<b>Northing:</b> 6244600.8 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> GeoProbe	<b>Total Depth:</b> 6.30 m	<b>Surface:</b> Fill
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 80-84 mm	<b>Permit No.:</b> -



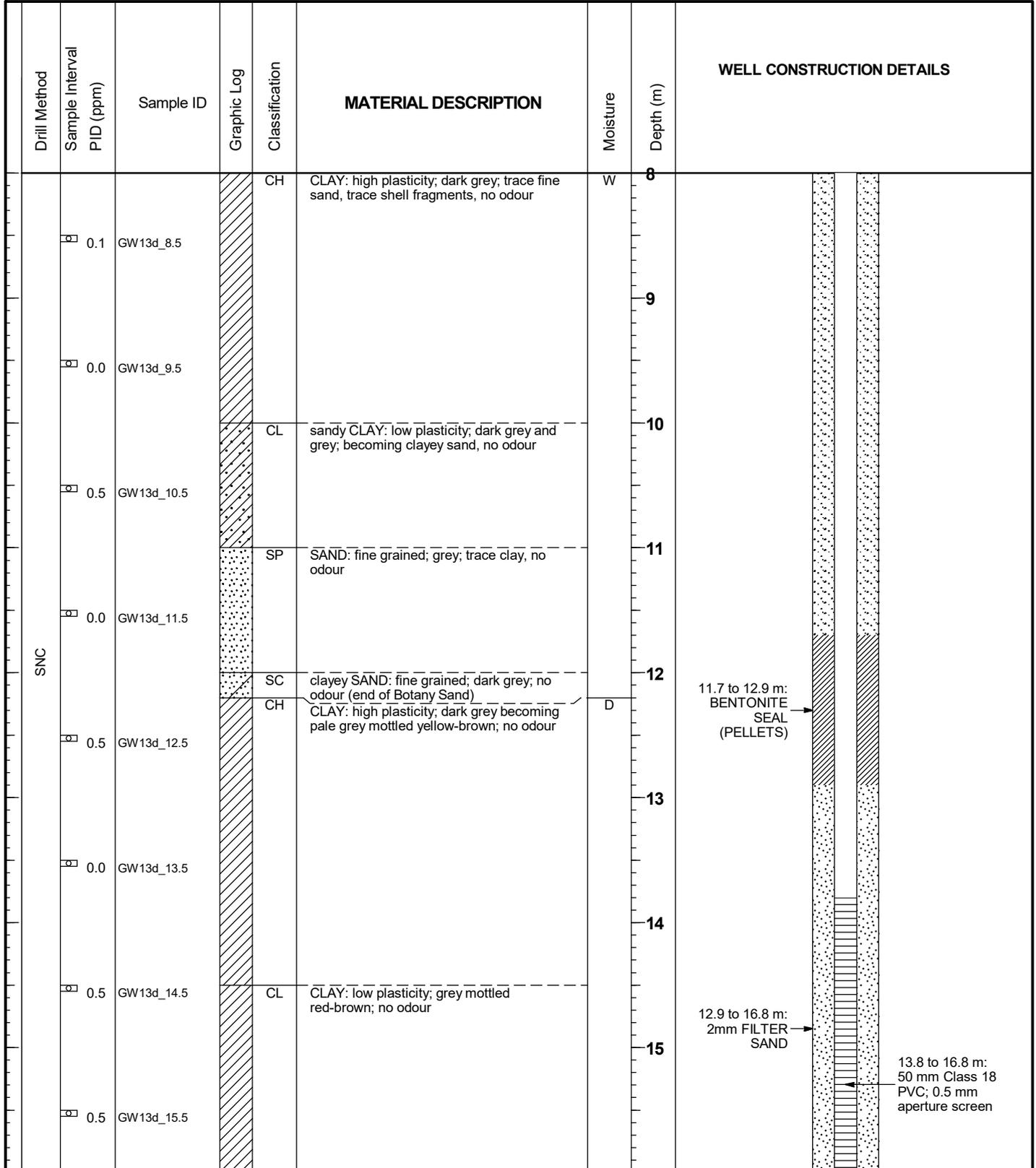
2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_60559345\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 02/11/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> AM	<b>End Date:</b> 02/11/2018
<b>Location:</b> Qantas Jetbase, Mascot	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Numac Drilling Services Australia Pty Ltd	<b>Easting:</b> 331785.8 m	<b>Top of Casing:</b> 2.5 m
<b>Drill Type:</b> Hand Auger, sonic drilling	<b>Northing:</b> 6244530.0 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 17.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-100 mm	<b>Surface:</b> Pavement (asphalt)
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -



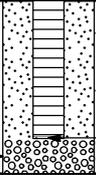
2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 02/11/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> AM	<b>End Date:</b> 02/11/2018
<b>Location:</b> Qantas Jetbase, Mascot	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Numac Drilling Services Australia Pty Ltd	<b>Easting:</b> 331785.8 m	<b>Top of Casing:</b> 2.5 m
<b>Drill Type:</b> Hand Auger, sonic drilling	<b>Northing:</b> 6244530.0 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 17.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-100 mm	<b>Surface:</b> Pavement (asphalt)
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -

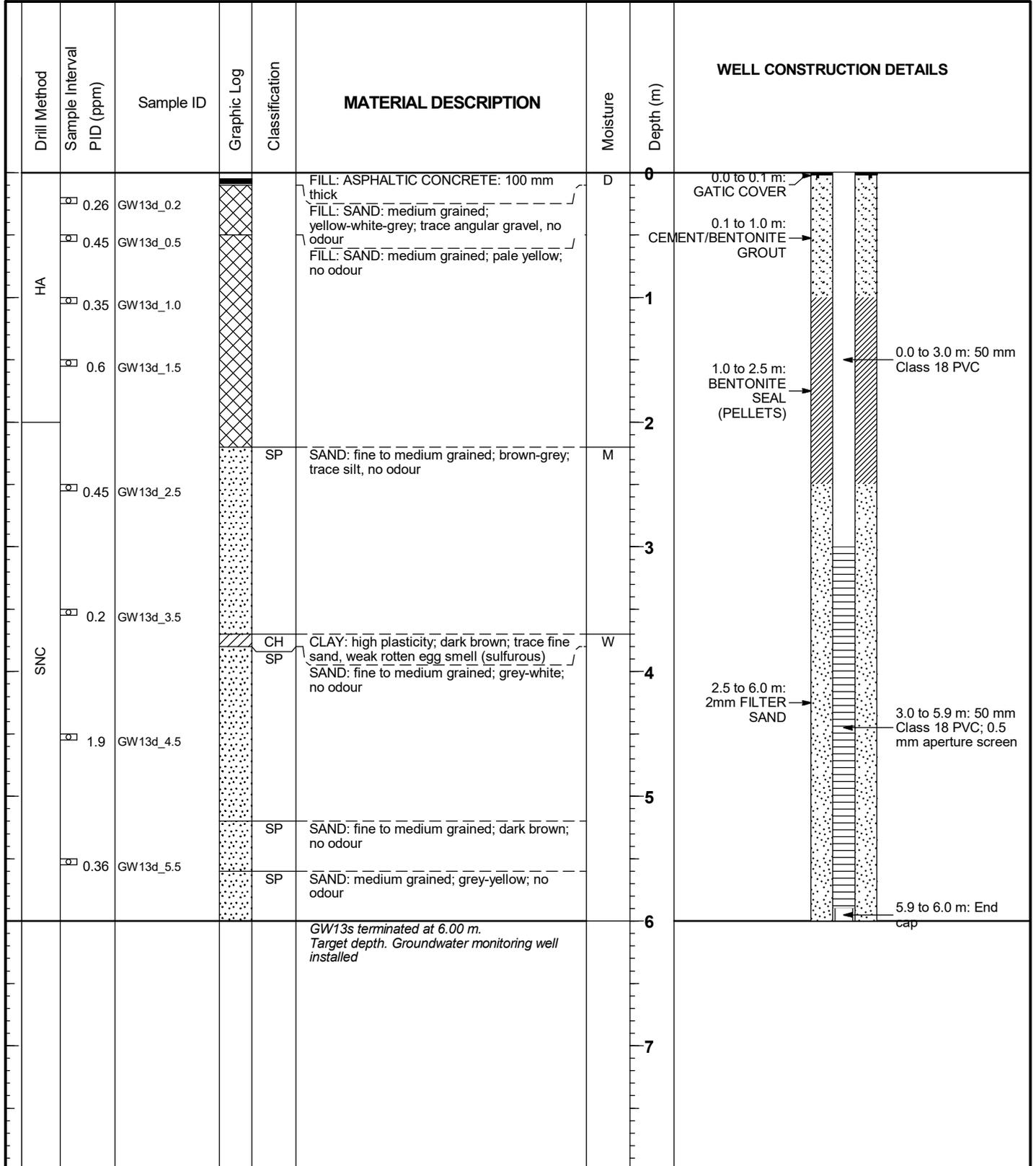


2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 02/11/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> AM	<b>End Date:</b> 02/11/2018
<b>Location:</b> Qantas Jetbase, Mascot	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Numac Drilling Services Australia Pty Ltd	<b>Easting:</b> 331785.8 m	<b>Top of Casing:</b> 2.5 m
<b>Drill Type:</b> Hand Auger, sonic drilling	<b>Northing:</b> 6244530.0 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 17.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-100 mm	<b>Surface:</b> Pavement (asphalt)
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -

Drill Method	Sample Interval PID (ppm)	Sample ID	Graphic Log	Classification	MATERIAL DESCRIPTION	Moisture	Depth (m)	WELL CONSTRUCTION DETAILS
SNC	0.0	GW13d_16.5		CL	CLAY: low plasticity; grey mottled red-brown; no odour	D	16	 <p>16.8 to 17.0 m: Arisings</p> <p>16.8 to 16.8 m: End cap</p>
					<p><i>GW13d terminated at 17.00 m.</i></p> <p><i>Target depth. Groundwater monitoring well installed</i></p>		17	
							18	
							19	
							20	
							21	
							22	
							23	

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 02/11/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> AM	<b>End Date:</b> 02/11/2018
<b>Location:</b> Qantas Jetbase, Mascot	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Numac Drilling Services Australia Pty Ltd	<b>Easting:</b> 331783.0 m	<b>Top of Casing:</b> 2.5 m
<b>Drill Type:</b> Hand Auger, sonic drilling	<b>Northing:</b> 6244530.7 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 6.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-100 mm	<b>Surface:</b> Pavement (asphalt)
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -

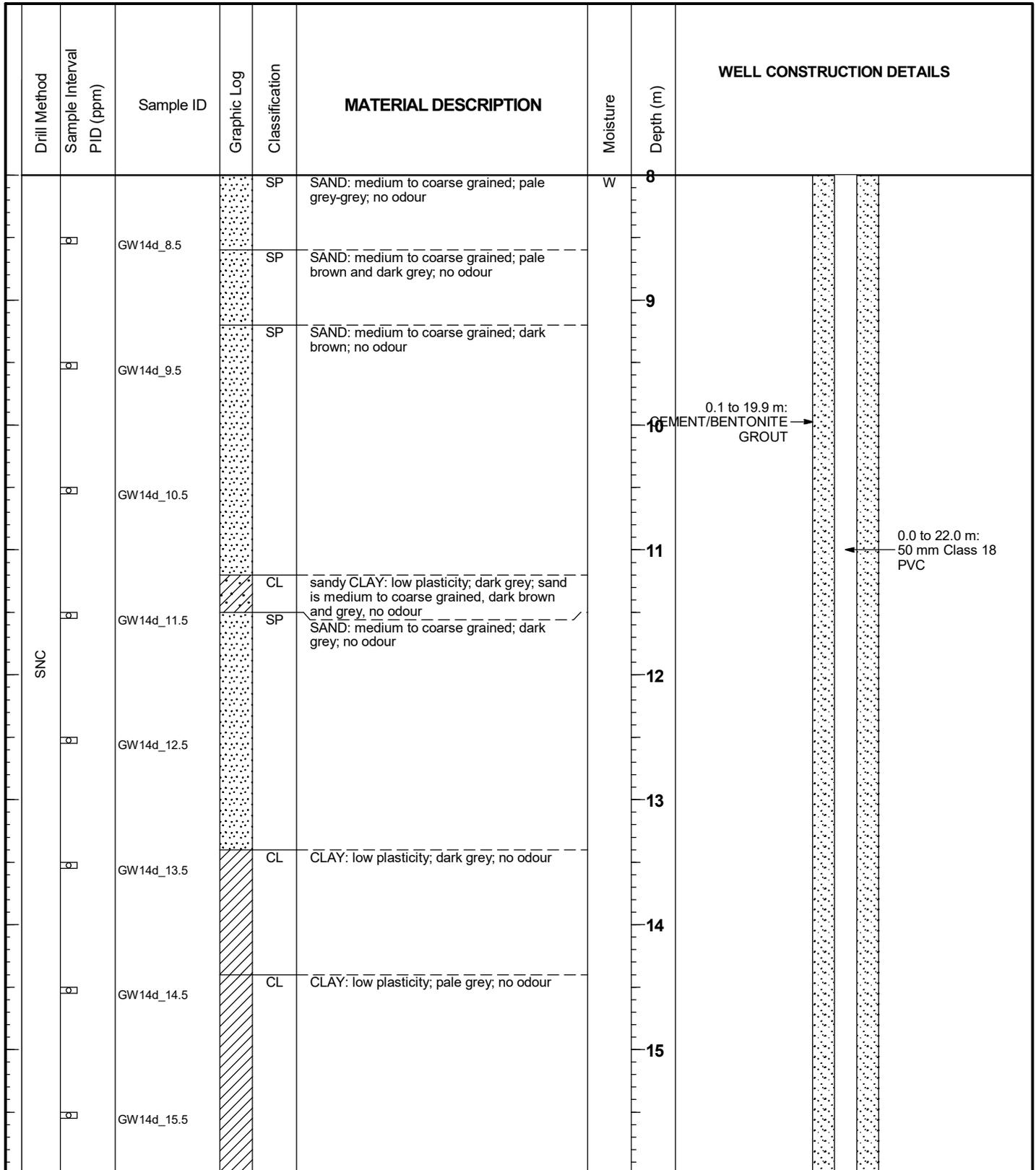


**Remarks:** 0.00-6.00 m: PID Readings and Soil Samples obtained from borehole GW13d

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 02/11/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 02/11/2018
<b>Location:</b> Qantas Jetbase, Mascot	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd PF/SM	<b>Easting:</b> 332106.3 m	<b>Top of Casing:</b> 4.2 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling, diatube	<b>Northing:</b> 6244352.9 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 25.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Surface:</b> Pavement (asphalt)
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -

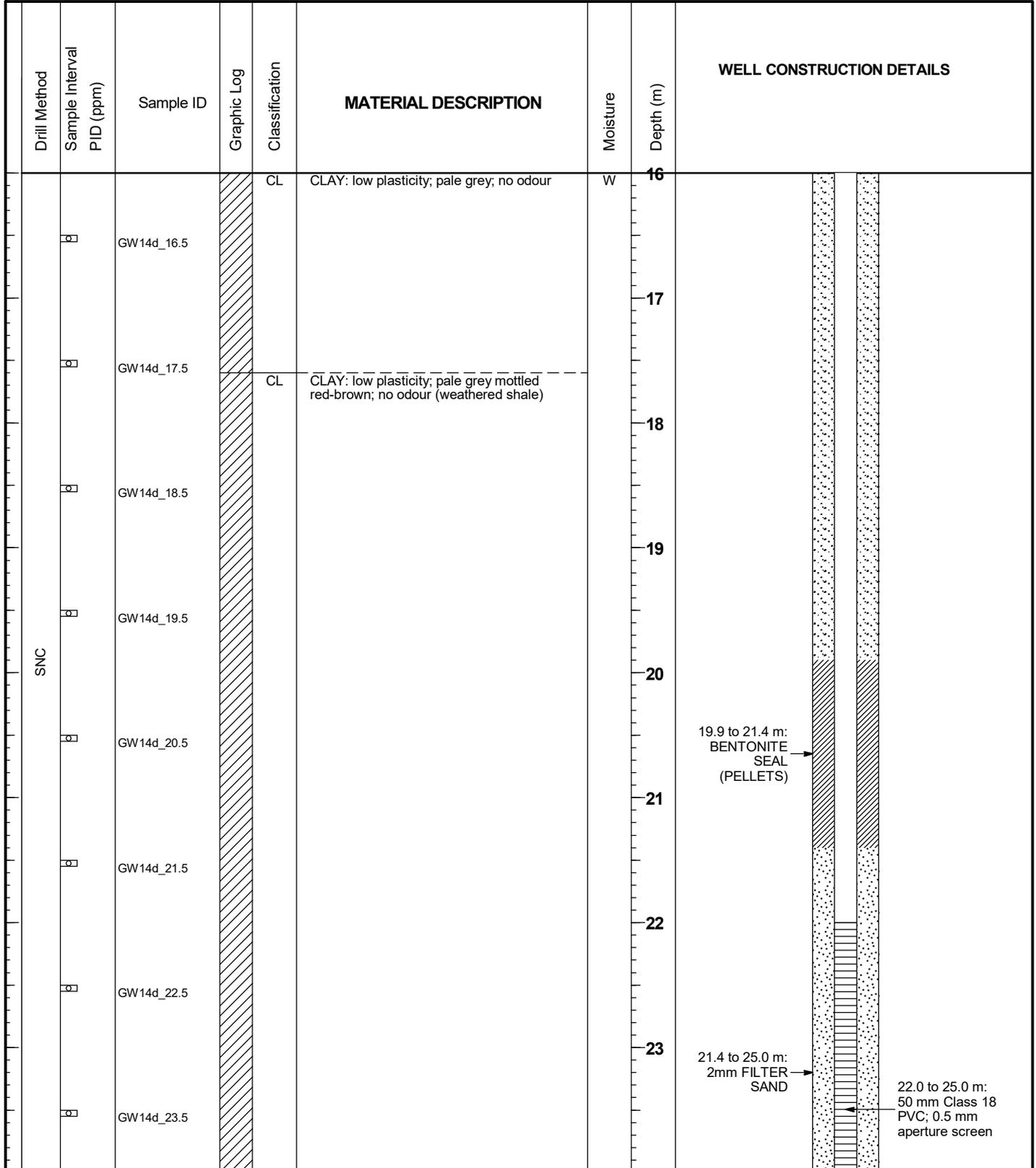
Drill Method	Sample Interval P ID (ppm)	Sample ID	Graphic Log	Classification	MATERIAL DESCRIPTION	Moisture	Depth (m)	WELL CONSTRUCTION DETAILS	
DT		GW14d_0.04			FILL: ASPHALTIC CONCRETE: dark grey; aggregate 10 mm to 60 mm, 40 mm thick; no odour	D	0	0.0 to 0.1 m: GATIC COVER	
	NDD			GW14d_0.5		FILL: SAND: medium to coarse grained; pale brown; no odour			
		GW14d_1.0		FILL: SAND: fine to medium grained; white-yellow-brown; no odour			1		
		GW14d_1.5				M			
SNC		GW14d_2.5		CL	sandy CLAY: low plasticity; pale grey; sand is fine grained, no odour	W			
		GW14d_2.5		SP	SAND: medium to coarse grained; pale brown; no odour		2		
		GW14d_3.5			from 2.30 m to 2.60 m: slight yellow staining				
		GW14d_4.5	SP	SAND: fine to medium grained; pale brown			3		
		GW14d_4.5	SP	SAND: medium to coarse grained; pale brown and dark brown; trace clay, dark grey; weak rotten egg smell (sulfurous) and compost odour					
		GW14d_4.5	CL	CLAY: low plasticity; dark grey and pale brown; trace rootlets; weak rotten egg smell (sulfurous)			4		
		GW14d_4.5	SC	SAND: medium grained; pale brown; no odour					
		GW14d_4.5	SP	clayey SAND: fine to medium grained; dark brown; clay is dark grey, no odour					
		GW14d_4.5	SP	SAND: medium to coarse grained; pale brown and dark grey-brown; no odour			5		
		GW14d_4.5	SP	SAND: fine to medium grained; dark brown; no odour					
	GW14d_5.5	CL		CL	sandy CLAY: low plasticity; pale grey and dark grey; sand is fine to medium grained, no odour		6		
	GW14d_6.5								
	GW14d_7.5						7		

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 02/11/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 02/11/2018
<b>Location:</b> Qantas Jetbase, Mascot	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd PF/SM	<b>Easting:</b> 332106.3 m	<b>Top of Casing:</b> 4.2 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling, diatube	<b>Northing:</b> 6244352.9 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 25.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Surface:</b> Pavement (asphalt)
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -



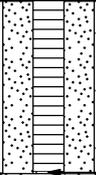
2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_60559345\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 02/11/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 02/11/2018
<b>Location:</b> Qantas Jetbase, Mascot	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd PF/SM	<b>Easting:</b> 332106.3 m	<b>Top of Casing:</b> 4.2 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling, diatube	<b>Northing:</b> 6244352.9 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 25.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Surface:</b> Pavement (asphalt)
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -

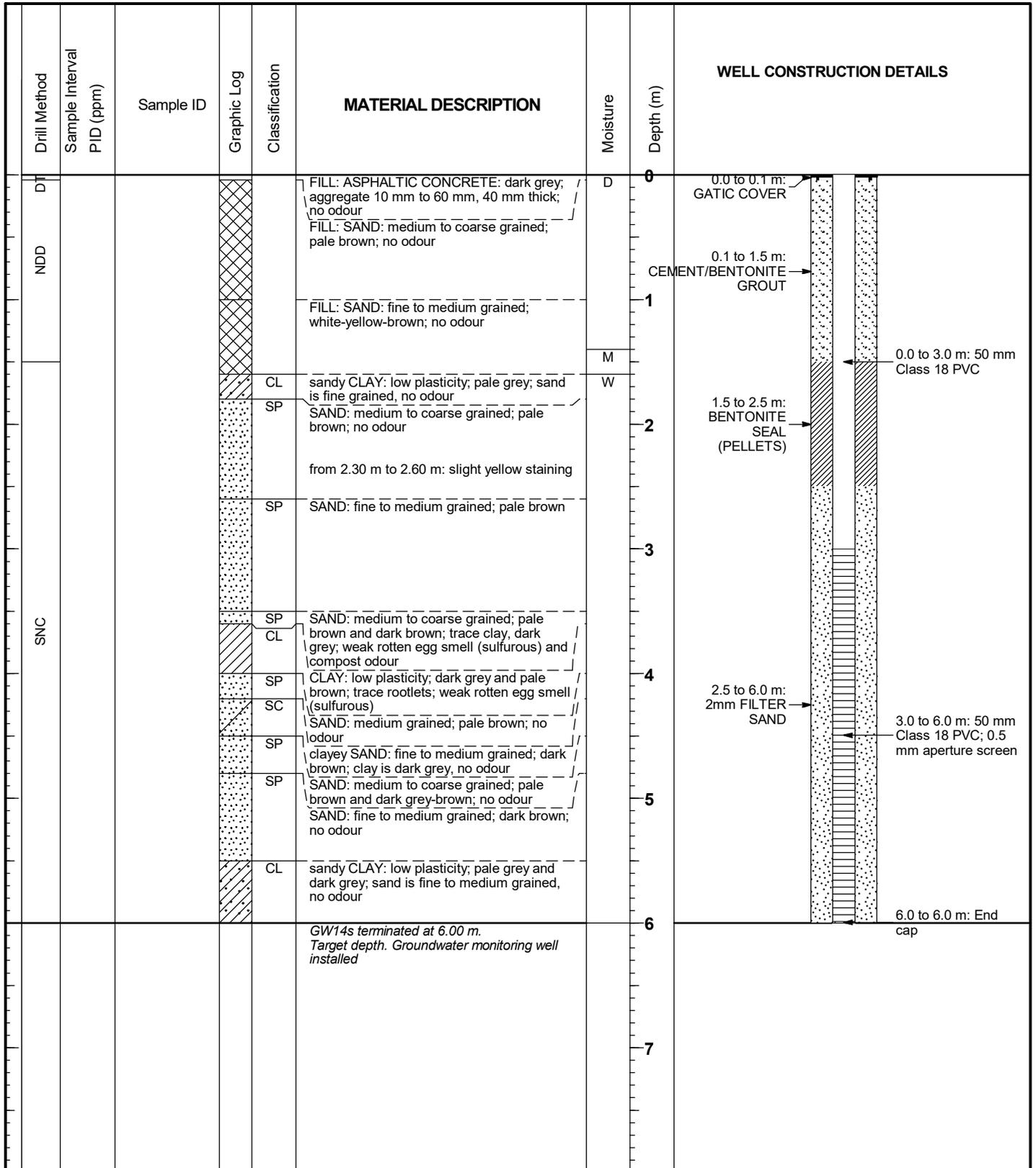


2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_60559345\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 02/11/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 02/11/2018
<b>Location:</b> Qantas Jetbase, Mascot	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> 332106.3 m	<b>Top of Casing:</b> 4.2 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling, diatube	<b>Northing:</b> 6244352.9 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 25.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Pipe Dia.:</b> 50 mm
		<b>Surface:</b> Pavement (asphalt)
		<b>Permit No.:</b> -

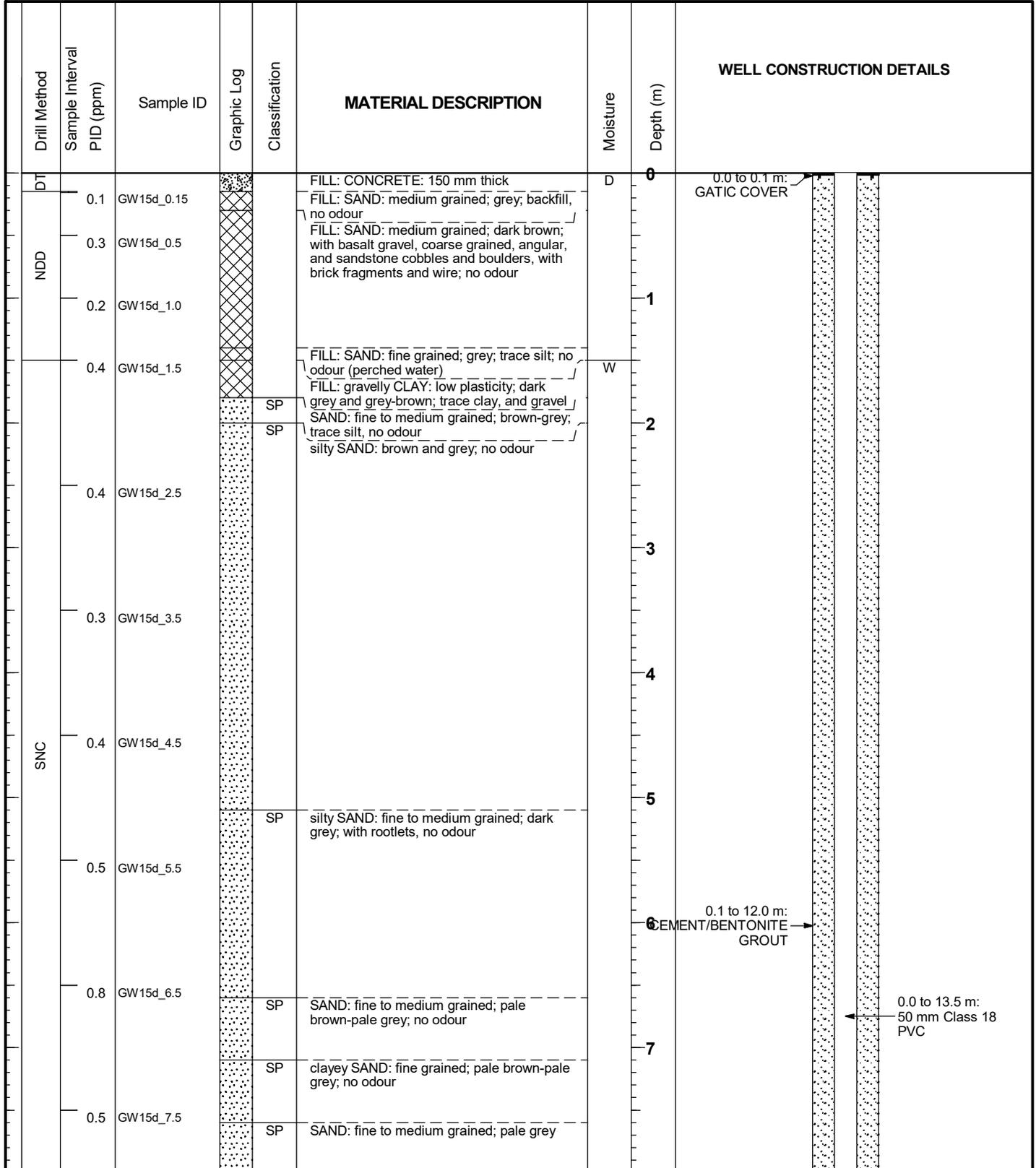
Drill Method	Sample Interval PID (ppm)	Sample ID	Graphic Log	Classification	MATERIAL DESCRIPTION	Moisture	Depth (m)	WELL CONSTRUCTION DETAILS
SNC	□	GW14d_24.5		CL	CLAY: low plasticity; pale grey mottled red-brown; no odour (weathered shale)	W	24	
					<i>GW14d terminated at 25.00 m. Target depth. Groundwater monitoring well installed</i>		25	25.0 to 25.0 m: End cap
							26	
							27	
							28	
							29	
							30	
							31	

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 05/11/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD/AM	<b>End Date:</b> 05/11/2018
<b>Location:</b> Qantas Jetbase, Mascot	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> 332104.7 m	<b>Top of Casing:</b> 4.1 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling, diatube	<b>Northing:</b> 6244353.2 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 6.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Surface:</b> Pavement (asphalt)
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -



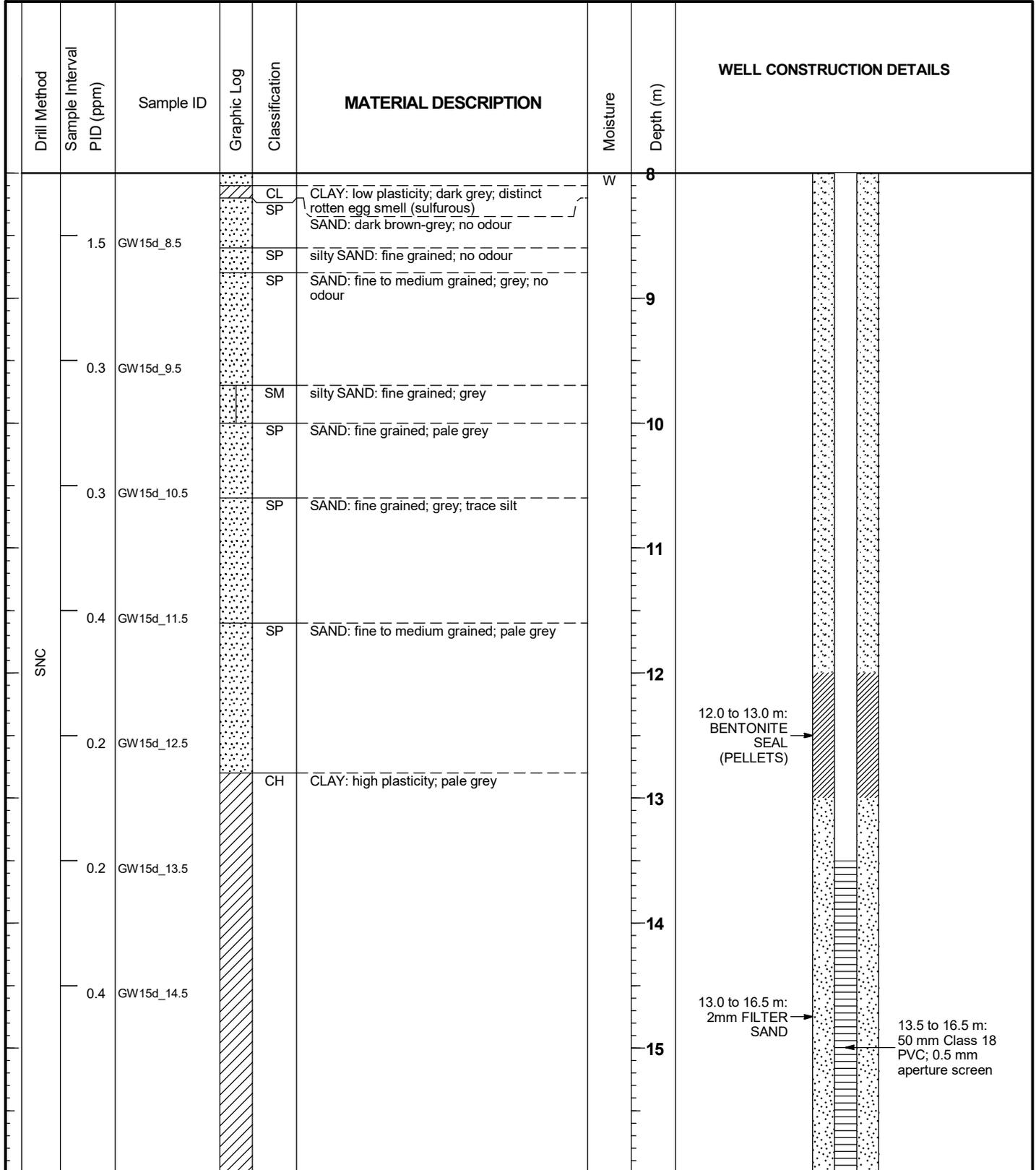
**Remarks:** 0.00-6.00 m: Material descriptions taken from observed profile of borehole GW14d. No environmental sampling - groundwater monitoring well installation only

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 31/10/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD/AM	<b>End Date:</b> 01/11/2018
<b>Location:</b> Qantas Jetbase, Mascot	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd PF/NS/WS	<b>Easting:</b> 332079.9 m	<b>Top of Casing:</b> 3.2 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling, diatube	<b>Northing:</b> 6244179.4 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 16.50 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 152-250 mm	<b>Pipe Dia.:</b> 50 mm
		<b>Permit No.:</b> -



2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 31/10/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD/AM	<b>End Date:</b> 01/11/2018
<b>Location:</b> Qantas Jetbase, Mascot	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd PF/NS/WS	<b>Easting:</b> 332079.9 m	<b>Top of Casing:</b> 3.2 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling, diatube	<b>Northing:</b> 6244179.4 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 16.50 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 152-250 mm	<b>Surface:</b> Concrete
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -

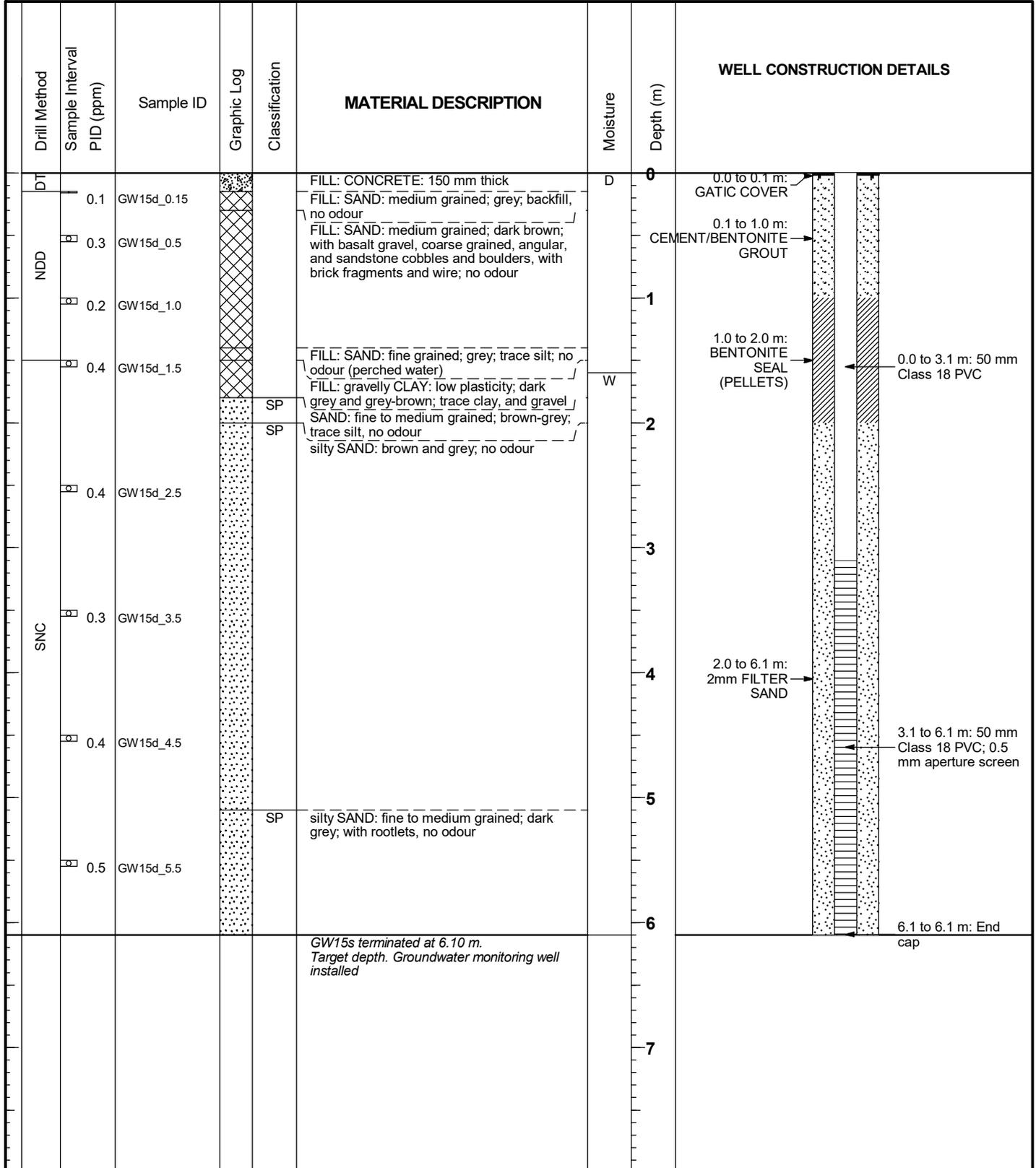


2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_60559345\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 31/10/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD/AM	<b>End Date:</b> 01/11/2018
<b>Location:</b> Qantas Jetbase, Mascot	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd PF/NS/WS	<b>Easting:</b> 332079.9 m	<b>Top of Casing:</b> 3.2 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling, diatube	<b>Northing:</b> 6244179.4 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 16.50 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 152-250 mm	<b>Surface:</b> Concrete
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -

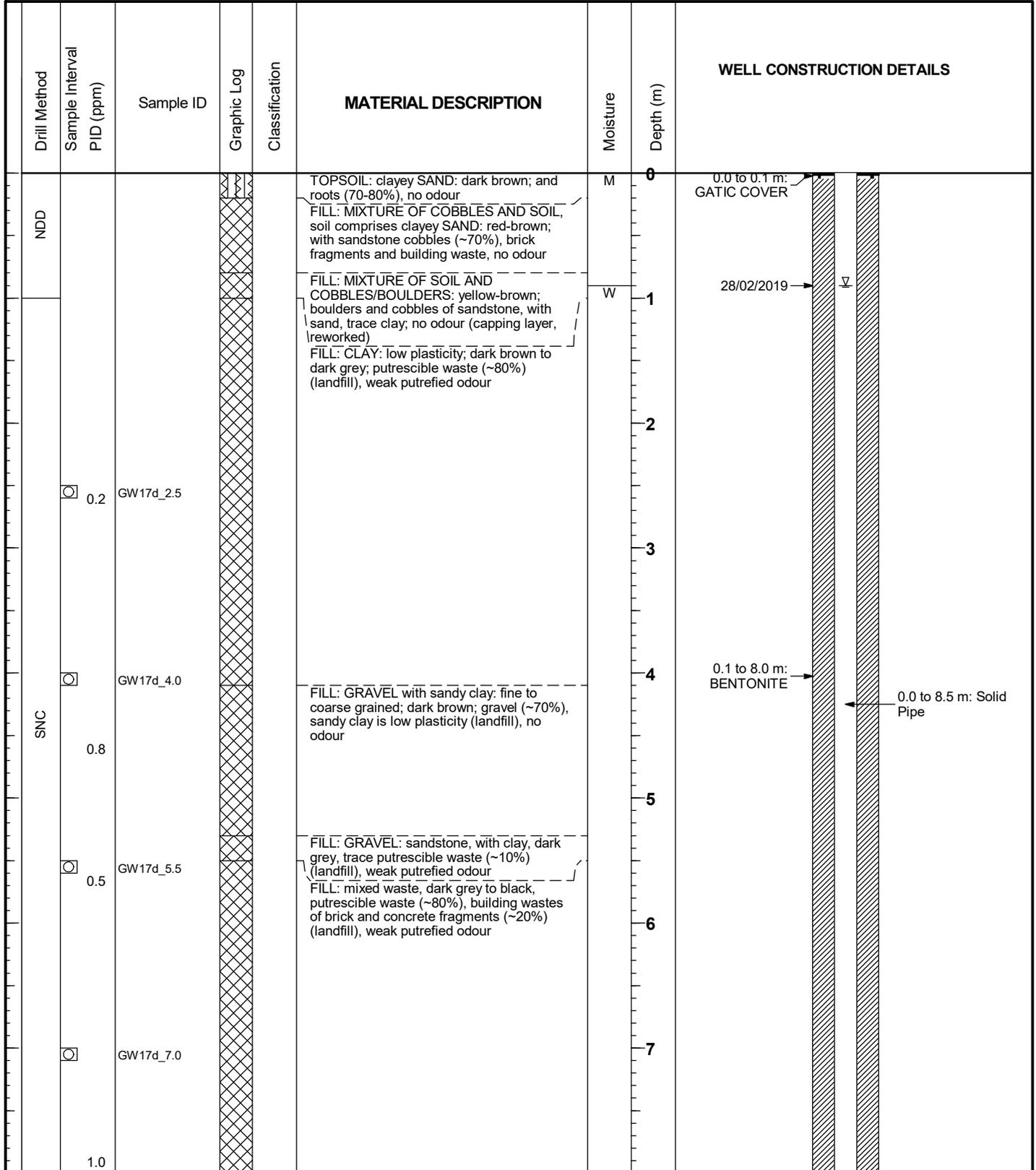
Drill Method	Sample Interval PID (ppm)	Sample ID	Graphic Log	Classification	MATERIAL DESCRIPTION	Moisture	Depth (m)	WELL CONSTRUCTION DETAILS
SNC				CH	CLAY: high plasticity; pale grey	W	16	 16.5 to 16.5 m: End cap
					<i>GW15d terminated at 16.50 m. Target depth. Groundwater monitoring well installed</i>		17	
							18	
							19	
							20	
							21	
							22	
							23	

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 01/11/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD/AM	<b>End Date:</b> 01/11/2018
<b>Location:</b> Qantas Jetbase, Mascot	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> 332081.8 m	<b>Top of Casing:</b> 3.2 m
<b>Drill Type:</b> sonic drilling, non-destructive drilling, diatube	<b>Northing:</b> 6244179.5 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 6.10 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Pipe Dia.:</b> 50 mm
		<b>Surface:</b> Concrete
		<b>Permit No.:</b> -



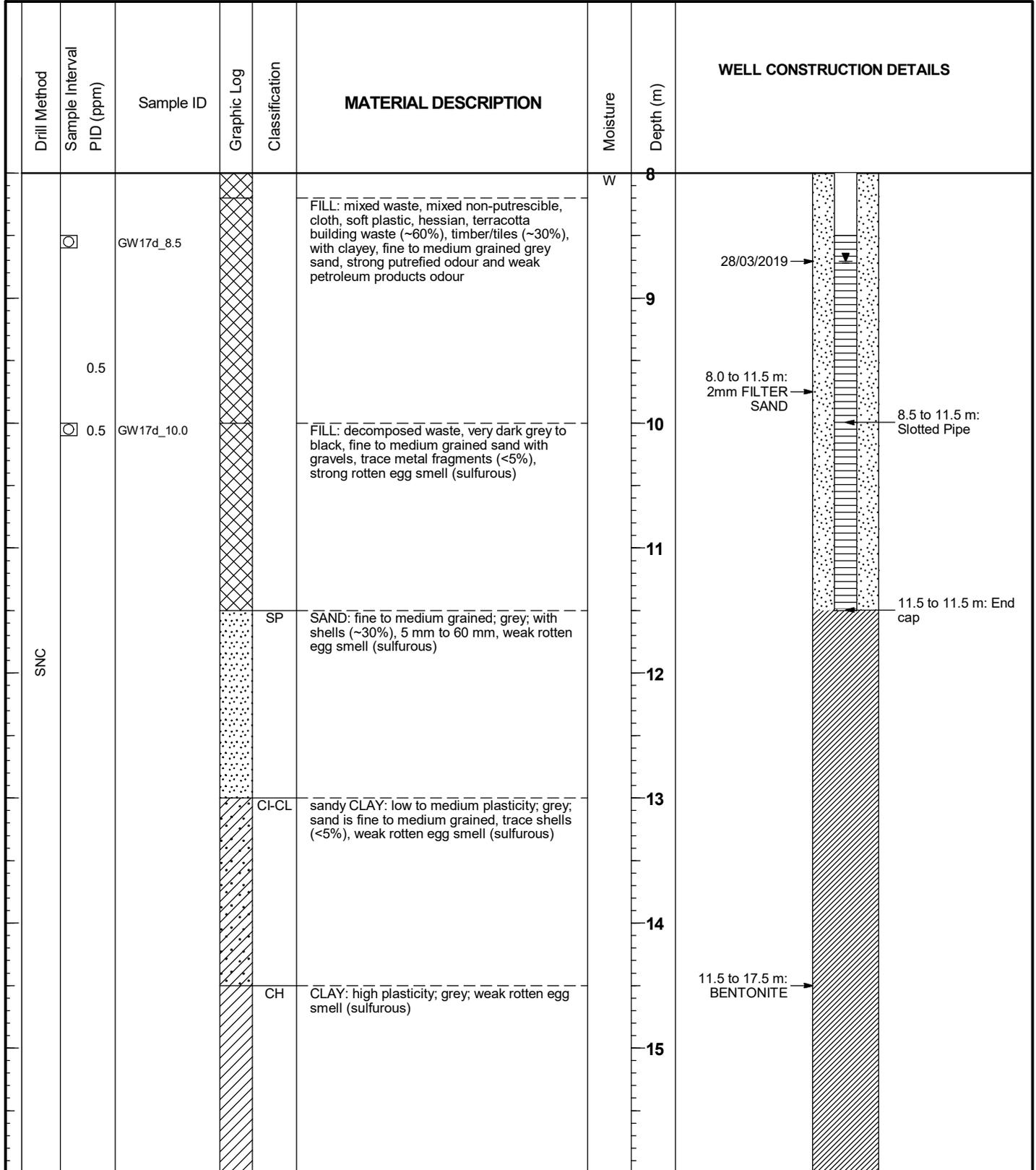
**Remarks:** 0.00-6.00 m: PID Readings, Soil Samples and Soil Profile obtained from borehole GW15d

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 28/02/2019
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 28/02/2019
<b>Location:</b> Vacant lot near Tyne Container, Tempe	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd PF/SM/RA	<b>Easting:</b> 330670.6 m	<b>Top of Casing:</b> 9.845
<b>Drill Type:</b> non-destructive drilling, sonic drilling	<b>Northing:</b> 6244467.9 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 17.50 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Surface:</b> Grass
		<b>Permit No.:</b> -



2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_60559345\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

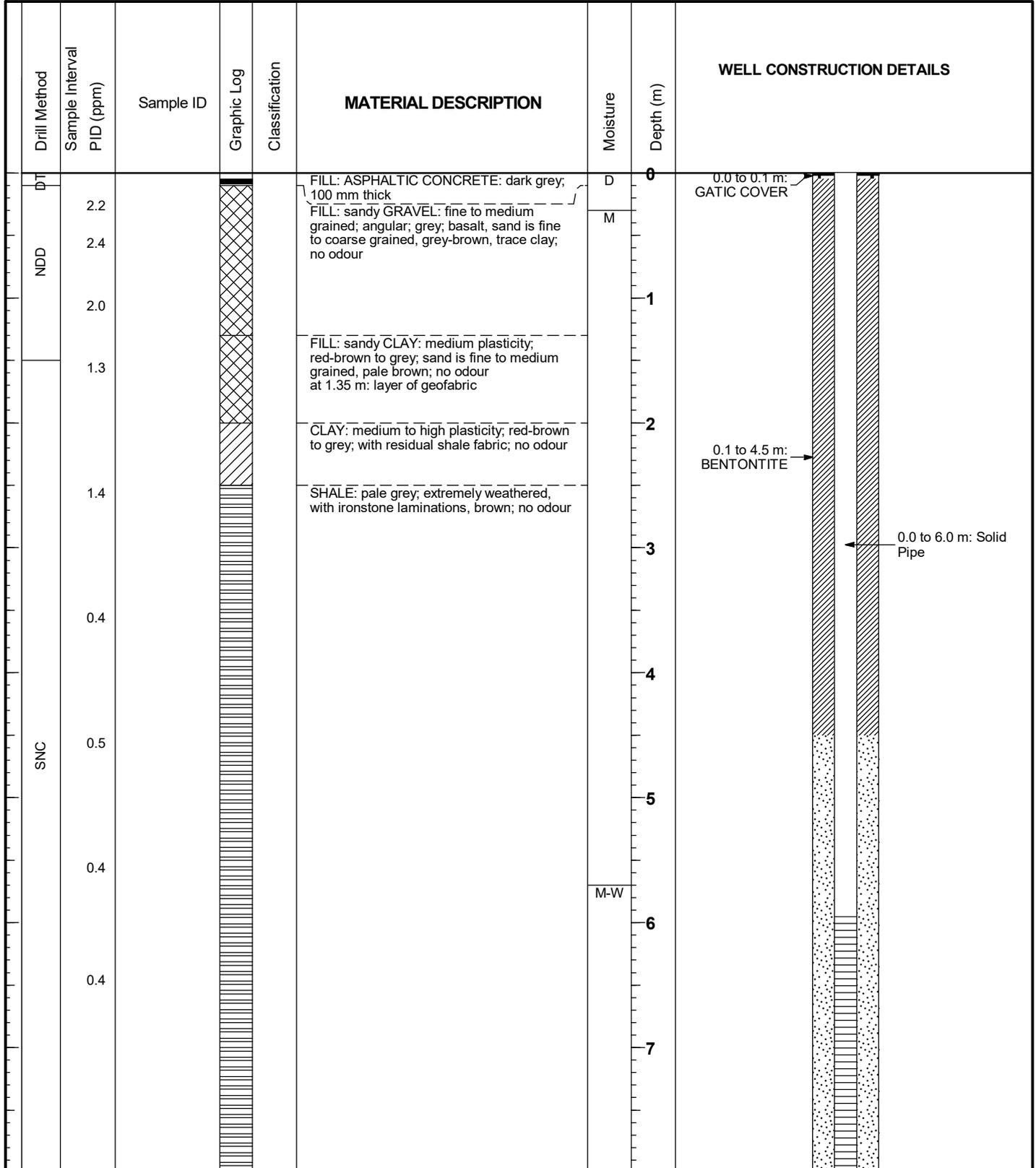
<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 28/02/2019
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 28/02/2019
<b>Location:</b> Vacant lot near Tyne Container, Tempe	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd PF/SM/RA	<b>Easting:</b> 330670.6 m	<b>Top of Casing:</b> 9.845
<b>Drill Type:</b> non-destructive drilling, sonic drilling	<b>Northing:</b> 6244467.9 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 17.50 m	<b>Surface:</b> Grass
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Permit No.:</b> -



<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 28/02/2019
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 28/02/2019
<b>Location:</b> Vacant lot near Tyne Container, Tempe	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> 330670.6 m	<b>Top of Casing:</b> 9.845
<b>Drill Type:</b> non-destructive drilling, sonic drilling	<b>Northing:</b> 6244467.9 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 17.50 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Surface:</b> Grass
		<b>Permit No.:</b> -

Drill Method	Sample Interval PID (ppm)	Sample ID	Graphic Log	Classification	MATERIAL DESCRIPTION	Moisture	Depth (m)	WELL CONSTRUCTION DETAILS
SNC				CH	CLAY: high plasticity; grey; weak rotten egg smell (sulfurous)	W	16	
				CL	CLAY: low plasticity; brittle, red-yellow staining, no odour from 17.30 m: clay shows residual shale fabric		17	
					GW17d terminated at 17.50 m. Target depth. Groundwater monitoring well installed		18	
							19	
							20	
							21	
							22	
							23	

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 18/03/2019
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 19/03/2019
<b>Location:</b> Smith Street, Tempe	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd PF/SM/CH	<b>Easting:</b> 330363.6 m	<b>Top of Casing:</b>
<b>Drill Type:</b> non-destructive drilling, sonic drilling, diatube	<b>Northing:</b> 6244640.3 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Comacchio 450P	<b>Total Depth:</b> 11.95 m	<b>Surface:</b> Pavement (asphalt)
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98 mm	<b>Permit No.:</b> -



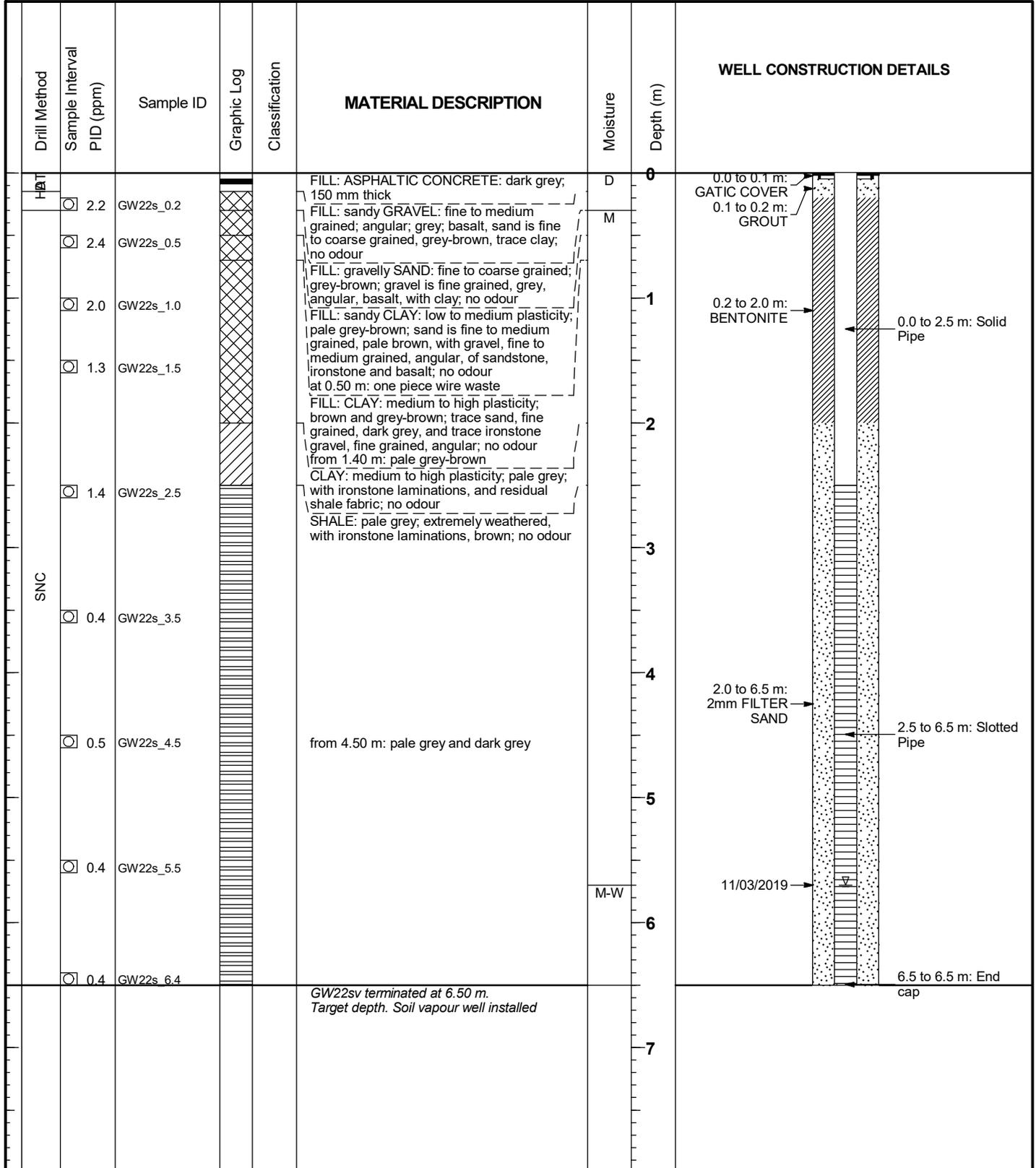
**Remarks:** 0.00-11.95 m: No environmental sampling - combined groundwater and soil vapour well installation

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 18/03/2019
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 19/03/2019
<b>Location:</b> Smith Street, Tempe	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd PF/SM/CH	<b>Easting:</b> 330363.6 m	<b>Top of Casing:</b>
<b>Drill Type:</b> non-destructive drilling, sonic drilling, diatube	<b>Northing:</b> 6244640.3 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Comacchio 450P	<b>Total Depth:</b> 11.95 m	<b>Surface:</b> Pavement (asphalt)
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98 mm	<b>Permit No.:</b> -

Drill Method	Sample Interval PID (ppm)	Sample ID	Graphic Log	Classification	MATERIAL DESCRIPTION	Moisture	Depth (m)	WELL CONSTRUCTION DETAILS
SNC					SHALE: pale grey; extremely weathered, with ironstone laminations, brown; no odour	M-W	8	<p>4.5 to 12.0 m: 2mm FILTER SAND</p> <p>6.0 to 11.9 m: Slotted Pipe</p> <p>11.9 to 12.0 m: End cap</p>
					GW22s terminated at 11.95 m. Target depth. Monitoring well installed		9 10 11 12 13 14 15	

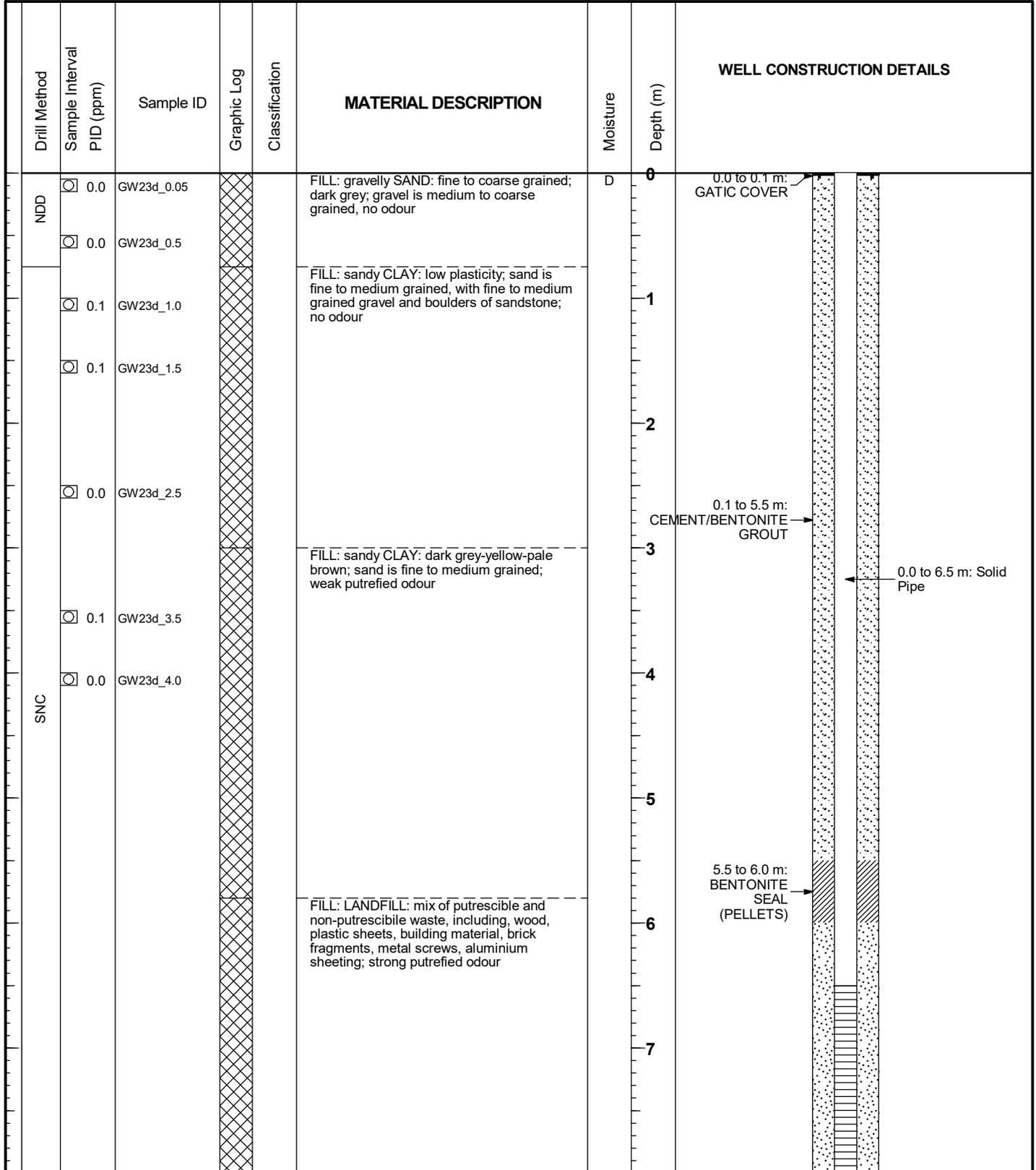
2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_60559345\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 11/03/2019
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> AC	<b>End Date:</b> 11/03/2019
<b>Location:</b> Smith Street, Tempe	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd PF/SM/CK	<b>Easting:</b> 330366.4 m	<b>Top of Casing:</b>
<b>Drill Type:</b> diatube, Hand Auger, sonic drilling	<b>Northing:</b> 6244640.9 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Comacchio 450P	<b>Total Depth:</b> 6.50 m	<b>Surface:</b> Pavement (asphalt)
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98 mm	<b>Permit No.:</b> -



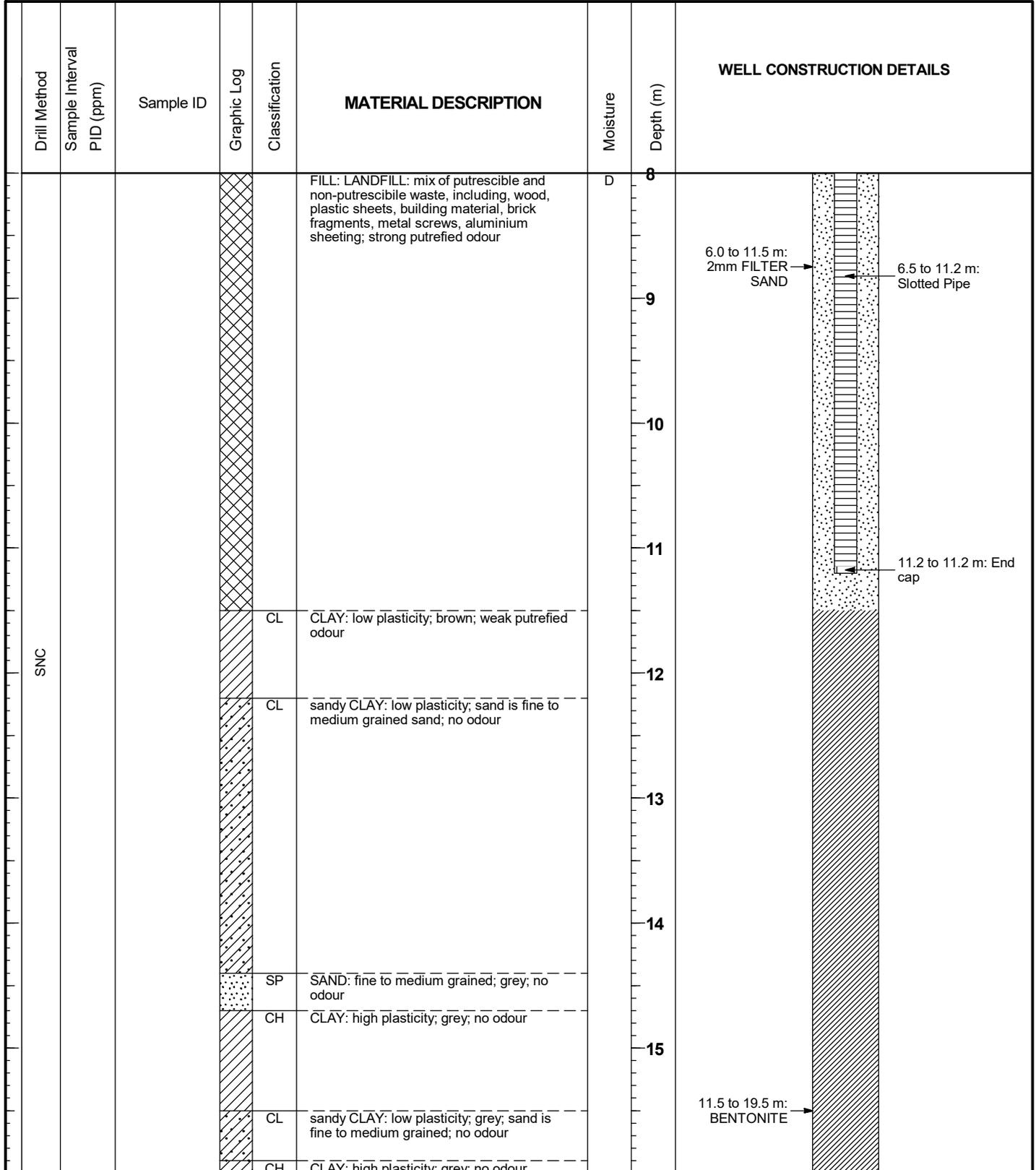
2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 06/12/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 06/12/2018
<b>Location:</b> SACL Northern land, St Peters	<b>Checked by:</b> KM/AD	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> 330736.6 m	<b>Top of Casing:</b>
<b>Drill Type:</b> non-destructive drilling, sonic drilling	<b>Northing:</b> 6244785.4 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 19.50 m	<b>Surface:</b> Fill
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Permit No.:</b> -



2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

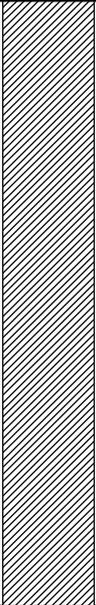
<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 06/12/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 06/12/2018
<b>Location:</b> SACL Northern land, St Peters	<b>Checked by:</b> KM/AD	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> 330736.6 m	<b>Top of Casing:</b>
<b>Drill Type:</b> non-destructive drilling, sonic drilling	<b>Northing:</b> 6244785.4 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 19.50 m	<b>Surface:</b> Fill
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Permit No.:</b> -



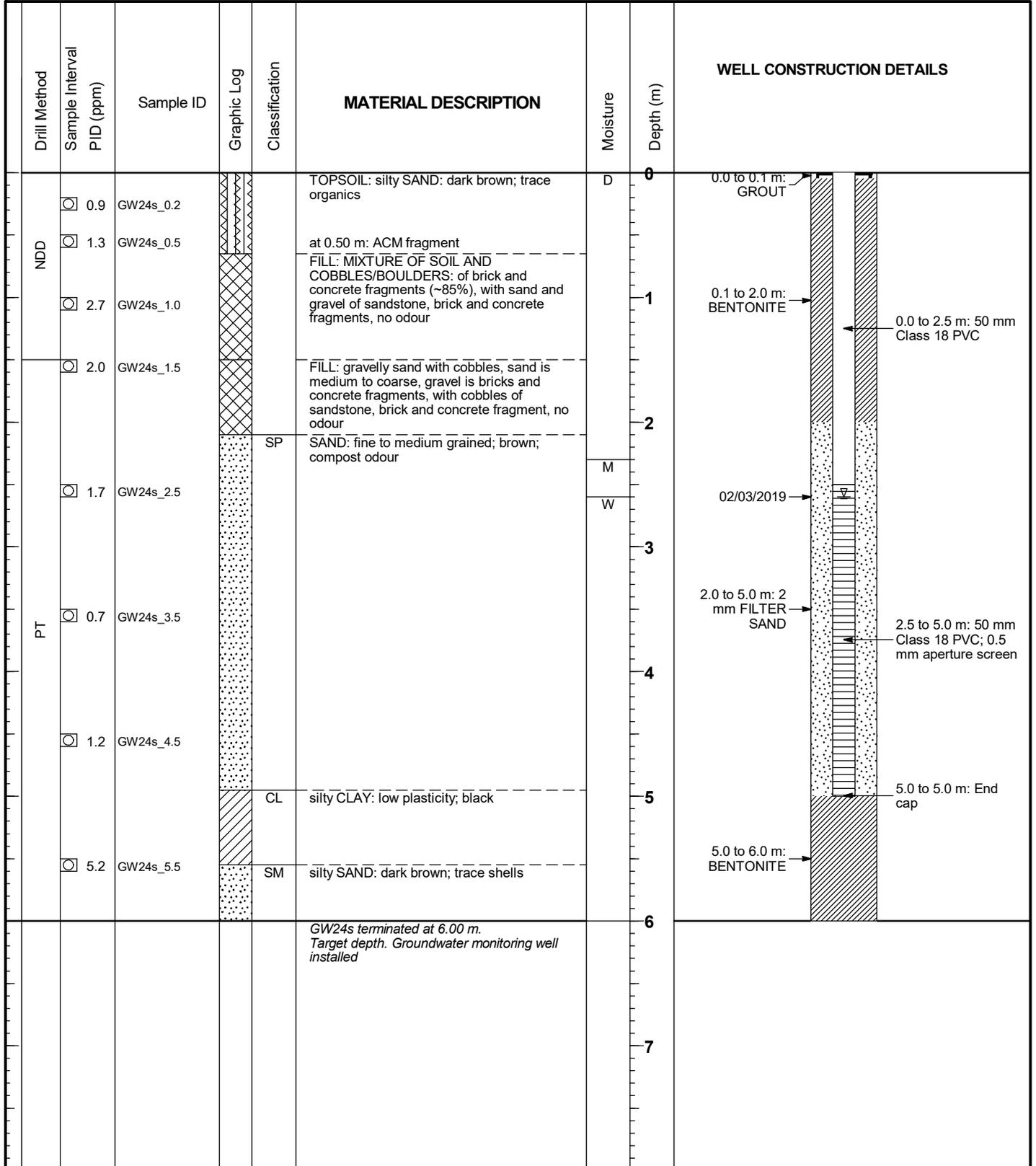
2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_60559345\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

SNC

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 06/12/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 06/12/2018
<b>Location:</b> SACL Northern land, St Peters	<b>Checked by:</b> KM/AD	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> 330736.6 m	<b>Top of Casing:</b>
<b>Drill Type:</b> non-destructive drilling, sonic drilling	<b>Northing:</b> 6244785.4 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 19.50 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Surface:</b> Fill
		<b>Permit No.:</b> -

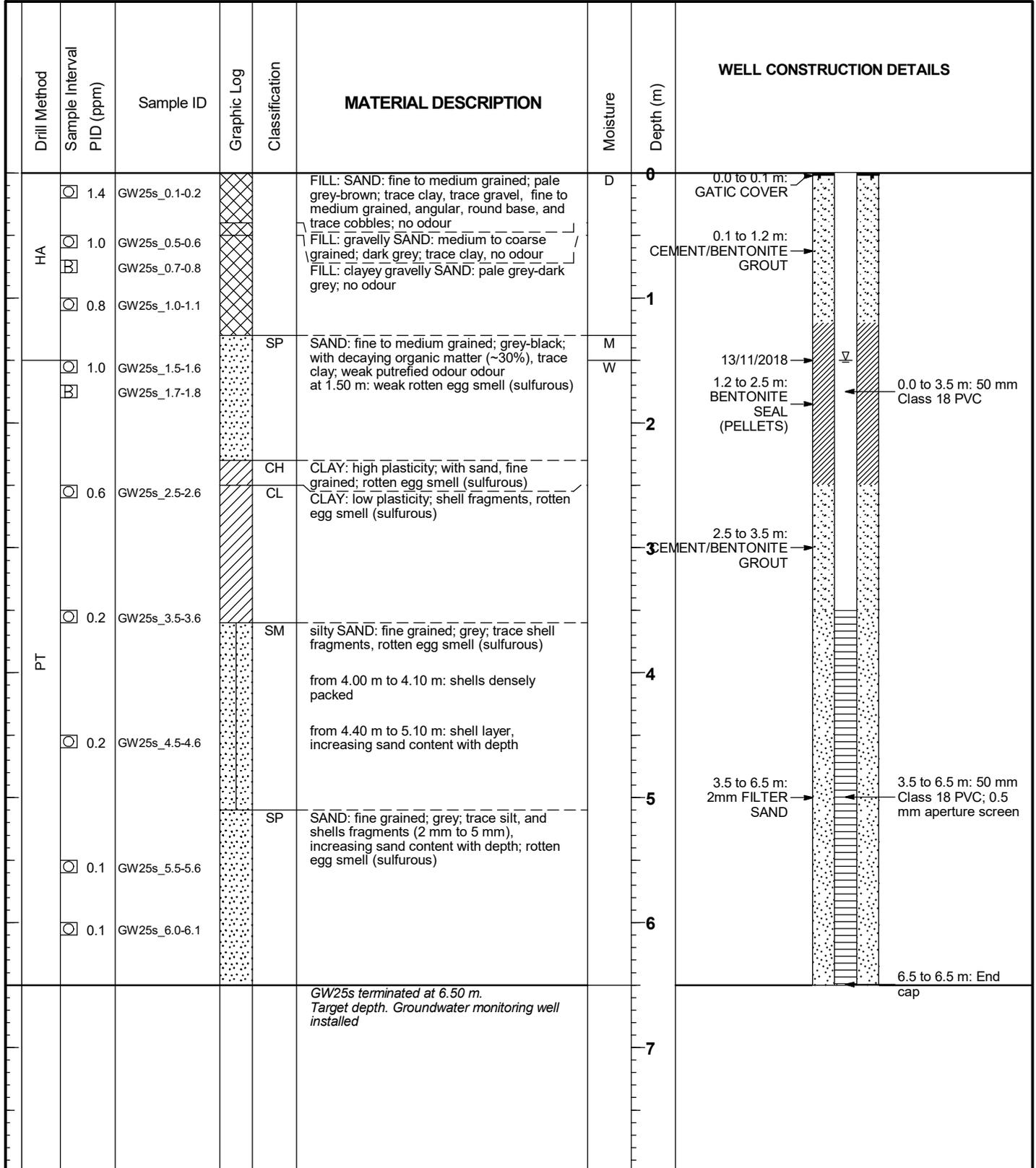
Drill Method	Sample Interval PID (ppm)	Sample ID	Graphic Log	Classification	MATERIAL DESCRIPTION	Moisture	Depth (m)	WELL CONSTRUCTION DETAILS
SNC				CH	CLAY: high plasticity; grey; no odour	D	16	
				SM	silty SAND: fine to medium grained; grey; no odour		17	
				CH	CLAY: high plasticity; grey; no odour		18	
					from 19.00 m: with red speckling		19	
					SHALE: extremely weathered; no odour GW23d terminated at 19.50 m. Target depth. Monitoring well installed		20	
							21	
							22	
							23	

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 02/03/2019
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> SR	<b>End Date:</b> 02/03/2019
<b>Location:</b> Boral, St Peters	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Matrix Drilling Pty Ltd	<b>Easting:</b> 331207.1 m	<b>Top of Casing:</b>
<b>Drill Type:</b> non-destructive drilling, push tube	<b>Northing:</b> 6244765.7 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> GeoProbe	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H	<b>Surface:</b> Topsoil
<b>Drill Fluid:</b> -	<b>Total Depth:</b> 6.00 m	<b>Permit No.:</b> -
	<b>Bore Dia.:</b> 90 mm	
	<b>Pipe Dia.:</b> 50 mm	



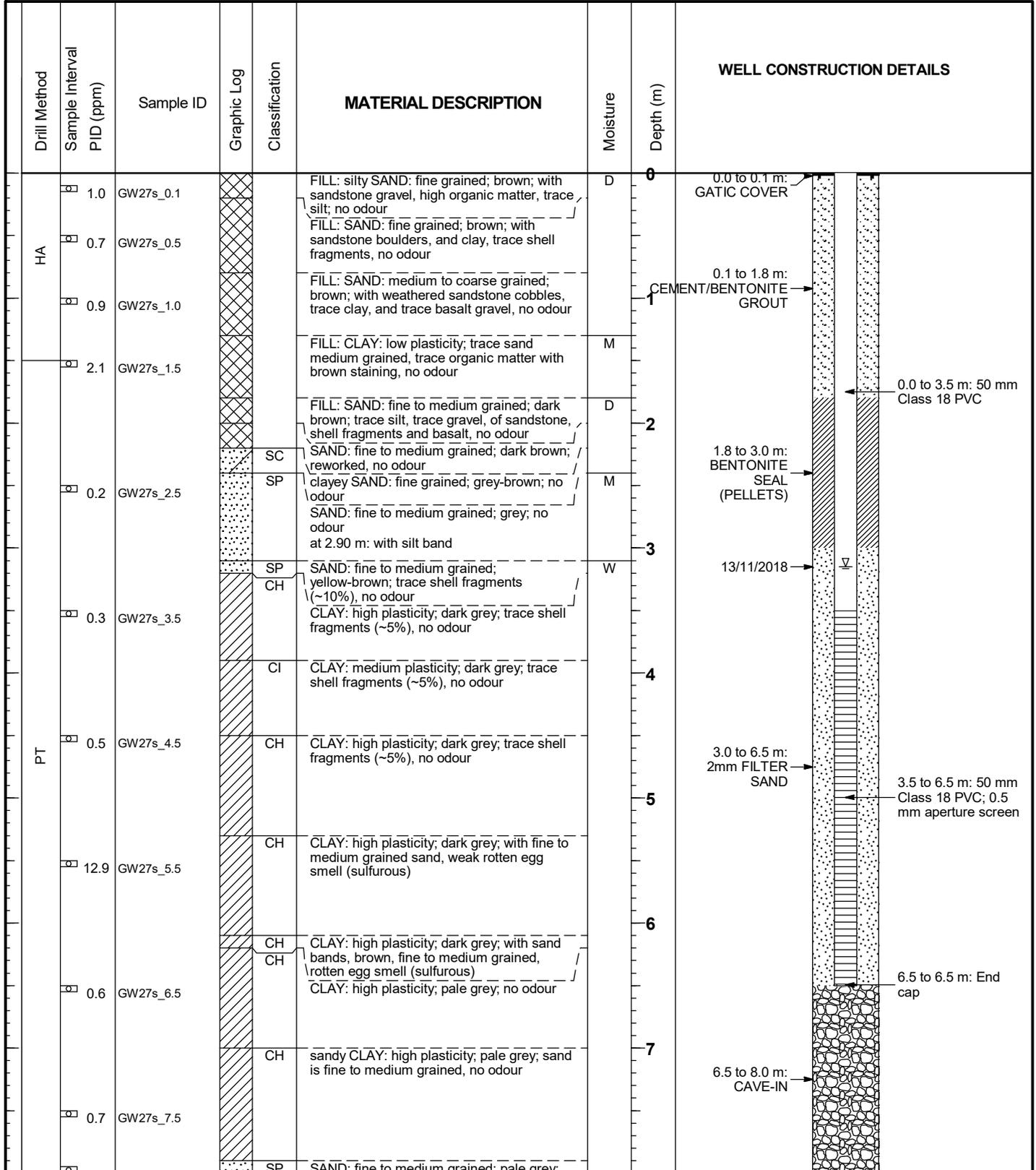
2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 13/11/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> RP	<b>End Date:</b> 14/11/2018
<b>Location:</b> SAFL Northern land, St Peters	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Numac Drilling Services Australia Pty Ltd	<b>Easting:</b> 331150.4 m	<b>Top of Casing:</b> 1.6 m
<b>Drill Type:</b> Hand Auger, push tube	<b>Northing:</b> 6244594.2 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> GeoProbe	<b>Total Depth:</b> 6.50 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 84-250 mm	<b>Pipe Dia.:</b> 50 mm
		<b>Surface:</b> Sand
		<b>Permit No.:</b> -



2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 12/11/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> AM/RP	<b>End Date:</b> 13/11/2018
<b>Location:</b> Off Airport Drive, Mascot	<b>Checked by:</b> AD	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Numac Drilling Services Australia Pty Ltd	<b>Easting:</b> 331249.6 m	<b>Top of Casing:</b> 2.2 m
<b>Drill Type:</b> Hand Auger, push tube	<b>Northing:</b> 6244550.0 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> GeoProbe	<b>Total Depth:</b> 8.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 80-84 mm	<b>Pipe Dia.:</b> 50 mm
		<b>Surface:</b> Soil
		<b>Permit No.:</b> -

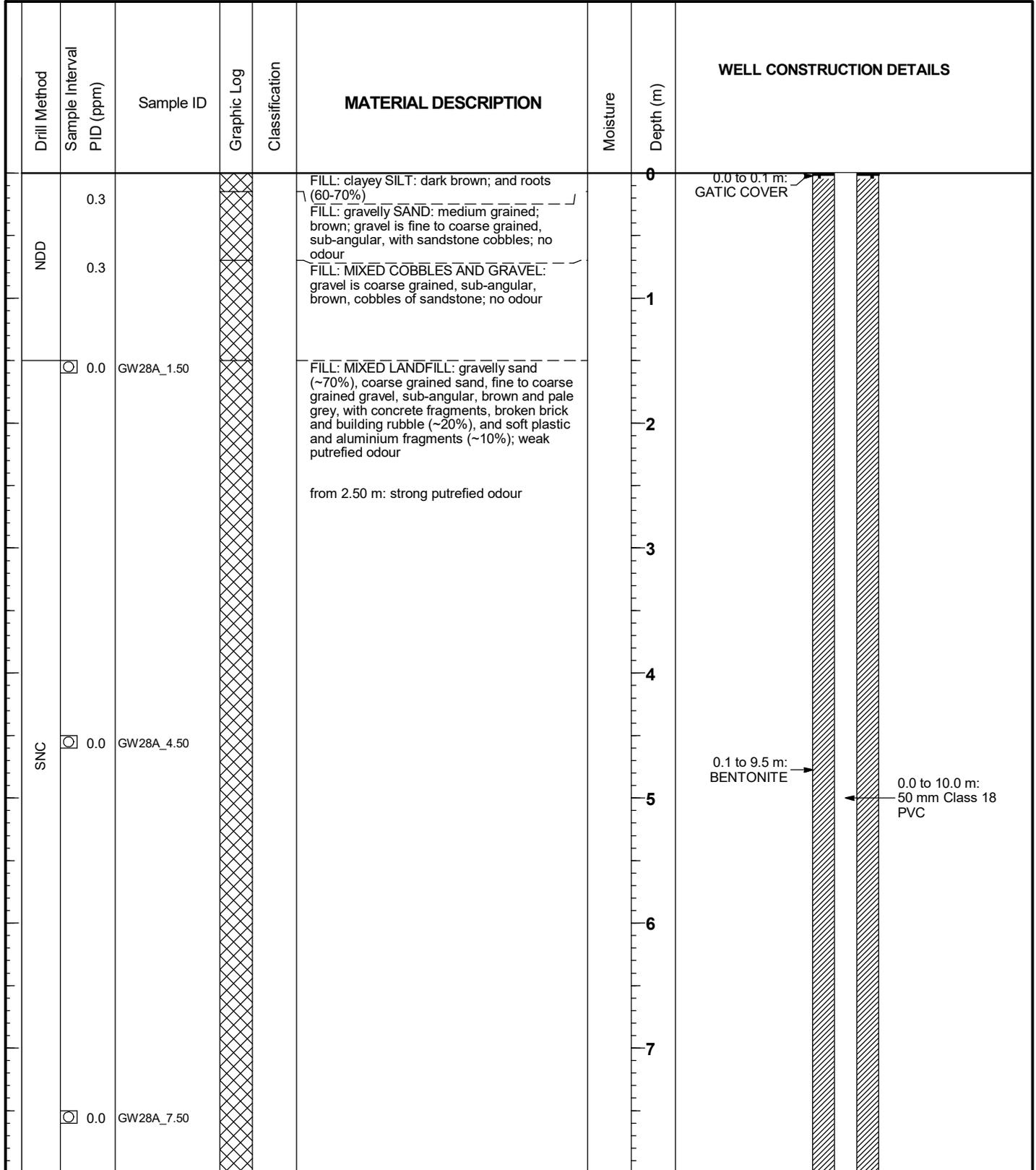


2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_60559345\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

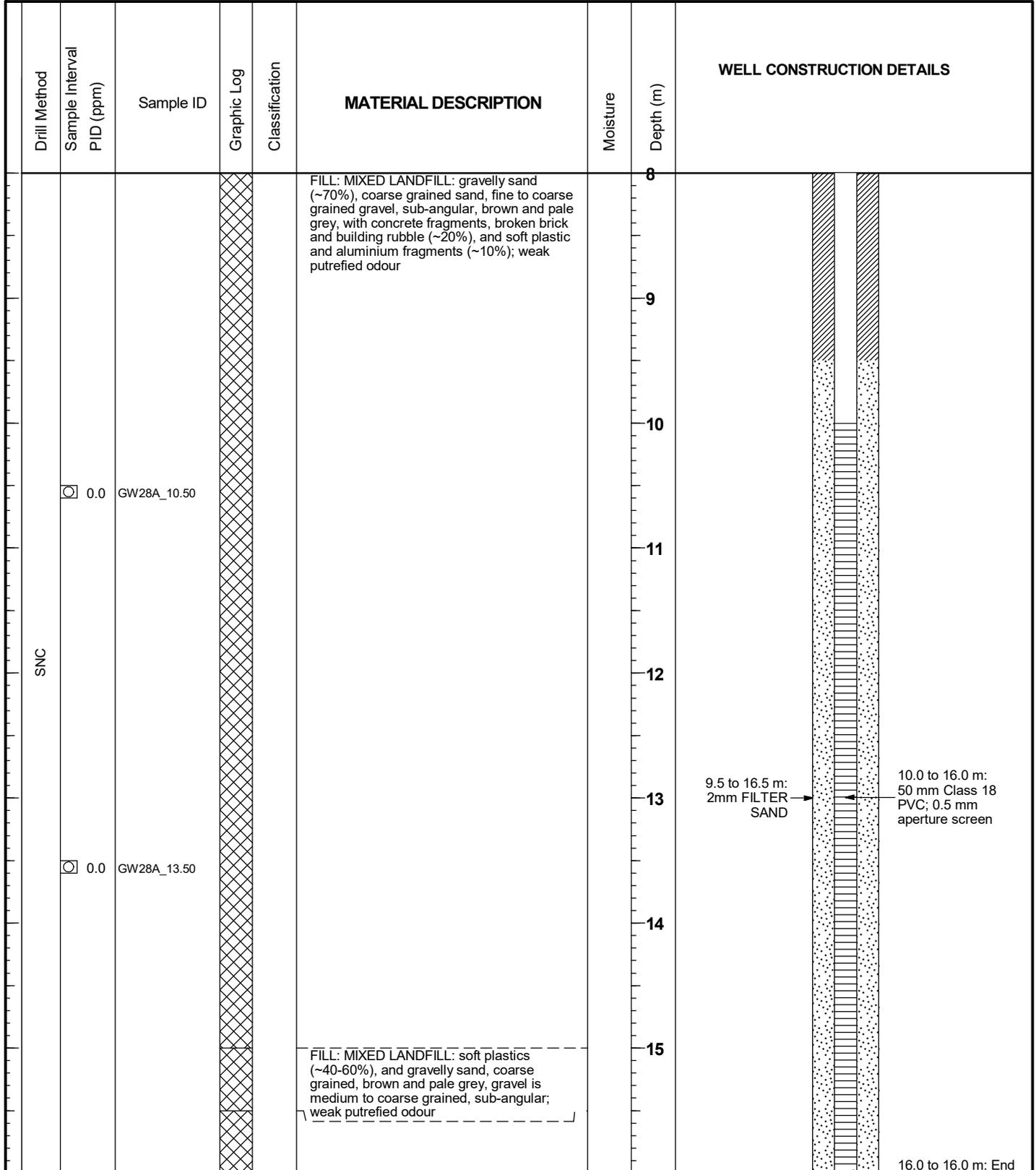
<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 12/11/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> AM/RP	<b>End Date:</b> 13/11/2018
<b>Location:</b> Off Airport Drive, Mascot	<b>Checked by:</b> AD	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Numac Drilling Services Australia Pty Ltd AE/SR	<b>Easting:</b> 331249.6 m	<b>Top of Casing:</b> 2.2 m
<b>Drill Type:</b> Hand Auger, push tube	<b>Northing:</b> 6244550.0 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> GeoProbe	<b>Total Depth:</b> 8.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 80-84 mm	<b>Surface:</b> Soil
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -

Drill Method	Sample Interval PID (ppm)	Sample ID	Graphic Log	Classification	MATERIAL DESCRIPTION	Moisture	Depth (m)	WELL CONSTRUCTION DETAILS
	0.6	GW27s_8.0			no odour GW27s terminated at 8.00 m. Target depth. Groundwater monitoring well installed		8	
							9	
							10	
							11	
							12	
							13	
							14	
							15	

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 20/03/2019
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 21/03/2019
<b>Location:</b> Tempe Recreation Reserve	<b>Checked by:</b> ES/PW	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> 330286.5 m	<b>Top of Casing:</b> 16.1 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling	<b>Northing:</b> 6244270.3 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 18.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98 mm	<b>Surface:</b> Grass
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -

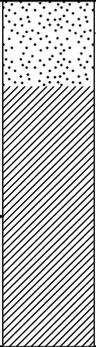
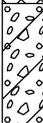


<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 20/03/2019
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 21/03/2019
<b>Location:</b> Tempe Recreation Reserve	<b>Checked by:</b> ES/PW	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> 330286.5 m	<b>Top of Casing:</b> 16.1 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling	<b>Northing:</b> 6244270.3 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 18.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98 mm	<b>Surface:</b> Grass
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -



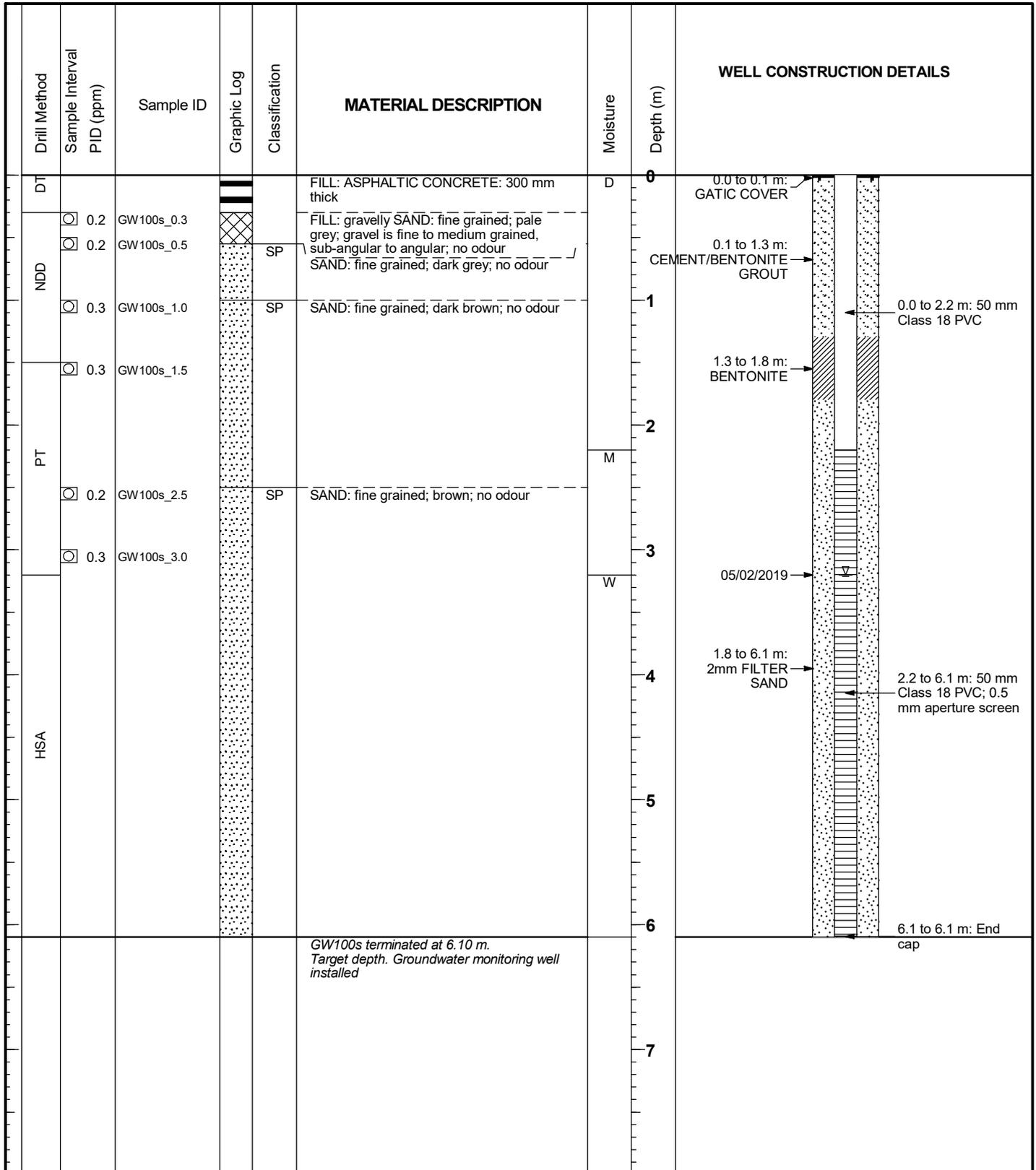
2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 20/03/2019
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 21/03/2019
<b>Location:</b> Tempe Recreation Reserve	<b>Checked by:</b> ES/PW	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> 330286.5 m	<b>Top of Casing:</b> 16.1 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling	<b>Northing:</b> 6244270.3 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 18.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98 mm	<b>Surface:</b> Grass
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -

Drill Method	Sample Interval PID (ppm)	Sample ID	Graphic Log	Classification	MATERIAL DESCRIPTION	Moisture	Depth (m)	WELL CONSTRUCTION DETAILS
SNC	0.0	GW28A_16.50			FILL: clayey SAND: medium grained; dark grey; putrescible waste has decomposed into clayey material, trace metal waste fragments; weak putrefied odour from 16.00 m: strong rotten egg smell (sulfurous)		16	 <p>cap</p> <p>16.5 to 18.0 m: BENTONITE</p>
				GP-GM	clayey GRAVEL: fine to medium grained; angular, shell fragments (~60%), clay is low plasticity, dark grey, trace sand; weak rotten egg smell (sulfurous)	M	17	
				CH	CLAY: high plasticity; grey; slight yellow staining at end of hole; weak rotten egg smell (sulfurous)		18	
					GW28A terminated at 18.00 m. Target depth. Groundwater monitoring well installed		18	
							19	
							20	
							21	
							22	
							23	

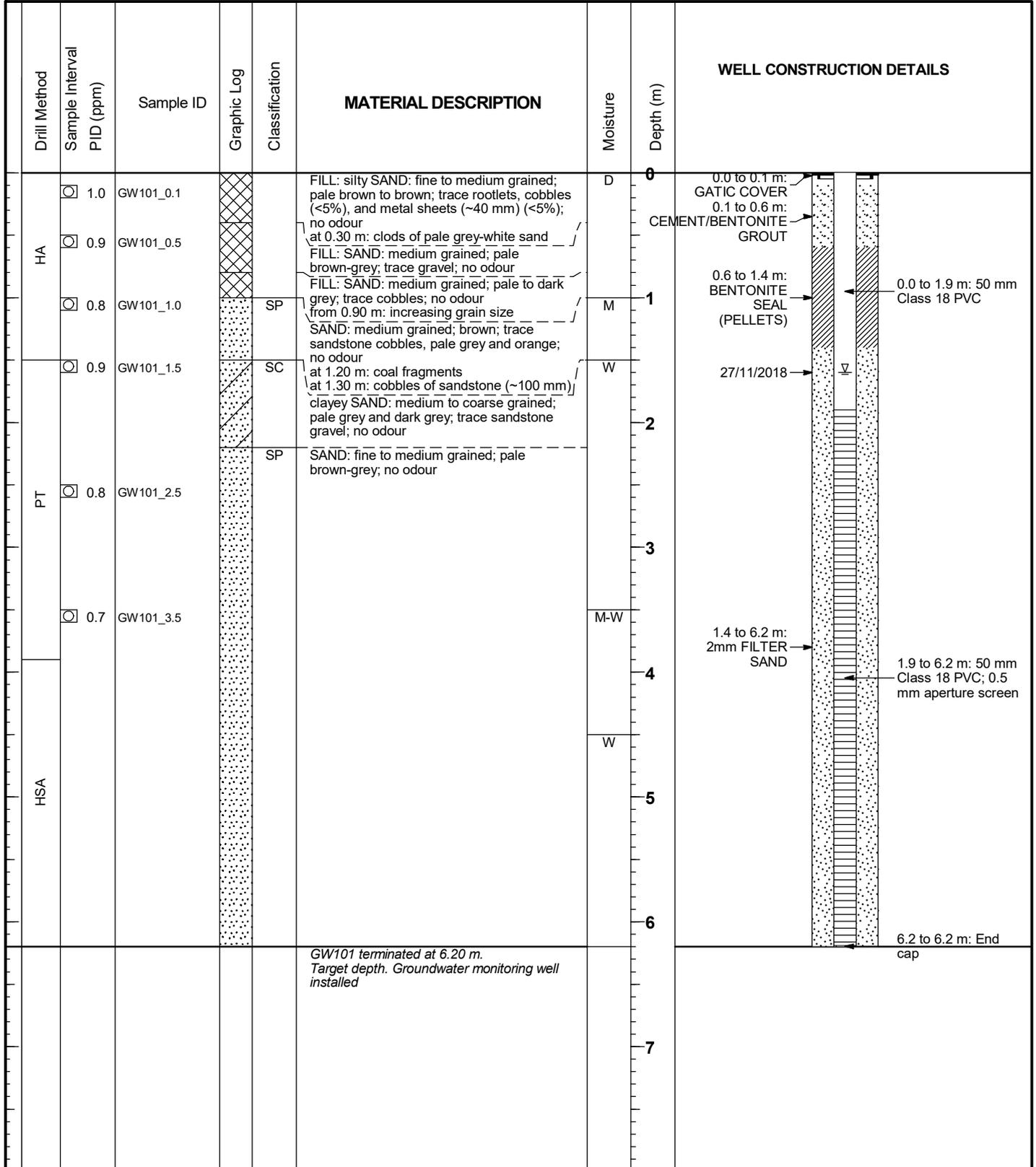
2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_60559345\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 05/02/2019
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> SR	<b>End Date:</b> 05/02/2019
<b>Location:</b> 55 Qantas Service Road, Mascot	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Matrix Drilling Pty Ltd	<b>Easting:</b> 331988.7 m	<b>Top of Casing:</b> 3.4 m
<b>Drill Type:</b> diatube, non-destructive drilling, push tube, Hollow Stem Auger	<b>Northing:</b> 6244625.9 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> GeoProbe	<b>Total Depth:</b> 6.10 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 84-250 mm	<b>Surface:</b> Pavement (asphalt)
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -



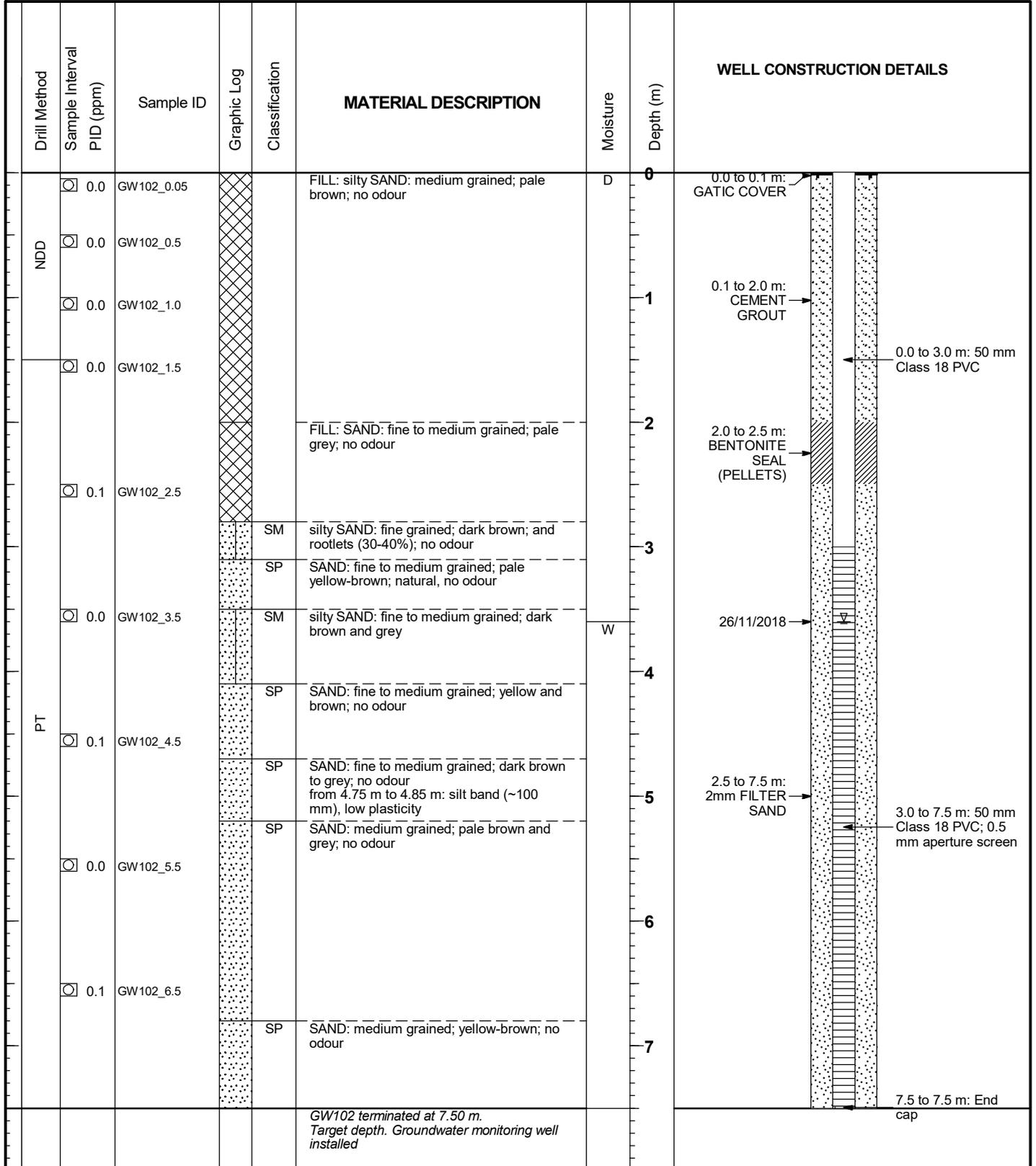
**Remarks:** 3.20-6.10 m: Method changed to hollow steam auger due to saturated loose sands, unable to continue with push tube from 3.2 m onwards

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 27/11/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> RP	<b>End Date:</b> 27/11/2018
<b>Location:</b> 288 Coward St., Mascot	<b>Checked by:</b> ES	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Numac Drilling Services Australia Pty Ltd	<b>Easting:</b> 331863.6 m	<b>Top of Casing:</b> 2.2 m
<b>Drill Type:</b> Hand Auger, push tube, Hollow Stem Auger	<b>Northing:</b> 6244877.5 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> GeoProbe	<b>Total Depth:</b> 6.20 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 80-194 mm	<b>Pipe Dia.:</b> 50 mm
		<b>Surface:</b> Topsoil
		<b>Permit No.:</b> -

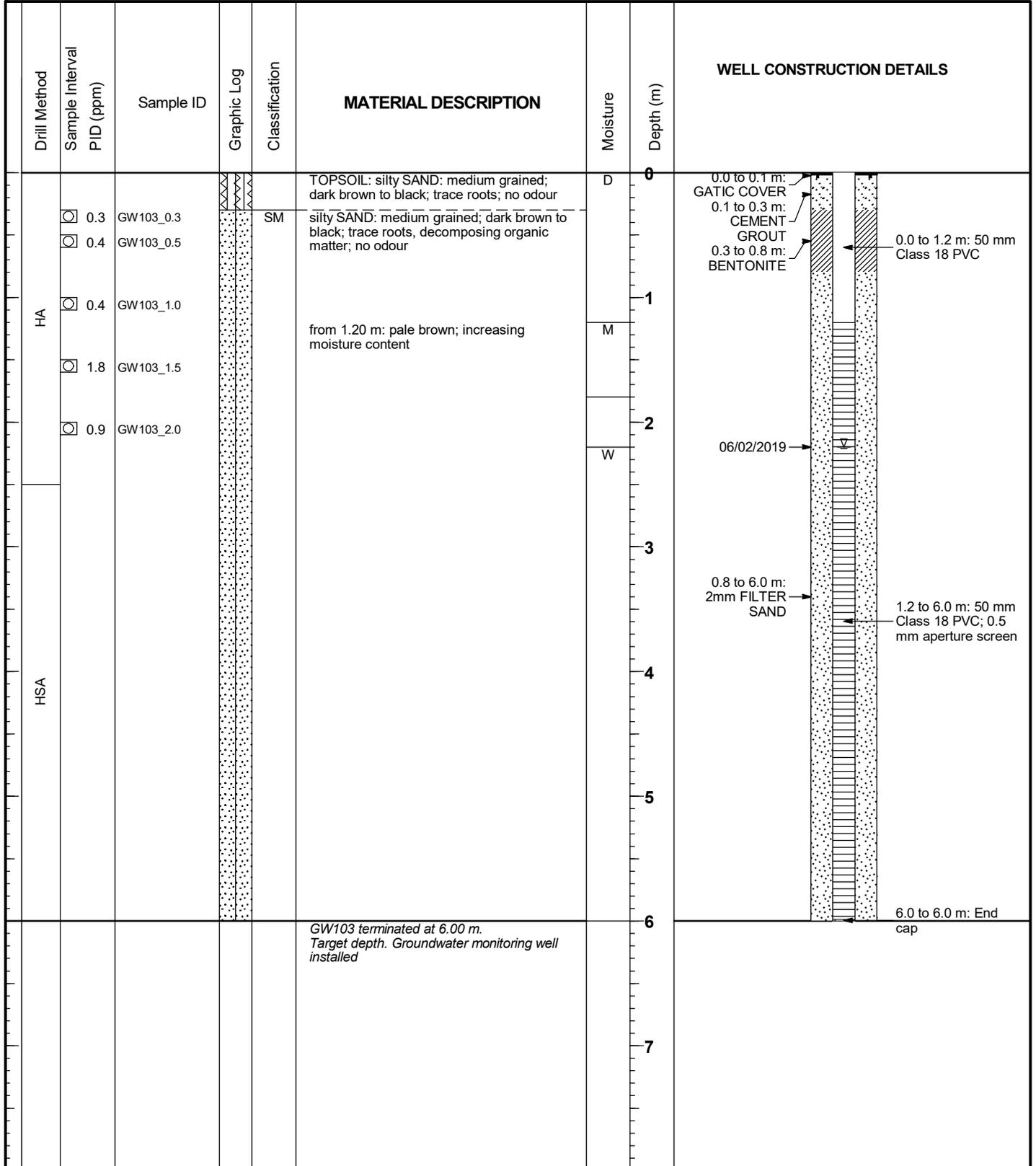


2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_60559345\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 26/11/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 26/11/2018
<b>Location:</b> Mascot Oval, Mascot	<b>Checked by:</b> AD	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Matrix Drilling Pty Ltd AE/SR	<b>Easting:</b> 332774.6 m	<b>Top of Casing:</b> 9.2 m
<b>Drill Type:</b> non-destructive drilling, push tube	<b>Northing:</b> 6244535.0 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> GeoProbe	<b>Total Depth:</b> 7.50 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 84-250 mm	<b>Surface:</b> Sand
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -



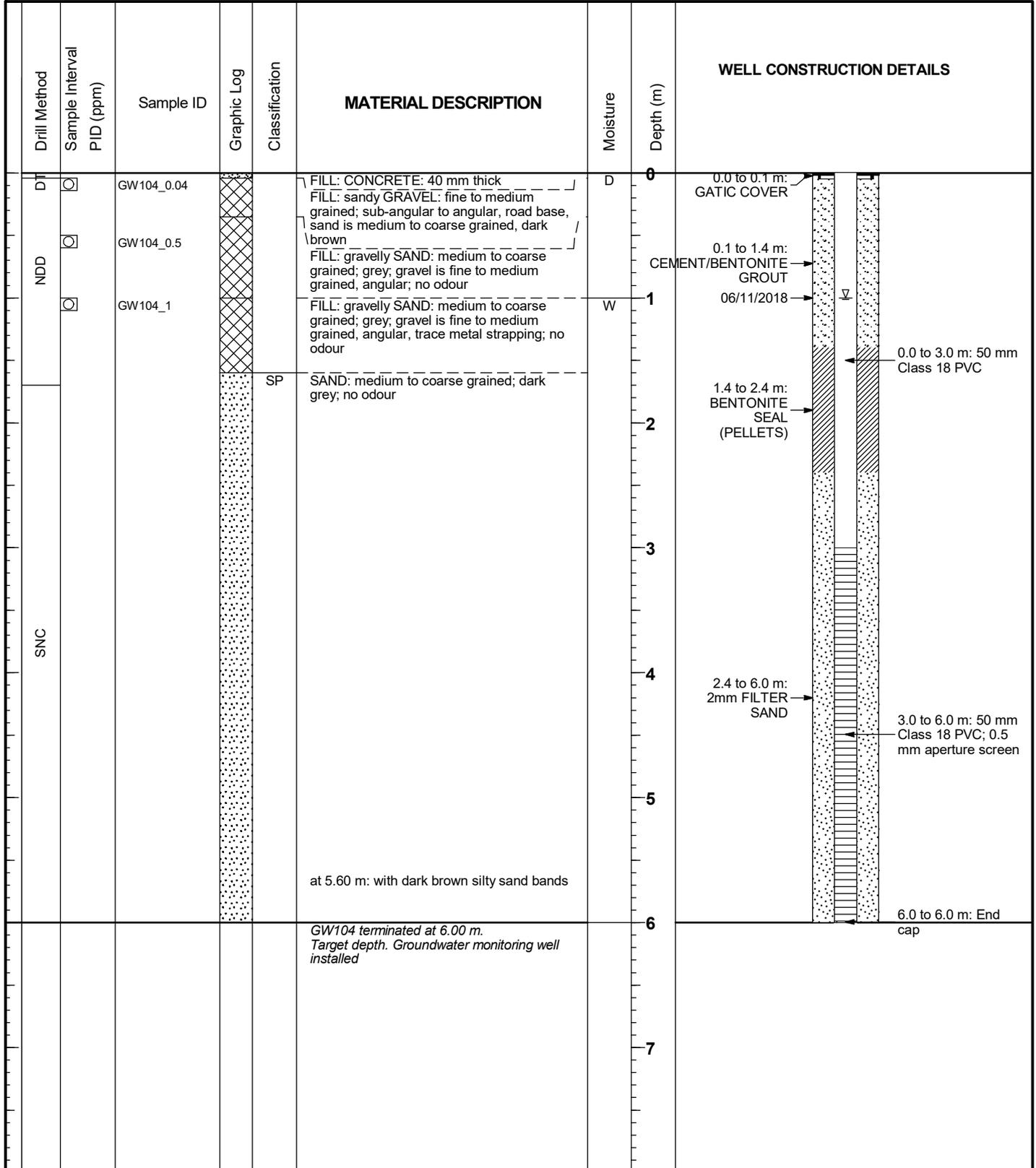
<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 06/02/2019
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> SR	<b>End Date:</b> 06/02/2019
<b>Location:</b> 258-322 King St., Mascot	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Matrix Drilling Pty Ltd	<b>Easting:</b> 333004.7 m	<b>Top of Casing:</b> 6.1 m
<b>Drill Type:</b> Hand Auger, Hollow Stem Auger	<b>Northing:</b> 6244155.2 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> GeoProbe	<b>Total Depth:</b> 6.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 80-194 mm	<b>Surface:</b> Topsoil
	<b>Pipe Dia.:</b> 50 mm	<b>Permit No.:</b> -



GW103 terminated at 6.00 m. Target depth. Groundwater monitoring well installed

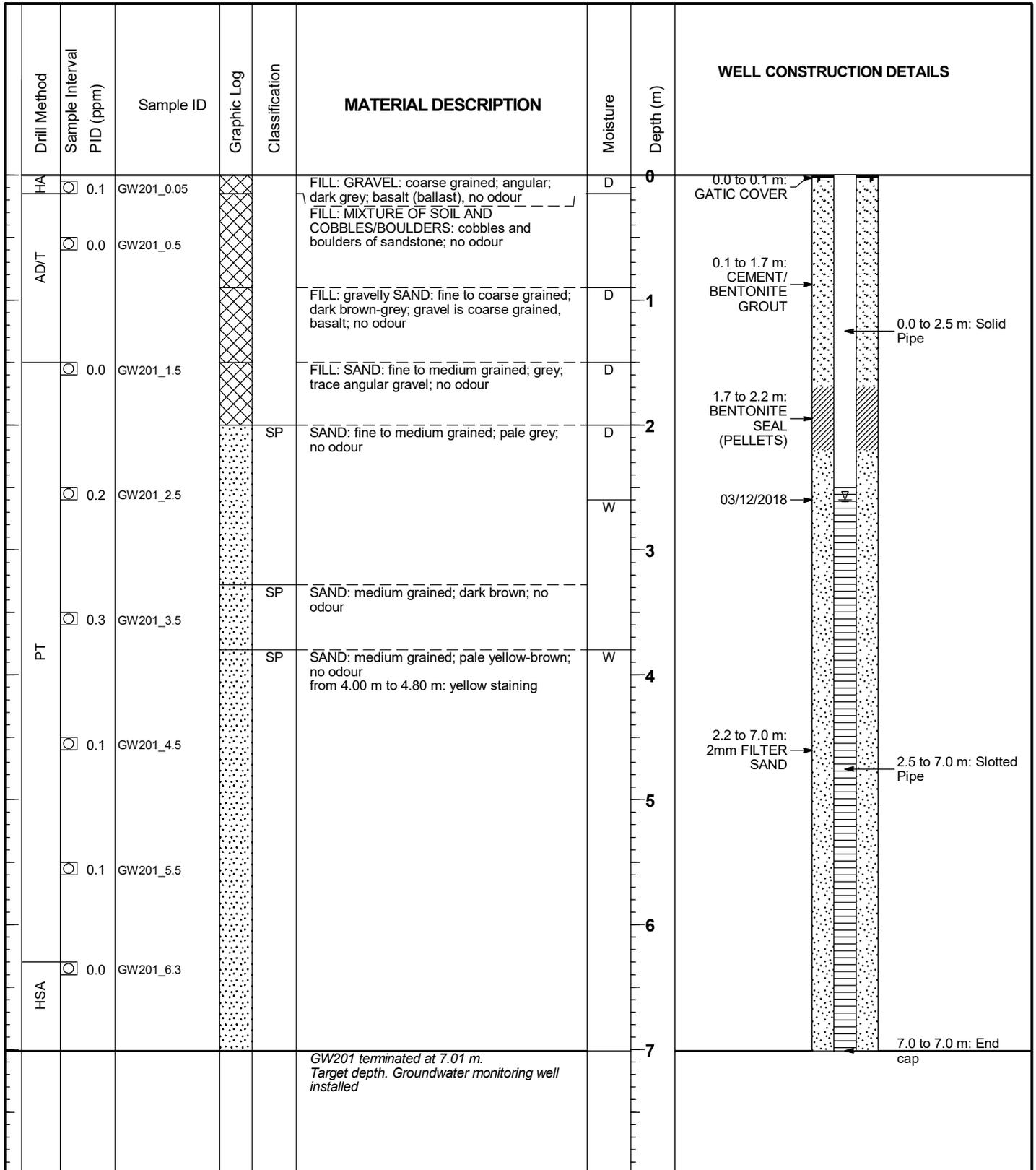
**Remarks:** 2.50-6.00 m: Method changed to hollow steam auger due to saturated loose sands, unable to continue with push tube from 2.5m onwards

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 06/11/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> AM/PD	<b>End Date:</b> 06/11/2018
<b>Location:</b> Qantas Jetbase, Mascot	<b>Checked by:</b> AD	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> 331896.3 m	<b>Top of Casing:</b> 2.6 m
<b>Drill Type:</b> non-destructive drilling, sonic drilling, diatube	<b>Northing:</b> 6244380.0 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Sonic Rig	<b>Total Depth:</b> 6.00 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 98-250 mm	<b>Pipe Dia.:</b> 50 mm
		<b>Permit No.:</b> -



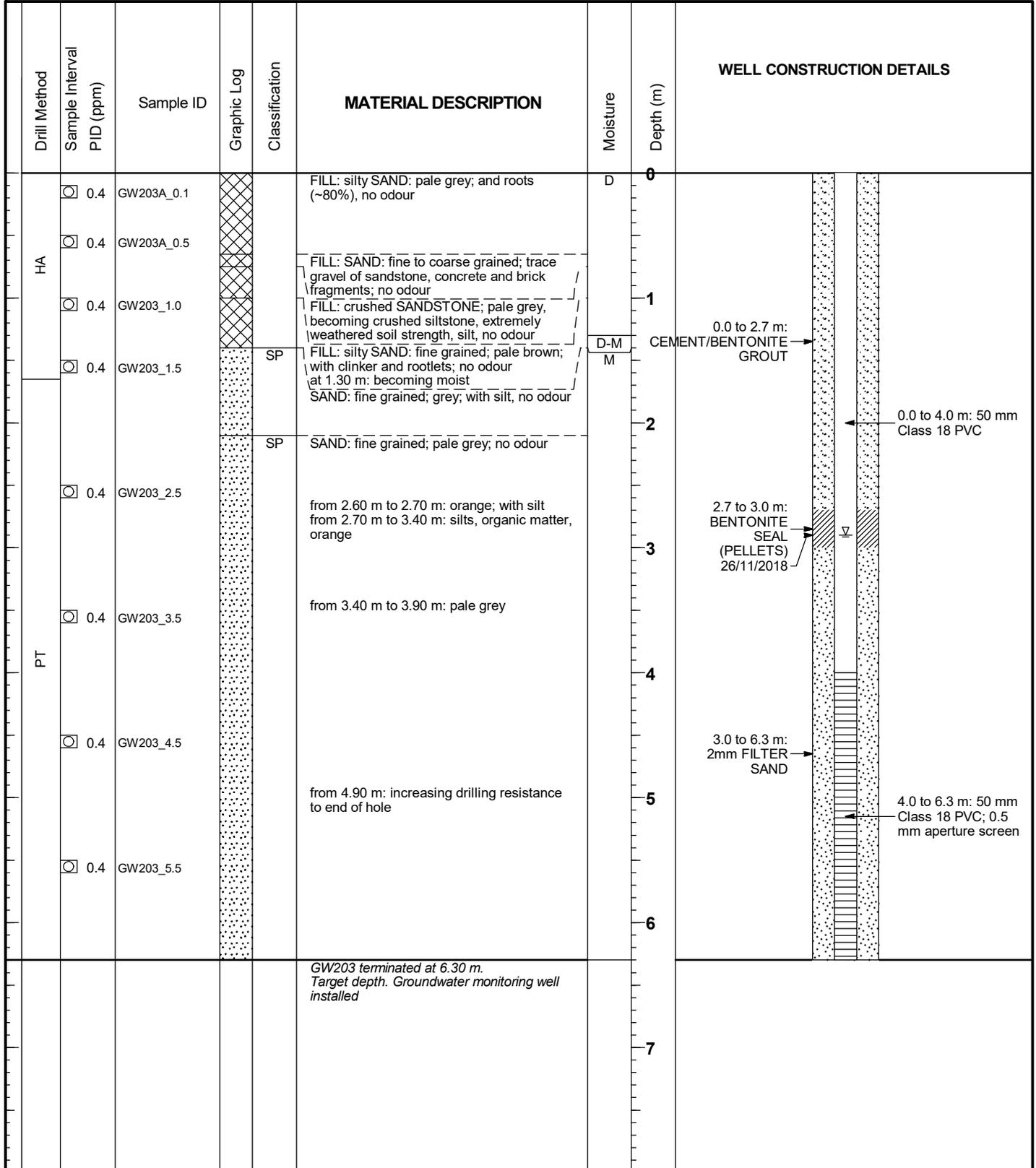
2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 03/12/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> PD	<b>End Date:</b> 03/12/2018
<b>Location:</b> Myrtle St, Botany (ARTC)	<b>Checked by:</b> KM/AD	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Numac Drilling Services Australia Pty Ltd	<b>Easting:</b> 333899.7 m	<b>Top of Casing:</b> 9.3 m
<b>Drill Type:</b> Hand Auger, push tube, Hollow Stem Auger, auger drilling with tc-bit	<b>Northing:</b> 6243165.1 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> GeoProbe	<b>Total Depth:</b> 7.01 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 80-194 mm	<b>Surface:</b> Gravel
		<b>Permit No.:</b> -



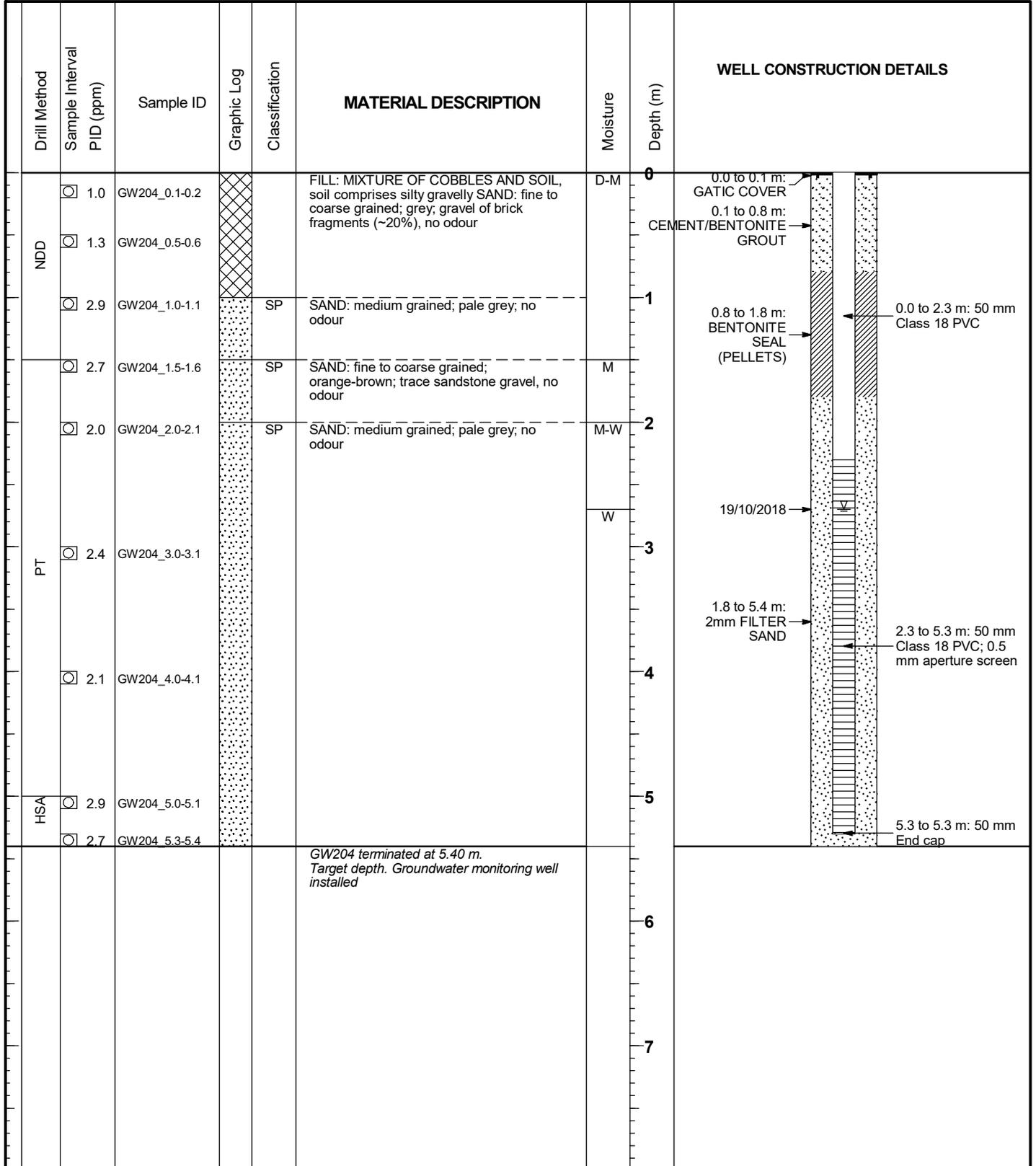
2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_60559345\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 23/11/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> RP	<b>End Date:</b> 26/11/2018
<b>Location:</b> Gaiarine Gardens, Pagewood	<b>Checked by:</b> AD	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Numac Drilling Services Australia Pty Ltd	<b>Easting:</b> 334326.8 m	<b>Top of Casing:</b> 10.6 m
<b>Drill Type:</b> Hand Auger, push tube	<b>Northing:</b> 6242790.8 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> GeoProbe	<b>Total Depth:</b> 6.30 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 80-84 mm	<b>Pipe Dia.:</b> 50 mm
		<b>Surface:</b> Grass
		<b>Permit No.:</b> -



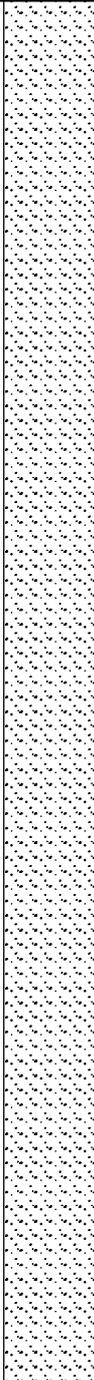
2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 29/10/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> LL	<b>End Date:</b> 29/10/2018
<b>Location:</b> 127 Banksia St., Botany (ARTC)	<b>Checked by:</b> KM	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Numac Drilling Services Australia Pty Ltd SR/MC	<b>Easting:</b> 334297.1 m	<b>Top of Casing:</b> 9.9 m
<b>Drill Type:</b> non-destructive drilling, push tube, Hollow Stem Auger	<b>Northing:</b> 6242711.5 m	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> GeoProbe	<b>Total Depth:</b> 5.40 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> -	<b>Bore Dia.:</b> 84-250 mm	<b>Pipe Dia.:</b> 50 mm
		<b>Surface:</b> Fill
		<b>Permit No.:</b> -



2018\_ANZ\_ENV\_01\_WELL\_GATEWAY\_MASTER\_ACCESS.GPJ AECOM\_5-00.GDT AECOM\_5-00AA\_GATEWAY.GLB 15.5.2019

<b>Client:</b> RMS	<b>Project No:</b> 60559345	<b>Start Date:</b> 10/12/2018
<b>Project:</b> Sydney Gateway	<b>Logged by:</b> MC	<b>End Date:</b> 11/12/2018
<b>Location:</b> 57-62 McBurney Avenue, Mascot (ARTC)	<b>Checked by:</b> NW	<b>Location Meth.:</b> dGPS0.1
<b>Driller:</b> Terratest Pty Ltd	<b>Easting:</b> TBC	<b>Top of Casing:</b> 8.3 m TBC
<b>Drill Type:</b> AZ/CH Hand Auger, auger drilling, TC bit, washbore, washbore, NMLC core	<b>Northing:</b> TBC	<b>Ver. Datum:</b> AHD
<b>Drill Model:</b> Comacchio 205	<b>Total Depth:</b> 44.90 m	<b>Hor. Proj/Dat:</b> MGA94/GDA94-56H
<b>Drill Fluid:</b> Drilling Mud	<b>Bore Dia.:</b> 75-118 mm	<b>Pipe Dia.:</b> 50 mm
		<b>Surface:</b> Grass
		<b>Permit No.:</b> -

Drill Method	Sample Interval PID (ppm)	Sample ID	Graphic Log	Classification	MATERIAL DESCRIPTION	Moisture	Depth (m)	WELL CONSTRUCTION DETAILS	
				SP	SAND: medium to coarse grained; pale brown; no odour		8		
							9		
							10		
					from 10.40 m, becoming pale grey		11		
							12		
							13		
							14		
							15		
					SAND: medium to coarse grained; dark grey; with quartz gravel, fine to medium grained				

# GROUND TEST PTY. LTD. - FIELD DRILLING REPORT

PROJECT: Tempe BORE No. MPEZ  
 PROJECT No. 36422A RIG. Scotti DATE - Start 21-07-04  
 DRILLER. 21040 OFFSIDER. Barry PROJECT MGR. MST - Finish

DESCRIPTION OF STRATA <small>(Leave one blank line between each strata with strata change at that level)</small>	Change at (m)	Sampling, penetration and coring								
		Type	No.	From	To	Measured depth	Recovery	SPT Blows		
								0-150 mm	150-300 mm	300-450 mm
	0.0									
<u>yellow sand crushed sandstone</u>	0.8									
<u>Dark Grey sandy clay</u>										
<u>Dark Grey sandy clay shells wet</u>	2.14									
<u>Dark Grey sandy material with shells</u>	2.6									
<u>light dark grey sandy clay shells</u>	7.14									
<u>Dark Grey clay</u>	10.14									
<u>light grey silt &amp; clay</u>	11.14									
<u>weathered light grey sandstone</u>	14.6									
<u>END 15M</u>										
Final Depth (measure by tape)										

A - Auger sample U - Undisturbed Tube sample B - Bulk sample  
 W - Wash sample C - Diamond Core sample V - Vane Shear Test  
 S - SPT sample (Note: 25/50 = 25 blows for 50mm penetration)

Groundwater observed <input checked="" type="checkbox"/> / N	Standpipe installed <input checked="" type="checkbox"/> / N	Drilling Methods	From	To
Initial Depth <u>2.6</u> m	Depth <u>15.14</u> m	Dia. tube		
After ..... hrs at ..... m	Stick up <u>1.14</u> m	Hand Auger		
Remarks (water loss, soft zones or faster penetration rate etc.)	Gatic Cover <u>Y / <input checked="" type="checkbox"/></u>	Solid Flight (V bit)		
	Screen interval <u>3m to 15m</u>	(TC bit)	<u>0.0</u>	<u>5.5</u>
	Gravel interval <u>2m to 15m</u>	Casing	<u>0.0</u>	<u>5.5</u>
	Bentonite interval <u>1m to 2m</u>	(size) <u>4w</u>		
	Cuttings/backfill <u>0.0 to 1.14</u>	Rotary (water)	<u>5.5</u>	<u>15.14</u>
		(mud)		
Has bore been backfilled Y / N		Coring (.....)		
Has bore been moved If YES has site plan been updated NA / Y / N		Other .....		

# GROUND TEST PTY. LTD. - FIELD DRILLING REPORT

PROJECT: Tempe BORE No. MPG3  
 PROJECT No. 36422A RIG. Scam DATE - Start 21-09-03  
 DRILLER: Lloyd OFFSIDER: Benny PROJECT MGR: MST - Finish

DESCRIPTION OF STRATA <small>(Leave one blank line between each strata with strata change at that level)</small>	Change at (m)	Sampling, penetration and coring								
		Type	No.	From	To	Measured depth	Recovery	SPT Blows		
								0-150 mm	150-300 mm	300-450 mm
<u>Crushed concrete sand</u>	0.0									
<u>Dark Grey sandy clay</u>	1.1									
<u>Dark Grey <sup>with shells</sup> marine clay</u>	2.1									
<u>Light Grey sandy clay</u>	6.2									
<u>Mottled Brown red Grey clay</u>	7.0									
<u>very stiff Brown red clay</u>	7.5									
<u>extremely weathered sandstone?</u>										
<u>very stiff light Grey clay</u>	8.3									
<u>extremely weathered sandstone</u>										
<u>low to medium strength</u>	9.1									
Final Depth (measure by tape)										

A - Auger sample U - Undisturbed Tube sample B - Bulk sample  
 W - Wash sample C - Diamond Core sample V - Vane Shear Test  
 S - SPT sample (Note: 25/50 = 25 blows for 50mm penetration)

Groundwater observed <u>Y / N</u>	Standpipe installed <u>Y / N</u>	Drilling Methods
Initial Depth: <u>2.5</u> m	Depth: <u>9.1</u> m	From: ..... To: .....
After ..... hrs at ..... m	Stick up: <u>1.1</u> m	Hand Auger
Remarks (water loss, soft zones or faster penetration rate etc.)	Gatic Cover: <u>Y / N</u>	Solid Flight (V bit)
	Screen interval: <u>3.2m to 9.1m</u>	(TC bit) <u>2.5</u> to <u>9.5</u>
	Gravel interval: <u>2.1m to 9.1m</u>	Casing (size) <u>175</u>
	Bentonite interval: <u>1.1m to 2.1m</u>	Rotary (water) <u>5.5</u> to <u>9.1</u>
	Cuttings/backfill: <u>2.5</u> to <u>1.1</u> m	(mud) ..... to .....
Has bore been backfilled Y / N		Coring (.....) ..... to .....
Has bore been moved If YES has site plan been updated NA / Y / N		Other .....

# GROUND TEST PTY. LTD. - FIELD DRILLING REPORT

PROJECT: Tempe BORE No. MPE4  
 OBJECT No. 3622A RIG. SCOUT DATE - Start 28.9.04  
 DRILLER. PAUL OFFSIDER. ELBERT PROJECT MGR. - Finish 28.9.04

DESCRIPTION OF STRATA <small>(Leave one blank line between each strata with strata change at that level)</small>	Change at (m)	Sampling, penetration and coring									
		Type	No.	From	To	Measured depth	Recovery	SPT Blows			
								0-150 mm	150-300 mm	300-450 mm	
<u>BROWN SANDY CRUSHED SANDSTONE CRUSHED</u>	0.0										
<u>SANDSTONE CRUSHED</u>	0.0										
<u>FRONSTONE</u>	0.0										
<u>DARK GREY SANDY CLAY</u>	0.8										
<u>GRAVEL FILL</u>	0.8										
<u>YELLOW BROWN WET SAND</u>	1.3										
<u>LIGHT GREEN BROWN SAND</u>	1.8										
<u>GREEN SANDY CLAY</u>	2.3										
<u>CRUSHED SANDSTONE &amp; GRAVEL</u>	6.2										
<u>RED SILTY CLAY</u>	6.45										
Final Depth (measure by tape) <u>is a cored test bore</u> <u>END 6.45</u>		A - Auger sample U - Undisturbed Tube sample B - Bulk sample W - Wash sample C - Diamond Core sample V - Vane Shear Test S - SPT sample (Note: 25/50 = 25 blows for 50mm penetration)									
<b>Groundwater observed</b> (Y/N) <u>Y</u>	<b>Standpipe installed</b> (Y/N) <u>Y</u>	<b>Drilling Methods</b>									
Initial Depth <u>0.8</u> m	Depth ..... m	From		To							
After ..... hrs at ..... m	Stick up ..... m	Hand Auger		.....							
Remarks (water loss, soft zones or faster penetration rate etc.)	Gatic Cover <u>Y/N</u>	Solid Flight (V bit)		<u>G.L. 4.5</u>							
	Screen interval <u>6.5 to 3.05m</u>	(TC bit)		.....							
	Gravel interval <u>6.5 to 2.0m</u>	Casing HW (size)		<u>G.L. 6.5</u>							
	Bentonite interval <u>2.0 to 1.0m</u>	Rotary (water)		<u>4.5 6.45</u>							
	Cuttings/backfill <u>1.0 to 6.4m</u>	(mud)		.....							
Has bore been backfilled (Y/N) <u>Y</u>		Coring (.....)		.....							
Has bore been moved If YES has site plan been updated <u>NA</u> (Y/N)		Other		.....							

# GROUND TEST PTY. LTD. - FIELD DRILLING REPORT

PROJECT: Tempe BORE No. MPE 25  
 PROJECT No. 3GT22A RIG. Scout DATE - Start 29-9-04  
 DRILLER: Paul OFFSIDER: Elbert PROJECT MGR. MST - Finish

DESCRIPTION OF STRATA <small>(Leave one blank line between each strata with strata change at that level)</small>	Change at (m)	Sampling, penetration and coring																			
		Type	No.	From	To	Measured depth	Recovery	SPT Blows													
								0-150 mm	150-300 mm	300-450 mm											
Brown sand gravel fill	0.0																				
Dark grey sand with trace of clay with petrol smell	0.3																				
Dark grey sandy clay no petrol smell	1.8																				
Marine clay with shells natural fibres	2.4																				
Extremely weathered light grey sandstone (sandy clay)	4.1																				
Very soft light grey sandy clay shells	4.6																				
weathered to low sandstone (grey light)	4.8																				
Final Depth (measure by tape) <small>if a correct test bore</small> <u>5.4</u>		A - Auger sample U - Undisturbed Tube sample B - Bulk sample W - Wash sample C - Diamond Core sample V - Vane Shear Test S - SPT sample (Note: 25/50 = 25 blows for 50mm penetration)																			
<b>Groundwater observed</b> Y / N		<b>Standpipe installed</b> <input checked="" type="checkbox"/> / N			<b>Drilling Methods</b> From To																
Initial Depth .....m		Depth ..... <u>5.4</u> .....m			Dia. tube ..... .....																
After .....hrs at .....m		Stick up ..... <u>1.1</u> .....m			Hand Auger ..... .....																
<b>Remarks</b> (water loss, soft zones or faster penetration rate etc.)		Gatic Cover <input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>			Solid Flight (V bit) ..... .....																
		Screen interval ... <u>3.1</u> to <u>5.4</u> m			(TC bit) <u>6.2</u> <u>4.5</u>																
		Gravel interval ... <u>2.1</u> to <u>5.4</u> m			Casing ..... <u>4.5</u>																
		Bentonite interval <u>1.1</u> to <u>2.1</u> m			(size) <u>HW</u> ..... .....																
		Cuttings/backfill <u>0.0</u> to <u>1.1</u> m			Rotary (water) <u>4.5</u> <u>5.4</u> (mud) ..... .....																
Has bore been backfilled Y / N		Coring (.....) ..... .....																			
Has bore been moved If YES has site plan been updated NA / Y / N		Other ..... .....																			

# GROUND TEST PTY. LTD. - FIELD DRILLING REPORT

PROJECT: Tempe BORE No. MPE6  
 PROJECT No. 36422A RIG: Scout DATE Start 29  
 DRILLER: Way/John OFFSIDER, ADAM PROJECT MGR. MS - Finish 30-7-04

DESCRIPTION OF STRATA <small>(Leave one blank line between each strata with strata change at that level)</small>	Change at (m)	penetration and coring					SPT Blows			
		Type	No.	From	To	Measured depth	Recovery	0-150 mm	150-300 mm	300-450 mm
Brown sand gravel fill	0.0									
Dark Grey sandy clay fill	0.6									
MARINE clay shells	2.1									
Light Grey clay	6.1									
Light Grey traces Brown clay	7.1									
Stiff Grey clay	8.5									
Weathered sandstone	9.1									
Low strength sandstone	9.5									
Final Depth (measure by tape of a cored test bore) <u>9.5</u>		A - Auger sample U - Undisturbed Tube sample B - Bulk sample W - Wash sample C - Diamond Core sample V - Vane Shear Test S - SPT sample (Note: 25/50 = 25 blows for 50mm penetration)								

Groundwater observed <u>Y / N</u>	Standpipe installed <u>Y / N</u>	Drilling Methods
Initial Depth <u>5.5</u> m	Depth <u>9.5</u> m	From To
After ..... hrs at ..... m	Stick up <u>1.1</u> m	Dia. tube
Remarks (water loss, soft zones or faster penetration rate etc)	Gatic Cover <u>Y / N</u>	Hand Auger
	Screen interval <u>3.3</u> to <u>9.5</u> m	Solid Flight (V bit)
	Gravel interval <u>2.1</u> to <u>9.5</u> m	(TC bit) <u>5.5</u> to <u>9.5</u>
	Bentonite interval <u>1.1</u> to <u>2.1</u> m	Casing (size) <u>HW</u>
	Cuttings/backfill <u>0.5</u> to <u>1.1</u> m	Rotary (water) <u>5.5</u> to <u>9.5</u>
Has bore been backfilled <u>Y / N</u>		(mud)
Has bore been moved If YES has site plan been updated <u>NA / Y / N</u>		Coring (.....)
		Other .....

# GROUND TEST PTY. LTD. FIELD DRILLING REPORT

PROJECT: Tempe BORE No. MPE 7  
 PROJECT No. 36422A RIG. Scaev DATE - Start 22/09/04  
 DRILLER: Lloyd OFFSIDER: Berry PROJECT MGR. MST - Finish " " "

DESCRIPTION OF STRATA <small>(Leave one blank line between each strata with strata change at that level)</small>	Change at (m)	Sampling, penetration and coring								
		Type	No.	From	To	Measured depth	Recovery	SPT Blows		
								0-150 mm	150-300 mm	300-450 mm
	0.0									
<i>Crushed brick concrete clay</i>	0.0									
<i>Sand fill</i>										
	1.3									
<i>Dark light grey sand</i>										
	2.7									
<i>Dark grey marl clay shells</i>										
	6m									
<i>Dark light grey sandy clay shales</i>										
	8.2									
<i>Light grey clay bit of brown</i>										
	9.3									
<i>Light grey brown clay very stiff</i>										
	10.5									
<i>Light grey brown clay bit of sandstone</i>										
	13.6									
<i>Low strength sandstone</i>										
<b>CMD 13.6</b>										
Final Depth (measure by tape)										

A - Auger sample U - Undisturbed Tube sample B - Bulk sample  
 W - Wash sample C - Diamond Core sample V - Vane Shear Test  
 S - SPT sample (Note: 25/50 = 25 blows for 50mm penetration)

Groundwater observed	Standpipe installed	Drilling Methods
Y / N	Y / N	From To
Initial Depth: <u>5.5</u> m	Depth: <u>13.6</u> m	Dia. tube
After ..... hrs at ..... m	Stick up: <u>1.5</u> m	Hand Auger
Remarks (water loss, soft zones or faster penetration rate etc.)	Gatic Cover: <u>Y / N</u>	Solid Flight (V bit)
	Screen interval: <u>3.5 to 13.6</u> m	(TC bit) <u>0.0 to 5.5</u>
	Gravel interval: <u>1.2 to 13.6</u> m	Casing (size) <u>etc</u>
	Bentonite interval: <u>0.8 to 2.0</u> m	Rotary (water) <u>5.5 to 13.6</u>
<i>Peris installed on 23/09/04</i>	Cuttings/backfill: <u>0.0 to 0.8</u> m	(mud)
Has bore been backfilled Y / N		Coring (.....)
Has bore been moved If YES has site plan been updated NA / Y / N		Other

# GROUND TEST PTY. LTD. - FIELD DRILLING REPORT.

PROJECT Tempo BORE No. MPE8  
 PROJECT No. 36422A RIG. Scotty DATE - Start 23-09-04  
 DRILLER. Lloyd OFFSIDER. Steve PROJECT MGR. HST - Finish 11/11

<b>DESCRIPTION OF STRATA</b> (Leave one blank line between each strata with strata change at that level)	Change at (m)	Sampling, penetration and coring								
		Type	No.	From	To	Measured depth	Recovery	SPT Blows		
								0-150 mm	150-300 mm	300-450 mm
hand fill waste clay	0.0									
crushed brick gravelly clay	1.1m									
petrol silt	1.7									
dark grey sandy clay petrol silt	3.2									
dark light grey sandy marine clay shells	7.1m									
light grey silty clay	11m									
very mottled brown grey clay silty	12m									
very stiff brown grey red clay	17m									
ironstone weathered rock	17m									
low to medium strength siltstone	17m									
END 17m										
Final Depth (measure by tape)		A - Auger sample U - Undisturbed Tube sample B - Bulk sample W - Wash sample C - Diamond Core sample V - Vane Shear Test S - SPT sample (Note: 25/50 = 25 blows for 50mm penetration)								

Groundwater observed <input checked="" type="checkbox"/> / N	Standpipe installed <input checked="" type="checkbox"/> / N	Drilling Methods From To
Initial Depth 1.2 m	Depth 17.1 m	Dia. tube
After ..... hrs at ..... m	Stick up ..... m	Hand Auger
Remarks (water loss, soft zones or fast penetration rate etc.)	Gatic Cover Y / <input checked="" type="checkbox"/>	Solid Flight (V bit)
	Screen interval 3m to 17m	(TC bit) 3.5 5.5
	Gravel interval 2m to 17m	Casing (size) Hm 3.5 5.5
	Bentonite interval 1.7 to 2.1m	Rotary (water) 3.5 17m
	Cuttings/backfill 2.1 to 17m	(mud)
Has bore been backfilled, Y / N		Coring (.....)
Has bore been moved If YES has site plan been updated NA / Y / N		Other

# GROUND TEST PTY. LTD. - FIELD DRILLING REPORT

PROJECT: Tempe BORE No. 14029  
 PROJECT No. 36422A RIG. Scout 1 DATE - Start 24-09-07  
 DRILLER. WLOYD OFFSIDER. Steve PROJECT MGR. MST - Finish

<b>DESCRIPTION OF STRATA</b> (Leave one blank line between each strata with strata change at that level)	Change at (m)	Sampling, penetration and coring								
		Type	No.	From	To	Measured depth	Recovery	SPT Blows		
								0-150 mm	150-300 mm	300-450 mm
Cravey clay fill	0.0									
wet Petrol smelly sandy clay	1.1									
light grey sandy clay petrol	2.1									
light grey marine clay shells	3.41M									
dark grey marine clay shells	5M									
light grey clay sand layers	<del>7.5</del>									
dark grey layers	7.5									
Mottled Brown grey clay strata	11M									
Mottled red Brown grey clay	14M									
low strength siltstone	20.1									
Final Depth (measure by tape)		A - Auger sample U - Undisturbed Tube sample B - Bulk sample W - Wash sample C - Diamond Core sample V - Vane Shear Test S - SPT sample (Note: 25/50 = 25 blows for 50mm penetration)								

Groundwater observed <input checked="" type="checkbox"/> / N	Standpipe installed <input checked="" type="checkbox"/> / N	Drilling Methods
Initial Depth .....m	Depth ..... 20.1 .....m	Dia. tube
After .....hrs at .....m	Stick up ..... 1.1 .....m	Hand Auger
Remarks (water loss, soft zones or faster penetration rate etc.)	Gatic Cover Y / <input checked="" type="checkbox"/>	Solid Flight (V bit)
	Screen interval .. 3m to 20.1m	(TC bit) 0.0 5.5
	Gravel interval .. 2.1m to 20.1m	Casing (size) 170
	Bentonite interval .. 1.1m to 20.1m	Rotary (water) 5.5 20.1
	Cuttings/backfill .. 0.0 to 1.1m	(mud)
Has bore been backfilled Y / N		Coring (.....)
Has bore been moved If YES has site plan been updated NA / Y / N		Other

# GROUND TEST PTY. LTD. FIELD DRILLING REPORT

PROJECT: Tempe BORE No. MPE  
 PROJECT No. 30422A RIG: Scout DATE - Start 3-09-04  
 DRILLER: Wayd OFFSIDER: ADAM PROJECT MGR. MST - Finish 6-10-04

<u>DESCRIPTION OF STRATA</u> <small>(Leave one blank line between each strata with strata change at that level)</small>	Change at (m)	Sampling, penetration and coring								
		Type	No.	From	To	Measured depth	Recovery	SPT Blows		
								0-150 mm	150-300 mm	300-450 mm
	0.0									
<u>Brown Gravelly Sand</u>										
<u>crushed orange Brown Clay Sandstone</u>	1.1									
<u>DARK Brown Sandy Gravel</u>	1.7									
<u>DARK Grey Gravelly clay wet</u>	2.6									
<u>crushed DARK Grey Gravelly sand shale</u>	3.5									
<u>DARK Grey Silty Clay shells</u>	5.5									
<u>Light Grey sandy clay shells</u>	8.5									
<u>SHALLOU DARK Grey Brown clay</u>	14M									
Final Depth (measure by tape) <u>is a correct test bore</u> <u>17m</u>		A - Auger sample U - Undisturbed Tube sample B - Bulk sample W - Wash sample C - Diamond Core sample V - Vane Shear Test S - SPT sample (Note: 25/50 = 25 blows for 50mm penetration)								

Groundwater observed <u>Y / N</u>	Standpipe installed <u>Y / N</u>	Drilling Methods From To
Initial Depth <u>7.7m</u>	Depth <u>17.1m</u>	Dia. tube
After <u>      </u> hrs at <u>      </u> m	Stick up <u>1.1m</u>	Hand Auger
Remarks (water loss, soft zones or faster penetration rate etc.)	Gatic Cover <u>Y / N</u>	Solid Flight (V bit)
	Screen interval <u>3.1m to 1.7m</u>	(TC bit) <u>5.5</u>
	Gravel interval <u>2.6m to 1.7m</u>	Casing (size) <u>4W</u>
	Bentonite interval <u>1.0 to 2.7m</u>	Rotary (water) <u>5.5</u>
	Cuttings/backfill <u>0.0 to 1.0m</u>	(mud)
Has bore been backfilled <u>Y / N</u>		Coring (.....)
Has bore been moved If YES has site plan been updated <u>NA / Y / N</u>		Other

# GROUND TEST PTY. LTD. - FIELD DRILLING REPORT

PROJECT: Tempe BORE No. MPE-2 MPE-2  
 PROJECT No. 36422A RIG. Scout DATE - Start 17-09-04  
 DRILLER. Lloyd OFFSIDER. Barry PROJECT MGR. MST - Finish

DESCRIPTION OF STRATA <small>(Leave one blank line between each strata with strata change at that level)</small>	Change at (m)	Sampling penetration and coring								
		Type	No.	From	To	Measured depth	Recovery	SPT Blows		
								0-150 mm	150-300 mm	300-450 mm
Dark Brown Sandy Soil	0.0									
Crave fill										
Silty clay fill	0.5									
Light grey to brown sand wet	1.2									
Dark Grey massive clay with layers of grey sand	2.1									
Brown clay sand & shells	4.1									
Marine clay shells with sand layers	6.1									
Light grey sandy clay shells	8.2									
Mottled brown to grey sandy clay	9.8									
Extremely weathered brown red sandstone clay	11.8									
Final Depth (measure by tape) <u>yes</u> <u>low to medium strength sandstone</u>	13.9									
<small>A - Auger sample U - Undisturbed Tube sample B - Bulk sample                      W - Wash sample C - Diamond Core sample V - Vane Shear Test                      S - SPT sample (Note: 25/50 = 25 blows for 50mm penetration)</small>										
Groundwater observed <u>Y/N</u>	Standpipe installed <u>Y/N</u>	Drilling Methods From To								
Initial Depth .....m	Depth .....m	Dia. tube .....								
After ..... hrs at .....m	Stick up .....m	Hand Auger .....								
Remarks (water loss, soft zones or faster penetration rate etc.)	Gatic Cover <u>Y/N</u>	Solid Flight (V bit) .....								
	Screen interval ..3.1 to 13.9 m	(TC bit) ..3.1 5.5								
	Gravel interval ..2.1 to 13.9 m	Casing .....								
	Bentonite interval ..9.7 to 3.1 m	(size) ..3.1 5.5								
	Cuttings/backfill ..9.7 to 3.7 m	Rotary (water) ..5.5 13.9								
		(mud) .....								
Has bore been backfilled <u>Y/N</u>		Coring (.....) .....								
Has bore been moved if YES has site plan been updated <u>NA/Y/N</u>		Other .....								

# Engineering Log - Borehole

client: **WestConnex Delivery Authority**  
 principal:  
 project: **WestConnex Stage 2 - Sydney Gateway**  
 location: **Car park off Ross Smith Ave**

Borehole ID: **WCX\_GTY\_BH\_002**  
 sheet: 1 of 2  
 project no: **GEOTLCOV25385AA**  
 date started: **18 Sep 2015**  
 date completed: **21 Sep 2015**  
 logged by: **RH**  
 checked by: **DMH**

position: E: 332396; N: 6243839 (MGA94 Zone 56) surface elevation: 5.53 m (AHD) angle from horizontal: 90°  
 drill model: Comacchio 450P, Track mounted casing diameter: HW

drilling information				material substance							
method & support	penetration	samples & field tests	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations	
HA AD/T W HW casing 18/09/15 15:30	1	E	0.0		SP	<b>FILL: ASPHALT:</b> 30mm thickness.	M		100	<b>FILL</b>  <b>MARINE DEPOSITS</b>          trace of organic odour	
	2	E	0.5		SP	<b>FILL: Gravelly CLAY:</b> medium plasticity, red brown, with some sub-rounded to sub angular gravel, trace to some sand.	MD		200		
	3	E	1.0		SP	<b>SAND:</b> fine grained, pale grey/brown, trace silt.			300		
	4	E	1.5		SP	<b>SAND:</b> fine to medium grained, brown/pale yellow.	M to W		400		
	5	E	2.0								
	6	E	2.5			from 2.5m, sand is pale yellow	W				
	7	SPT 4, 5, 9 N*=14	E	3.0		SM	<b>Silty SAND:</b> fine grained, black.				
	8	E	4.0								
	9	SPT 9, 13, 9/50mm N*=R	E	5.0							
	10	E	6.0								
11	E	7.0									
12	SPT 18, 26, 30/50mm N*=R	E	7.5		SP	<b>SAND:</b> fine to medium grained, grey, trace of silt.		VD			

<b>method</b> AD auger drilling* AS auger screwing* HA hand auger W washbore DT diatube HA hand auger  * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	<b>support</b> M mud N nil C casing  <b>penetration</b>  no resistance ranging to refusal  <b>water</b>  10-Oct-12 water level on date shown water inflow water outflow	<b>samples &amp; field tests</b> B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	<b>classification symbol &amp; soil description</b> based on Unified Classification System  <b>moisture</b> D dry M moist W wet Wp plastic limit Wl liquid limit	<b>consistency / relative density</b> VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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CDF\_0\_9\_04BB.GLB Log\_COF\_BOREHOLE: NON CORED GEOTLCOV25385AA SYDNEY GATEWAY - MASTER.GPJ <<DrawingFile>> 30/10/2015 15:51

# Engineering Log - Borehole

Borehole ID: **WCX\_GTY\_BH\_002**  
 sheet: 2 of 2  
 project no: **GEOTLCOV25385AA**  
 date started: **18 Sep 2015**  
 date completed: **21 Sep 2015**  
 logged by: **RH**  
 checked by: **DMH**

client: **WestConnex Delivery Authority**  
 principal:  
 project: **WestConnex Stage 2 - Sydney Gateway**  
 location: **Car park off Ross Smith Ave**

position: E: 332396; N: 6243839 (MGA94 Zone 56) surface elevation: 5.53 m (AHD) angle from horizontal: 90°  
 drill model: Comacchio 450P, Track mounted casing diameter: HW

drilling information				material substance								
method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
							SP	<b>SAND:</b> fine to medium grained, grey, trace of silt. (continued)	W	VD	100 200 300 400	<b>MARINE DEPOSITS</b>
			SPT 18, 30/145mm N*=R		3.0							
					9.0							
							SC	<b>Clayey SAND:</b> fine to medium grained, dark brown and dark grey, high plasticity clay.		MD		
			SPT 16, 6, 4 N*=10		4.0							
					10.0							
							CH	<b>CLAY:</b> high plasticity, grey.	<Wp	VSt		<b>ALLUVIUM</b>
			SPT 6, 11, 17 N*=28		6.0							
					11.0							
								from 14.0 m, becoming pale grey mottled red				
			SPT 11, 22, 30/120mm N*=R		7.0							
					12.0							
								Borehole WCX_GTY_BH_002 terminated at 14.92 m Target depth Well installed upon completion				
					13.0							
					14.0							
					15.0							
					10.0							
					11.0							
					12.0							
					13.0							
					14.0							
					15.0							

CDF\_0\_9\_04BB.GLB Log\_COF\_BOREHOLE\_NON\_CORED\_GEOTLCOV25385AA\_SYDNEY\_GATEWAY - MASTER.GPJ <<DrawingFile>> 30/10/2015 15:51

<b>method</b> AD auger drilling* AS auger screwing* HA hand auger W washbore DT diatube HA hand auger  * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	<b>support</b> M mud N nil C casing  <b>penetration</b>  no resistance ranging to refusal  <b>water</b>  10-Oct-12 water level on date shown water inflow water outflow	<b>samples &amp; field tests</b> B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear, peak/remoulded (kPa) R refusal HB hammer bouncing	<b>classification symbol &amp; soil description</b> based on Unified Classification System  <b>moisture</b> D dry M moist W wet Wp plastic limit Wl liquid limit	<b>consistency / relative density</b> VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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# Engineering Log - Borehole

Borehole ID: **WCX\_GTY\_BH\_003**  
 sheet: 2 of 5  
 project no: **GEOTLCOV25385AA**  
 date started: **29 Sep 2015**  
 date completed: **01 Oct 2015**  
 logged by: **TO**  
 checked by: **DMH**

client: **WestConnex Delivery Authority**  
 principal:  
 project: **WestConnex Stage 2 - Sydney Gateway**  
 location: **Corner of Qantas Drive and O'Riordan Street**

position: E: 332326; N: 6243919 (MGA94 Zone 56) surface elevation: 5.21 m (AHD) angle from horizontal: 90°  
 drill model: AUSROC, Truck mounted casing diameter: HW

drilling information				material substance								
method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
				-3			SP	<b>SAND:</b> fine to medium grained, grey. (continued)	W	MD / D		<b>MARINE DEPOSITS</b>
			SPT 5, 3, 17 N*=20		9.0			8.5 m: becoming pale grey with trace of silt				
										VD		
			SPT 15, 27, 21 N*=48		10.0			10 m: no silt				
			SPT 25, 24, 22 N*=46		11.0			11.5 m: becoming grey with trace of silt				
			SPT 14/140mm N*=R		13.0			13 m: becoming pale grey with no silt				
					14.0		CH	<b>Silty CLAY:</b> high plasticity, pale grey, trace of sand.	<Wp	St / VSt		<b>ALLUVIUM</b>
			SPT 2, 6, 7 N*=13		15.0							
							CH	<b>CLAY:</b> high plasticity, pale grey mottled red brown, with some ironstone gravel.				

CDF\_0\_9\_04BB.GLB Log COF BOREHOLE: NON CORED GEOTLCOV25385AA SYDNEY GATEWAY - MASTER.GPJ <<DrawingFile>> 30/10/2015 15:51

<b>method</b> AD auger drilling* AS auger screwing* HA hand auger W washbore DT diatube HA hand auger  * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	<b>support</b> M mud N nil C casing  <b>penetration</b>  no resistance ranging to refusal 10-Oct-12 water level on date shown water inflow water outflow	<b>samples &amp; field tests</b> B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	<b>classification symbol &amp; soil description</b> based on Unified Classification System  <b>moisture</b> D dry M moist W wet Wp plastic limit Wl liquid limit	<b>consistency / relative density</b> VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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# Engineering Log - Borehole

Borehole ID: **WCX\_GTY\_BH\_003**  
 sheet: 3 of 5  
 project no: **GEOTLCOV25385AA**  
 date started: **29 Sep 2015**  
 date completed: **01 Oct 2015**  
 logged by: **TO**  
 checked by: **DMH**

client: **WestConnex Delivery Authority**  
 principal:  
 project: **WestConnex Stage 2 - Sydney Gateway**  
 location: **Corner of Qantas Drive and O'Riordan Street**

position: E: 332326; N: 6243919 (MGA94 Zone 56) surface elevation: 5.21 m (AHD) angle from horizontal: 90°  
 drill model: AUSROC, Truck mounted casing diameter: HW

drilling information				material substance			
method & support	penetration	samples & field tests	depth (m)	graphic log	classification symbol	material description	structure and additional observations
	1 2 3	U75	-11	[Hatched pattern]	CH	<b>CLAY:</b> high plasticity, pale grey mottled red brown, with some ironstone gravel. <i>(continued)</i>	ALLUVIUM
		SPT 6, 10, 15 N*=25	-12		CH	<b>CLAY:</b> high plasticity, pale grey mottled yellow brown.	
		SPT 11, 24, 25/100mm N*=R	-13		CH	<b>CLAY:</b> high plasticity, brown mottled red brown and yellow brown.	RESIDUAL SOIL
			-14			Borehole WCX_GTY_BH_003 continued as cored hole	
			-15				
			-16				
			-17				
			-18				

<b>method</b> AD auger drilling* AS auger screwing* HA hand auger W washbore DT diatube HA hand auger  * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	<b>support</b> M mud N nil C casing  <b>penetration</b>  no resistance ranging to refusal  <b>water</b>  10-Oct-12 water level on date shown water inflow water outflow	<b>samples &amp; field tests</b> B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	<b>classification symbol &amp; soil description</b> based on Unified Classification System  <b>moisture</b> D dry M moist W wet Wp plastic limit Wl liquid limit	<b>consistency / relative density</b> VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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CDF\_0\_9\_04BB.GLB Log\_COFBOREHOLE: NON CORED GEOTLCOV25385AA SYDNEY GATEWAY - MASTER.GPJ <<DrawingFile>> 30/10/2015 15:51



# Engineering Log - Cored Borehole

Borehole ID: **WCX\_GTY\_BH\_003**  
 sheet: 5 of 5  
 project no: **GEOTLCOV25385AA**  
 date started: **29 Sep 2015**  
 date completed: **01 Oct 2015**  
 logged by: **TO**  
 checked by: **DMH**

client: **WestConnex Delivery Authority**  
 principal:  
 project: **WestConnex Stage 2 - Sydney Gateway**  
 location: **Corner of Qantas Drive and O'Riordan Street**

position: E: 332326; N: 6243919 (MGA94 Zone 56) surface elevation: 5.21 m (AHD) angle from horizontal: 90°  
 drill model: AUSROC, Truck mounted drilling fluid: casing diameter: HW

drilling information		material substance				rock mass defects						
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	estimated strength & Is(50) X = axial O = diametral a = axial d = diametral	samples, field tests & Is(50) (MPa)	core run & RQD	defect spacing (mm)	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)	
											particular	general
HC		-19			<b>SILTSTONE:</b> dark grey, with some distinct pale grey laminations at 0-15°. ( <i>continued</i> )	SW / MW			0%		JT, 25 - 35°, PL, RO, CN JT, 25 - 35°, PL, RO, CN JT, 55°, PL, RO, CN	Defects are: PT, 0 - 10°, PL, RO, CN, unless otherwise described
		-20			Borehole WCX_GTY_BH_003 terminated at 25.00 m Target stratum borehole grouted upon completion							
		-21										
		-22										
		-23										
		-24										
		-25										
		-26										

CDF\_0\_9\_04BB.GLB Log\_COFBOREHOLE: CORED GEOTLCOV25385AA SYDNEY GATEWAY - MASTER.GPJ <<DrawingFiles>> 02/11/2015 08:53

<b>method &amp; support</b> AS auger screwing AD auger drilling CB claw or blade bit W washbore NMLC NMLC core (51.9 mm) NQ wireline core (47.6mm) HQ wireline core (63.5mm) PQ wireline core (85.0mm) SPT standard penetration test DT diatube HA hand auger	<b>water</b> 10/10/12, water level on date shown water inflow complete drilling fluid loss partial drilling fluid loss water pressure test result (lugeons) for depth interval shown 25uL	<b>graphic log / core recovery</b> core recovered (graphic symbols indicate material) no core recovered <b>core run &amp; RQD</b> barrel withdrawn RQD = Rock Quality Designation (%)	<b>weathering &amp; alteration*</b> RS residual soil XW extremely weathered HW highly weathered DW distinctly weathered MW moderately weathered SW slightly weathered FR fresh *W replaced with A for alteration <b>strength</b> VL very low L low M medium H high VH very high EH extremely high	<b>defect type</b> PT parting JT joint SZ shear zone SS shear surface CS crushed seam SM seam DB drilling break <b>roughness</b> SL slickensided POL polished SO smooth RO rough VR very rough	<b>planarity</b> PL planar CU curved UN undulating ST stepped IR irregular <b>coating</b> CN clean SN stain VN veneer CO coating
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# Engineering Log - Borehole

Borehole ID: **WCX\_GTY\_BH\_004**  
 sheet: 1 of 4  
 project no: **GEOTLCOV25385AA**  
 date started: **16 Sep 2015**  
 date completed: **17 Sep 2015**  
 logged by: **TO**  
 checked by: **DMH**

client: **WestConnex Delivery Authority**  
 principal:  
 project: **WestConnex Stage 2 - Sydney Gateway**  
 location: **CASA car park off Qantas Drive**

position: E: 332116; N: 6243987 (MGA94 Zone 56) surface elevation: 3.19 m (AHD) angle from horizontal: 90°  
 drill model: Aus Rock, Truck mounted casing diameter: HW

drilling information				material substance							
method & support	penetration	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
HA	1 2 3	E	3	0.0	[Cross-hatched pattern]	D	ASPHALT: 30mm thick.	D			PAVEMENT ROAD BASE PID = 79 ppm FILL Enviro. includes QC002 / QC002A and PCF (PID = 15.3 ppm) PID = 55 ppm
							FILL: Gravelly SAND: coarse grained, dark grey, gravel is medium grained.				
							FILL: Silty SAND: fine grained, dark brown.				
							becoming with a trace of silt				
AD/T	SPT	4, 5, 6 N*=11	2	1.0	[Dotted pattern]	SP	SAND: fine to medium grained, yellow-brown.	W	MD		MARINE DEPOSITS SPT sample used for enviro. jar sample only (PID = 60 ppm)
							becoming brown, with a trace of silt				
							becoming brown to yellow brown, with no silt				
W	SPT	2, 3, 3 N*=6	3	2.0	[Dotted pattern]	SP					
W	SPT	6, 9, 10 N*=19	4	3.0	[Dotted pattern]	SP					
W	SPT	1, 1, 4 N*=5	5	4.0	[Dotted pattern]	SM	Silty SAND: fine to medium grained, grey to dark grey.		L		
W	SPT	14, 18, 23 N*=41	6	5.0	[Dotted pattern]	SP	SAND: fine to medium grained, grey.		VD		

<b>method</b> AD auger drilling* AS auger screwing* HA hand auger W washbore DT diatube HA hand auger  * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	<b>support</b> M mud N nil C casing  <b>penetration</b>  <b>water</b> 10-Oct-12 water level on date shown water inflow water outflow	<b>samples &amp; field tests</b> B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear, peak/remoulded (kPa) R refusal HB hammer bouncing	<b>classification symbol &amp; soil description</b> based on Unified Classification System  <b>moisture</b> D dry M moist W wet Wp plastic limit Wl liquid limit	<b>consistency / relative density</b> VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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CDF\_0\_9\_04BB.GLB Log COF BOREHOLE: NON CORED GEOTLCOV25385AA SYDNEY GATEWAY - MASTER.GPJ <<DrawingFile>> 30/10/2015 15:51

# Engineering Log - Borehole

Borehole ID: **WCX\_GTY\_BH\_004**  
 sheet: 2 of 4  
 project no: **GEOTLCOV25385AA**  
 date started: **16 Sep 2015**  
 date completed: **17 Sep 2015**  
 logged by: **TO**  
 checked by: **DMH**

client: **WestConnex Delivery Authority**  
 principal:  
 project: **WestConnex Stage 2 - Sydney Gateway**  
 location: **CASA car park off Qantas Drive**

position: E: 332116; N: 6243987 (MGA94 Zone 56) surface elevation: 3.19 m (AHD) angle from horizontal: 90°  
 drill model: Aus Rock, Truck mounted casing diameter: HW

drilling information				material substance								
method & support	penetration	samples & field tests	water	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
				-5			SP	<b>SAND:</b> fine to medium grained, grey. (continued)	W	VD		<b>MARINE DEPOSITS</b>
		SPT 17, 18, 22 N*=40		-6	9.0			becoming pale grey				
				-7	10.0			becoming dark grey				
		SPT 15, 27, 12/90mm HB N*=R		-8	11.0		SC	<b>Clayey SAND:</b> fine grained, dark brown to grey.			X X	
				-9	12.0		SP	<b>SAND:</b> fine to coarse grained, brown to pale grey.				
		SPT 16, 21, 6/40mm HB N*=R		-10	13.0		CH	<b>Silty CLAY:</b> high plasticity, grey.	>Wp	S / F	X X X	<b>ALLUVIUM</b>
		SPT 0, 0, 0 N*=0		-11	14.0							
		U75		-12	15.0							

CDF\_0\_9\_04BB.GLB Log\_COF\_BOREHOLE: NON CORED GEOTLCOV25385AA SYDNEY GATEWAY - MASTER.GPJ <<DrawingFile>> 30/10/2015 15:51

<b>method</b> AD auger drilling* AS auger screwing* HA hand auger W washbore DT diatube HA hand auger  * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	<b>support</b> M mud N nil C casing  <b>penetration</b>  <b>water</b> 	<b>samples &amp; field tests</b> B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	<b>classification symbol &amp; soil description</b> based on Unified Classification System  <b>moisture</b> D dry M moist W wet Wp plastic limit Wl liquid limit	<b>consistency / relative density</b> VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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# Engineering Log - Borehole

Borehole ID: **WCX\_GTY\_BH\_004**  
 sheet: 3 of 4  
 project no: **GEOTLCOV25385AA**  
 date started: **16 Sep 2015**  
 date completed: **17 Sep 2015**  
 logged by: **TO**  
 checked by: **DMH**

client: **WestConnex Delivery Authority**  
 principal:  
 project: **WestConnex Stage 2 - Sydney Gateway**  
 location: **CASA car park off Qantas Drive**

position: E: 332116; N: 6243987 (MGA94 Zone 56) surface elevation: 3.19 m (AHD) angle from horizontal: 90°  
 drill model: Aus Rock, Truck mounted casing diameter: HW

drilling information				material substance								
method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
			SPT 5, 7, 10 N*=17	-13			CH	<b>Silty CLAY:</b> high plasticity, grey. (continued)	<Wp	VSt		<b>ALLUVIUM</b>
			SPT 5, 5, 8 N*=13	-14	17.0			becoming pale grey mottled red brown and yellow brown		St		
			SPT 7, 10, 13 N*=23	-15	18.0		CH	<b>CLAY:</b> high plasticity, red-brown to yellow-brown.		VSt		
			SPT 10, 11, 18 N*=29	-16	19.0			becoming with some ironstone		VSt		
			SPT 7, 11, 16 N*=27	-17	20.0					VSt / H		
			SPT 13, 20, 30/110mm HB	-18	21.0					VSt / H		
				-19	22.0							
				-20	23.0							

CDF\_0\_9\_04BB.GLB Log\_COF\_BOREHOLE\_NON\_CORED\_GEOTLCOV25385AA\_SYDNEY\_GATEWAY - MASTER.GPJ <<DrawingFile>> 30/10/2015 15:51

<b>method</b> AD auger drilling* AS auger screwing* HA hand auger W washbore DT diatube HA hand auger  * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	<b>support</b> M mud N nil C casing  <b>penetration</b>  no resistance ranging to refusal 10-Oct-12 water level on date shown water inflow water outflow	<b>samples &amp; field tests</b> B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	<b>classification symbol &amp; soil description</b> based on Unified Classification System  <b>moisture</b> D dry M moist W wet Wp plastic limit Wl liquid limit	<b>consistency / relative density</b> VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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# Engineering Log - Borehole

Borehole ID: **WCX\_GTY\_BH\_004**  
 sheet: 4 of 4  
 project no: **GEOTLCOV25385AA**  
 date started: **16 Sep 2015**  
 date completed: **17 Sep 2015**  
 logged by: **TO**  
 checked by: **DMH**

client: **WestConnex Delivery Authority**  
 principal:  
 project: **WestConnex Stage 2 - Sydney Gateway**  
 location: **CASA car park off Qantas Drive**

position: E: 332116; N: 6243987 (MGA94 Zone 56) surface elevation: 3.19 m (AHD) angle from horizontal: 90°  
 drill model: Aus Rock, Truck mounted casing diameter: HW

drilling information				material substance								
method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
W HW casing	1 2 3		N*=R	-21			CH	<b>CLAY:</b> high plasticity, red-brown to yellow-brown, with some ironstone.	<Wp	VSt / H	100 200 300 400	<b>ALLUVIUM</b>
			SPT 19, 30/130mm HB N*=R	-22	25.0			Borehole WCX_GTY_BH_004 terminated at 25.28 m Target depth Standpipe piezometer installed			X	
				-23								
				-24								
				-25								
				-26								
				-27								
				-28								

CDF\_0\_9\_04BB.GLB Log\_COFBOREHOLE: NON CORED GEOTLCOV25385AA SYDNEY GATEWAY - MASTER.GPJ <<DrawingFile>> 30/10/2015 15:51

<b>method</b> AD auger drilling* AS auger screwing* HA hand auger W washbore DT diatube HA hand auger  * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	<b>support</b> M mud N nil C casing  <b>penetration</b>  no resistance ranging to refusal  <b>water</b>  10-Oct-12 water level on date shown water inflow water outflow	<b>samples &amp; field tests</b> B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	<b>classification symbol &amp; soil description</b> based on Unified Classification System  <b>moisture</b> D dry M moist W wet Wp plastic limit Wl liquid limit	<b>consistency / relative density</b> VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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# Engineering Log - Borehole

Borehole ID: **WCX\_GTY\_BH\_009**  
 sheet: 1 of 5  
 project no: **GEOTLCOV25385AA**  
 date started: **22 Oct 2015**  
 date completed: **23 Oct 2015**  
 logged by: **CL**  
 checked by: **MG**

client: **WestConnex Delivery Authority**  
 principal:  
 project: **WestConnex Stage 2 - Sydney Gateway**  
 location: **Adjacent to ARTC property off Qantas Drive**

position: E: 331385; N: 6244540 (MGA94 Zone 56) surface elevation: 2.56 m (AHD) angle from horizontal: 90°  
 drill model: DB8, Track mounted hole diameter : 100 mm

drilling information				material substance									
method & support	penetration	samples & field tests	water	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations	
method & support: HA AD/T W CASING	1 2 3	SPT 1, 2, 2 N*=4		2.0	1.0		SP	<b>FILL: Clayey GRAVEL:</b> fine to coarse grained, grey, gravel is ballast, with some ballst cobbles. <b>FILL: Gravely CLAY:</b> low plasticity, brown, grey and dark grey, gravel is fine to medium grained, with a trace of sand.	M <Wp		100 200 300 400	<b>FILL</b> PID @ 0.1m = 4 PID @ 0.3m = 0.5 PID @ 0.5m = 0.5 PFC sample taken at 0.5m  PID @ 1m = 0.7 <b>MARINE DEPOSITS</b>	
				1.0	2.0		SP	<b>SAND:</b> fine to medium grained, grey/dark grey.	M MD				PID @ 2m = 0.5
				0.0	3.0		SP	<b>Silty SAND:</b> fine to medium grained, grey/dark grey.	W VL				SPT sample only 100mm recovery
				-1.0	4.0		OH	<b>ORGANIC CLAY:</b> high plasticity, dark grey/black, with a trace of shell fragments and organic fibres.	>Wp VS				strong organic odour in SPT sample
				-2.0	5.0		U75						U75 sample taken from 5m to 5.45m but only approximately 200mm recovery
SPT 1, 0, 0 N*=0  SPT 1, 0, 1 N*=1  SPT 0, 0, 1 N*=1		3.0	6.0		SP	<b>Silty SAND:</b> fine to medium grained, grey, with some shell fragments.	W VL						
		4.0	7.0		CH	<b>Silty CLAY:</b> high plasticity, pale grey/grey.	>Wp St						

<b>method</b> AD auger drilling* AS auger screwing* HA hand auger W washbore DT diatube HA hand auger  * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	<b>support</b> M mud C casing  <b>penetration</b>  no resistance ranging to refusal  <b>water</b>  10-Oct-12 water level on date shown water inflow water outflow	<b>samples &amp; field tests</b> B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	<b>classification symbol &amp; soil description</b> based on Unified Classification System  <b>moisture</b> D dry M moist W wet Wp plastic limit Wl liquid limit	<b>consistency / relative density</b> VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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CDF\_0\_9\_04BB.GLB Log\_COF BOREHOLE: NON CORED GEOTLCOV25385AA SYDNEY GATEWAY - MASTER.GPJ <<DrawingFile>> 30/10/2015 15:52

# Engineering Log - Borehole

Borehole ID: **WCX\_GTY\_BH\_009**  
 sheet: 2 of 5  
 project no: **GEOTLCOV25385AA**  
 date started: **22 Oct 2015**  
 date completed: **23 Oct 2015**  
 logged by: **CL**  
 checked by: **MG**

client: **WestConnex Delivery Authority**  
 principal:  
 project: **WestConnex Stage 2 - Sydney Gateway**  
 location: **Adjacent to ARTC property off Qantas Drive**

position: E: 331385; N: 6244540 (MGA94 Zone 56) surface elevation: 2.56 m (AHD) angle from horizontal: 90°  
 drill model: DB8, Track mounted hole diameter : 100 mm

drilling information				material substance								
method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
							SP	<b>SAND:</b> fine to medium grained, pale grey/grey. (continued)	W	D		<b>MARINE DEPOSITS</b>
			SPT 22, 24, 21 N*=45	-6	9.0							
			SPT 13, 12, 9 N*=21	-7	10.0					MD		
			SPT 5, 7, 10 N*=17	-8	11.0		SP	<b>Silty SAND:</b> fine to medium grained, dark grey/grey.				<b>ALLUVIUM</b>
			SPT 1, 5, 6 N*=11	-9	12.0			12.3 m: with some clay content				
			SPT 5, 10, 12 N*=22	-10	13.0		CH	<b>Silty CLAY:</b> high plasticity, grey.	<Wp	St / VSt		
				-11	14.0							failed U75 attempt at 14m to 14.45m
				-12	15.0			14.8 m: becoming mottled grey and yellow brown				

CDF\_0\_9\_04BB.GLB Log\_COFBOREHOLE: NON CORED GEOTLCOV25385AA SYDNEY GATEWAY - MASTER.GPJ <<DrawingFile>> 30/10/2015 15:52

<b>method</b> AD auger drilling* AS auger screwing* HA hand auger W washbore DT diatube HA hand auger  * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	<b>support</b> M mud N nil C casing  <b>penetration</b>  no resistance ranging to refusal  <b>water</b>  10-Oct-12 water level on date shown  water inflow water outflow	<b>samples &amp; field tests</b> B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	<b>classification symbol &amp; soil description</b> based on Unified Classification System  <b>moisture</b> D dry M moist W wet Wp plastic limit Wl liquid limit	<b>consistency / relative density</b> VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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# Engineering Log - Borehole

client: **WestConnex Delivery Authority**  
 principal:  
 project: **WestConnex Stage 2 - Sydney Gateway**  
 location: **Vacant lot - Burrows Road South**

Borehole ID: **WCX\_GTY\_BH\_027**  
 sheet: 1 of 4  
 project no: **GEOTLCOV25385AA**  
 date started: **08 Sep 2015**  
 date completed: **09 Sep 2015**  
 logged by: **TO**  
 checked by: **MG**

position: E: 331296; N: 6245034 (MGA94 Zone 56) surface elevation: 2.13 m (AHD) angle from horizontal: 90°  
 drill model: AUSROC, Truck mounted casing diameter: HW

drilling information				material substance									
method & support	penetration	samples & field tests	water	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations	
method & support: HA AD/T W HW casing	1	E		-2	0.0	[Cross-hatched]		<b>FILL: SAND:</b> fine to medium grained, brown, some fine to medium sub-rounded to sub-angular gravel, rootlets.	M		100	<b>FILL</b> PID=3.4ppm	
	2	E		-	0.5	[Cross-hatched]		<b>FILL: Gravelly SAND:</b> fine to coarse grained, dark brown to dark grey, fine to medium size, sub-rounded to sub-angular gravel and gravel size brick fragments.			200	PID=3.0ppm	
	3	E		-	1.0	[Cross-hatched]					300	PID=0.8ppm	
		SPT 10, 12, 6 N*=18			-	1.5	[Cross-hatched]		<b>FILL: Silty SAND:</b> fine to coarse grained, dark grey, some fine-medium sub-rounded to sub-angular gravel and glass.	M / W		400	PID=0.8ppm
		E			-	2.0	[Cross-hatched]		with some pale grey to pale brown high plasticity clay	W			PID=1.6ppm
		SPT 1, 0, 3 N*=3			-	2.5	[Cross-hatched]	ML	<b>Sandy SILT:</b> dark brown to dark grey, some shell fragments, trace peat and rootlets.		S		<b>MARINE DEPOSITS</b> PID=3.1ppm
		SPT 5, 5, 7 N*=12			-	3.5	[Cross-hatched]	SP	<b>SAND:</b> fine to medium grained, brown.		L		
		SPT 13, 15, 17 N*=32			-	4.5	[Cross-hatched]	CH	<b>Sandy CLAY:</b> high plasticity, pale grey, Sand is fine to medium grained.	>Wp	St	X	
		SPT 4, 6, 16 N*=22			-	5.5	[Cross-hatched]	SP	<b>Clayey SAND:</b> fine to medium grained, pale grey.	W	D		
					-	6.5	[Cross-hatched]	SP	<b>SAND:</b> fine to medium grained, pale grey.				

<b>method</b> AD auger drilling* AS auger screwing* HA hand auger W washbore DT diatube HA hand auger  * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	<b>support</b> M mud N nil C casing  <b>penetration</b>  10-Oct-12 water level on date shown water inflow water outflow	<b>samples &amp; field tests</b> B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	<b>classification symbol &amp; soil description</b> based on Unified Classification System  <b>moisture</b> D dry M moist W wet Wp plastic limit Wl liquid limit	<b>consistency / relative density</b> VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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CDF\_0\_9\_04BB.GLB Log COF BOREHOLE: NON-CORED GEOTLCOV25385AA SYDNEY GATEWAY - MASTER.GPJ <<DrawingFile>> 30/10/2015 15:53

# Engineering Log - Borehole

Borehole ID: **WCX\_GTY\_BH\_027**  
 sheet: 2 of 4  
 project no: **GEOTLCOV25385AA**  
 date started: **08 Sep 2015**  
 date completed: **09 Sep 2015**  
 logged by: **TO**  
 checked by: **MG**

client: **WestConnex Delivery Authority**  
 principal:  
 project: **WestConnex Stage 2 - Sydney Gateway**  
 location: **Vacant lot - Burrows Road South**

position: E: 331296; N: 6245034 (MGA94 Zone 56) surface elevation: 2.13 m (AHD) angle from horizontal: 90°  
 drill model: AUSROC, Truck mounted casing diameter: HW

drilling information				material substance								
method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
				-6			SP	<b>SAND:</b> fine to medium grained, pale grey. (continued)	W	VD		<b>MARINE DEPOSITS</b>
			SPT 8, 18, 30 N*=48		9.0							
				-7								
			U75		10.0		CL	<b>Silty CLAY:</b> medium plasticity, dark grey, some peat and sand.	>Wp	S / F		
				-8								
				-9			CH	<b>CLAY:</b> high plasticity, pale grey mottled yellow-brown.	<Wp	VSt / H		<b>ALLUVIUM</b>
			SPT 10, 12, 24 N*=36		11.0							
				-10			CH	<b>CLAY:</b> high plasticity, pale grey mottled yellow-brown and red, trace sand.				<b>RESIDUAL SOIL</b>
				-11								
			SPT 30/100mm N*=R		12.0							
				-13				<b>LAMINITE:</b> dark grey, extremely weathered, estimated very low to low strength.				<b>BEDROCK</b>
				-14								
				-12				Borehole WCX_GTY_BH_027 continued as cored hole				
				-13								

CDF\_0\_9\_04BB.GLB Log\_COF BOREHOLE: NON CORED GEOTLCOV25385AA SYDNEY GATEWAY - MASTER.GPJ <<DrawingFile>> 30/10/2015 15:53

<b>method</b> AD auger drilling* AS auger screwing* HA hand auger W washbore DT diatube HA hand auger  * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	<b>support</b> M mud N nil C casing  <b>penetration</b> no resistance ranging to refusal  <b>water</b> 10-Oct-12 water level on date shown water inflow water outflow	<b>samples &amp; field tests</b> B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	<b>classification symbol &amp; soil description</b> based on Unified Classification System  <b>moisture</b> D dry M moist W wet Wp plastic limit WL liquid limit	<b>consistency / relative density</b> VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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# Engineering Log - Cored Borehole

Borehole ID: **WCX\_GTY\_BH\_027**  
 sheet: 3 of 4  
 project no: **GEOTLCOV25385AA**  
 date started: **08 Sep 2015**  
 date completed: **09 Sep 2015**  
 logged by: **TO**  
 checked by: **MG**

client: **WestConnex Delivery Authority**  
 principal:  
 project: **WestConnex Stage 2 - Sydney Gateway**  
 location: **Vacant lot - Burrows Road South**

position: E: 331296; N: 6245034 (MGA94 Zone 56) surface elevation: 2.13 m (AHD) angle from horizontal: 90°  
 drill model: AUSROC, Truck mounted drilling fluid: casing diameter: HW

drilling information		material substance				rock mass defects					
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	estimated strength & Is(50) X = axial O = diametral a = axial d = diametral	samples, field tests & Is(50) (MPa)	core run & RQD	defect spacing (mm)	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)
							VL L M H VH EH			30 100 300 1000 3000	particular general
		-6									
			9.0								
			10.0								
			11.0								
			12.0								
			13.0								
			14.0		start coring at 14.00m						
					LAMINITE: (80% siltstone, 20% sandstone), siltstone is dark grey, sandstone is fine grained, grey, distinctly laminated at 0°-10°.	MW	Ox	a=0.06 d=0.02	100%		PT, 10°, PL, RO, Fe SN
			15.0			SW	xd	a=0.03 d=0.07	55%		JT, 40°, PL, RO, CN JT, 70 - 80°, PL, RO, CN JT, 80 - 90°, CU, RO, CN

CDF\_0\_9\_04BB.GLB Log\_COFBOREHOLE: CORED GEOTLCOV25385AA SYDNEY GATEWAY - MASTER.GPJ <<DrawingFiles>> 02/11/2015 08:55

<b>method &amp; support</b> AS auger screwing AD auger drilling CB claw or blade bit W washbore NMLC NMLC core (51.9 mm) NQ wireline core (47.6mm) HQ wireline core (63.5mm) PQ wireline core (85.0mm) SPT standard penetration test DT diatube HA hand auger	<b>water</b> 10/10/12, water level on date shown water inflow complete drilling fluid loss partial drilling fluid loss water pressure test result (lugeons) for depth interval shown 25uL	<b>graphic log / core recovery</b> core recovered (graphic symbols indicate material) no core recovered <b>core run &amp; RQD</b> barrel withdrawn RQD = Rock Quality Designation (%)	<b>weathering &amp; alteration*</b> RS residual soil XW extremely weathered HW highly weathered DW distinctly weathered MW moderately weathered SW slightly weathered FR fresh *W replaced with A for alteration <b>strength</b> VL very low L low M medium H high VH very high EH extremely high	<b>defect type</b> PT parting JT joint SZ shear zone SS shear surface CS crushed seam SM seam DB drilling break <b>roughness</b> SL slickensided POL polished SO smooth RO rough VR very rough <b>planarity</b> PL planar CU curved UN undulating ST stepped IR irregular <b>coating</b> CN clean SN stain VN veneer CO coating
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Borehole ID: **WCX\_GTY\_BH\_027**  
 sheet: 4 of 4  
 project no: **GEOTLCOV25385AA**  
 date started: **08 Sep 2015**  
 date completed: **09 Sep 2015**  
 logged by: **TO**  
 checked by: **MG**

# Engineering Log - Cored Borehole

client: **WestConnex Delivery Authority**  
 principal:  
 project: **WestConnex Stage 2 - Sydney Gateway**  
 location: **Vacant lot - Burrows Road South**

position: E: 331296; N: 6245034 (MGA94 Zone 56) surface elevation: 2.13 m (AHD) angle from horizontal: 90°  
 drill model: AUSROC, Truck mounted drilling fluid: casing diameter: HW

drilling information		material substance			rock mass defects						
method & support	water	RL (m)	depth (m)	graphic log	material description	weathering & alteration	estimated strength & Is(50)	samples, field tests & Is(50) (MPa)	defect spacing (mm)	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)	
					ROCK TYPE: grain characteristics, colour, structure, minor components		VL = axial L = diametral N = axial H = diametral VH = axial EH = diametral	a = axial d = diametral	30 100 300 1000 3000	particular	general
		-14			<b>LAMINITE:</b> (80% siltstone, 20% sandstone), siltstone is dark grey, sandstone is fine grained, grey, distinctly laminated at 0°-10°. <i>(continued)</i>	FR		d=0.08		JT, 20°, ST, RO, CN  JT, 80 - 90°, IR, RO, CN JT, 30°, IR, RO, CN PT, 0 - 20°, PL, RO, CN  JT, 40°, CU, RO, CN  PT, 20°, CU, RO, CN JT, 70°, IR, RO, CN JT, 15 - 25°, CU, RO, CN JT, 5 - 15°, CU, RO, CN JT, 50° JT, 60 - 70°, PL, RO, Clay CO JT, 60 - 70°, PL, RO, Clay CO JT, 60 - 70°, CU, RO, CN	
		-15	17.0				a=0.13 d=0.07	55%			
		-16	18.0				a=0.08 d=0.03				
		-17	19.0				a=0.92 d=0.27 a=1.33 d=0.22				
		-18	20.0				a=0.76 d=0.73	66%			
		-19	21.0				a=1.12 d=0.87				
		-19	21.0		Borehole WCX_GTY_BH_027 terminated at 21.00 m Target depth Standpipe piezometer installed						
		-20	22.0								
		-21	23.0								

CDF\_0\_9\_04BB.GLB Log\_COFBOREHOLE: CORED\_GEOTLCOV25385AA SYDNEY GATEWAY - MASTER.GPJ <<DrawingFile>> 02/11/2015 08:55

<b>method &amp; support</b> AS auger screwing AD auger drilling CB claw or blade bit W washbore NMLC NMLC core (51.9 mm) NQ wireline core (47.6mm) HQ wireline core (63.5mm) PQ wireline core (85.0mm) SPT standard penetration test DT diatube HA hand auger	<b>water</b> 10/10/12, water level on date shown water inflow complete drilling fluid loss partial drilling fluid loss water pressure test result (lugeons) for depth interval shown 25uL	<b>graphic log / core recovery</b> core recovered (graphic symbols indicate material) no core recovered <b>core run &amp; RQD</b> barrel withdrawn RQD = Rock Quality Designation (%)	<b>weathering &amp; alteration*</b> RS residual soil XW extremely weathered HW highly weathered DW distinctly weathered MW moderately weathered SW slightly weathered FR fresh *W replaced with A for alteration <b>strength</b> VL very low L low M medium H high VH very high EH extremely high	<b>defect type</b> PT parting JT joint SZ shear zone SS shear surface CS crushed seam SM seam DB drilling break <b>roughness</b> SL slickensided POL polished SO smooth RO rough VR very rough	<b>planarity</b> PL planar CU curved UN undulating ST stepped IR irregular <b>coating</b> CN clean SN stain VN veneer CO coating
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# Engineering Log - Borehole

Borehole ID: **WCX\_GTY\_BH\_033**  
 sheet: 1 of 5  
 project no: **GEOTLCOV25385AA**  
 date started: **20 Jul 2015**  
 date completed: **21 Jul 2015**  
 logged by: **GC**  
 checked by: **AC**

client: **WestConnex Delivery Authority**  
 principal:  
 project: **WestConnex Stage 2 - Sydney Gateway**  
 location: **Kent Road Cul-De-Sac**

position: E: 332001; N: 6244621 (MGA94 Zone 56) surface elevation: 3.47 m (AHD) angle from horizontal: 90°  
 drill model: Comacchio 305, Track mounted casing diameter : HW

drilling information				material substance							
method & support	penetration	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
DT	1	E		0.0			ASPHALT: 0.1m.	D			PAVEMENT
	2	E		0.3			FILL: Gravelly SAND: fine grained, grey, dark grey, with some fine grained gravel. becoming black				FILL
	3	E		1.0							
		SPT 7, 7, 7 N*=14		2.0		SP	SAND: fine to medium grained, dark brown.	M	D		MARINE DEPOSITS
		E		2.0				W			
		SPT 5, 7, 7 N*=14		3.0							
		E		4.0			trace of silt				
		SPT 3, 5, 12 N*=17		5.0							
		E		6.0							
		SPT 8, 12, 14 N*=26		7.0							
		E		8.0					VL		
		SPT 1, 0, 0 N*=0		9.0							

CDF\_0\_9\_04BB.GLB Log\_COFBOREHOLE: NON CORED GEOTLCOV25385AA SYDNEY GATEWAY - MASTER.GPJ <<DrawingFile>> 30/10/2015 15:53

<b>method</b> AD auger drilling* AS auger screwing* HA hand auger W washbore DT diatube HA hand auger  * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	<b>support</b> M mud N nil C casing  <b>penetration</b>  no resistance ranging to refusal  <b>water</b>  10-Oct-12 water level on date shown water inflow water outflow	<b>samples &amp; field tests</b> B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	<b>classification symbol &amp; soil description</b> based on Unified Classification System  <b>moisture</b> D dry M moist W wet Wp plastic limit Wl liquid limit	<b>consistency / relative density</b> VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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# Engineering Log - Borehole

Borehole ID: **WCX\_GTY\_BH\_033**  
 sheet: 2 of 5  
 project no: **GEOTLCOV25385AA**  
 date started: **20 Jul 2015**  
 date completed: **21 Jul 2015**  
 logged by: **GC**  
 checked by: **AC**

client: **WestConnex Delivery Authority**  
 principal:  
 project: **WestConnex Stage 2 - Sydney Gateway**  
 location: **Kent Road Cul-De-Sac**

position: E: 332001; N: 6244621 (MGA94 Zone 56) surface elevation: 3.47 m (AHD) angle from horizontal: 90°  
 drill model: Comacchio 305, Track mounted casing diameter: HW

drilling information				material substance								
method & support	penetration	samples & field tests	water	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
	1 2 3						SP	<b>SAND:</b> fine to medium grained, pale grey, trace silt.  becoming grey	W	VL	100 200 300 400	<b>MARINE DEPOSITS</b>
		SPT 12, 19, 23 N*=42		-5	9.0					VD		
		SPT 11, 25, 27 N*=52		-6	10.0							
		SPT 2, 3, 8 N*=11		-7	11.0		SM	<b>Silty SAND:</b> fine to medium grained, brown, silt is dark brown, organic odour.		MD		
		SPT 1, 2, 3 N*=5		-8	12.0							
		SPT 1, 4, 7 N*=11		-9	13.0		CH	<b>Silty CLAY:</b> high plasticity, grey to dark grey.  becoming grey	>Wp	F	X X X X X	
				-10	14.0				~Wp	VSt	X X X X X	
				-11	15.0							
				-12								

CDF\_0\_9\_04BB.GLB Log\_COFBOREHOLE: NON CORED GEOTLCOV25385AA SYDNEY GATEWAY - MASTER.GPJ <<DrawingFile>> 30/10/2015 15:53

<b>method</b> AD auger drilling* AS auger screwing* HA hand auger W washbore DT diatube HA hand auger  * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	<b>support</b> M mud N nil C casing  <b>penetration</b>  no resistance ranging to refusal  <b>water</b>  10-Oct-12 water level on date shown water inflow water outflow	<b>samples &amp; field tests</b> B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	<b>classification symbol &amp; soil description</b> based on Unified Classification System  <b>moisture</b> D dry M moist W wet Wp plastic limit WI liquid limit	<b>consistency / relative density</b> VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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# Engineering Log - Borehole

Borehole ID: **WCX\_GTY\_BH\_033**  
 sheet: 3 of 5  
 project no: **GEOTLCOV25385AA**  
 date started: **20 Jul 2015**  
 date completed: **21 Jul 2015**  
 logged by: **GC**  
 checked by: **AC**

client: **WestConnex Delivery Authority**  
 principal:  
 project: **WestConnex Stage 2 - Sydney Gateway**  
 location: **Kent Road Cul-De-Sac**

position: E: 332001; N: 6244621 (MGA94 Zone 56) surface elevation: 3.47 m (AHD) angle from horizontal: 90°  
 drill model: Comacchio 305, Track mounted casing diameter: HW

drilling information				material substance			
method & support	penetration	samples & field tests	depth (m)	graphic log	classification symbol	material description	structure and additional observations
		SPT 3, 5, 5 N*=10	-13		CH	<b>Silty CLAY:</b> high plasticity, grey to dark grey. (continued)	RESIDUAL SOIL
		SPT 5, 9, 12 N*=21	-18.0		CH	<b>Silty CLAY:</b> high plasticity, pale grey mottled red-brown, with some iron staining.	
		SPT 13, 25, 26 N*=51	-16		CH	<b>Silty CLAY:</b> high plasticity, red-brown.	
		SPT 14, 29, /0mm N*=R	-17				
			-21.0			Borehole WCX_GTY_BH_033 continued as cored hole	

<b>method</b> AD auger drilling* AS auger screwing* HA hand auger W washbore DT diatube HA hand auger  * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	<b>support</b> M mud N nil C casing  <b>penetration</b>  <b>water</b> 	<b>samples &amp; field tests</b> B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	<b>classification symbol &amp; soil description</b> based on Unified Classification System  <b>moisture</b> D dry M moist W wet Wp plastic limit Wl liquid limit	<b>consistency / relative density</b> VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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CDF\_0\_9\_04BB.GLB Log\_COFBOREHOLE: NON CORED GEOTLCOV25385AA SYDNEY GATEWAY - MASTER.GPJ <<DrawingFile>> 30/10/2015 15:53

# Engineering Log - Cored Borehole

client: **WestConnex Delivery Authority**

date started: **20 Jul 2015**

principal:

date completed: **21 Jul 2015**

project: **WestConnex Stage 2 - Sydney Gateway**

logged by: **GC**

location: **Kent Road Cul-De-Sac**

checked by: **AC**

position: E: 332001; N: 6244621 (MGA94 Zone 56) surface elevation: 3.47 m (AHD) angle from horizontal: 90°  
 drill model: Comacchio 305, Track mounted drilling fluid: casing diameter: HW

drilling information		material substance				rock mass defects						
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	estimated strength & Is(50) X = axial O = diametral a = axial d = diametral	samples, field tests & Is(50) (MPa)	defect spacing (mm)	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)		
						VL L M H VH EH			30 100 300 1000 3000	particular	general	
		-13										
			17.0									
		-14										
			18.0									
		-15										
			19.0									
		-16										
			20.0									
		-17										
			21.0		start coring at 20.80m <b>NO CORE: 0.27 m</b>							
		-18			<b>SILTSTONE:</b> dark grey, with some red-brown iron staining, becoming dark grey, trace of red-brown to yellow-brown iron staining	XW MW		a=0.07 d=0.01	40%		JT, 70 - 80°, CU, RO, SN	
			22.0									
		-19			<b>SILTSTONE:</b> dark grey, with some thin pale grey sandstone laminae.			a=0.05 d=0.08	92%		PT, 0 - 5°, PL, RO, Fe SN SM, 0°, 10 mm, extremely weathered	
			23.0									
		-20				FR		a=0.50 d=0.35			JT, 45°, PL, CN	

CDF\_0\_9\_04BB.GLB Log\_COF\_BOREHOLE: CORED\_GEOTLCOV25385AA\_SYDNEY\_GATEWAY - MASTER.GPJ <<DrawingFiles>> 02/11/2015 08:55

<b>method &amp; support</b> AS auger screwing AD auger drilling CB claw or blade bit W washbore NMLC NMLC core (51.9 mm) NQ wireline core (47.6mm) HQ wireline core (63.5mm) PQ wireline core (85.0mm) SPT standard penetration test DT diatube HA hand auger	<b>water</b> 10/10/12, water level on date shown water inflow complete drilling fluid loss partial drilling fluid loss water pressure test result (lugeons) for depth interval shown 25uL	<b>graphic log / core recovery</b> core recovered (graphic symbols indicate material) no core recovered <b>core run &amp; RQD</b> barrel withdrawn RQD = Rock Quality Designation (%)	<b>weathering &amp; alteration*</b> RS residual soil XW extremely weathered HW highly weathered DW distinctly weathered MW moderately weathered SW slightly weathered FR fresh *W replaced with A for alteration <b>strength</b> VL very low L low M medium H high VH very high EH extremely high	<b>defect type</b> PT parting JT joint SZ shear zone SS shear surface CS crushed seam SM seam DB drilling break <b>roughness</b> SL slickensided POL polished SO smooth RO rough VR very rough	<b>planarity</b> PL planar CU curved UN undulating ST stepped IR irregular <b>coating</b> CN clean SN stain VN veneer CO coating
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# Engineering Log - Cored Borehole

Borehole ID: **WCX\_GTY\_BH\_033**  
 sheet: 5 of 5  
 project no: **GEOTLCOV25385AA**  
 date started: **20 Jul 2015**  
 date completed: **21 Jul 2015**  
 logged by: **GC**  
 checked by: **AC**

client: **WestConnex Delivery Authority**  
 principal:  
 project: **WestConnex Stage 2 - Sydney Gateway**  
 location: **Kent Road Cul-De-Sac**

position: E: 332001; N: 6244621 (MGA94 Zone 56) surface elevation: 3.47 m (AHD) angle from horizontal: 90°  
 drill model: Comacchio 305, Track mounted drilling fluid: casing diameter: HW

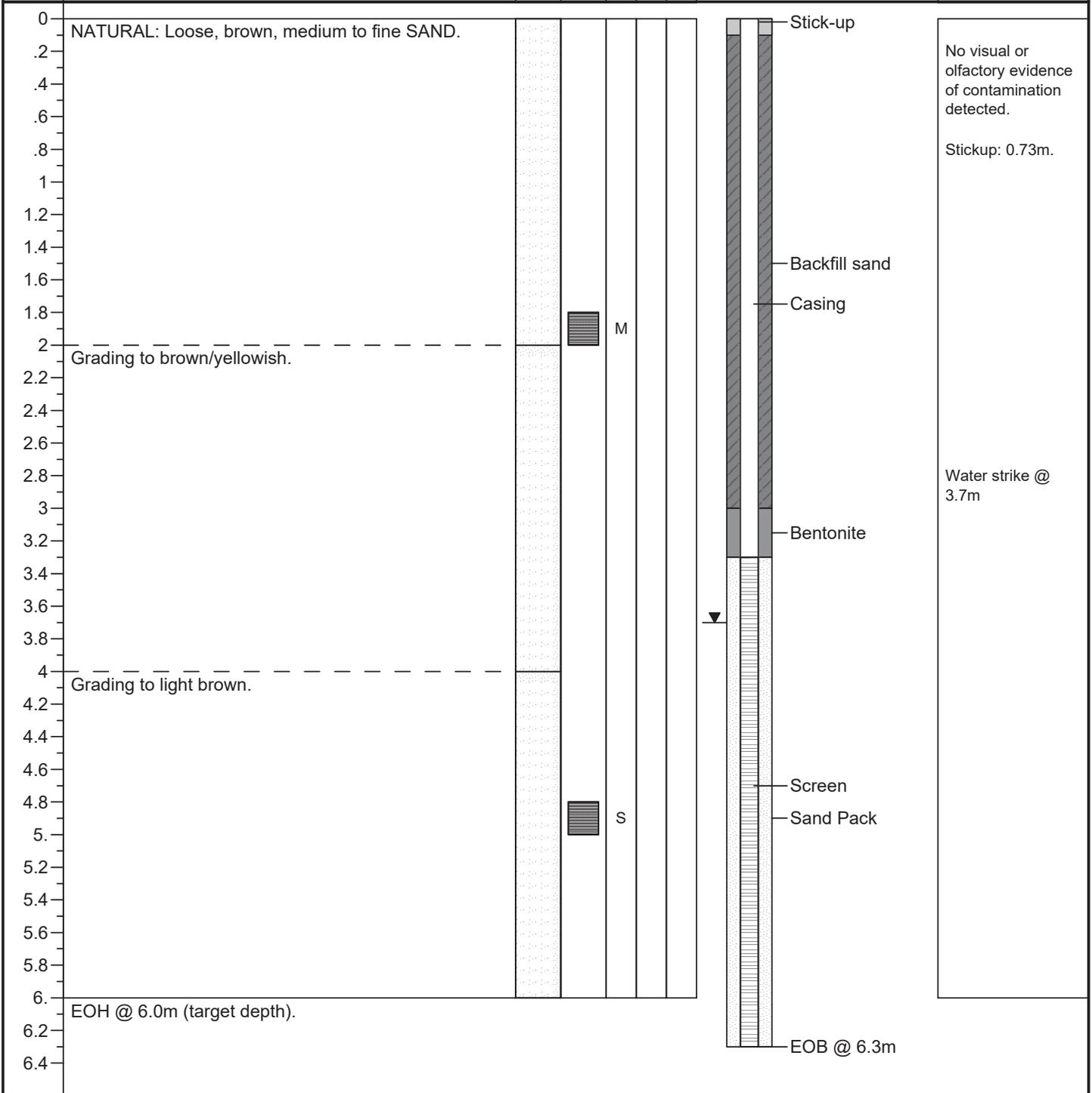
drilling information		material substance				rock mass defects					
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characteristics, colour, structure, minor components	weathering & alteration	estimated strength & Is(50) X = axial O = diametral a = axial d = diametral	samples, field tests & Is(50) (MPa)	defect spacing (mm)	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)	
						VL L M H VH EH		core run & RQD	30 100 300 1000 3000	particular	general
		-21			<b>SILTSTONE:</b> dark grey, with some thin pale grey sandstone laminae. <i>(continued)</i>	FR			92%		
		25.0			<b>LAMINITE:</b> siltstone (60%) is dark grey, sandstone (40%) is fine grained, pale grey, distinctly laminated at 0° to 10°.			a=0.63 d=0.29			
		-22				HW / XW FR		a=1.97 d=0.56		SM, 0°, 80 mm, highly to extremely weathered	
		26.0							75%	PT, 0 - 5°, PL, CN	
		-23						a=2.83 d=0.99			
		27.0									
		-24						a=3.47 d=1.28			
		28.0			Borehole WCX_GTY_BH_033 terminated at 28.00 m Target stratum Standpipe piezometer installed				92%		
		-25									
		29.0									
		-26									
		30.0									
		-27									
		31.0									
		-28									

CDF\_0\_9\_04BB5.GLB Log\_COF\_BOREHOLE\_CORED\_GEOTLCOV25385AA\_SYDNEY\_GATEWAY - MASTER.GPJ <<DrawingFiles>> 02/11/2015 08:55

<b>method &amp; support</b> AS auger screwing AD auger drilling CB claw or blade bit W washbore NMLC NMLC core (51.9 mm) NQ wireline core (47.6mm) HQ wireline core (63.5mm) PQ wireline core (85.0mm) SPT standard penetration test DT diatube HA hand auger	<b>water</b> 10/10/12, water level on date shown water inflow complete drilling fluid loss partial drilling fluid loss water pressure test result (lugeons) for depth interval shown	<b>graphic log / core recovery</b> core recovered (graphic symbols indicate material) no core recovered <b>core run &amp; RQD</b> barrel withdrawn RQD = Rock Quality Designation (%)	<b>weathering &amp; alteration*</b> RS residual soil XW extremely weathered HW highly weathered DW distinctly weathered MW moderately weathered SW slightly weathered FR fresh *W replaced with A for alteration <b>strength</b> VL very low L low M medium H high VH very high EH extremely high	<b>defect type</b> PT parting JT joint SZ shear zone SS shear surface CS crushed seam SM seam DB drilling break <b>roughness</b> SL slickensided POL polished SO smooth RO rough VR very rough	<b>planarity</b> PL planar CU curved UN undulating ST stepped IR irregular <b>coating</b> CN clean SN stain VN veneer CO coating
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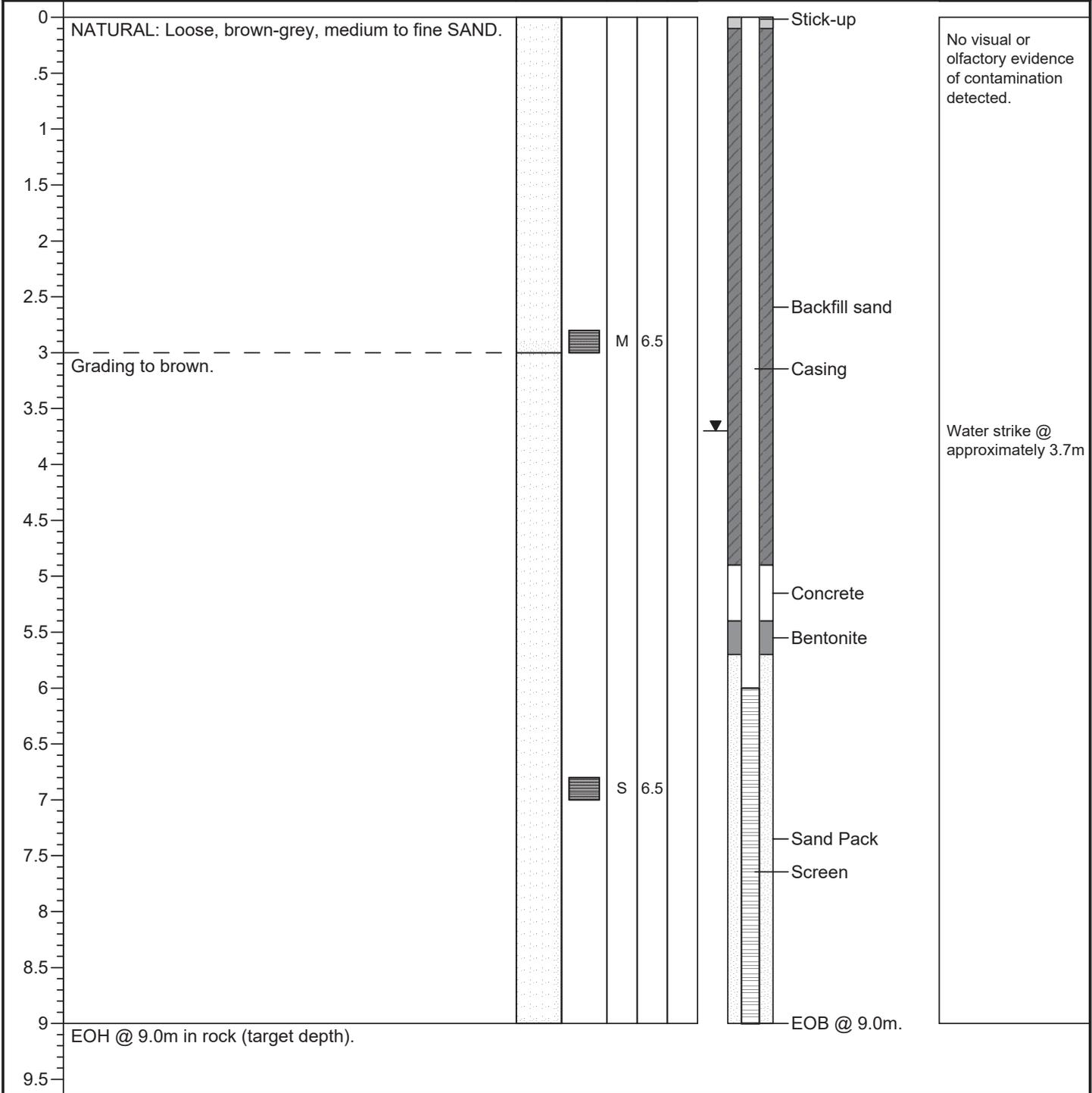
LOCATION: Airport East, Mascot	JOB No. 117014	BOREHOLE LOG: MW1_6	LOGGED BY: AC
EASTING:	DRILL TYPE: SFA		APPROVED: MR
NORTHING:	DATE STARTED: 16/02/2017	CLIENT: John Holland	
ELEVATION:	DATE FINISHED: 16/02/2017		

Depth (metres)	<b>Sample</b>  Disturbed  Undisturbed <b>Moisture</b> M=Moist D=Dry S=Saturated	<b>Groundwater</b>  Water Strike  Standing Water Level	<b>GRAPHIC LOG</b>	<b>SAMPLES</b>				Well: MW1_6	PAGE #: 1/1  COMMENTS
	<b>STRATIGRAPHY</b>	Type Moisture pH PID (ppm)							



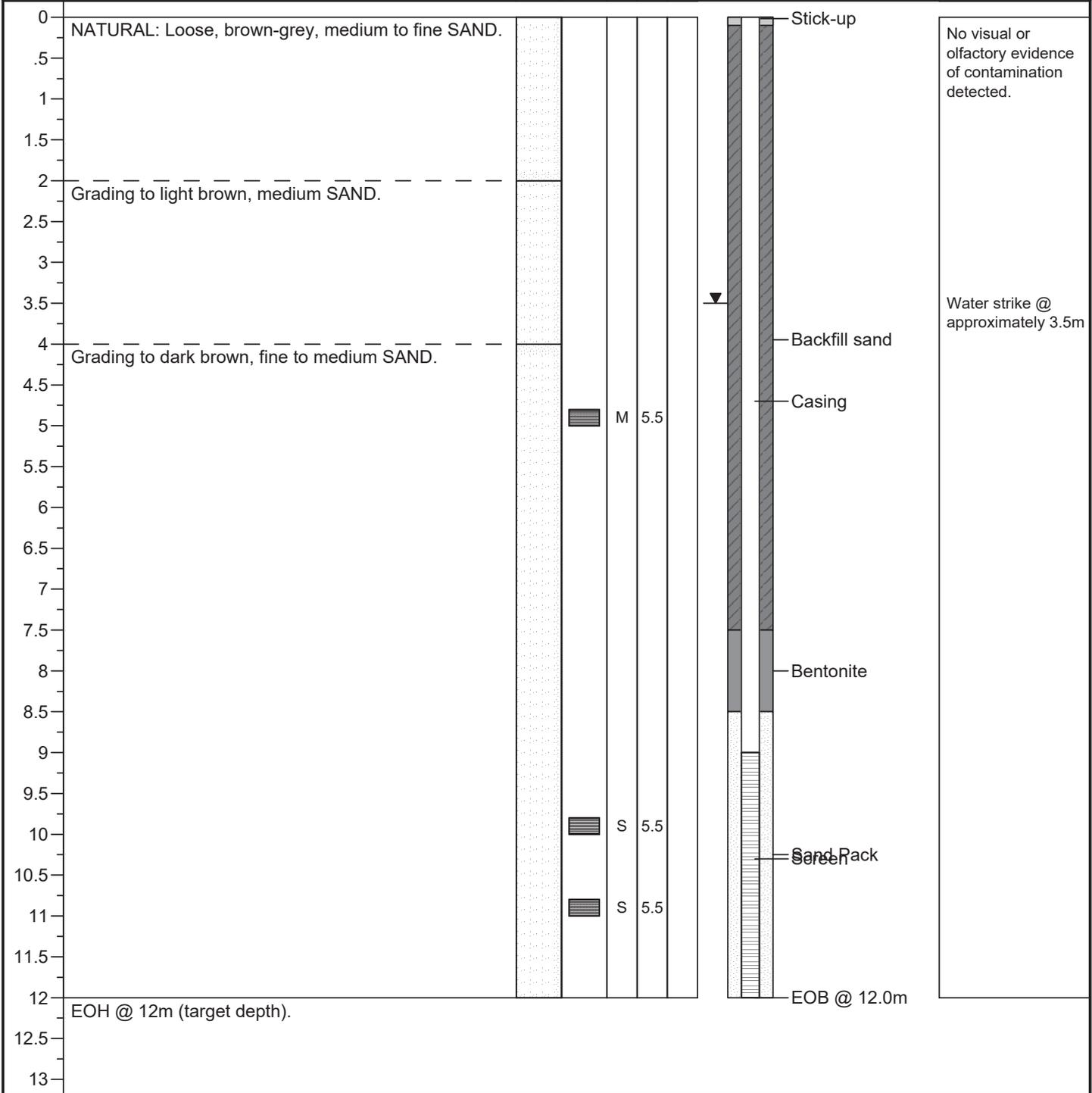
LOCATION: Airport East, Mascot	JOB No. 117014	BOREHOLE LOG: MW1_9	LOGGED BY: AC
EASTING:	DRILL TYPE: SFA		APPROVED: MR
NORTHING:	DATE STARTED: 16/02/2017	CLIENT: John Holland	
ELEVATION:	DATE FINISHED: 16/02/2017		

Depth (metres)	<b>Sample</b>  Disturbed  Undisturbed <b>Moisture</b> M=Moist D=Dry S=Saturated	<b>Groundwater</b>  Water Strike  Standing Water Level	<b>GRAPHIC LOG</b>	<b>SAMPLES</b>				Well: MW1_9	PAGE #: 1/1  COMMENTS
	<b>STRATIGRAPHY</b>	Type Moisture pH PID (ppm)							



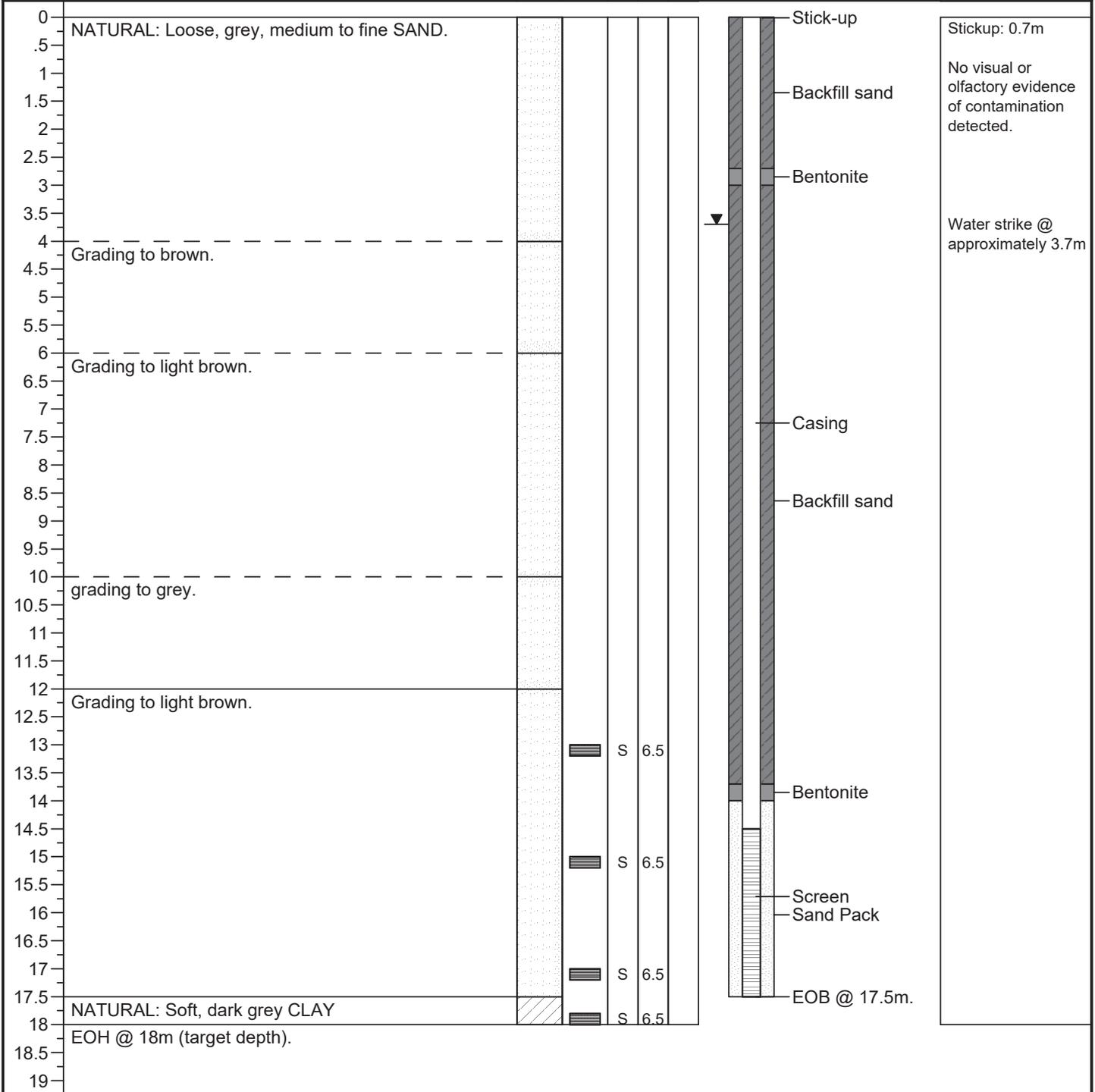
LOCATION: Airport East, Mascot	JOB No. 117014	BOREHOLE LOG: MW1_12	LOGGED BY: AC
EASTING:	DRILL TYPE: SFA		APPROVED: MR
NORTHING:	DATE STARTED: 16/02/2017	CLIENT: John Holland	
ELEVATION:	DATE FINISHED: 16/02/2017		

Depth (metres)	<b>Sample</b>  Disturbed  Undisturbed <b>Moisture</b> M=Moist D=Dry S=Saturated	<b>Groundwater</b>  Water Strike  Standing Water Level	<b>GRAPHIC LOG</b>	<b>SAMPLES</b>				Well: MW1_9	PAGE #: 1/1  COMMENTS
	<b>STRATIGRAPHY</b>	Type Moisture pH PID (ppm)							



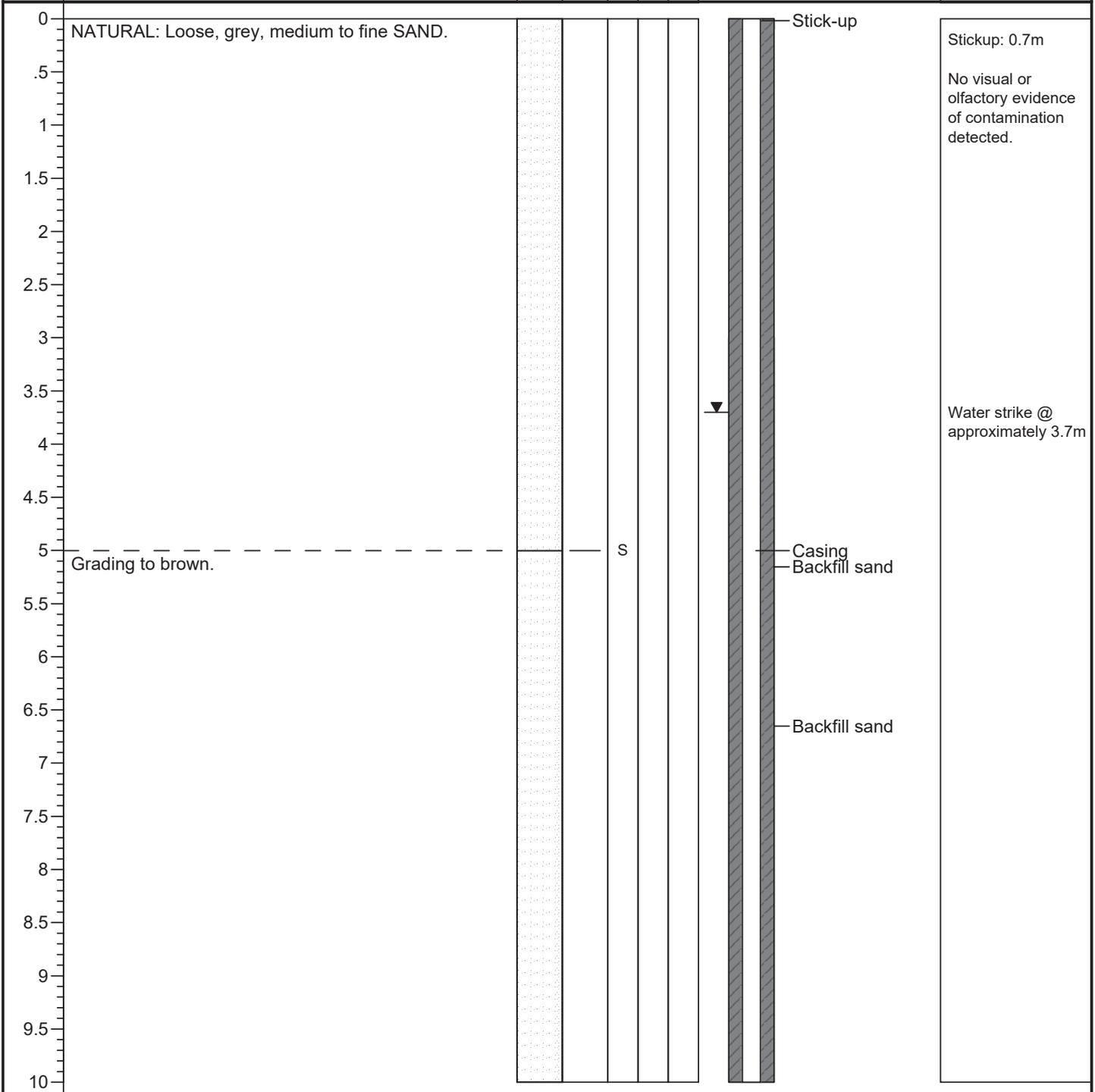
LOCATION: Airport East, Mascot	JOB No. 117014	BOREHOLE LOG: MW1_18	LOGGED BY: MB
EASTING:	DRILL TYPE: SFA		APPROVED: MR
NORTHING:	DATE STARTED: 17/02/2017	CLIENT: John Holland	
ELEVATION:	DATE FINISHED: 17/02/2017		

Depth (metres)	<b>Sample</b>  Disturbed  Undisturbed Moisture M=Moist D=Dry S=Saturated	<b>Groundwater</b>  Water Strike  Standing Water Level	<b>GRAPHIC LOG</b>	<b>SAMPLES</b>				Well: MW1_18	PAGE #: 1/1  <b>COMMENTS</b>
	<b>STRATIGRAPHY</b>	Type		Moisture	pH	PID (ppm)			



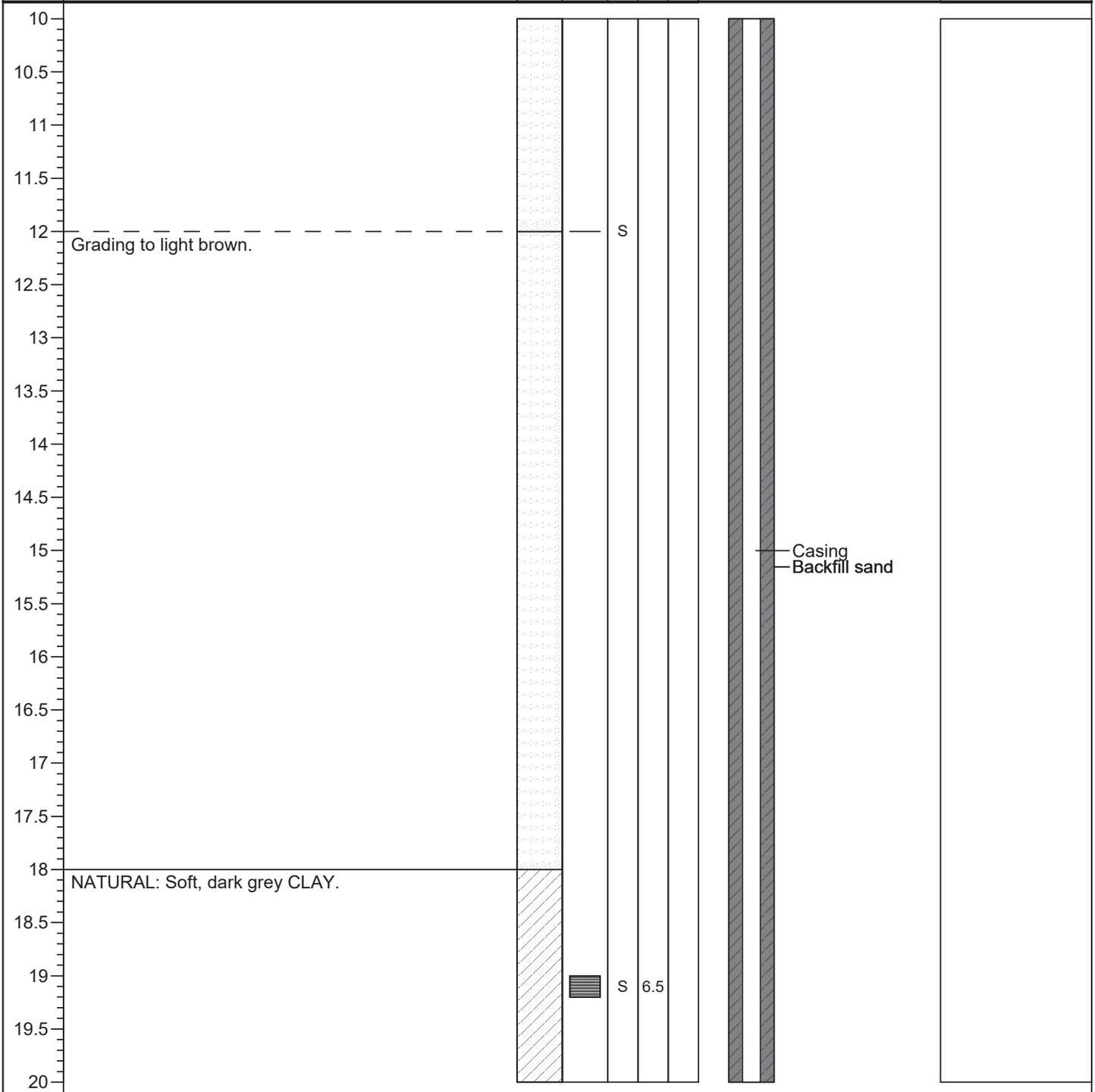
LOCATION: Airport East, Mascot	JOB No. 117014	BOREHOLE LOG: MW1_25	LOGGED BY: MB
EASTING:	DRILL TYPE: SFA		APPROVED: MR
NORTHING:	DATE STARTED: 17/02/2017	CLIENT: John Holland	
ELEVATION:	DATE FINISHED: 17/02/2017		

Depth (metres)	<b>Sample</b>  Disturbed  Undisturbed Moisture M=Moist D=Dry S=Saturated	<b>Groundwater</b>  Water Strike  Standing Water Level	GRAPHIC LOG	SAMPLES				Well: MW1_25	PAGE #: 1/3	COMMENTS
	STRATIGRAPHY	Type		Moisture	pH	PID (ppm)				



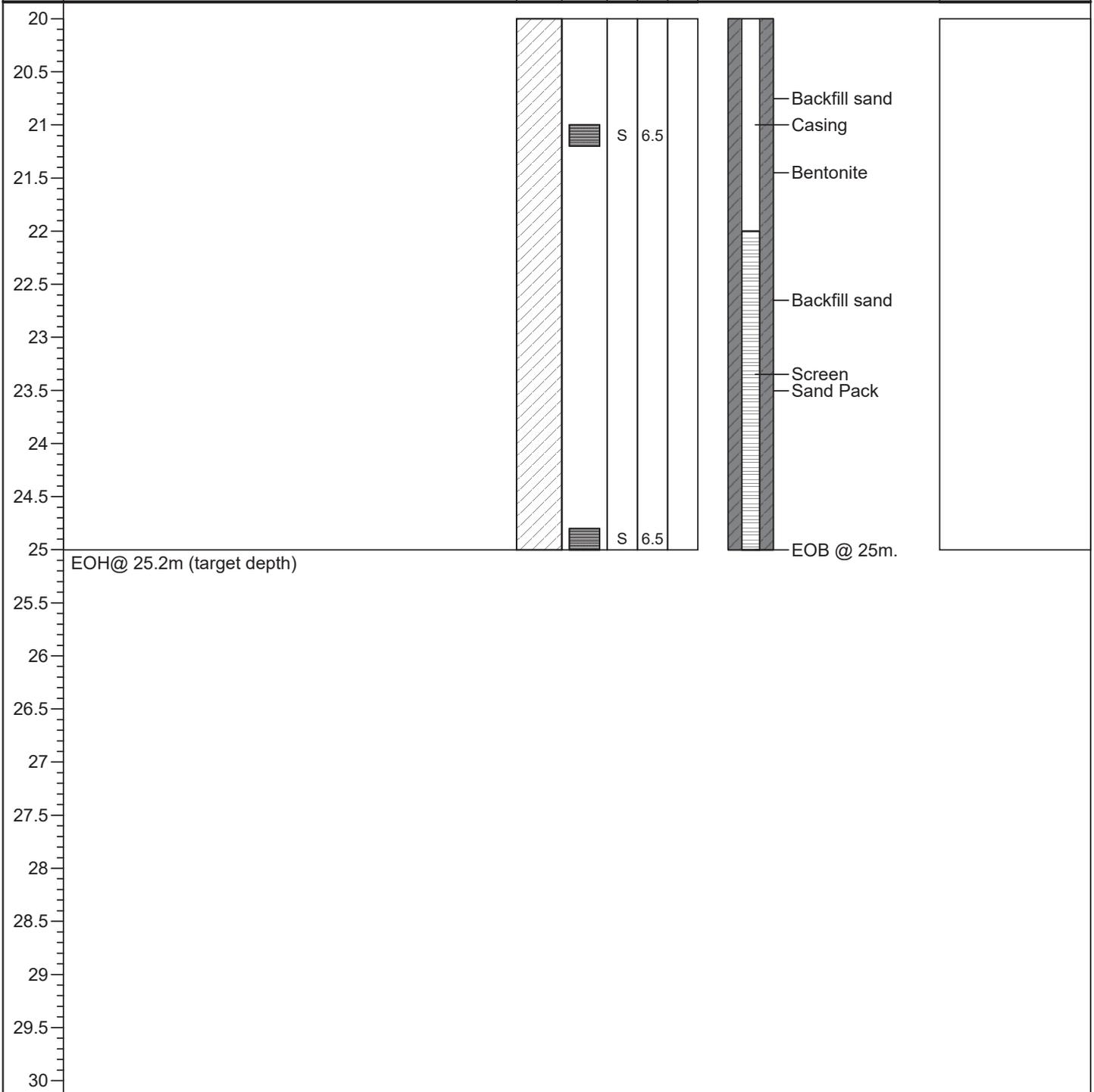
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EASTING:	DRILL TYPE: SFA		APPROVED: MR
NORTHING:	DATE STARTED: 17/02/2017	CLIENT: John Holland	
ELEVATION:	DATE FINISHED: 17/02/2017		

Depth (metres)	<b>Sample</b>  Disturbed  Undisturbed <b>Moisture</b> M=Moist D=Dry S=Saturated	<b>Groundwater</b>  Water Strike  Standing Water Level	<b>GRAPHIC LOG</b>	<b>SAMPLES</b>				Well: MW1_25	PAGE #: 2/3  COMMENTS
	<b>STRATIGRAPHY</b>	Type Moisture pH PID (ppm)							



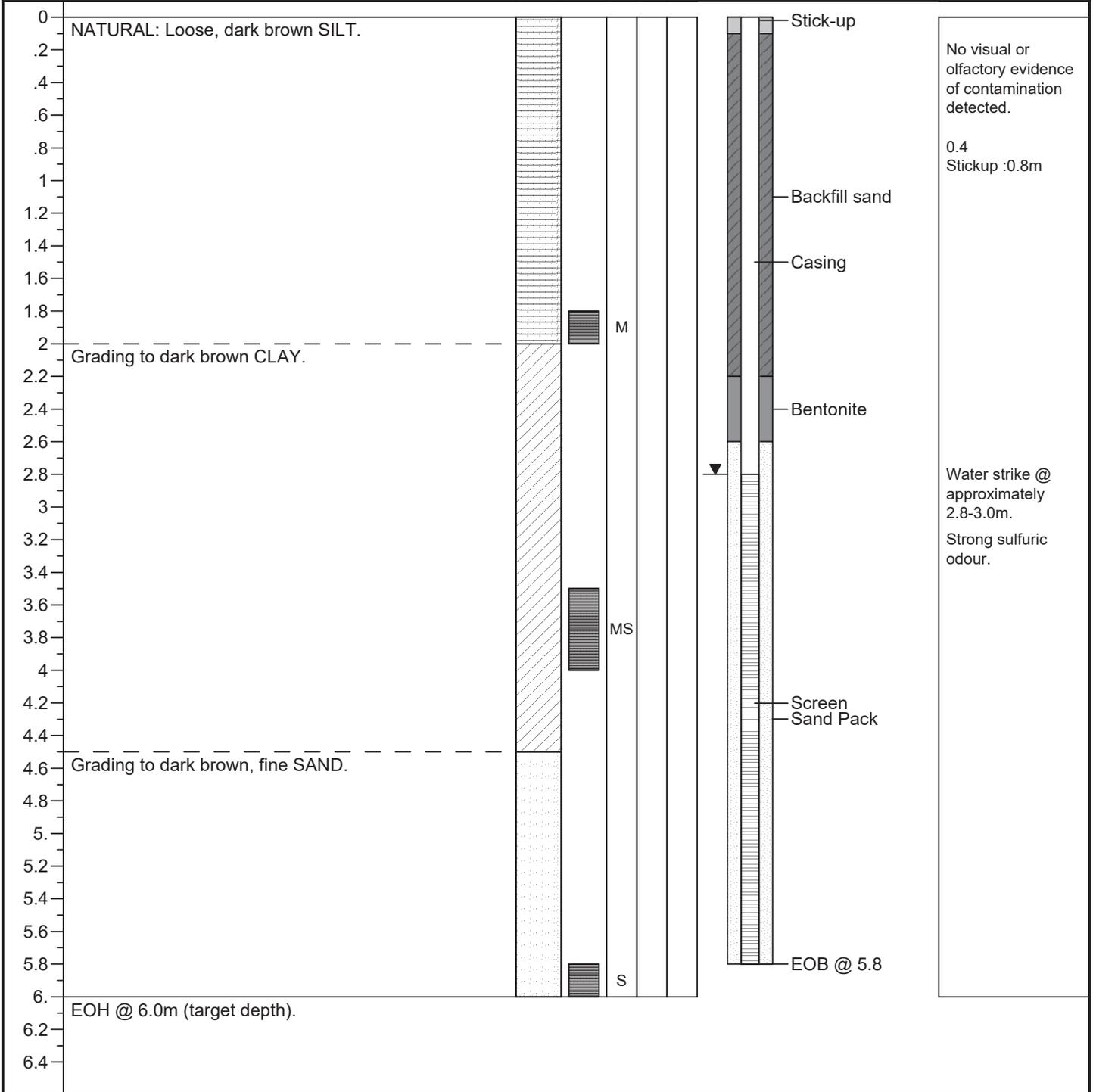
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EASTING:	DRILL TYPE: SFA		
NORTHING:	DATE STARTED: 17/02/2017	CLIENT: John Holland	APPROVED: MR
ELEVATION:	DATE FINISHED: 17/02/2017		

Depth (metres)	<b>Sample</b>  Disturbed  Undisturbed <b>Moisture</b> M=Moist D=Dry S=Saturated	<b>Groundwater</b>  Water Strike  Standing Water Level	GRAPHIC LOG	SAMPLES				Well: MW1_25	PAGE #: 3/3	COMMENTS
	<b>STRATIGRAPHY</b>	Type		Moisture	pH	PID (ppm)				



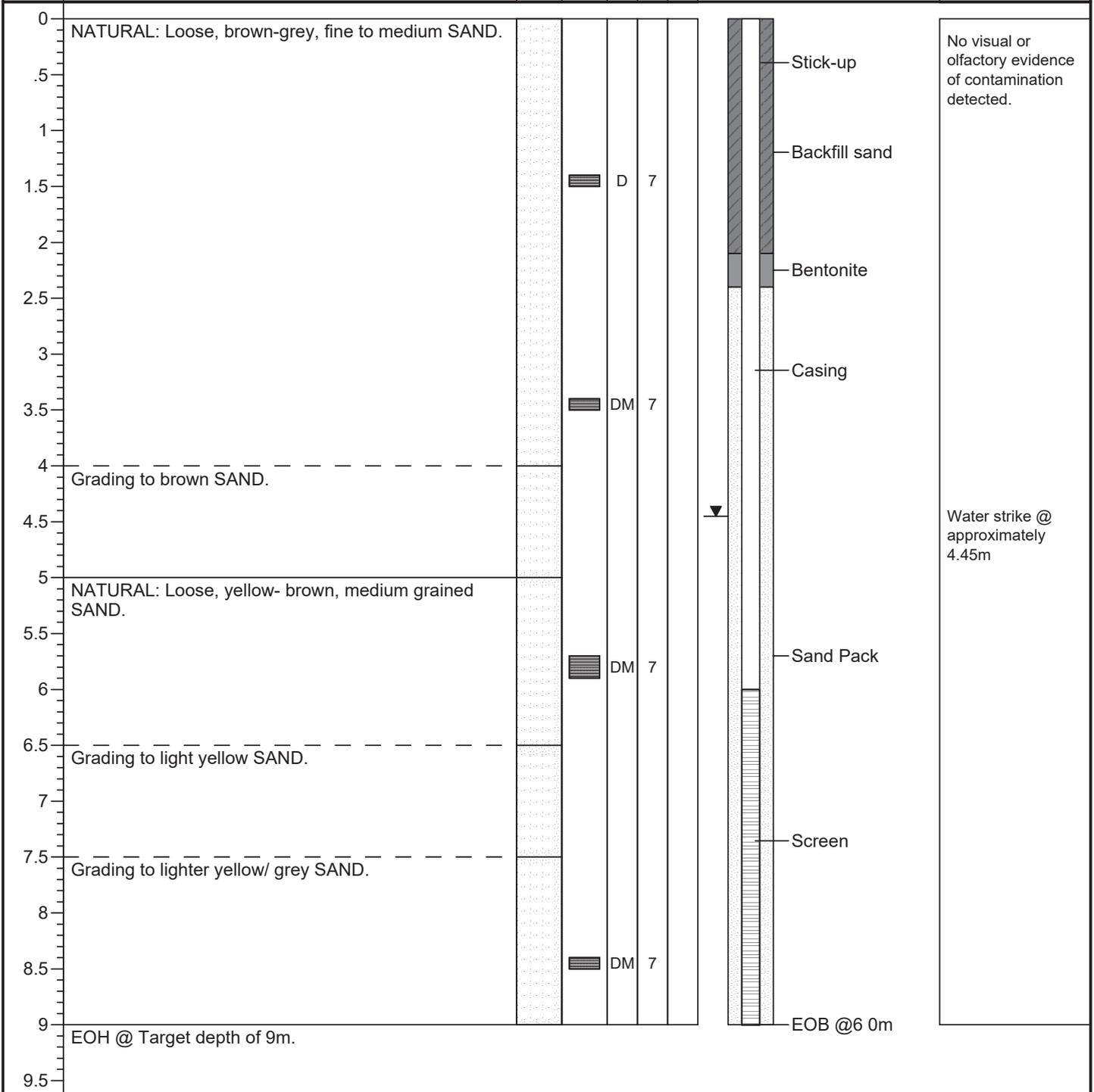
LOCATION: Airport East, Mascot	JOB No. 117014	BOREHOLE LOG: MW2	LOGGED BY: AC
EASTING:	DRILL TYPE: SFA		APPROVED: MR
NORTHING:	DATE STARTED: 17/02/2017	CLIENT: John Holland	
ELEVATION:	DATE FINISHED: 17/02/2017		

Depth (metres)	<b>Sample</b>  Disturbed  Undisturbed <b>Moisture</b> M=Moist D=Dry S=Saturated	<b>Groundwater</b>  Water Strike  Standing Water Level	<b>GRAPHIC LOG</b>	<b>SAMPLES</b>				Well: MW2	PAGE #: 1/1  COMMENTS
	<b>STRATIGRAPHY</b>	Type Moisture pH PID (ppm)							



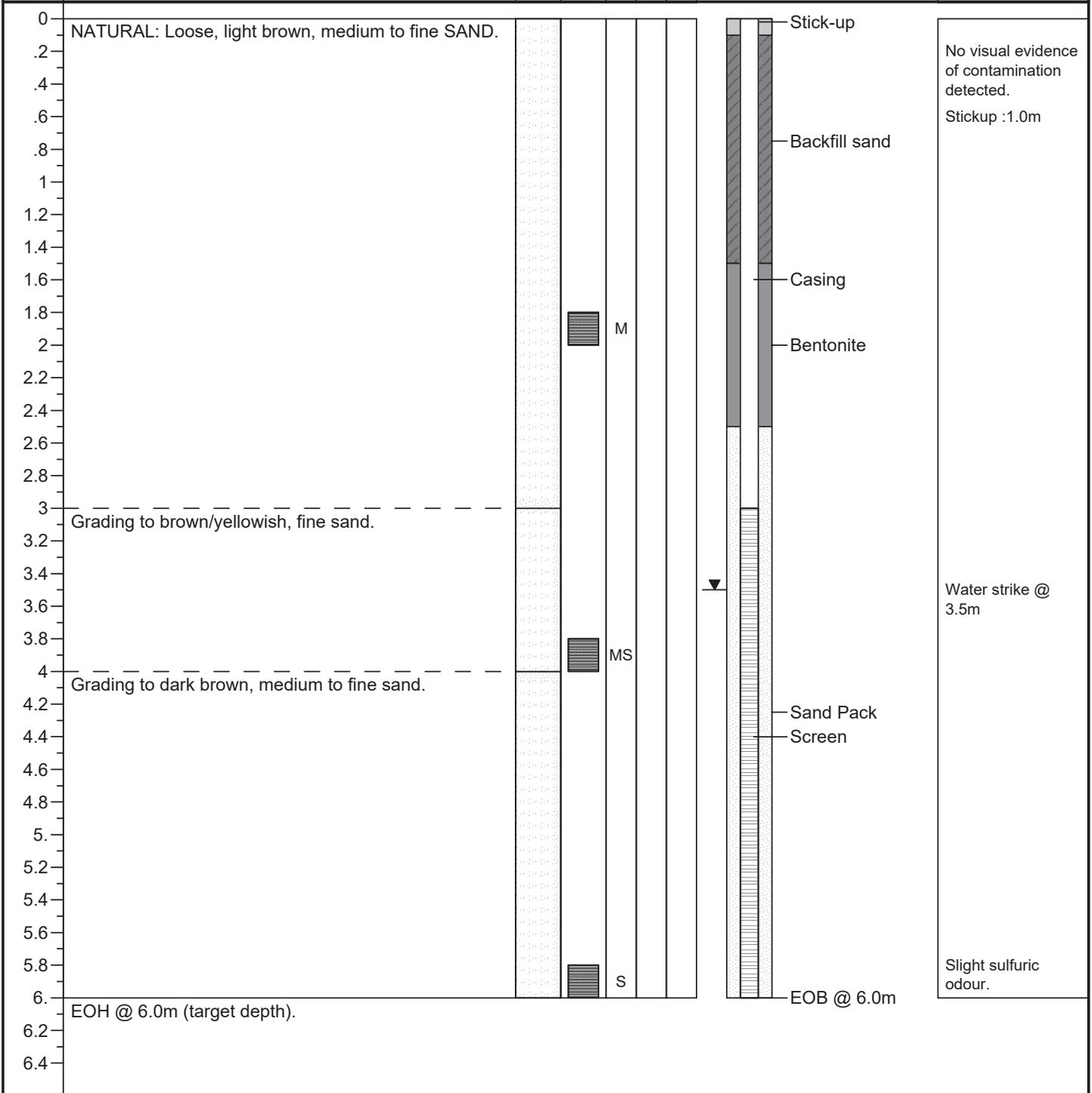
LOCATION: Airport East, Mascot	JOB No. 117014	BOREHOLE LOG: MW3	LOGGED BY: AR
EASTING:	DRILL TYPE: HFA		APPROVED: MR
NORTHING:	DATE STARTED: 16/02/2017	CLIENT: John Holland	
ELEVATION:	DATE FINISHED: 16/02/2017		

Depth (metres)	<b>Sample</b>  Disturbed  Undisturbed <b>Moisture</b> M=Moist D=Dry S=Saturated	<b>Groundwater</b>  Water Strike  Standing Water Level	<b>GRAPHIC LOG</b>	<b>SAMPLES</b>				Well: MW3	PAGE #: 1/1  COMMENTS
	<b>STRATIGRAPHY</b>	Type Moisture pH PID (ppm)							



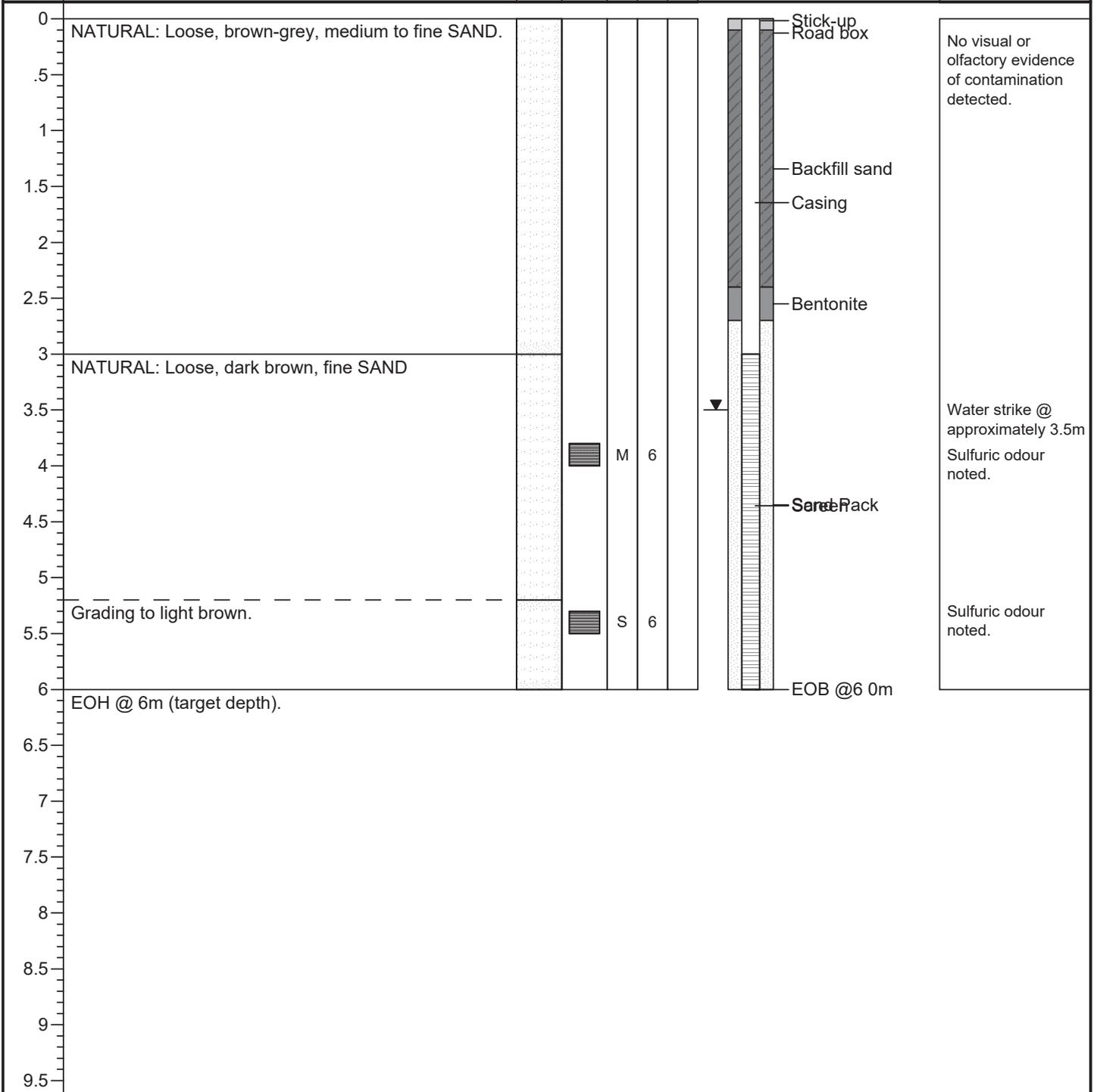
LOCATION: Airport East, Mascot	JOB No. 117014	BOREHOLE LOG: MW4	LOGGED BY: AC
EASTING:	DRILL TYPE: SFA		APPROVED: MR
NORTHING:	DATE STARTED: 17/02/2017	CLIENT: John Holland	
ELEVATION:	DATE FINISHED: 17/02/2017		

Depth (metres)	<b>Sample</b>  Disturbed  Undisturbed <b>Moisture</b> M=Moist D=Dry S=Saturated	<b>Groundwater</b>  Water Strike  Standing Water Level	<b>GRAPHIC LOG</b>	<b>SAMPLES</b>				Well: MW4  <b>COMMENTS</b>
	<b>STRATIGRAPHY</b>	Type		Moisture	pH	PID (ppm)	PAGE #: 1/1	



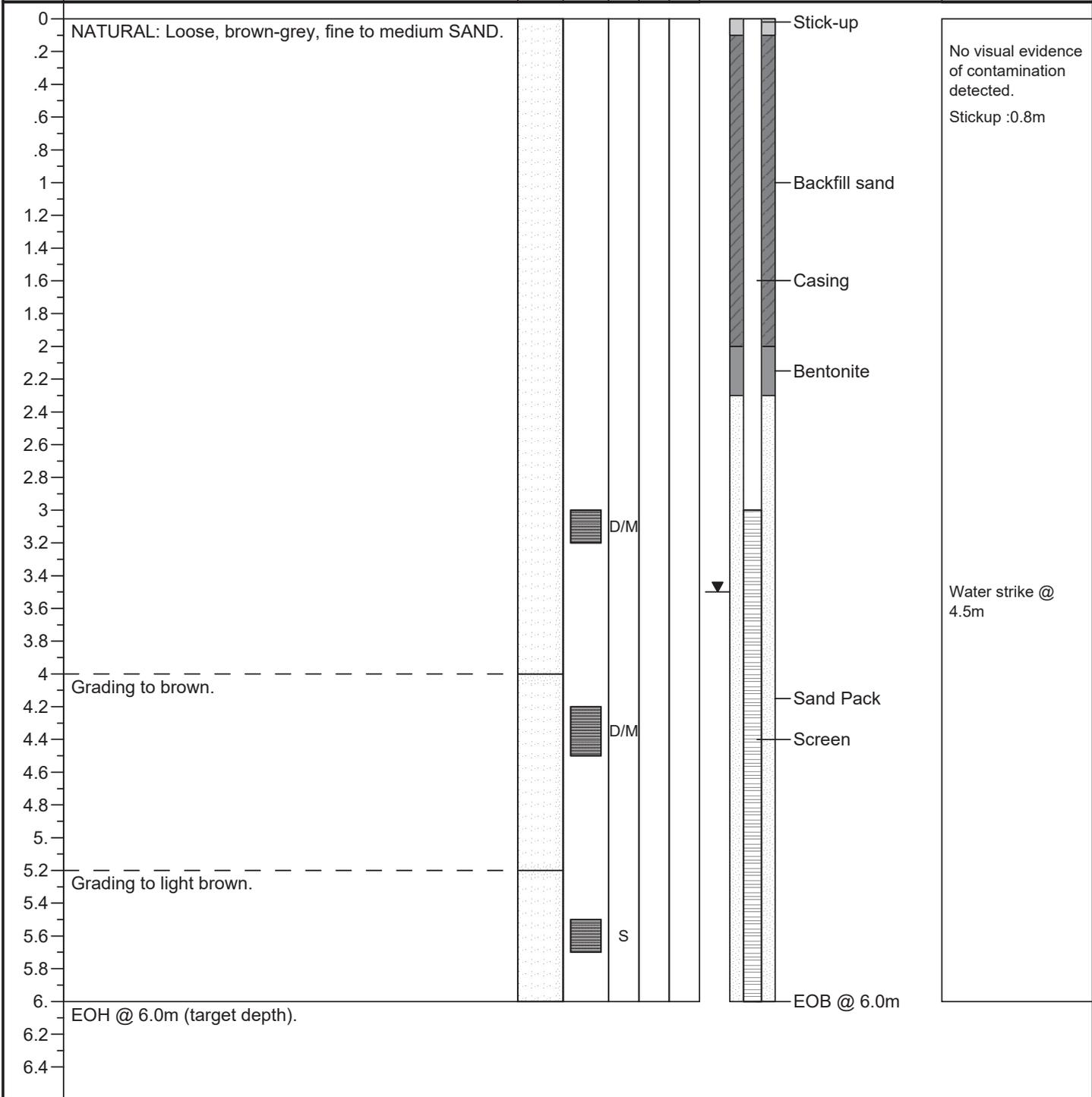
LOCATION: Airport East, Mascot	JOB No. 117014	BOREHOLE LOG: MW5	LOGGED BY: AC
EASTING:	DRILL TYPE: SFA		APPROVED: MR
NORTHING:	DATE STARTED: 14/02/2017	CLIENT: John Holland	
ELEVATION:	DATE FINISHED: 14/02/2017		

Depth (metres)	<b>Sample</b>  Disturbed  Undisturbed <b>Moisture</b> M=Moist D=Dry S=Saturated	<b>Groundwater</b>  Water Strike  Standing Water Level	GRAPHIC LOG	SAMPLES				Well: MW5	PAGE #: 1/1	COMMENTS
	<b>STRATIGRAPHY</b>			Type	Moisture	pH	PID (ppm)			



LOCATION: Airport East, Mascot	JOB No. 117014	BOREHOLE LOG: MW6	LOGGED BY: AR
EASTING:	DRILL TYPE: SFA		APPROVED: MR
NORTHING:	DATE STARTED: 17/02/2017	CLIENT: John Holland	
ELEVATION:	DATE FINISHED: 17/02/2017		

Depth (metres)	<b>Sample</b>  Disturbed  Undisturbed <b>Moisture</b> M=Moist D=Dry S=Saturated	<b>Groundwater</b>  Water Strike  Standing Water Level	<b>GRAPHIC LOG</b>	<b>SAMPLES</b>				Well: MW6	PAGE #: 1/1  COMMENTS
	<b>STRATIGRAPHY</b>	Type Moisture pH PID (ppm)							



**Client:** WDA  
**Project:** WestConnex Stage 2: M5  
**Location:** 5A Canal Road, St Peters, NSW

**Project No:** 60327128  
**Logged by:** LS  
**Start Date:** 26/11/2014  
**Checked by:** CH  
**End Date:** 26/11/2014

<b>Driller:</b> Terratest Pty. Ltd.	<b>Hole Diameter:</b> 150 mm	<b>Easting:</b> 331682.3 m	<b>Surface RL:</b> 4.60 m
<b>Drill Rig:</b> Geoprobe 6620	<b>Inclination:</b> -90°	<b>Northing:</b> 6245544.3 m	<b>Installation RL:</b> 4.52 m
	<b>Bearing:</b> N/A	<b>Hor. Proj/Dat:</b> MGA94/GDA94	<b>Ver. Datum:</b> m AHD

Field Data				Material Description			Soil Condition		Installation	
Method	Support	Field Tests	Samples	Reduced Level (m)	Depth (m)	Graphic Log	Classification Symbol	Moisture Condition	Density / Consistency	Well Diagram
DT										Lockable Gatic cover Bentonite plug
HA		PID=0.1	BH300_0.40-0.50	4.0	0.5			M		Cement grout
		PID=0.0	BH300_1.00-1.10 QC300	3.0	1.0					Bentonite plug
		PID=0.4	BH300_2.00-2.20	2.0	1.5					2 mm sand backfill
		PID=0.9	BH300_2.90-3.00	2.0	2.0					
		PID=0.6	BH300_4.10-4.30	1.0	3.0			W		Slotted screen 2 mm sand
		PID=0.3	BH300_5.00-5.20	0.0	4.0					
				1.0	4.5					
				2.0	5.0					
				3.0	5.5					
				4.0	6.0					
				5.0	6.5					
				6.0	7.0					
				7.0	7.5					
				8.0	8.0					
				9.0	8.5					
				10.0	9.0					
				11.0	9.5					
				12.0	10.0					

ANZ\_BOREHOLE\_CONTAM\_INSTALLATION\_60327128\_GINT\_PHASE\_2\_ESA.GPJ WCX.GDT AECOM\_2-01-AA\_VER42A.GLB 7.7.2015

**Client:** WDA  
**Project:** WestConnex Stage 2: M5  
**Location:** 5A Canal Road, St Peters, NSW

**Project No:** 60327128  
**Logged by:** GE/DS/BH  
**Start Date:** 27/11/2014  
**Checked by:** CH  
**End Date:** 2/12/2014

<b>Driller:</b> Numac Drilling Services Australia Pty. Ltd.	<b>Hole Diameter:</b> 150 mm	<b>Easting:</b> 331562.0 m	<b>Surface RL:</b> 2.32 m
<b>Drill Rig:</b> Sonicor 50K/Comacchio MC900	<b>Inclination:</b> -90°	<b>Northing:</b> 6245434.0 m	<b>Installation RL:</b> 2.25 m
	<b>Bearing:</b> N/A	<b>Hor. Proj/Dat:</b> MGA94/GDA94	<b>Ver. Datum:</b> m AHD

Field Data				Material Description		Soil Condition		Installation	
Method	Support	Field Tests	Samples	Reduced Level (m)	Depth (m)	Classification Symbol	Moisture Condition	Density / Consistency	Well Diagram
DT	Ground Water			2.0	0.5	PAVEMENT: Concrete	-	-	Lockable Gatic cover Bentonite plug
NDD		PID=0.0	BH312_0.50-0.60	0.5	0.5	FILL: Gravelly SAND: fine to medium grained, black, angular to sub-angular ironstone and sandstone gravel, with silt. Inclusions of timber, tile, ceramic pipe, and glass from 0.50 m: inclusions of concrete, glass, ceramic pipe and tile (80% by volume) NO RECOVERY: from 0.75 m to 4.00 m in push tubes or via sonic drilling	D	MD	
				1.0	1.0				
				1.5	1.5				
				2.0	2.0				
				2.5	2.5				
				3.0	3.0				
				3.5	3.5				
				4.0	4.0				
		PID=0.4	BH312_4.20-4.30	4.0	4.0	SM Silty SAND: fine to medium grained, dark grey (70%), silt (30%), with inclusions of shell fragments	W	MD	
				4.5	4.5				
		PID=0.2	BH312_5.00-5.10	5.0	5.0	CH Sandy CLAY: high plasticity, grey (70%), fine to medium grained sand (30%). No obvious contamination	M	St	Bentonite plug
				5.5	5.5				
				6.0	6.0	SP SAND: fine to medium grained, grey. No obvious contamination	W	D	2 mm sand backfill
		PID=0.1	BH312_6.50-6.60	6.5	6.5				
				7.0	7.0				Slotted screen 2 mm sand
				7.5	7.5				
				8.0	8.0	CH CLAY: high plasticity, dark grey. No obvious contamination	M	St	
				8.5	8.5				Cement grout
				9.0	9.0				
				9.5	9.5	BH312/ MW302 terminated at 9.00 m. Reached target depth			
				10.0	10.0				

ANZ\_BOREHOLE\_CONTAM\_INSTALLATION\_60327128\_GINT\_PHASE\_2\_ESA.GPJ WCX.GDT AECOM\_2-01-AA\_VER42A.GLB 7.7.2015



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