CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

Qantas Flight Training Centre and Carpark

297 King St, Mascot NSW 2020

21 JUNE 2019

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QANTAS AIRWAYS LTD CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

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297 King St, Mascot NSW 2020

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This report has been prepared for Qantas Airways Ltd in accordance with the terms and conditions of appointment for Construction Environmental Management Plan (CEMP), Qantas Flight Training Centre and Carpark - 297 King Street, Mascot NSW dated 1st March 2019. Arcadis Australia Pacific Pty Limited (ABN 76 104 485 289), incorporating Environmental Strategies Pty Ltd (ABN 91 104 512 816) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

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GLOSSARY

Term	Definition
Accreditation	The formal recognition of a laboratory's competence to carry out specific tests. It covers a lab's quality system and its technical quality.
Acid Sulfate Soil	Acid sulfate soils are natural sediments that contain iron sulfides. When disturbed or exposed to air these soils can release acid, damaging built structures and harming or killing animals and plants. Because of their estuarine origin, they are usually found at elevations less than 1 metre above sea level.
Analyte	The specific component or element measured in chemical analysis.
Anthropogenic	Coming from or having been caused by man.
Aquatic	Growing, living in or frequenting water, occurring or situated in or on water.
Aquifer	Stratum or zone below the surface of the earth capable of producing water as from a well.
Aromatic Compounds	Contain ring structure formed from closed loops of carbon chains (most often containing C-atoms) where carbons in the ring have resonant double bonds. Aromatic compounds include compounds such as benzene, toluene, ethylbenzene and xylene (BTEX), as well as polyaromatic compounds such as naphthalene. Because of the double bonding between carbon atoms, the molecules are not saturated with hydrogen atoms (as with un-saturated hydrocarbons).
Background	An area not influenced by chemicals released from the site under evaluation or other impacts created by the activity on the site under evaluation.
Bentonite	A type of mineral deposit consisting principally of montmorillonite clay. (A major constituent of drilling muds.)
Calibration	Comparison of a measurement standard or instrument with another standard or instrument in order to report or eliminate by adjustment any variation (deviation) in the accuracy of the item being compared.
Casing	The lining put into a well. It extends the total length of the wellbore to ensure safe control of production, prevent water from entering the wellbore and keep rock formations from slumping into the well bore.
Contaminant	A general term referring to any chemical compound added to a receiving environment in excess of natural conditions. The term includes chemicals or effects not generally regarded as "toxic", such as nutrients, salts and colour.
Contamination	The condition or state of soil, water or air caused by a substance release or escape which results in an impairment of, or damage to, the environment, human health, safety, or property.
Environmental Health	The study of the protection of human populations from biological, chemical and physical hazards in their environment.
Exposure Assessment	The process of estimating the amount (concentration or dose) of a chemical that is taken up by a receptor from the environment.

Exposure Pathway	The route by which an organism comes into contact with a contaminant.
Fill	Depth of which material is to be placed (filled) to bring the surface to a predetermined grade. Also, the material itself.
Guideline	A basis for determining a course of action. An environmental guideline can be either procedural (directing a course of action) or numerical (providing a numerical value that is generally recommended to support and maintain a specified use.
Jetbase	Qantas leased land within the boundaries of Sydney Kingsford Smith Airport.
Light Non-Aqueous Phase Liquid (LNAPL)	Compounds that are soluble in hydrocarbons but less dense than water, thus, these compounds will float on water.
Mascot Campus	Over 19ha of Qantas Airways Limited controlled land in Mascot to the north of Sydney Kingsford Smith Airport consisting of freehold and leased land. The following lots are owned by Qantas: Lot 133 DP 659434; Lots 4 & 5 DP 38594 Lot 23 DP 883548; Lots 1 & 2 DP 738342; Lot 3 DP 230355; Lot 4 DP 537339; Lots 2 & 4 DP 234489; Lot 4 234489; Lot 1 DP 81210; Lot 1 DP 202093; Lot 1 DP 721562; Lot 2 DP 510447; Lot 1 DP 445957; Lot B DP 164829 and Lot 1 DP 202747 and equates to 16.5ha of land. The following lots are leased by Qantas: Lot 14 DP 1199594 and Lot 2 DP 792885 and equates to 2.7ha of land.
Mottling	Formation or presence of soil mottles (spots of blotches of different colour or shades of colour found in imperfectly drained soils).
Peat	Material constituting peatlands, exclusive of the live plant cover, consisting of largely organic residues accumulated as a result of incomplete decomposition of dead plant constituents under conditions of excessive moisture (submergence in water and/or waterlogging).
Petroleum	A naturally occurring mixture of hydrocarbons in gaseous, liquid or solid form.
Pit	An excavation in the surface made for the purposes of removing, opening up, or proving sand, gravel, clay or any other substances and includes any associated infrastructure, but does not include a mine, quarry or borrow excavation.
The Project	The construction of a new Flight Training Centre and ancillary uses to replace the existing facility on the Qantas Jetbase that will be impacted by RMS' Sydney Gateway Project.
Receptor	The person or organism subjected to exposure to chemicals or physical agents.
Remediation	The removal, reduction or neutralisation of substances, wastes or hazardous material from a site so as to prevent or minimise any adverse effects on the environment now or in the future.
Sediment	Soil material, both mineral or organic, that is in suspension, is being transported, or has been moved from its surface of origin by air, water, gravity or ice and has come to rest on the earth's surface either above or below sea level.

Sydney Gateway Project	A RMS Project including a road and rail component that is intended to increase capacity and improve connections to the ports to assist with growth in passenger, freight and commuter movements across the region, by expanding and improving the existing road and freight rail networks.
The Site	Qantas Airways Limited owned land in Mascot to the north of Sydney Kingsford Smith Airport consisting of Lots 2-5 DP 234489, Lot 1 DP 202747, Lot B DP 164829 and Lot 133 DP 659434. Current site improvements include including at-grade car parking for Qantas staff, an industrial shed to store spare aviation parts, a substation, a disused gatehouse, a Sydney Water Asset with two driveways over it, the Qantas catering facility and Qantas tri-generation plant.

ABBREVIATIONS

Acronym	Definition
ACM	Asbestos Containing Material
AF/FA	Asbestos Fines / Fibrous Asbestos
AHD	Australian Height Datum
ANZG	Australian and New Zealand Governments
ASS	Acid Sulfate Soil
ASSMP	Acid Sulfate Soil Management Plan
B(a)P	Benzo(a)pyrene
BBLEP	*Botany Bay Local Environmental Plan 2013*
BH	Borehole
BTEXN	Benzene, Toluene, Ethylbenzene, Xylene and Naphthalene
CEMP	Construction Environmental Management Plan
CLM Act	*Contaminated Land Management Act (1997)*
CoPC	Contaminants of Potential Concern
CSM	Conceptual Site Model
DNAPL	Dense Non-Aqueous Phase Liquid
DQO	Data Quality Objectives
DSI	Detailed Site Investigation
EMP	Environmental Management Plan
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
ESA	Environmental Site Assessment
GME	Groundwater Monitoring Event
IP	Interface Probe
LDPE	Low-density Polyethylene
LEP	Local Environmental Plan
LGA	Local Government Area
LNAPL	Light Non-Aqueous Phase Liquid
MW	Monitoring Well
NATA	National Association of Testing Authorities
NEPM/NEPC	National Environment Protection Measure (2013) / National Environment Protection Council
NEMP	National Environmental Plan
NSW	New South Wales
NSW EPA	New South Wales Environment Protection Authority
OCP & OPP	Organochlorine & Organophosphorus Pesticides
OEH	Office of Environment and Heritage
PACM	Potential Asbestos Containing Material
PAH	Polycyclic Aromatic Hydrocarbon

Acronym	Definition
PFAS	Per- and Poly- fluorinated Alkyl Substances
PPM	Parts Per Million
POEO Act	Protection of the Environment (Operations) Act 1997
PSI	Preliminary Site Investigation
QA/QC	Quality Assurance/Quality Control
Qantas	Qantas Airways Limited
RAP	Remedial Action Plan
RPD	Relative Percent Difference
SEARs	Secretary's Environmental Assessment Requirements
SEPP	*State Environmental Planning Policy*
SSD	State Significant Development
SVOCs	Semi Volatile Organic Compounds
SWMs	Safe Work Method Statement
The Airport	Sydney Kingsford Smith Airport
TPH/TRH	Total Petroleum Hydrocarbons / Total Recoverable Hydrocarbons
UCL	Upper Control Limit
UPSS	Underground Petroleum Storage Systems
USCS	Unified Soil Classification System
UST	Underground Service Tank
VOCs/SVOCs	Volatile Organic Compounds / Semi-Volatile Organic Compounds

1 INTRODUCTION

Arcadis Australia Pacific Pty Ltd (Arcadis) was commissioned by Qantas Airways Ltd (Qantas) to prepare a Construction Environmental Management Plan (CEMP) in accordance with the technical requirements of the Secretary's Environmental Assessment Requirements (SEARs) and in support of the State Significant Development (SSD10154) for the development of a new flight training centre at 297 King Street, Mascot, NSW 2020 herein referred to as 'the site'.

1.1 Description of the site and locality

The total site area is 5.417 ha and comprises Lots 2-5 DP234489, Lot 1 DP202747, Lot B DP 164829 and Lot 133 DP 659434. The site is identified in Figure 1.

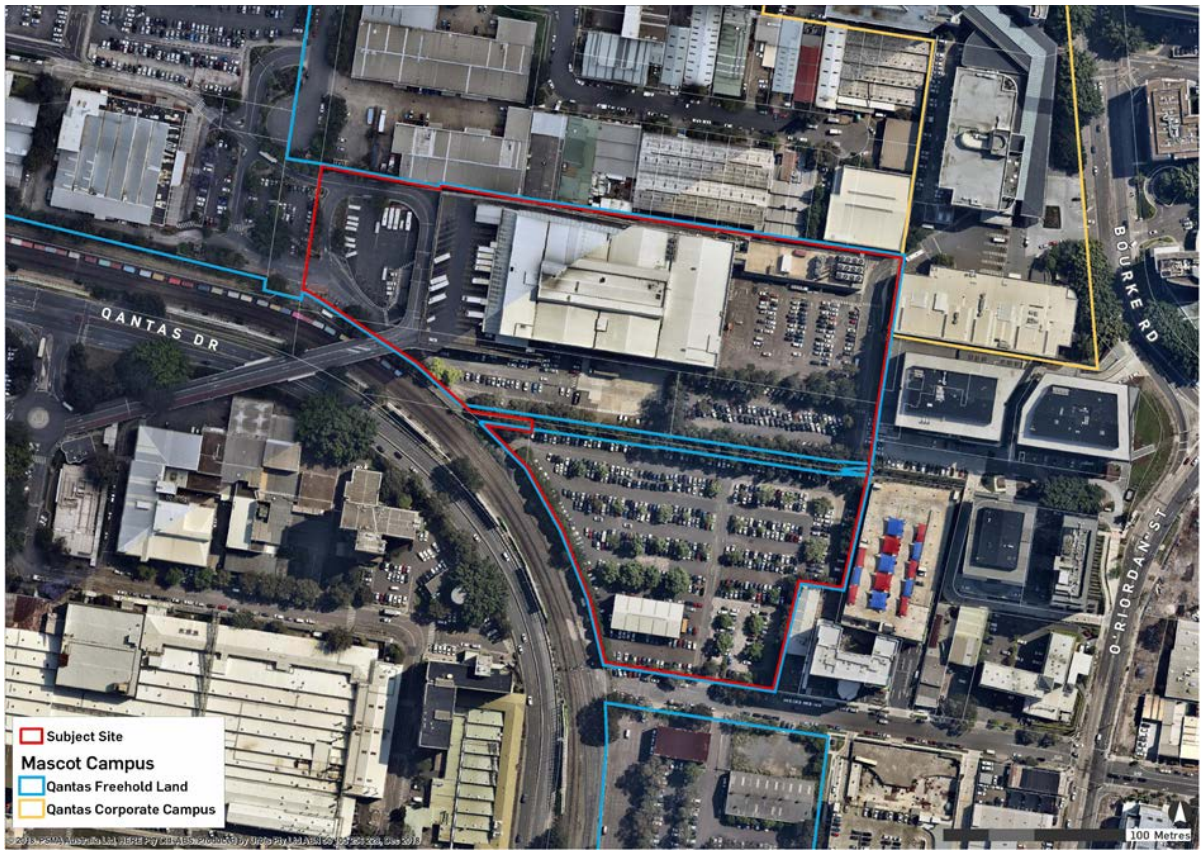

Figure 1 - The Site

Key features of the site are as follows:

- The site is approximately 5.417 ha and is an irregular shape. It is approximately 240 m in length and maintains a variable width of between approximately 321m in the northern portion of the site and approximately 93 m along the King Street frontage (refer to ***Figure 1 Appendix A***).
- The site possesses a relatively level slope across the site. An open Sydney Water drainage channel bisects the northern portion of the site in an east-west direction. There are some isolated changes in level immediately adjacent to this channel. A Site Survey Plan accompanies the application which details the topographic characteristics of the site.
- Multiple mature Plane Trees are scattered throughout the site. A variety of native and exotic tress and vegetation also exist around the perimeter of the site which help screen the site from surrounding uses.

- Site improvements include at-grade car parking for Qantas staff, an industrial shed to store spare aviation parts, a substation, a disused gatehouse, a Sydney Water Asset with two driveways over it, the Qantas catering facility and Qantas tri-generation plant.
- The site forms part of a larger land holding under the ownership of Qantas that generally extends between Qantas Drive to the west, Ewan Street to the south, Coward Street to the north, with the Qantas "Corporate Campus" fronting Bourke Road.
- Vehicular access to the site from the local road network is available from King Street. The site has intra-campus connections along the northern boundary in the form of two connecting driveways in the north-eastern and north-western corner of the site along the northern boundary which link it to the broader Mascot Campus.
- The site is located within the Bayside Council Local Government Area (LGA).

Key features of the locality are:

- **North:** The site is bounded to the north low scale industrial development, beyond which is Coward Street. Further north of the site is the Mascot Town Centre which is characterised by transport-oriented development including high density mixed-use development focussed around the Mascot Train Station.
- **East:** The site is bordered to the east by commercial development including a newly completed Travelodge hotel which includes a commercial car park. Additional commercial development to the east includes the Ibis Hotel and Pullman Sydney Airport fronting O'Riordan Street.
- **South:** The site is bounded to the south by King Street, beyond which is Qantas owned at-grade car parking and other industrial uses. Further south is the Botany Freight Rail Line and Qantas Drive beyond which is the Domestic Terminal at Sydney Airport.
- **West:** The site is bordered to the west by the Botany Freight Rail Line and Qantas Drive, beyond which lies Sydney Kingsford Smith Airport and the Qantas Jetbase (location of the current Flight Training Centre).

Project Description

Safety is Qantas' first priority. The flight training centre is a key pillar of this value. The facility enables pilots and flight crews to undertake periodic testing to meet regulatory requirements by simulating both aircraft and emergency procedural environments. The Project seeks consent for the construction and operation of a new flight training centre, and associated ancillary uses including a multi-deck car park. The Project is comprised of the following uses:

Flight Training Centre
The proposed flight training centre will occupy the southern portion of the site. It is a building that comprises four (4) core elements as follows:

- An emergency procedures hall that contains:
  - cabin evacuation emergency trainers;
  - an evacuation training pool;
  - door trainers;
  - fire trainers;
  - slide descent towers;
  - security room;
  - aviation medicine training and equipment rooms.
- A flight training centre that contains:
  - a flight training hall with 14 bays that will house aircraft simulators;

  - integrated procedures training rooms, computer rooms, a maintenance workshop, storerooms, multiple de-briefing and briefing rooms, pilot's lounge and a shared lounge.
- Teaching Space that contains:
  - training rooms;
  - classrooms and two computer-based exam rooms.
- Office Space:
  - Office space for staff and associated shared amenities including multiple small, medium and large meeting rooms, think tank rooms, informal meeting spaces, a video room and lunch/tearoom.
  - Ancillary spaces including the reception area at the ground floor, toilets, roof plant and vertical circulation. The external ground floor layout will include a loading dock, at-grade car parking for approximately 39 spaces and a bus drop-off zone at the northern site boundary.

- Car Park

The proposed multi-deck car park will be located to the north-east of the flight training centre and adjacent the existing Qantas catering facility and tri-generation plant. The car park is 13 levels and will provide 2059 spaces for Qantas staff. Vehicle access to the car park will be provided via King Street, Kent Road and from Qantas Drive via the existing catering bridge.

Disturbance Footprint

The Project site boundary encompasses 5.417 ha, however, the actual 'disturbance footprint' is constrained to approximately, 2.807 ha. The existing Qantas Catering facility including the airport linkage roads and aircraft loading trucks / buses / vans, will not be impacted by the proposed construction activities.

Construction activities will be constrained to areas that currently features at-grade open car parks along the east and the entire area south of the open Sydney Water drainage channel easement that bisect the site, north/south.

The Project disturbance footprint (2.807 ha) includes construction the two (2) new structures and feature the majority of sealed surfaces. Construction at the site will involve limited cut and fill earthworks and minor excavations for a services and utilities trenches, lift wells and a pool. The proposed developed as includes the majority 'slab on grade' training building, multideck carpark surrounded by sealed surfaces (internal road network, ground level parking, etc.) with minimal access to soils and groundwater (except for the open Sydney Water channel).

1.2 Objectives

Arcadis (2019) completed an Environmental Site Assessment (ESA) for the site that recommended the preparation of an CEMP to manage potential human exposure to impacted soil and groundwater during the construction phase of the project. Deep excavations, namely the construction of the evacuation training pool, lift wells and services / utilities trenches, are a key focus of this CEMP.

The primary objective of the CEMP is to provide a framework for the protection of the environment during the site demolition and construction works. The objectives of the CEMP are as follows:

- Ensure all personnel involved are aware of the environmental issues that could be encountered during the demolition works;
- Define the roles and responsibilities of project stakeholders during the construction process; and
- Ensure that the CEMP outlines the required procedures in the event of unexpected finds of contamination at the site.

It is assumed that the appointed civil works contractor will prepare and manage site specific environmental management measures (i.e. operational hours, noise mitigation and traffic control) associated with the proposed construction and excavation works.

1.2.1 Site Audit

The site is subject to an audit in relation to the 'contamination status' in accordance with the requirements / provisions of policy and guidelines made or endorsed under Part 4 of the Contaminated Land Management Act 1997 (CLM Act).

An Interim Advice (IA) letter regarding the site contamination status has been submitted to the NSW EPA.

Letter dated 20th May 2019. Site Audit of 297 King Street, Mascot, NSW (LBJ 19/02). Interim Audit Advice #1 From Review of Environmental Site Assessment Report and Environmental Management Plan Geosyntec Project: GSY0099.

In order to achieve signoff by the NSW EPA Accredited Site Auditor (Auditor), this CEMP will need to be implemented in full along with comprehensive records maintained.

A Site Audit Report (SAR) and Site Audit Statement (SAS) is required at the completion of civil and bulk earthworks. The State Significant Development consent conditions must be adhered to.

At the completion of bulk earthworks, a validation report must be prepared to facilitate the completion of the site audit process. The validation report must document the implementation of this CEMP with respect to contaminated land and water at the site, including:

- **the contamination status of the site based on the investigation results in the environmental site assessment report and any changes resulting from the excavation, movement and/or importation and placement of fill material;**
- **the source, volumes, classification, tracking and disposal of any waste materials generated at the site;**
- **the location and design of any management measures at the site to reduce or eliminate exposure to potentially contaminated material remaining at the site; and**
- **a clear statement by a suitably qualified environmental consultant regarding the suitability of the land for the future land uses, from a contamination perspective.**

Detailed records will need to be maintained by the nominated construction contractor and submitted as follows;

- CLM consultant (Arcadis) in order to finalise / update the long-term EMP; and
- NSW EPA Auditor to inform and be included in subsequent IA, SAS or SAR.

Documentation and evidence are required by the site Auditor but does not pre-empt the conclusion that may be made at the end of the audit process.

Example forms and templates required by the Auditor and CLM consultant (Arcadis) are provided in **Appendix D**, as follows:

- Excavated Material Tracking Form;
- Material Tracking Sheet;
- Stockpiled Material Reuse Form;
- Waste Tracking Form; and
- Waste Classification Form.

A list of contamination management actions and essential records in included in **Section 14.2**.

1.3 Limitations

This CEMP has been developed based on the objectives outlined in **Section 1.2**. Arcadis performed its services in a manner consistent with the normal level of care and expertise exercised by members of the environmental assessment profession. No warranties expressed or implied are made.

Subject to the objectives, Arcadis' guidance for environmental management at the site is strictly limited to environmental conditions as reported by Arcadis (2019), ESA associated with the subject property and does not include evaluation and / or management of any other issues. Hazardous or toxic materials not previously reported by Arcadis (2019), may still exist on the subject property.

Additionally, Arcadis did *not* conduct sampling (of any matrix) nor analysis, in development of this CEMP. All environmental management recommendations regarding the property are the professional opinions of the Arcadis personnel involved with the project, subject to the qualifications made above.

Arcadis assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements or sources outside of Arcadis, or developments resulting from situations outside the boundary of this CEMP.

Arcadis is not engaged for the purpose of advertising sales promoting, or endorsement of any client interests, including raising investment capital, recommending investment decisions, or other publicity purposes. The client acknowledges that this CEMP is for the exclusive use of the client.

2 SITE DESCRIPTION AND SURROUNDING ENVIRONMENT

The site location is shown in ***Figure 1*** and ***Figure 2, Appendix A***.

The site details are provided in the table below and described in detail in the sections.

Table 1 - Summary Site Details

Site Characteristics	Details
Street Address	297 King St, Mascot NSW 2020
Lot and Deposited Plan	Lot 133 DP 659434; Lot B DP 164829; Lot 1 DP 202747; Lot 4 DP 234489; and Lots 2-5 DP 234489.
Local Government Area	Bayside Council
Land Use Information	IN1 – General Industrial' under the Botany Bay Local Environmental Plan 2013
Site Coordinates to the approximate centre of the site (Geographic)	Latitude: -33.926712 Longitude: 151.184601
Site Area	5.417 ha
Disturbed Area	2.807 ha

2.1 Surrounding Land Uses

The land uses currently surrounding the site are as follows:

- **North:** The site is bounded to the north low scale industrial development, beyond which is Coward Street. Further north of the site is the Mascot Town Centre which is characterised by transport-oriented development including high density mixed-use development focussed around the Mascot Train Station;
- **South:** The site is bounded to the south by King Street, beyond which is Qantas owned at-grade car parking and other industrial uses. Further south is the Botany Freight Rail Line and Qantas Drive beyond which is the Domestic Terminal at Sydney Airport;
- **East:** The site is bordered to the east by commercial development including a newly completed Travelodge hotel which includes a commercial car park. Additional commercial development to the east includes the Ibis Hotel and Pullman Sydney Airport fronting O'Riordan Street; and
- **West:** The site is bordered to the west by the Botany Freight Rail Line and Qantas Drive, beyond which lies Sydney Kingsford Smith Airport and the Qantas Jetbase (location of the current Flight Training Centre).

2.1 Sensitive Environments

The nearest sensitive environments are as follows:

- The Sydney Water Corporation concrete lined canal running through the centre of the site allotments;
- The nearest residential area is located approximately 200 m southeast of the site and contains a series of medium to high density residential dwellings;

- Alexandra Canal located approximately 700 m northwest of the site, which drains into Botany Bay; and
- Botany Bay located approximately 2.50 km south of the site.

2.2 Topography

The topography of the site is largely a result of cut and fill earthworks. The site elevation peaks in the centre of the site and along the eastern border and slopes very slightly to the northwest. The site has an approximate elevation of 6 m Australian Height Datum (AHD).

2.3 Geology

The 1:100,000 Geological Survey of NSW Map for Sydney describes the site as underlain by the following geological units and structures;

- Quaternary medium to fine-grained marine sand with podsols; and
- Quaternary peat, sandy peat and mud.

The Sydney 1:100,000 Soil Landscapes map indicates that the soil landscape of the site comprises Tuggerah aeolian and disturbed terrain soils.

2.3.1 Site Specific Geology

Arcadis (2019) described the site as fill material varied in thickness. The depth of fill across the site ranged from 1.20 m to 3.50 m and generally consisted of the following layers:

- Asphalt or concrete hardstands surface;
- Road base consisting of sandy gravels, high compaction, poorly sorted, dry;
- Reworked, silty sand, light brown to grey, coarse grained, poorly sorted, some angular gravels. Foreign inclusions including glass fragments, scrap metal, brick fragments, terracotta fragments, woodchips, were evident at some locations; and
- Isolated ash layers were observed in the southernmost carpark in the northeast and northwest corners.

The natural material consisted of silty Sand, silty Clay, clayey Sand, sandy Silt and peat and was generally described as light grey to brown in colour.

2.4 Hydrogeology

Arcadis (2019) reported the hydrogeology as follows:

NSW Department of Primary Industries Office of Water records for groundwater bores within a 2.0 km radius of the site indicated the presence of 276 water bores. The majority of existing boreholes are used as monitoring bores, but some are also used for industrial, testing, domestic, irrigation and recreational purposes. The inferred local groundwater flow direction on the site is East to West.

Recorded standing water levels (SWL) of the bores ranged from 0.90 m to 14.90 m below ground level (bgl). The inferred groundwater flow direction is aligned from east to west across the site as reported by Arcadis ESA (2019).

2.5 Hydrology

The nearest surface water deposit is Alexandra Canal, which is located approximately 700 m west of the site. The Alexandra Canal drains into Botany Bay, located approximately 2.5 km south of the site.

2.6 Summary of Site History

Arcadis (2019) reported the following summary from review of historical aerial photographs:

- the site appears to have been used largely for farming and agricultural purposes between 1943 and 1961;
- during the mid-1950's to 1960, there is evidence of the site having been used as a commercial / industrial site (possibly a batching plant, laydown and storage areas), likely in relation to the construction of the railway line, and a rail line extends into the site;
- a glass factory operated in the southern portion of the site from approximately 1965 and 1982;
- the site has been in its present-day configuration since at least 2000, with sections of the site being converted to the present-day carparks at different times between 1976 and 2000;
- The Tri-Generation Plant located in the north eastern section of the site appears to have been constructed post 2009; and
- The surrounding land has been either developed or used for farming and agricultural purposes since at least 1943.

The site has a history of farming and agriculture, manufacturing and commercial / industrial, minor rail land uses. Contaminants of potential concern (CoPC) associated with historical land uses include heavy metals, benzene, toluene, ethyl benzene, xylenes and naphthalene (BTEXN), total recoverable hydrocarbons (TRH), asbestos, pesticides, volatile organic compounds and semi volatile organic compounds (VOCs/SVOCs) and per- and poly-fluorinated alkyl substances (PFAS).

2.7 Site Condition

Arcadis (2018) and Arcadis (2019), identified isolated areas / hotspots of the following CoPC in soils and fill material;

- Lead;
- Total Recoverable Hydrocarbons (TRH);
- Benzo(a)pyrene (B(a)P); and
- Asbestos fines / fibrous asbestos (AF/FA) and asbestos containing materials (ACM)fragments.

Arcadis (2018) also reported heavy metals and metalloids (predominantly zinc and to a much lesser extent arsenic, cadmium and copper) and ammonia impacts in groundwater.

The CoPC exceedances relevant to this CEMP are detailed below.

2.7.1 Soil

The ESA prepared by Arcadis (2019) reported the following **human health** guideline exceedances.

Several soil contaminant exceedances were reported for the location BH47 southwest of the USTs in the Qantas Catering / bus refuel area, located outside of the Project disturbance footprint.

- Concentrations of C_6-C_{10} less BTEX (F1) in BH47@2.4m (2,440 mg/kg) exceeded the NEPM 2013 Commercial / Industrial Coarse Soil **HSL** (Sand) guideline (630 mg/kg).
- Concentrations of C_{10}-C_{16} in BH47@2.40m (11,800 mg/kg) exceeded the NEPM 2013 Commercial / Industrial Coarse Soil **HSL** (Sand) guideline (630 mg/kg).
- Concentrations of Benzene in BH47@2.4m (3.40 mg/kg) exceeded the NEPM 2013 Commercial / Industrial Coarse Soil **HSL** (Sand) guideline (3 mg/kg).

Several additional locations within the Project disturbance footprint, 2.807 ha, at the Site reported soil contaminant concentrations above the adopted soil guidelines.

- Heavy metals
  a) Lead concentration in BH08@1.00m exceeded the NEPM 2013 Commercial / Industrial **HIL** guideline value (1,500 mg/kg). However, a 95 % UCL of 180.1 mg/kg was calculated for lead across the site making this location an isolated occurrence.
- Asbestos
  a) Soil sample MW05@1.00m (south western corner of the site) was found to contain asbestos fibres and asbestos fines (AF) / fibrous asbestos (FA). MW04@0.50m was found to contain asbestos fibres and one (1) fragment of ACM was identified in BH44;
     - MW05 and MW04 are located within the Project disturbance footprint; and
     - BH44 is located outside of the Project disturbance footprint.
  b) Arcadis ESA (2019) recommended the inclusion of an Asbestos Management Plan (AMP) within the CEMP (this Plan) to manage potential human exposure to ACM during the construction phase. Refer to the Asbestos Management Plan (AMP) in **Appendix C** for asbestos work.

2.7.2 Acid Sulfate Soils

In January 2019, Arcadis prepared an ESA for the site. Review of the Botany Bay Local Environmental Plan 2013 Environmental Planning Instrument (EPI) indicated that the site is located in a Soil Class 2 Acid Sulfate Soils area. The description of a Soil Class 2 area is 'works below natural ground surface present an environmental risk and works likely to lower the water table present an environmental risk'.

A review of the Atlas of Australian Acid Sulfate Soils (ASS) map shows the site is situated in a Class B category with a low probability of occurrence (60-70 % chance of occurrence) with occurrence across the site. Online acid sulfate soil risk mapping shows the site to be located in an area of 'X4: Disturbed Terrain (www.environment.nsw.gov.au/eSpade2WebApp).

The Project includes bulk earthworks (cut / fill site levelling) to 1.5 mbgl, limited excavations of up to 4.0 mbgl for the pool and lift wells and trench excavations of >1.0 mbgl for services and utilities.

Arcadis completed an ASS investigation for the Site in February (2019). The following is a summary of the Conclusions and Recommendations of the (2019) ASS investigation:

- 48 samples were analysed and 37 were subsequently characterised as PASS;
- PASS was generally identified near the fill/natural horizon and likely to be present within undisturbed natural layers of soil;
- ASS was not been identified, however excavation or disturbance of the soils where PASS was identified is likely to encounter ASS; and
- Arcadis recommend development of an Acid Sulfate Soil Management Plan (ASSMP) for the site.

Excavations at the site have the potential to encounter PASS and ASS >1.0 mbgl. Under Section 6.10 of the SLEP 2013, an acid sulfate soil management plan (ASSMP) is required for these works.

Arcadis developed the ASSMP for the site in February 2019. The ASSMP details the management protocols including soil handling and treatment/storage, water management, monitoring requirements and contingency plans.

2.7.3 Groundwater

Groundwater contaminant concentrations were reported above the adopted groundwater guidelines for the following locations:

- Concentrations of Zinc up to 1,660 µg/L in MW01, MW02, MW04, MW05, MW06 and MW07 were all reported above the adopted ANZG 2018 MW (95%) and NEPM 2013 MW GIL guideline values (15 µg/L).
- Concentrations of Ammonia as N in MW1 and MW4 were reported marginally above the extrapolated ANZG 2018 FW (95%) criteria.

Section 8.0 of this CEMP provides guidance for groundwater management throughout construction.

Arcadis (2019), prepared a Long-Term Environmental Management Plan (EMP) for the management of groundwater at the Site if intrusive works, excavation or other works are undertaken during future construction or maintenance events due to the presence of residual groundwater contamination remaining onsite post redevelopment.

2.7.4 Conceptual Site Model (CSM)

Arcadis ESA 2019, identified the potential sources of contamination at the site and the associated contaminants of potential concern (CoPC) as follows:

Table 2-2 – Potential Contaminant Sources.

Source	Associated Contaminants	CoPC
Potential Onsite Sources of Contamination		
Soils within the former farming / agricultural areas	Pesticides and herbicides	OCPs, OPPs, DDT, arsenic
Old buildings previously located onsite	Asbestos, building materials	Asbestos, heavy metals
Fill materials of unknown origin and composition – entire site	Asbestos, ash, slag, foundry waste	Asbestos, PAH, heavy metals, TRH, BTEXN
USTs in the Qantas bus refuel area located to the north west of the site.	Diesel and petrol.	TRH, BTEXN, PAH, Lead
Previous commercial / industrial land use associated with historical rail operations accessing the property from the west.	Asbestos building materials and break-pads, Herbicides, Ash.	Asbestos, PAH, heavy metals, TRH, BTEXN, OCPs, OPPs, PCB, PFAS.
Previous commercial / industrial and manufacturing land uses onsite including glass bottle manufacturing, smelting, storage of industrial and heavy equipment and leasing of land for electrical substation usage.	Asbestos and building materials, glass, metals, slag, foundry waste.	Asbestos, PAH, heavy metals, TRH, BTEXN, VOCs/SVOCs, PFAS.
Sydney Water Corporation concrete lined canal running through the centre of the site.	Pesticides, Herbicides, Hydrocarbons.	PAH, heavy metals, TRH, BTEXN, OCPs, OPPs, PCB, PFAS.

2.7.4.1 Affected Media

Affected media at the site include:

- Soil, and
- Groundwater.

2.7.4.2 Pathways

Pathways or transport mechanisms by which receptors may be exposed to contamination on and offsite include:

- Direct contact with contaminated soil / groundwater;
- Ingestion of dust;
- Inhalation of asbestos fibres.

All these pathways are considered to be potentially complete at the site.

2.7.4.3 Receptors

Potential receptors to contamination at the site are identified to include:

- Site workers;
- Intrusive maintenance workers;
- Demolition/construction workers;
- Future site users;
- Surrounding residents; and
- Groundwater users (offsite).

2.7.4.4 Exposure Assessment

Based on the site history, CSM and findings of the detailed site investigations (2018 / 2019), Arcadis considers the site potential for the presence of residual contamination to be - moderate to high.

2.7.5 Summary of Contamination Hazards

The following section provides a summary of the soil and groundwater contamination identified and hazards posed within the context of the Project disturbance footprint, 2.807 ha, at the Site.

- Soils:
  - Heavy metals;
    - An elevated concentration of Lead was reported in BH08@1.00m, however, was subsequently determined to be an isolated occurrence.
    - Heavy metals in soils are therefore, unlikely to present an ongoing hazard for construction.
  - Asbestos;
    - MW05@1.00m (south western corner of the site) was found to contain AF/FA;
    - MW04@0.50m (south eastern corner of the site) was found to contain AF/FA; and
    - ACM was identified in BH44 (outside of the disturbance footprint);
    - Although there was a very limited amount of asbestos detected (ACM and AF/FA), it is a very common inclusion in fill materials;

    - The presence of ACM and AF/FA suggests there is potential for additional detections of asbestos within the fill material; and
    - An Asbestos Management Plan (AMP) has been prepared for the site, **Appendix C**.
  - Acid Sulfate Soils;
    - PASS was identified near the fill/natural horizon and likely to be present within undisturbed natural layers of soil;
    - ASS was not been identified, however, is likely to be present where PASS was identified;
    - bulk earthworks (cut / fill) to 1.5 mbgl may encounter PASS ASS in soils along east site margin / upgradient areas where the fill horizon is approximately 1.0 mbgl;
    - excavation for the pool (southwest corner) to 4.0 mbgl is likely to encounter minor PASS ASS in soils at depths >2.0 mbgl.
    - lift wells and trench excavations (services and utilities) of >1.0 mbgl may encounter minor and localised PASS ASS soil especially along the east site margin;
    - Arcadis developed an Acid Sulfate Soil Management Plan (ASSMP) for the site.
- Groundwater
  - Heavy metals and metalloids;
    - elevated concentrations of Zinc were reported in all wells within the disturbance footprint (with exception for MW03);
    - isolated elevated concentrations of Cadmium and Arsenic were reported;
    - elevated concentrations of Ammonia (N) was reported in wells *outside the disturbance footprint* (near the Qantas Catering UST);
  - Per and polyfluoroalkyl substances (PFAS);
    - PFAS compounds were reported at concentrations greater than the laboratory limit of reporting LOR, but below the site acceptance criteria.
- Residual Contamination Hazard
  - Soil contamination hazards is largely associated with potential for unexpected finds of ACM AF/FA within fill material across the site. All soils outside of the known ACM area should be handled and screened for additional asbestos finds, prior to reuse onsite and / or offsite disposal.
  - The following sections of this CEMP are relevant to the management of soils and sediment at the site during construction:
    - Soil, Sediment and Erosion Control (refer Section 7);
    - Water Management and Drainage Controls (refer Section 8);
    - Dust and Odour Controls (refer Section 10);
    - Waste Management (refer Section 11);
    - Stockpile Management (refer to Section 13);
    - Asbestos Management Plan (AMP), **Appendix C**.
  - Groundwater was encountered at depths between 0.975 and 3.553 mbgl across the site. Excavations for lift wells and excavations associated with construction of the multideck carpark are require groundwater management. Excavations associated with construction of the flight training centre are unlikely to require groundwater management, except for deeper excavations associated with the pool and lift well.
    - **Section 8.0** of this CEMP provides guidance for groundwater management throughout construction.

- The following sections of this CEMP are relevant to the management of surface and groundwaters at the site during construction:
  - Soil, Sediment and Erosion Control (refer to Section 7);
  - Groundwater Management and Controls (refer to Section 8);
  - Water Management and Drainage Controls (refer to Section 9);
  - Waste Management (refer to Section 11);

Arcadis (2019), prepared a Long-Term Environmental Management Plan (EMP) for the management of groundwater at the Site if intrusive works, excavation or other works are undertaken during future construction or maintenance events due to the presence of residual groundwater contamination remaining onsite post redevelopment.

3 ROLES AND RESPONSIBILTIES

A guide to the roles and responsibilities of the stakeholders is presented in the following sections.

3.1 Superintendent

A Superintendent for the demolition of the buildings on the site is yet to be determined.

Arcadis understand AAP Property and Infrastructure are the Project Managers supporting Qantas Group with applications and approvals processes.

The role and responsibility of the Superintendent is as follows:

- Monitor and audit the compliance by the Principal Contractor against the requirements of the CEMP;
- Collect and collate of the following records on behalf of the principal:
  a) Inducted personnel approved to undertake work on the site;
  b) EPA approvals for the disposal of soil;
  c) Records of soil movements as Beneficial Re-Use (BRU) or waste in accordance with any EPA approvals;
  d) Records and appropriate handling of unexpected finds that may be encountered during earthworks.

3.2 Principal Contractor

The nominated Principal Contractor will act as the site manager during demolition and will be responsible for the daily operation of the site. The Principal Contractor will be responsible for the implementation, maintenance and compliance with the requirements of this CEMP. The Principal Contractor (or their delegate) will be responsible for the following:

- Understanding the requirements of this CEMP and ensure that all workers and sub-contractors comply with the CEMP;
- Ensure that all site workers are inducted into the CEMP and that they understand the potential contamination issues related to the site. Senior Principal Contractor staff who have been inducted by a suitably qualified environmental scientist may induct site workers;
- Maintaining the following records during the life of the project and provide these to the Superintendent:
  a) Details of all inducted personnel approved to undertake work on the site. An example of an induction record form is attached as Appendix B;
  b) Records of unexpected finds on the site;
  c) Assessment reports for the classification of soil (e.g. application for the beneficial reuse of soil or waste disposal applications);
  d) Records of EPA approval to remove or dispose soil from the site;
  e) Soil tracking information for material that is either removed from the site or brought to the site for use; and
- Appropriate handling of Unexpected Finds.

3.3 Site Workers / Sub-Contractors

Site workers and engaged sub-contractors will be responsible for complying with the requirements of this CEMP as follows:

- Ensuring they are inducted and understand the requirements of this CEMP;
- Report any occurrences of material suspected of containing contamination to the earthwork's contractor;
- Undertake tasks as required by the Principal Contractor.

3.4 Environmental Consultant (Arcadis)

The suitably qualified environmental consultant to provide advice and support should suspected material be encountered. The primary responsibilities of the environmental consultant would be:

- When required, undertake a risk assessment of material suspected of containing contamination;
- Provide advice to the Principal Contractor and/or Superintendent with regards to the management or disposal of contaminated soil. This may include recommendations for further assessment or disposal of contaminated material in accordance with **Section 15** of this CEMP;
- Undertake sampling as required for the classification of contaminated material in accordance with the relevant NSW legislation and guidelines;
- Prepare correspondence for submission to the NSW EPA for the removal of soil from the site; and
- Provide advice and assistance to the Principal Contractor regarding Unexpected Finds.

4 IMPLEMENTATION OF CEMP

4.1 Site Inductions and Training

All personnel including the Principal Contractor staff and subcontractors who will be working on the project or will require regular access to the site, will be required to undertake training and site inductions including environmental requirements as required by the Principal Contractor. All personnel should demonstrate an understanding of potential environmental issues and the measures that will be implemented to protect the construction workers, environment and local community, as detailed in this document.

4.2 CEMP Induction

The CEMP awareness induction will cover:

1. Outlining the objective and purpose of the works; and
2. Contents of the CEMP and their (the workers) responsibility.

All site workers will sign the CEMP induction register acknowledging receipt and understanding of this CEMP. All induction sessions will be recorded in the induction register.

In addition to this, the civil contractor managing the works will provide their own Construction Management Plan (CMP), which will be adhered to for the duration of the works.

4.3 Daily Toolbox Meetings

The Principal Contractor will also conduct daily toolbox meetings with all personnel to review management procedures and identify / discuss daily site conditions and potential hazards. Site inductions and toolbox talks will highlight specific environmental requirements and activities being undertaken at the worksite each day.

A record of issues covered in daily toolbox meetings should be maintained for future audit. Note that these daily toolbox meetings could be combined with the required daily Health and Safety toolbox meetings.

4.4 Personal Protective Equipment

All site personnel will be provided with, utilise and be appropriately trained in the requirements of personal protective equipment (PPE). PPE requirements will depend on the activity or situation, but may include the following:

- High visibility clothing;
- Protective clothing and footwear;
- Eye protection;
- Respirable (half-face) masks as required;
- Hard hat as required (i.e. in the vicinity of the working excavator or other overhead plant); and
- Sun protection as required (long sleeves, sunscreen, hat or hard hat fitted with wide brimmed sun protection).

Personnel will be trained in the requirements and use of PPE to an appropriate level according to responsibilities.

PPE requirements should be detailed in the Safe Work Method Statements (or similar) which will be provided to the Principal Contractor for review and endorsement. Additional PPE will be required to carry out some aspects of the construction process and the PPE outline above should only be

considered as the basic requirements. Refer to the Asbestos Management Plan (AMP) in **Appendix B** for additional PPE requirements for works conducted in asbestos work environs.

4.5 Responsibility and Reporting

The Principal Contractor is responsible for ensuring that all personnel under their jurisdiction have been provided with adequate training in the areas outlined in this document.

The Principal Contractor will maintain records of all personnel who have undergone training in relation to the CEMP and general environmental responsibilities. Records of trained personnel will be maintained in a log to be kept on site. A record of issues covered in daily toolbox meetings should be maintained.

The Principal Contractor will ensure that anyone who appears to lack an understanding in the above areas undergoes adequate retraining.

5 LEGISLATION AND GUIDELINES

All works on the site must be undertaken with all due regard to the environment and to statutory requirements. Work on site is to comply with the requirements of the NSW and Commonwealth legislation presented in Table 5.1.

Table 5.1 Summary of State and Commonwealth legislation applicable to site works.

Act/ Regulation / Planning Policy	Key Project Requirements	Jurisdiction
Protection of the Environment Operations Act 2011 (POEO Act) and Regulations	Undertake all activities so as to minimise harm to the environment (in particular pollution of air and water and noise emissions) and not cause an offence under the Act. Discharge to stormwater may require a license under the Act. Some transporters of waste are required to be licensed under the Act. Some waste disposal/processing facilities are required to be licensed under the Act.	State
Protection of the Environment Operations (Waste) Regulation 2014	Requirements in relation to transportation, collection, storage or disposal of waste including asbestos waste.	State
Protection of the Environment Operations (Clean Air) Regulation 2010	Requirements in relation to emission from vehicles and general obligations that the occupiers of non-residential premises do not cause air pollution by failing to operate or maintain plant, carry out work or deal with materials in a proper and efficient manner.	State
Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2014	Requirement for the removal / in-situ abandonment of Underground Storage Tanks.	State
Environmental Protection and Biodiversity Conservation Act 1999	Requirements in relation to protection and management of nationally and internationally important flora, fauna, ecological communities and heritage places.	Commonwealth
Work Health and Safety Act 2011	Requirements in relation to ensure work safety that are enforceable by law.	Commonwealth
Roads and Rail Transport (Dangerous Goods) (Road) Act 2014	Transport of waste classified as Dangerous Goods in accordance with Regulations	State
NSW EPA Asbestos and Waste Tyres Guidelines (2015).	Outlines the legal requirements that consignors, transporters and occupiers of premises must meet in addition to their obligations under the Waste Regulation.	State
The Waste Avoidance and Resource Recovery Act 2001	Minimise the amount of waste for disposal, where possible recycle	State

Act/ Regulation / Planning Policy	Key Project Requirements	Jurisdiction
Environmental Planning and Assessment Act 1979	Compliance with Development Consent Conditions issued by Consent Authority (Bayside Council) to manage effects on the environment.	State
Sydney Water Act (NSW) 1994	Written agreement of Sydney Water is to be obtained if discharge of certain substances to sewer is required. Approval required for any works that will affect Sydney Water's sewer, water mains, stormwater and or easements.	State
NSW ASMAC Acid Sulfate Soil Manual (August 1998)	Outline a stepwise process for site assessment and management of proposals in areas containing acid sulfate soils	State
NSW EPA (2014) Waste Classification Guidelines including Part 1: Addendum, October (2016).	Requirements in relation to permits required-soil/water that may need to be transported to landfill and appropriate waste classification will be required.	State
NSW Heritage Act 1977	Requirements in relation to Protection of heritage listed items	State
Environmentally Hazardous Chemicals Act 1985	Requirements in relation to a legal framework capable of regulating priority/high-risk chemicals throughout their entire life cycles	State
Contaminated Land Management Act 1997	Requirements in relation to management of contaminated lands and consultants reporting on contaminated sites.	State
Water Management Act 2000	Requirements in relation to management of groundwater resources	State

All work is to be conducted as appropriate in accordance with (but not limited to) the following Australian Standard, Acts, Guidelines and Codes of Practice:

- AS 2601 - 2001: Demolition of Structures;
- AS 2436 - 1981: Guide to Noise Control on Construction, Maintenance and Demolition Sites;
- AS 2986.1-2003 Workplace air quality - Sampling and analysis of volatile organic compounds by solvent desorption;
- AS 2986.2-2003 Workplace air quality – Part 2: Diffusive sampling method;
- AS/NZS ISO 19011-2003 Guidelines for quality and or environmental management systems auditing;
- NSW EPA (2014): Waste Avoidance and Resource Recovery Strategy;
- NSW EPA (2005): Approved Methods for the Modelling and Assessment of Air Pollutants in NSW;
- NSW EPA (2007): Approved methods for the Sampling and Analysis of Air Pollutants in NSW;
- NSW EPA (2013): Noise guide for Local Government;
- NSW EPA (2009): NSW Interim Construction Noise Guideline;

- NSW EPA (2013): Noise Guide for Local Government;
- NSW EPA (2014): Current orders and exemptions for commonly recovered and reused wastes, Excavation Natural Material (ENM).
- Landcom NSW (2004): Managing Urban Stormwater, Soils and Construction.
- National Environmental Protection Measure (NEPM) (2015): Ambient Air Quality;
- NEPM (2013): Assessment of Site Contamination;
- National Occupational Health and Safety Commission, 2nd Ed. NOHSC: 2002 (2005): Code of Practice for the Safe Removal of Asbestos;
- National Heritage Trust (2001). Guidelines for Erosion and Sediment Control on Building Sites NSW;
- NSW Department of Housing (1998): Managing Urban Stormwater- Soils and Construction;
- WorkCover NSW (1997). Code of Practice: Amenities for Construction Work;
- WorkCover NSW (1997). Code of Practice: Cutting and Drilling of Concrete and Other Masonry Products;
- SafeWork NSW (July 2015): Code of Practice: Excavation Work;
- NSW Government (March 2014): Managing asbestos in or on soil; and
- Other NSW EPA endorsed relevant guidelines.

The requirements of the CEMP must be explained to all site workers as a part of an induction process and a copy is to be maintained on site during the course of site works.

6 ENVIRONMENTAL MANAGEMENT

The environmental management activities and management measures which will be implemented during the demolition and construction works are outlined below. The Principal Contractor will ensure that personnel responsible for undertaking the works are aware of their roles and responsibilities detailed in this CEMP.

6.1 Potential Environmental Issues

The following potential environmental issues associated with the proposed demolition and construction works include the following:

- Soil and Sediment Control (refer to Section 7);
- Groundwater Management and Controls (refer to Section 8);
- Water Management and Drainage Controls (refer to Section 9);
- Dust and Odour Controls (refer to Section 10);
- Waste Management (refer to Section 11);
- Noise Management (refer to Section 12); and
- Stockpile Management (refer to Section 13).

6.2 General Structure of Environmental Management

Individual management measures have been prepared to address the Potential Environmental Issues listed above. Each individual plan is comprised of a number of elements, each with an overall associated management policy, mechanisms of policy implementation, proposed monitoring programs and potential corrective actions as described in Table 6 below.

Table 6: Management Measures

CEMP Element	The environmental aspect of construction or operation requiring management consideration
Potential Impacts	The potential impacts in relation to the environment.
Performance Objectives	The target or strategy to be achieved through the specific management actions.
Management Actions	The procedures to be undertaken to avoid or minimise potential impacts.
Performance Indicator	The criteria against which the implementation of the actions and the level of achievement of the performance objectives will be measured, as well as the success of the implementation of the policy.
Monitoring	The intended monitoring program and the process of measuring actual performance.
Responsibility	The entity assigned responsibility for carrying out each action.
Reporting	The process of documenting actual performance, or how well the policy has been achieved, including the format, timing and responsibility for reporting and auditing of the monitoring results.
Corrective Actions	The action to be implemented and by whom in the case where a performance requirement is not met.

7 SOIL AND SEDIMENT CONTROL

7.1 Summary of Potential Impacts

Potential impacts from sediments resulting from the works include dust emissions and storm water generated during earthworks/land clearance and construction.

The following are the potential impacts from sediments that may occur as part of the works programme:

- Complaints from local residents;
- Breaches in Regulatory requirements;
- Increased turbidity and sediment concentrations due to accidental release;
- Increased sediment load on storm water drains and infrastructure. Note that the concrete drainage channel which traverses across the site will require appropriate protection and control; and/or
- Damage to local ecological receptors.

Any impacts would be expected to be temporary only in nature and generally localised to the area of adjoining active works and transport routes but may have longer term impacts to local ecological communities.

7.2 Responsibility

The Principal Contractor is responsible for monitoring and managing sediment controls throughout the duration of the project.

7.3 Procedures

A summary of the minimum plan requirements is provided in Table 7.

Table 7: Summary of Sediment Management Procedures

Element	Sediment and Erosion Controls
Performance Objectives	The objective will be to avoid an impact on water quality in surface water drains which eventually discharge offsite by implementing prevention measures to control any sediment that is generated. Avoid or minimise soil migration and loss to surface drains. Avoid or minimise pollution of creeks and waterways. Avoid or minimise increased sediment load on storm water drains and infrastructure.
Management Actions	Installation of sediment and erosion controls in accordance with Managing Urban Storm water – Soils and Construction (Landcom, 2004) and the Sediment Control Plan. Site contractors will be required to observe any increases in sediment load in storm water drains when excavations are close to surface drains. Sediment control structures (i.e. silt fencing and/or hay bales) should be implemented in accordance with Environment Protection Guidelines for Construction and a Sediment Control Plan prior to the commencement of works. Evaluate weather conditions prior to works commencing and during any change in wind direction.

	Cease works if dust generation is excessive and undertake immediate and appropriate action. Covering of any stockpiles that are to remain for greater than two days, or if weather forecasts predict strong winds; with plastic or Hessian material. All dust control measures will be kept in good operating condition and functional at all times, with regular maintenance. Strategic placement of such structures down-gradient of stockpiles and slopes to minimise sediment entrainment. These measures should also be placed on the up-slope side of any storm water collection channels. If a significant rain event occurs, work should cease. There will be sediment control measures available for placement down gradient of the work area; and Works will also be conducted in a manner to minimise the potential for sediment and soil migration, whereby excavated material will be hauled offsite as soon as practicable and/or reinstated and compacted.
Performance Indicator	The prevention of sediment runoff is the best approach. Site contractors will be required to observe any increases in sediment load in storm water drains when excavating close to surface drains and site boundaries. No complaints from location residents, surrounding businesses or site personnel. Goal of nil complaints relating to sediment issues. No onsite observation of dust generation during excavation works by Project team. No visual evidence of tracked material on public roads
Monitoring	Regular observations will be made by the Principal Contractor and mitigation measures put into place if sediment loaded runoff is likely to occur or a rainfall event is predicted. Records of all corrective actions and known sediment releases will be kept. Implementation of visual monitoring of dust, material tracking, truck tarping, water spray use, exhaust plumes and stockpile covering.
Responsibility	The Principal Contractor is responsible for ensuring that the monitoring program is implemented by appropriately trained/qualified staff.
Reporting	Maintenance of records on site of visual monitoring undertaken. Records of all corrective actions and known sediment releases will be kept. Records of uncontrolled releases of runoff water from the site will be kept. The Site Manager will immediately report to the Superintendent any incidents of uncontrolled runoff / discharging off site.
Corrective Action (as required)	Clean-up of sediment. Installation of additional sediment and erosion controls. Additional storm water control measures. Altered excavation works. Cease works if a major storm event is likely to occur. Replace or repair sediment and erosion control devices. Should excessive dust be generated excavation works will also cease, until weather conditions improve and/or additional dust suppression measures have been implemented.

8 GROUNDWATER MANAGEMENT CONTROLS

The extraction of groundwater is restricted in sections of the Botany Bay area, which includes the Site, under the Water Management Act 2000 due to historical industrial pollution. Temporary water restrictions for groundwater extraction have been enforced in the Botany Bay area since 2006 to limit human exposure to potentially polluted groundwater and to additionally prevent the movement of polluted groundwater into uncontaminated areas through widespread pumping. In 2018, a revised temporary water restrictions order was issued for Areas 1 and 2. The site is located in the Area 2 prohibition area.

Works must comply with the requirements for groundwater extraction in Area 2 of the Botany Bay area in accordance with the Water Management Act 2000. and managed to minimise offsite and or downstream impacts. Where there is conflicting information between the CEMP and the Water Management Act 2000, the Water Management Act 2000 prevails.

The Arcadis ESA (2019), reported groundwater standing water level (SWL) was present at between 0.97 meters below ground level (mbgl) to 3.55 mbgl across the site. Assessment of SWL across the site as it applies to the two (2) distinct proposed construction elements of the Project, is provided below;

a) The Qantas Group Training Facility (QGTF) includes construction of a Pool. Arcadis constructed three (3) groundwater monitoring wells in the vicinity of the QGTF.
   - The localised groundwater SWL was reported to be as follows;
     - MW03 = 3.4 mbgl, MW04 = 2.2 mbgl and MW05 = 3.5 mbgl);
   - The proposed location of the Pool is immediately adjacent to MW05 where the GW was reported at 3.5 mbgl;
   - Bulk earthworks cut fill summary program shows the Pool excavation extending to 2.7 mbgl;
   - Based upon the reported SWL near the proposed Pool location, the excavation does not extend to a depth that will intercept groundwater. However, groundwater table can fluctuate especially after heavy rain;

b) The proposed development includes construction of a multideck carpark. Arcadis constructed two (2) groundwater monitoring wells in the vicinity of the multideck carpark. The reported groundwater SWL as follows;
   - MW01 = 1.0 mbgl and MW02 1.4 mbgl;
   - Construction activities at the multideck carpark are understood to include lift well/s, services and utilities trenches;
   - Excavations deeper than 1.0 m are at this location may intercept groundwater. Also, groundwater table can fluctuate especially after heavy rain.

Summary of Potential Impacts

The following are the potential impacts from groundwater that may occur as part of the works program:

a. Accumulation of contaminated groundwater in excavations and trenches;
b. Safety and health related issues;
c. Breaches in Regulatory requirements;
d. Unsuitable conditions for construction works;
e. Risk to downstream sensitive relievers if not managed correctly; and
f. Complaints from local residents;

Any impacts would be expected to be temporary in nature and localised to excavations and trenches only.

Responsibility

The Demolition Contractor is responsible for monitoring and managing groundwater throughout the duration of the project.

Procedures

A summary of the minimum plan requirements is provided in Table 8**.**

Table 8: Summary of Groundwater Quality Management Procedures.

Element	Groundwater Quality
Performance Objectives	Prevent contact with the groundwater table where possible. Minimise accumulation of groundwaters within excavations and trenches. Avoid or minimise the risk of release offsite of potentially contaminated groundwater to downstream environs. Prevent the movement of contaminated groundwater into uncontaminated areas. Prevent safety related incidents related to human exposure to contaminated groundwater. Prevent safety related incidents associated with wet or slippery work conditions.
Management Actions	Mitigation measures are to be carried out in accordance with the Temporary Water Restrictions Order 2018 for Area 2 under the Water Management Act 2000. In accordance with the Order, the following prohibitions apply: • Stock and domestic use of groundwater is not permitted. • The extraction of groundwater in Area 2 is restricted for industrial purposes to minimise the risk from exposure to potentially contaminated groundwater and to prevent the movement of contaminated water through pumping. • Water extracted for purposes other than remediation, **temporary construction dewatering**, testing or monitoring purposes, must be deemed fit for purpose. To be fit for purpose, the extracted water must be: – Sampled, tested and treated in accordance with industry guidelines and contaminant assessment criteria. – Certified in writing by a consultant as being safe and suitable for its intended use. Intrusive site works, excavations worker or subcontractors working at the site are to avoid encountering or digging into the groundwater table where possible. All intrusive works should be completed in a manner that minimises the need for excavations and trenches to be left open for extended periods.

	Intrusive site works such as lift well, services and utilities trenches should be opened and closed immediately, where possible. Intrusive site works including excavations and trenches should be scheduled to avoid forecasted heavy rainfall or soon after heavy rainfall (7 days withholding period). Where contact with the groundwater table is possible during intrusive site works, namely during the construction of the Pool, an additional task-based safety plan (JHA, SWMS) will be required to manage the risks associated with direct contact and dispersion of contaminated groundwater into uncontaminated areas. Where groundwater is encountered, site personnel / site workers are to prevent groundwater from entering stormwater drains or stormwater drainage channels. Installation of groundwater control structures (i.e. bunding, absorbent booms and pads) should be implemented in accordance with the Water Management Act 2000 prior to the commencement of works that may interfere with the groundwater table. This would include strategic placement of such structures downgradient of the excavation area and on nearby slopes or gullies to eliminate or otherwise minimise the spread of groundwater outside of the excavated area. Controlled pumping and extraction of groundwater, where required for construction dewatering works, is to be performed in a controlled manner. Extracted groundwater is to be collected and stored onsite in a bunded area to prevent the spread of groundwater across the site. Extracted groundwater will require environmental testing to determine whether the extracted groundwater is suitable for onsite reuse, or whether it requires offsite disposal. All groundwater requiring offsite disposal is to be disposed of in accordance with the NSW EPA (2014) Waste Classification Guidelines at a facility that is licensed to accept contaminated groundwater. Alternatively, the groundwater table could be lowered using mechanical pumping. This will most likely require onsite treatment before disposal to sewer can occur. A trade waste licence from Sydney Water will be required. It is noted that the site groundwater is part of a wider groundwater contamination plume (associated with an historical offsite source – the former Mascot Galvanising) and therefore extraction should be limited as much as possible. Prior and during extraction additional data should be collected to manage the onsite and offsite contaminated groundwater plume. Site contractors will be required to observe any groundwater control measures to ensure that they are working at a satisfactory level. Provision of a spill clean-up kit is required on all areas of the site where groundwater is being stored or is being transferred. Works are to be ceased if excessive groundwater interference makes conditions unsuitable for construction works. Cease works if excessive amounts of groundwater create site safety concerns.
Performance Indicator	Preventing the dispersion of groundwater across the site and into uncontaminated areas or onto surface drainage channels is the best approach. Site contractors will be required to observe any risks associated with groundwater extraction works and to monitor bunded groundwater being stored onsite. Any unplanned discharges of groundwater onsite

	or perceived groundwater dispersion risks are to be reported and addressed by site contractors. Site contractors will be required to observe any groundwater control measures to ensure that they are working at a satisfactory level. Site personnel should aim for zero records of near miss or injury in relation to wet conditions.
Monitoring	Regular observations are to be made by the Site Contractors and mitigation measures are to be put into place where there is a possibility of interference with the groundwater table.
Responsibility	The Demolition Contractor is responsible for ensuring that each of the groundwater extraction and associated monitoring programs are implemented by appropriately trained/qualified staff. These programs may be subcontracted out to a specialist subconsultant as required.
Reporting	Records of groundwater pumped from excavations and subsequent testing and analysis results. Records of all corrective actions and known groundwater releases will be kept. Records of uncontrolled releases of groundwater from the site will be kept. The Site Manager will immediately report to the Superintendent any incidents of groundwater discharging offsite.
Corrective Action (as required)	Installation of groundwater controls in accordance with Water Management Act 2000. Additional groundwater control measures based upon specific contaminant / treatment requirements if necessary Altered excavation works where possible. Cease excavation works that may to come into contact with the groundwater table if a major storm event is likely to occur to prevent groundwater building up and migrating across the site. Cease works if excessive groundwater makes conditions unsuitable for construction works. Cease works if excessive groundwater makes creates safety concerns. Groundwater collected onsite in bunded areas may be required to be subject to waste management and offsite disposal.

9 WATER MANAGEMENT AND DRAINAGE CONTROLS

Works must comply with requirements for storm water management in accordance with Guidelines for Erosion and Sediment Control on Building Sites NSW and develop an Erosion and Sediment Control Plans (ESCP) to minimise direct or indirect un-authorised release of surface water during site works to minimise impacts to surface water quality of surrounding environs.

9.1 Summary of Potential Impacts

The following are the potential impacts from surface water that may occur as part of the works programme:

- Complaints from local residents;
- Breaches in Regulatory requirements;
- Increased turbidity and sediment concentrations due to accidental release;
- Increased sediment load on storm water drains and infrastructure;
- Ruts and gullies in soil surfaces;
- Unsuitable conditions for construction works;
- Safety and Health related issues; and
- Damage to local ecological receptors.

Any impacts would be expected to be temporary only in nature and generally localised to the area of adjoining active works but may have longer term impacts to local ecological communities.

9.2 Responsibility

The Principal Contractor is responsible for monitoring and managing surface water throughout the duration of the project.

9.3 Procedures

A summary of the minimum plan requirements is provided in Table 9**.**

Table 9: Summary of Water Quality Management Procedures

Element	Water Quality
Performance Objectives	Avoid or minimise the disturbance to and release of potentially contaminated and /or poor-quality water to the surrounding environs. Prevent safety related incidents associated with wet or slippery work conditions.
Management Actions	Assessment of weather during excavation operations and consideration of temporarily halting works until more favourable conditions are encountered. Installation of stormwater control structures prior to the commencement of works. This would include strategic placement of such structures down-gradient of stockpiles and slopes to minimise contamination potential. These measures should also be placed on the up-slope side of any storm water collection channels. Control of drainage on the site by isolating clean surface water and dirty surface water micro-catchments.

	Interception and / or redirection of stormwater from upgradient and preventing these water contributing to the site water inventory. Collection of storm water on-site in trenches and sumps for appropriate management. Provide inlet protection for any potentially impacted locations. Site contractors will be required to observe storm water control measures to ensure that they are working at a satisfactory level. Provision of a Spill clean-up kit on all sites where bulk fuel is stored or is being transferred. Maintain a hardstand or lined, bunded, or covered area for the refuelling and storage of equipment. Cease works if excessive surface water makes conditions unsuitable for construction works. Cease works if excessive surface water makes creates safety concerns.
Performance Indicator	The prevention of increased storm water runoff is the best approach. Site contractors will be required to observe any increases in turbidity in storm water drains when working close to surface drains and report any discharges beyond the site boundaries. Site contractors will be required to observe any storm water control measures to ensure that they are working at a satisfactory level. Zero records of near miss or injury in relation to wet conditions
Monitoring	Regular observations will be made by the Site Contractors and the Principal Contractor and mitigation measures put into place if uncontrolled surface water runoff is likely to occur or a rainfall event is predicted.
Responsibility	The Principal Contractor is responsible for ensuring that each of the monitoring programs is implemented by appropriately trained/qualified staff. These programs may be sub-contracted out to a specialist sub-consultant as required.
Reporting	Records of uncontrolled releases of water from the site will be kept. The Site Manager will immediately report to the Superintendent any incidents of water discharging off site.
Corrective Action (as required)	Additional storm water control measures if and when necessary. Altered excavation works. Cease works if a major storm event is likely to occur. Cease works if excessive sitting / accumulated surface water makes conditions unsuitable for construction works. Cease works if excessive surface water makes creates safety concerns. Storm water collected on-site in trenches and sumps will be subject to waste management, characterisation and offsite disposal.

10 DUST AND ODOUR CONTROLS

10.1 Summary of Potential Impacts

Potential impacts to air quality resulting from the works include emissions from plant and equipment and dust generated during earthworks and land clearance.

Potential odour/vapour impacts may also occur as a result of the release of odour from impacted soils (if identified) and exposure from unexpected finds.

The following are the potential impacts from air quality that may occur as part of the works programme:

- Complaints from local residents;
- Breaches in Regulatory requirements;
- Unsuitable conditions for construction works;
- Safety and Health related issues;
- Damage to local ecological receptors.

Any impacts would be expected to be temporary in nature and generally localised to the area of adjoining active works and transport routes but may have longer term impacts to local ecological communities.

Dust deposition monitoring will be undertaken at the site during major excavation works only and in general accordance with the AS/NZS 3580.10.1:2003 'Methods for the sampling and analysis of ambient air Method 10.1: Determination of particulate matter – Deposited Matter – Gravimetric Method'.

Sampling will be performed during major excavation works at a minimum of four (4) sample locations. The following minimum requirements should be taken into consideration while selecting sampling locations:

- >5 m from source.
- Clear overhead sky angle 120^0.
- Unrestricted airflow of 360^0 around sample inlet.
- 10 m away from dripline of trees.
- No extraneous sources.

10.2 Responsibility

The Principal Contractor is responsible for monitoring and managing air quality throughout the duration of the project.

10.3 Procedures

A summary of the minimum plan requirements is provided in Table 10.

Table 10: Summary of Air Quality Management Procedures

Element	Air Quality
Performance Objectives	The objective of this management measure is to not generate any dust, to adopt the necessary PPE if presented with the occurrence of dust and to minimise the impacts of odours and/or vapours if encountered.

	Avoid or minimise the potential for odour and/or vapour emissions during the handling of exposed soils (if identified as being contaminated). Maintain plant and equipment such that exhaust emissions are minimised. Avoid or minimise disruption to amenity of residents and other land users in the vicinity of site works.
Management Actions	Heavy equipment and vehicles will be appropriately maintained to minimise exhaust emissions. Appropriate methods of dust suppression will be implemented, such as ensuring excavated materials remain moist to ensure dust is minimised during works. Evaluate weather conditions prior to works commencing and during any change in wind direction. Cease works if dust or odour generation is excessive. Immediate actions required to minimize environmental impacts. Use of surfactant spray may also be considered for an odour suppressant (if required). Covering of any stockpiles that are to remain for greater than two days, or if weather forecasts predict strong winds; with plastic or Hessian material. All dust control measures will be kept in good operating condition and functional at all times, with regular maintenance. All loads are to be covered and appropriately fitted with tarpaulins to contain dust and/or odour during transport. A complaints register will be established and maintained to receive and address complaints from the community regarding the detection of nuisance odour during the works. Residents in the vicinity of the proposed works will be informed of potential dust/odour impacts prior to the commencement of works.
Performance Indicator	No complaints from location residents, surrounding businesses or site personnel. Goal of nil complaints relating to air quality issues. No onsite observation of dust generation or odours during excavation works by Project team. No visual evidence of exhaust smoke during idle of equipment. No visual evidence of tracked material on public roads. A reduction in the number of complaints received in relation to air quality each month. Dust deposition results equal to or less than the baseline monitoring levels.
Monitoring	The air quality will be evaluated by the Principal Contractor and odours/vapours assessed by a suitably qualified environmental consultant if the Principal Contractor deems it necessary. Implementation of visual monitoring of dust, material tracking, truck tarping, water spray use, exhaust plumes and stockpile covering. In addition to the above, four (4) dust deposition monitors will be located on the site. Monitoring will be undertaken during major excavation works in accordance with AS/NZS 3580.10.1:2003. Following a review of the

	analytical results advice regarding dust concentrations and corrective actions (if required) will be provided by the environmental consultant.
Responsibility	The Principal Contractor is responsible for ensuring that the monitoring program is implemented by appropriately trained/qualified staff. This program may be sub-contracted out to a specialist sub-consultant as required. The Principal Contractor is to ensure responsible personnel are suitably qualified.
Reporting	Maintenance of records on site of visual monitoring undertaken. A monthly environmental report summarising the results of the dust deposition monitoring undertaken and recommendations.
Corrective Action (as required)	Replace or repair emission control devices. Provide equipment to enable wetting of exposed soils if required. Should excessive dust be generated excavation works will also cease, until weather conditions improve and/or additional dust suppression measures have been implemented. Works will stop, excavation quickly backfilled and the situation reassessed if odour identified and deemed excessive by the Principal Contractor. The application of odour suppressants should be used and then works can recommence once suitably qualified environmental consultant has assessed ambient air quality to be satisfactory.

11 WASTE MANAGEMENT

There is possibility for soil impacts to be present within the areas of site. Refer to Figure 04 in Attachment A with known locations of marginal exceedances of appropriate soil criteria.

Excavated material with the same preliminary waste classification should be stockpiled together, where appropriate, prevent contaminated material from impacting uncontaminated material.

If the material is to be transported off site, soil classification of the stockpiled material should be conducted in accordance with the following guidance documents:

- NSW EPA (2014) Waste Classification Guidelines for offsite disposal contaminated soils; and
- NEPM (2013) (Assessment of Site Contamination).

Soil classification of the stockpiles will be conducted by a suitably qualified environmental consultant. Assessment results from Arcadis 2018 and Arcadis 2019 will be included in final waste classifications.

Storm water collected on-site in trenches and sumps will be subject to waste management if offsite disposal is to take place. Disposal via the storm water system may be undertaken subject to EPA discharge license conditions.

Should excavations require dewatering, water samples will be collected by the Principal Contractor's suitably qualified environmental consultant and analysed prior to pump-out and offsite disposal.

If during any site earthworks or excavation, asbestos, evidence of gross contamination or unknown type of material not previously detected is observed, the Unexpected Finds protocol will be activated (Refer to Section 15).

Other waste, excluding soils and groundwater, generated during the redevelopment works may include:

- Domestic waste generated by site workers;
- Liquid waste; and
- Inert building materials.

Each truck should be logged as clean prior to dispatch along with information pertaining to the amounts of loads and number of trucks leaving the site in addition to copies of all waste classifications certificates, waste tracking certificates, weigh bridge dockets and any council approvals should be maintained onsite for inspection.

11.1 Responsibility

The Principal Contractor is responsible for waste management throughout the duration of the project.

11.2 Summary of Potential Impacts

The following are the potential impacts from waste management that may occur as part of the works programme:

- Complaints from local residents;
- Breaches in Legislative/Regulatory requirements; and
- Damage to local ecological receptors.

Any impacts would be expected to be temporary only in nature and generally localised to the area of adjoining active works but may have longer term impacts to local ecological communities.

11.3 Procedures

A summary of the minimum plan requirements is provided in Table 11.

Table 11: Summary of Waste Management and Minimisation Procedures

Element	Waste Management and Minimisation Quality
Performance Objectives	The objective will be to minimise and control any wastes that are generated and ensure that they will be appropriately disposed of. Avoid or minimise environmental impacts related to waste management and handling of potentially contaminated soils. Avoid or minimise health risks associated with potentially contaminated soil exposure and dust generation. Avoid or minimise impacts due to unexpected finds.
Management Actions	Provision of a spill clean-up kit on all sites where bulk fuel is stored or is being transferred. Maintain a hardstand or lined and bunded area for the refuelling and storage of equipment. Visual assessment of excavated material. Trucks to be used for transport of soil are to be fitted with cover tarpaulins to contain the load. Each truck prior to exiting site, shall be inspected prior to dispatch and either logged out as clean (wheels and chassis), or hosed down within a wheel wash down bay. Provide waste receptacles for all waste types and ensure that personnel use these correctly. Excess soil and inert building materials will be segregated, stockpiled and then classified for either reuse onsite or offsite disposal. Cease site works until the Principal Contractor has been notified of any unexpected finds and appropriate instructions have been provided to field personnel to address the issue. Principal Contractor to inform the Superintendent of any unexpected finds.
Performance Indicator	All waste materials are handled and stored in a safe and appropriate manner. Material for off-site disposal is transported to an appropriate landfill facility. Registration of waste disposal dockets, updated daily No environmental impact on and disturbance to, the surrounding area from waste, no leaks or spills of oil or fuel. No waste is to be disposed of in the surrounding environment.
Monitoring	Regular observations will be made by the Principal Contractor and measures put into place if sediment loaded runoff is likely to occur or a rainfall event is predicted. Records of all corrective actions and known sediment releases will be kept.
Responsibility	The Principal Contractor is responsible for ensuring that the monitoring program is implemented by appropriately trained/qualified staff. This program may be sub-contracted out to a specialist sub-consultant as required. The Principal Contractor is to ensure responsible personnel are suitably qualified.
Reporting	Maintenance of records on site of equipment inspections undertaken and landfill disposal/waste tracking and weigh bridge dockets and any council approvals should be maintained onsite for inspection.

Corrective Action (as required)	Revision of the works strategy including relocation and alteration to the operating procedure if waste is shown to be entering the surrounding environment.

12 NOISE AND VIBRATION MANAGEMENT

The Principal Contractor may wish to engage a suitably qualified consultant to develop a detailed Noise Management Plan. The findings and recommendations in the Noise Management Plan will supersede the minimum requirements outlined below. The NSW DECC (2009) NSW Interim Construction Noise Guideline recommends that construction works be undertaken between the hours of 7:00 am to 6:00 pm Monday to Saturday and there will be no work on Sundays or Public Holidays. However, Arcadis understand Qantas are seeking approval for construction to be undertaken between the hours of 6:00 am to 8:00 pm Monday to Sunday due to the “critical” nature of the project.

Norman Disney & Young (2019), (NDY) were commissioned to undertake a Noise and Vibration impact assessment to address the SEARs for the Project. NDY reported the closest ‘residential’ sensitive receiver is located at 8 O’Riordan Street, 200 m southeast of site.

A Pre-Works Noise survey at sensitive receptors and routine noise surveys, nominally monthly, will be undertaken throughout the works program.

The noise surveys will be performed for a minimum of fifteen (15) minutes. During this period the dominant noise source being performed on site and will be noted. In addition, the details and times of extraneous noises which may affect the measurement of the target noise source will be recorded.

- The LA_{10} and LA_{90} of the measurement will be recorded.
- Noise measurements will be collected from compliance point which is either designated under the regulation (any point as near as practicable to the boundary of the parcel of land), an environmental authorisation or an approval.

Noise monitoring will be undertaken in accordance with the NSW EPA (2013) Noise Guide for Local Government.

12.1 Summary of Potential Impacts

The following are the potential impacts from Noise that may occur as part of the works programme:

- Complaints from local residents;
- Breaches in Regulatory requirements; and
- Safety and Health related issues.

Any impacts would be expected to be temporary only in nature and generally localised to the area of adjoining active works and transport routes but may have longer term impacts to Safety and Health related issues.

12.2 Responsibility

The Principal Contractor is responsible for monitoring and managing noise throughout the duration of the project.

12.3 Procedures

A summary of the minimum plan requirements is provided in Table 12.

Table 12: Summary of Environmental Noise Management Procedures

Element	Noise Management
Performance Objectives	Avoid or minimise the impact of noise emissions from plant, equipment and vehicles used in the works.

	Avoid unnecessary revving of engines and turn plant off when not being used or required.
	Where possible, deliveries plant and equipment should drive forward and loop through the site to reduce the need to use reversing alarms.
	Avoid using tonal reversing alarms outside of standard construction hours.
	Site set up / movement of plant / delivery of material / waste removal to site should generally be restricted to day time period;
	Truck drivers are to be informed of site access routes, acceptable delivery hours and must minimise extended periods of engine idling;
	Ensure there is no unnecessary shouting or loud stereo / radios on site. There must be no dropping of metal from heights, throwing of metal items or slamming of doors;
	Employ the use of solid barrier plywood hoardings if required;
	Where practical, a partial enclosure shall be used to minimise noise levels.
	Plant and equipment will not be permitted to 'warm-up' before the nominated working hours.
	Where possible, plant and equipment will be located / orientated to direct noise away from the closest sensitive receivers.
	Undertake regular maintenance of plant and equipment to minimise noise emissions.
	All machinery will be kept in good working order and will comply with noise attenuation standards.
Management Actions	Other noise control measures, including acoustic barriers, will be examined and put in place should the need arise.
	Selection of the quietest suitable machinery reasonably available for each work activity.
	All plant and equipment to have efficient low noise muffler design and be well-maintained.
	Offset distance between noisy items of plant/machinery and nearby sensitive receivers to be maximised.
	Where practicable, ensure that noisy plant/machinery are not working simultaneously in close proximity to sensitive receivers.
	Queuing of trucks is not to occur adjacent to any residential receiver.
	Where queuing is required engines are to be switched off.
	Trucks to be fitted with efficient low noise mufflers and be well maintained.
	Trucks will follow the designated haulage route between locations.
	Trucks will adhere to the designated speed limits.
	Trucks will refrain from using compression breaking where possible.
	Any pumps or generators used will be encapsulated or appropriately encased to ensure noise generation is minimised and emissions are muffled.
	Use lower impact or low tonnage equipment;
	Maintain safety distance between construction plant and building, to be determined during detailed design stage.
	Scheduling the use of vibration causing equipment at the least sensitive time of the day;

	Sequencing operations so that high vibration causing activities do not occurs simultaneously.
Performance Indicator	No complaints from surrounding residents.
Monitoring	Noise generation is considered to be minimal if no complaints are received from the neighbours and areas of excavator use are in isolated areas away from any onsite facilities or neighbours. A Pre-Works Noise survey at sensitive receptors and routine noise surveys, nominally monthly, throughout the works program. Additional noise monitoring may be required upon receiving a complaint or under direction from a government agency.
Responsibility	The Principal Contractor is responsible for ensuring that the monitoring program is implemented by appropriately trained/qualified staff. This program may be sub-contracted out to a specialist sub-consultant as required. The Principal Contractor is to ensure responsible personnel are suitably qualified.
Reporting	Maintenance of records on site of equipment inspections undertaken and results of noise surveys. A monthly environmental report summarising the results of the noise monitoring undertaken and recommendations. Include a representative sample of typical site activities likely to occur on a day to day basis, activities causing complaints and / or nominated activities. Outline activities, noise levels and remedial measures undertaken. Make recommendations on control measures available where noise or vibration levels are found to exceed the guideline prescribed limits and describe the methods to be employed to ensure ongoing compliance. Define the permissible noise levels at all relevant sensitive zones.
Corrective Action (as required)	Revision of the works plan including revision to working hours as necessary or staggering use of noisy equipment to minimise impacts.

13 STOCKPILE MANAGEMENT

Arcadis understands Qantas is assessing the suitability of the site directly across the street at 364 King Street, which is proposed to be used as a 'staging yard' throughout development of the QGTF and carpark Project at 297 King Street.

Section 143 of the Protection of the Environment Operations Act 1997 (POEO Act) requires waste to be transported to a place that can lawfully accept it by a suitably qualified / licenced transport contractor.

Contaminated waste generated through development of the Project must be managed and stockpiled onsite and is not permitted to be stockpiled, including temporarily, offsite. Contaminated waste / soil material also requires waste classification prior to offsite disposal.

Soil materials originating from the Project that are not contaminated, also require stockpiling and management onsite as the site does not hold the necessary approvals for 'export' of ENM VENM materials.

The NSW EPA may grant an exemption to this process on a case by case basis. The Project is classified as an SSD, as such, may be justified in an exemption to temporarily stockpile of soil material offsite.

Arcadis would be supportive in principal, of temporary / short term stockpiling of soil materials at the Qantas Car Park 'south' site throughout construction / earthworks on the following basis:

- Qantas have existing freehold title over the Project site (297 King Street) as well as the neighbouring address directly across the road, 364 King Street;
- Both Qantas properties (address numbers 297 and 364) are located at the end of dead-end street / no-through road;
- Soils and groundwaters have been screened on both sites in accordance with the applicable guidelines;
- The carpark south site (364) comprises the majority of sealed surfaces;
- Through application of appropriate environmental controls (erosion and sediment control, etc.) risks to human health and environment originating from temporary stockpiling of soil materials can be managed by the Principal Contractor.

Stockpiled soil material is to be managed onsite until the material is approved for onsite reuse or classified for offsite disposal if required.

13.1 Summary of Potential Impacts

Previous investigation works have assessed and identified isolated elevated CoPC including, asbestos ACM and AF/FA, lead, TRH, B(a)P[1] in soils at the site, refer Section 2.7 Site Condition. Arcadis prepared the following Management Plans which are relevant to the management of stockpiles at the site:

- Arcadis (2019) Asbestos Management Plan (AMP) for the site, refer **Appendix C**; and
- Arcadis (2019) Acid Sulfate Soil Management Plan (ASSMP).

Stockpile management of PASS soils materials is documented in ASSMP and for Asbestos in the AMP. Stockpile management in this CEMP is therefore, only relevant to soils and stockpiled materials that are not contaminated.

[1] TRH, B(a)P were identified in BH47@2.4m, however, BH47 is outside of the disturbance footprint

As summarised in section 2.7 Site Condition, the following contaminants were identified within the disturbance footprint:

- Heavy metals;
  - The isolated elevated concentration of Lead was reported in BH08@1.00m;
- Asbestos[2];
  - MW05@1.00m and MW04@0.50m were found to contain AF/FA;
- Acid Sulfate Soils;
  - PASS was identified near the fill/natural horizon; and
  - AASS was not been identified.

Potential impacts from stockpile management resulting from the works include airborne contaminants, contaminated runoff and cross contamination hazards during earthworks/land clearance and construction.

The following are the potential impacts from stockpiled material and soils that may occur as part of the works programme:

- Complaints from residents;
- Breaches in Regulatory requirements;
- Contaminated storm water runoff entering drains;
- Contamination of groundwaters through infiltration of contaminated runoff;
- Cross contamination of soils and stockpiles;
- Increased disposal costs for waste disposal;
- Damage to local downstream receptors.

Contaminated soils at the site were identified to be generally localised to the area of adjoining active works and transport routes and impacts would be expected to be temporary, however, but may have longer term impacts to local ecological communities.

Arcadis understand the bulk earthworks are balanced with a cut/fill factor of 1:1 for both the carpark and training centre (enstruct Engineers, drawing, dated 22.02.2019). The proposed construction for both facilities is *at grade* with localised excavations required for the pool and lift wells.

13.2 Responsibility

The Principal Contractor is responsible for management of stockpiles throughout the duration of the project.

13.3 Procedures

A summary of the minimum plan requirements are provided in Table 13.

Table 13: Summary of Stockpile Management Procedures

[2] ACM was identified in BH44, however, BH44 is outside of the disturbance footprint.

Element	Stockpile Management and Controls
Performance Objectives	The objectives will be to avoid an impacts on air quality, surface water quality and groundwaters which may extend beyond the site boundary by implementing appropriate management measures. Avoid or minimise cross contamination of soils across the site. Avoid or minimise contaminated runoff entering surface water drainage systems. Avoid or minimise contaminate runoff infiltrating into groundwaters.
Management Actions	The following section is not intended to be exhaustive, where the Principal Contractor has more robust systems / controls / templates for stockpile management, then these can be used in addition to the following information. Soils should be excavated/stockpiled as follows; • Contaminated soils should be stockpiled separately, and excavations validated by an asbestos hygienist / contamination consultant (Arcadis); a) AF/FA contaminated soils are to be stockpiled and sampled for waste classification in order to characterise for additional contaminants *prior* to being removed as pre-classified general solid waste (special waste - asbestos); b) Stockpiling of contaminated soils is to be confined to a designated area with barricades or exclusion to control access and signage of potential risks; Refer to the ASSMP and AMP for management of PASS and Asbestos stockpiles. • Earthworks and excavations across the site; a) All excavations of fill material should be considered potentially contaminated and visually screened for evidence of the presence of ACM and / or other gross contamination by the contamination consultant; b) materials should be segregated and stockpiled; c) visually screened soils free from gross contamination (clear of ACM unexpected finds) can be disposed of offsite, following waste classification, or reused onsite; d) screened soils with evidence of contamination (ACM or gross contamination) are to be segregated and stockpiled separately and disposed offsite as special waste or reused onsite depending on the final validation results and containment options / requirements; e) the site AMP includes an Unexpected Finds Protocol; f) contaminated material should be stockpiled on an impermeable surface (sealed hardstand, heavy duty plastic, etc.) or other suitable location/s away from drains, flow-paths, flood prone areas etc.; g) avoid long term stockpiling of contaminated materials and consider covering with tarps, heavy duty plastic and wetting to control dust, odour, infiltration of stormwater to groundwater, runoff of contaminates and sediment; h) wetting of materials during excavation / demolition, transport, stockpiled, backfill and surrounding areas to control dust and odour generation; i) consider additional environmental management protocols, dust, odour, runoff, infiltration, sediment, bunding etc.; j) Accumulation of porewaters within excavations will need to be tested and managed appropriately;

- Stockpiles are to be managed / tracked as follows;
  a) Ensure contaminated site plant are decontaminated prior to commencing work in clean soil areas;
  b) Signs and record keeping should indicate the origin and location of contaminated materials;
  c) Avoid stockpiling of impacted soils to prevent cross contamination of clean soils.
  d) Direct transport form contaminated soils area to screening and assessment area, reuse stockpile and offsite removal; and
  e) Validated areas should be stockpiled for reuse immediately to prevent cross contamination.
  f) Excavations are to be tracked, date, location, dimensions (H*W*D); and
  g) Stockpiles are to be segregated and tracked across the site;
  h) Excavations and soil movement onsite and offsite needs to be accurately reconciled;
     - Day, date, material description, volume (m^3), tonnage (t), contamination status;
     - Truck ID, registration, driver, material destination, material origin;
     - Material certificates / classification, VENM, ENM, Waste Classification Certificate, NSW EPA Online Waste Tracking of hazardous waste (where relevant);
     - Imported soil material (ENM, VENM, etc.) should not be permitted to proceed with tipping onsite without appropriate paperwork to certify / validate the contamination status of the material;
     - Exported soil material should not be permitted to depart site without appropriate paperwork to certify / validate the contamination status of the material and destination for disposal;
  i)
     - Soil materials can be reused onsite for cut and fill, bulk earthworks, backfill of excavations, landscaping etc. with consideration of the contaminants.
     - Reuse of contaminated soil material onsite are to be placed in areas that will be contained beneath structures or capped by hardstand (where possible).
     - Contaminated soils material used in other areas (e.g. landscaping, bunds etc.) will need to be capped with a marker layer and 0.5 m cover of VENM. The location of such materials will need to be documented in order to be captured in the long-term Environmental Management Plan (EMP) for the site post construction;
     - Soils should be stripped and stockpiled in a manner that facilitates reuse of the profile / stockpiles;
       - Soils excavated from the depth of groundwater across the site were identified with elevated concentrations of metals of arsenic, zinc, cadmium. Excavation of soil materials from depths of groundwater should be avoided, controls for soils excavated and reinstatement of soils excavated as soon as practicable to minimise accumulation porewaters within excavations and potential for surface contamination.
       - Soils excavated from near the fill/natural horizon may be PASS or ASS. To minimise the potential for oxidation of acid-forming minerals, PASS/ASS soils should be buried below the water table to avoid

	contact with infiltrating surface waters and diffusion of atmospheric oxygen; - Soils should be replaced in layers similar to how the material was excavated, e.g. deeper soils replaced first at depth and topsoils replaced at surface (where possible); - Excavation of contaminated soil material should be timed to avoid the need for long term stockpiling; - Environmental controls need to be considered prior to excavation contaminated materials (dust, odour, runoff, sediment, infiltration etc.). Site contractors will be required to observe any runoff from any stockpiles and implement appropriate controls as listed in surface water and sediment control section this CEMP. Evaluate weather conditions prior to works excavations and stockpiling commencing and during any change in weather conditions (rain, wind etc.). Cease works if dust generation is excessive and undertake immediate and appropriate action. Covering of any stockpiles that are to remain for greater than two days, or if weather forecasts predict strong winds; with plastic or Hessian material. All dust control measures will be kept in good operating condition and functional at all times, with regular maintenance. Strategic placement of such structures down-gradient of stockpiles and slopes to minimise sediment entrainment. These measures should also be placed on the up-slope side of any storm water collection channels. If a significant rain event occurs, work should cease. There will be sediment control measures available for placement down gradient of the work area; and Works will also be conducted in a manner to minimise the potential for sediment and soil migration, whereby excavated material will be hauled offsite as soon as practicable and/or reinstated and compacted.
Performance Indicator	The prevention of sediment runoff is the best approach. Site contractors will be required to observe runoff from stockpiles. Increases in sediment load in storm water drains when excavating close to surface drains and site boundaries. No complaints from location residents, surrounding businesses or site personnel. Goal of nil complaints relating to stockpiles. No onsite observation of dust or odour noted during excavation works by Project team. No visual evidence of tracked material on public roads.
Monitoring	Regular observations will be made by the Principal Contractor and mitigation measures put into place for management of stockpiles if a rainfall is predicted. Records of all corrective actions and known releases will be kept (dust, odour, runoff, sediment etc.). Implementation of environmental controls for dust, material tracking, truck tarping, water spray use, exhaust plumes and stockpile covering. Detailed tracking of all soil's materials entering or exiting site. Detailed tracking of all stockpiled materials onsite. Timing of excavations or movement of stockpiles of contaminated soil materials.

Responsibility	The Principal Contractor is responsible for ensuring that stockpile monitoring and records management programs are implemented by appropriately trained/qualified staff.
Reporting	Maintenance of records on site of visual monitoring undertaken. Tracking of all soil's materials entering or exiting site. Tracking of all stockpiled soil material onsite and detailed reconciliation of materials moved / received / disposed of offsite. Example forms and templates are provided in Appendix D, as follows: • Excavated Material Tracking Form; • Material Tracking Sheet; • Stockpiled Material Reuse Form; • Waste Tracking Form; and • Waste Classification Form. Records of all corrective actions and known environmental releases (dust, odour, surface water, sediment etc.). Records of uncontrolled releases (dust, odour, surface water, sediment etc.) from the site. The Site Manager will immediately report to the Superintendent any incidents of uncontrolled runoff / discharging off site. For the purposes of the site audit, sufficient documentation must be recorded to allow the volume and classification of excavated contaminated material from the site to be accurately reconciled with: ▪ Weighbridge dockets from the receiving landfill, for waste disposed off-site, and/or ▪ The volume and location of any material reused on-site.
Corrective Action (as required)	Protection of stockpiles of contaminated material from forecast rain and / winds conditions. Installation of additional environmental controls, dust, odour, runoff, sediment etc. Additional storm water control measures. Altered excavation works and timing. Cease works if a rain or wind are forecast. Replace or repair environmental controls.

14 MONITORING REQUIREMENTS

14.1 Documentation and Records

A representative of Superintendent will conduct regular surveillance monitoring of the Principal Contractors implementation of the CEMP. Surveillance monitoring and site inspections will involve a review of all environmental documents, records and reports to ensure compliance with the requirements of the CEMP. If non-compliance is detected, the Principal Contractor will initiate to the satisfaction of the Superintendent the appropriate corrective action.

Key environmental and procedural issues to be covered by the audit will include, but may not be limited to:

- Environmental management measures presented in Section 7 to Section 13;
- Adherence to reporting procedures;
- Compliant and incident management; and
- Legislative requirements.

Records of auditing and reporting will be maintained to demonstrate compliance with environmental requirements.

Environmental records will include, but may not be limited to:

- Complaint records;
- Incident, non-conformance and corrective action reporting;
- Communications with stakeholders;
- Monthly dust, noise and vibration monitoring report;
- Monthly waste management reporting; and
- CEMP audit documentation.

14.2 Auditing

The site is subject to NSW EPA Contaminated Site Audit and signoff by the site Auditor.

An SAR and SAS is required at the completion of civil and bulk earthworks. The State Significant Development consent conditions should be adhered to.

At the completion of bulk earthworks, a validation report must be prepared to facilitate the completion of the site audit process. The validation report must document the implementation of this CEMP with respect to contamination at the site, including:

- **the contamination status of the site based on the investigation results in the environmental site assessment report and any changes resulting from the excavation, movement and/or importation and placement of fill material;**
- **the source, volumes, classification, tracking and disposal of any waste materials generated at the site;**
- **the location and design of any management measures at the site to reduce or eliminate exposure to potentially contaminated material remaining at the site; and**
- **a clear statement by a suitably qualified environmental consultant regarding the suitability of the land for the future land uses, from a contamination perspective.**

Detailed records are to be maintained by the nominated construction (bulk earthworks, civil works, building) contractor and submitted as follows;

- CLM consultant (Arcadis) in order to prepare a CEMP Close-out / Validation Report;

- CLM consultant (Arcadis) in order to finalise / update the long-term EMP; and
- NSW EPA Auditor to inform and be included in subsequent IA, SAS or SAR.

At the conclusion of earthworks and civil construction, the following information is required to inform a CEMP 'Close-out Report':

- Waste management and validation (stockpile handling, tracking, excavation / stockpile volume, etc.);
- Survey plans (final earthworks and civils, etc.);
- Offsite disposal and import of fill material is not permitted without Auditor approval. Offsite disposal and waste tracking (waste classification certificates, laboratory analysis reports, tickets, weighbridge dockets, disposal location, NSW EPA Online waste tracking certificates, etc.);
- Imported fill (volume, source, VENM, ENM);
- Land-use suitability statement.

A summary of the documentation reporting and evidence requirements is provided in Table 14.

Table 14: Summary of Documentation Reporting and Evidence

Environmental Element / Section	Documentation / Reporting / Evidence
7.0 Sediment and Erosion Control	Maintenance of records on site of visual monitoring undertaken. Records of all corrective actions and known sediment releases will be kept. Records of uncontrolled releases of runoff water from the site will be kept. Records of any incidents of uncontrolled runoff / discharging off site.
8.0 Groundwater Management Controls	Records of groundwater pumped from excavations and subsequent testing and analysis results. Records of all corrective actions and known groundwater releases will be kept. Records of uncontrolled releases of groundwater from the site will be kept. The Site Manager will immediately report to the Superintendent any incidents of groundwater discharging offsite.
9.0 Water Management and Drainage Controls	Records of uncontrolled releases of water from the site will be kept. The Site Manager will immediately report to the Superintendent any incidents of water discharging off site.
10.0 Dust and Odour Controls	Maintenance of records on site of visual monitoring undertaken. A monthly environmental report summarising the results of the dust deposition monitoring undertaken and recommendations.
11.0 Waste Management	Maintenance of records on site of equipment inspections undertaken and landfill disposal/waste tracking and weigh bridge dockets and any council approvals should be maintained onsite for inspection. Example forms and templates are provided in Appendix D, as follows: • Excavated Material Tracking Form;

	• Material Tracking Sheet; • Stockpiled Material Reuse Form; • Waste Tracking Form; and • Waste Classification Form.
12.0 Noise Management	Maintenance of records on site of equipment inspections undertaken and results of noise surveys. A monthly environmental report summarising the results of the noise monitoring undertaken and recommendations. Include a representative sample of typical site activities likely to occur on a day to day basis, activities causing complaints and / or nominated activities. Outline activities, noise levels and remedial measures undertaken. Make recommendations on control measures available where noise or vibration levels are found to exceed the guideline prescribed limits and describe the methods to be employed to ensure ongoing compliance. Define the permissible noise levels at all relevant sensitive zones.
13.0 Stockpile Management	Maintenance of records on site of visual monitoring undertaken. Tracking of all soil's materials entering or exiting site. Tracking of all stockpiled soil material onsite and detailed reconciliation of materials moved / received / disposed of offsite. Example forms and templates are provided in Appendix D, as follows: • Excavated Material Tracking Form; • Material Tracking Sheet; • Stockpiled Material Reuse Form; • Waste Tracking Form; and • Waste Classification Form. Records of all corrective actions and known environmental releases (dust, odour, surface water, sediment etc.). Records of uncontrolled releases (dust, odour, surface water, sediment etc.) from the site. The Site Manager will immediately report to the Superintendent any incidents of uncontrolled runoff / discharging off site.

15 UNEXPECTED FINDS PROTOCOL

This 'Unexpected Finds' protocol has been prepared to assist site workers with the identification and procedures for managing material that is suspected of containing contamination in the remainder of the site.

Where an unexpected find is encountered, work must stop and the Principal Contractor is to be informed as soon as practicable. The Principal Contractor would then inform the Superintendent of the unexpected find and if required, the Environmental Consultant would be engaged to assess the find.

15.1 Identification of Potentially Contaminated Material

Material that is suspected of containing contamination may be identified by one or more of the following characteristics:

- Soil has visible rubbish material such as plastic, brick, concrete, metal etc. which may indicate the material is uncontrolled fill. Soil that contains such material could have asbestos containing material (ACM) even if it is not visible and must be assessed by a suitably qualified environmental consultant;
- Fill material is reported to be present across the site to a maximum depth of 3.50 m bgl and generally comprised of a layer of asphalt and or concrete hardstand, underlain by a poorly sorted sandy gravel road base and a layer of reworked silty sand, Arcadis (2019). Fill material that deviates from this current understanding of the site geology may indicate the presence of previously uncharacterised fill material;
- Soil has visible staining or discolouration which may be an indication of the presence of chemical contaminants such as hydrocarbons and/or oil;
- Soil has a noticeable odour which may be an indicator of chemical contamination (e.g. hydrocarbons, oil, other volatile compounds such as solvents) or microbiological contaminants associated with effluent water or sewage (e.g. E-coli, faecal coliforms etc.).

Should material be encountered that exhibits the above properties, then work must stop immediately and the Principal Contractor informed of the presence of the material.

15.2 Assessment of Potentially Contaminated Material

After material that is suspected of being contaminated has been identified, the Principal Contractor is to engage a suitably qualified environmental consultant to undertake an assessment of the material. The environmental consultant may be required to undertake one or more of the following tasks:

- Undertake a visual assessment of the material and provide the Principal Contractor with recommendations for the management of the material. This may include sampling for asbestos should it be considered a risk or screening and removal of rubbish should it be present; and
- Undertake soil sampling to assess whether the material may pose a risk to the proposed commercial/industrial land use on the site. Sampling would be required to assess the concentration of possible contaminants within the unexpected find.

The environmental consultant is to advise the Principal Contractor of the management or disposal requirements of material that is assessed as being contaminated.

15.3 Interim Management of Contaminated Material

Material that is suspected of containing contamination must be isolated from other soil material to prevent possible cross-contamination from occurring. The engaged environmental consultant may make recommendations in addition to those outlined below depending upon the nature of the

contamination (e.g. should asbestos be suspected, then airborne fibre monitoring may be required around the impacted area to assess the potential risk of exposure of workers to respirable asbestos).

15.4 Excavations Containing Contaminated Material

Areas that have been excavated and are suspected of containing contaminated material should be managed using the following interim controls:

- The area must be isolated and barricaded to prevent unauthorized access. If required, appropriate signage indicating the presence of contamination should be placed on the barricade (e.g. a 'Danger - Asbestos' sign should be used if possible ACM or non-bonded asbestos is identified);
- A suitably qualified environmental consultant must be engaged to assess and provide recommendations (if required) for appropriate management and/or remedial actions;
- Work may not resume until approval to do so has been given by the environmental consultant.

15.5 Stockpiles with Contaminated Material

The following interim management procedures should be implemented for excavated material that has been stockpiled and contains contaminated material:

- The stockpile should be isolated and not combined with uncontaminated material. Should contaminated material be accidently mixed with uncontaminated soil, then a conservative approach must be adopted and all material is to be considered contaminated until proven otherwise;
- Sediment and erosion controls (e.g. hay bales or sediment fences) should be placed around the low side of the stockpile. Drainage channels or soil bunds should be placed around the high side of the stockpiled material to divert surface flows around the stockpiled soil;
- If ACM or non-bonded asbestos material is present in the contaminated soil, then the stockpile should be covered with a heavy-duty plastic or a geofabric to prevent the possibility of respirable fibres from being generated;
- A suitably qualified environmental consultant must be engaged to assess the material and provide recommendations for the management or removal of material (e.g. suitability of material for BRU or waste);
- Work in the area of the contaminated stockpile cannot resume until approval from the environmental consultant to do so has been received.

The above interim management controls should remain in place until the material has been assessed as suitable for reuse on the site or the material can be removed from the site.

15.6 Procedures for the Disposal of Contaminated Material

Material that is assessed as unsuitable for use on the site may require disposal as waste soil to a landfill licensed to accept the contaminated material.

Procedures for the assessment and classification of contaminated material are presented below.

- The environmental consultant would be required to collect samples of the contaminated material in general accordance with NSW EPA (2014) Waste Classification Guideline and Construction and Demolition Waste;
- Samples would require analysis for contaminants of potential concern as identified by the environmental consultant at a National Association of Testing Authorities (NATA) accredited laboratory;
- Laboratory results would be assessed against the ASC NEPM 2013 criteria for Health Investigation Levels (HIL) D – Commercial / Industrial with minimal access to soil and the material

is suitable for use on the site. If the material is unsuitable for reuse, the following options for the removal of soil may be available:

a) The laboratory results may be assessed against a less conservative land use criteria (e.g. Management Limits) for possible treatment and reuse or containment onsite;

b) In the event contaminated material is assessed as unsuitable for BRU, the soil will then require classification as waste in accordance with NSW EPA Waste Classification Guidelines (2014 and amendment to Part 1 (2016)).

15.7 Beneficial onsite reuse of Soil

Prior to soil being removed from the site for beneficial reuse (BRU) purposes, approval must be obtained from the NSW EPA. The soil must be assessed in accordance with the requirements of Waste Avoidance and Resource Recovery Strategy NSW EPA (2014). Current orders and exemptions for commonly recovered and reused wastes, Excavation Natural Material (ENM).

The results of the assessment must be presented in a brief report prepared by the environmental consultant. The following information should be provided in the report:

- A brief site history;
- The source and type of contamination;
- The volume of material that is to be removed from the site;
- The sampling methods used;
- Justification for the selection of contaminants analysed by the laboratory;
- Information regarding Quality Assurance / Quality Control procedures;
- Assessment against the relevant Commercial/Industrial criteria in the ASC NEPM 2013;
- Figures showing the location of the source site and sample locations;
- A summary table of the laboratory results;
- Copies of the laboratory reports.

Soil must not be removed from the site until the engaged Environmental Consultant have provided written approval to do so. After approval has been obtained, soil should be removed in accordance with any conditions specified by the Consultant.

15.8 Disposal of Soil as Waste

Prior to soil being removed from the site as waste, written approval from the Environmental Consultant must obtained. The soil must be assessed in accordance with the requirements of NSW EPA (2014) part 1: Waste Classification guidelines.

The results of the assessment must be presented in a brief report prepared by the environmental consultant. The following information should be provided in the report:

- A brief site history;
- The source and type of contamination;
- The volume of material that is to be removed from the site;
- The sampling methods used;
- Justification for the selection of contaminants analysed by the laboratory;
- Information regarding Quality Assurance / Quality Control procedures;
- Classification of the waste in accordance with NSW EPA Waste Classification Guidelines;

- Figures showing the location of the source site and sample locations;
- A summary table of the laboratory results including historical results from Arcadis 2018 and Arcadis 2019;
- Copies of the laboratory reports;

Soil must not be removed from the site until the Consultant have provided written approval to do so. After approval has been obtained, soil should be removed in accordance with any conditions specified by the Consultant.

16 VARIATIONS TO THE CEMP

Should site conditions and / or the proposed redevelopment change, an amendment to the CEMP should be completed by a suitably qualified environmental consultant. Any amendments to the CEMP with respect to contamination management should be provided to the Site Auditor for review and endorsement.

17 REFERENCES

Arcadis (2019). Environmental Site Assessment (ESA), January 2019.

Arcadis (2019). Acid Sulfate Soil Investigation (ASS), February 2019.

Arcadis (2019). Acid Sulfate Soil Management Plan (ASSMP), February 2019.

Arcadis (2019). Remediation Action Plan (RAP), February 2019.

Arcadis (2019). Asbestos Management Plan (AMP), March 2019.

Norman Disney and Young (2019). Report - Assessment of Noise and Vibration Emissions (SEARs), February 2019.

Section 5.0 of the CEMP lists the relevant Act, Guidelines, Standards and Codes of Practice.

APPENDIX A

Figures

10026439 - King Street North

Legend

- Site Boundary
- Motorway
- Major roads
- Local road
- Railway

1:10,000 at A3

ARCADIS Design & Consultancy for natural and built assets

ARCADIS AUSTRALIA PACIFIC PTY LTD
ABN 76 104 485 289
Level 16, 580 George St | Sydney NSW 2000
P: +61 (0) 2 8907 9000 | F: +61 (0) 2 8907 9001

Coordinate System: GDA 1994 MGA Zone 56
Date issued: February 8, 2019

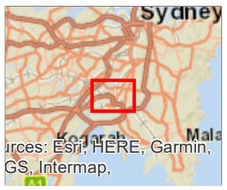

Figure 1 - Site Location

0 100 200 400 600 800
m

Date: 8/02/2019 Path: C:\Arc Templates\Temporary Projects\10026439 - King Street North\10026439 - Figure 1 - Site Location.mxd
Created by : Environmental Restoration
QA by : Environmental Restoration

10026439
Qantas Flight Training Centre and Carpark
297 King St, Mascot NSW 2020

Legend

Site Boundary

Sampling Locations

- Soil Bores
- Monitoring Wells
- Existing Monitoring Wells (ES, 2013)

1:1,300 at A3

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Date issued: February 15, 2019

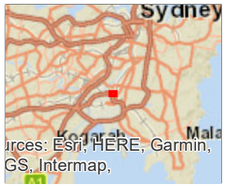

Figure 2 - Sample Locations

0 12.5 25 50 75 100
m

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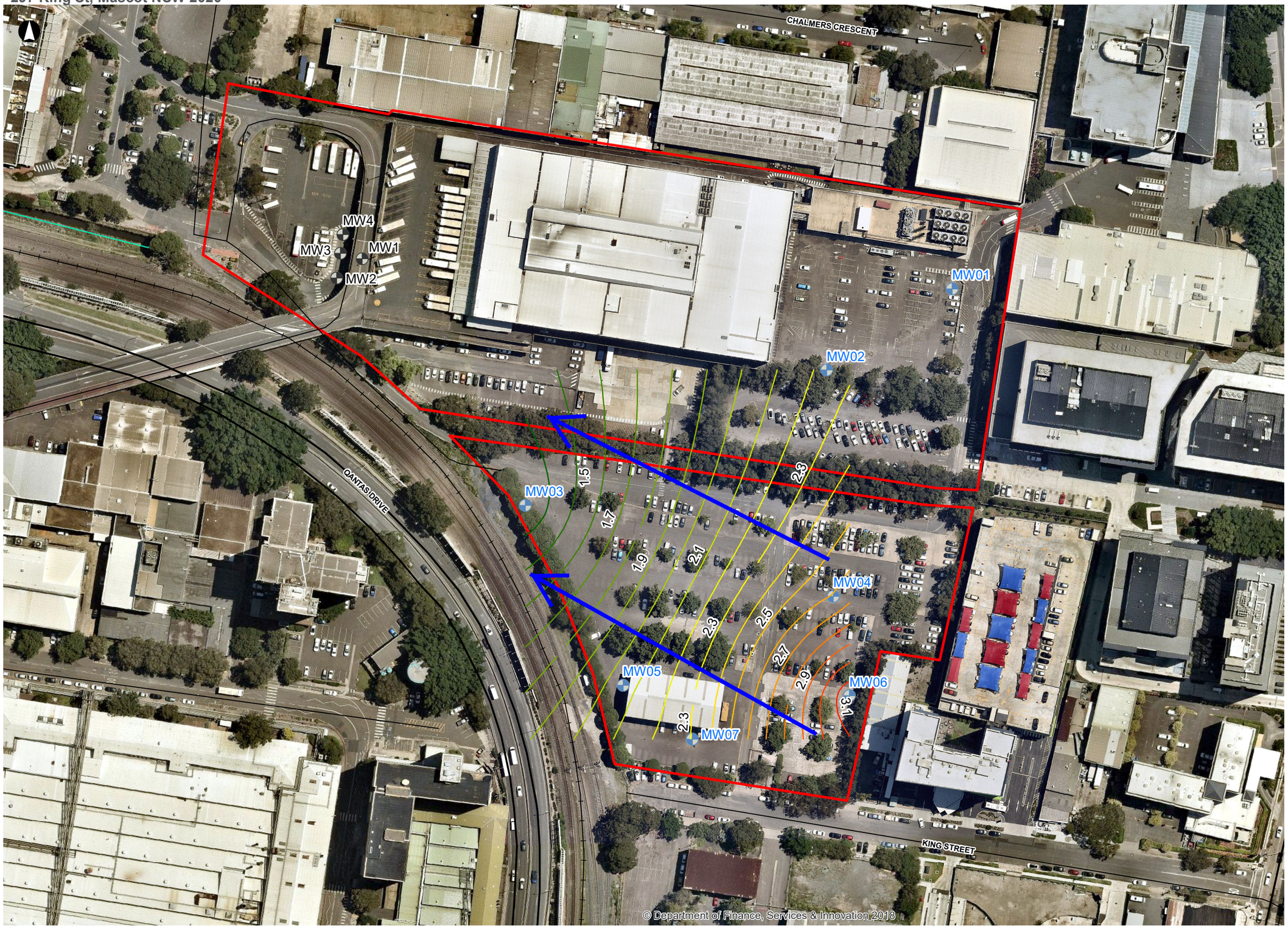

Legend

Site Boundary

Sampling Locations

- Monitoring Wells
- Existing Monitoring Wells (ES, 2013)

Height (AHD)

- 1.5
- 2
- 2.5
- 3

Groundwater Flow Direction

1:1,500 at A3

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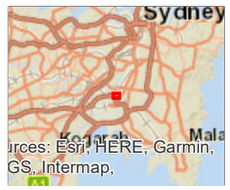

Figure 3 - Groundwater Contours

0 15 30 60 90 120
m

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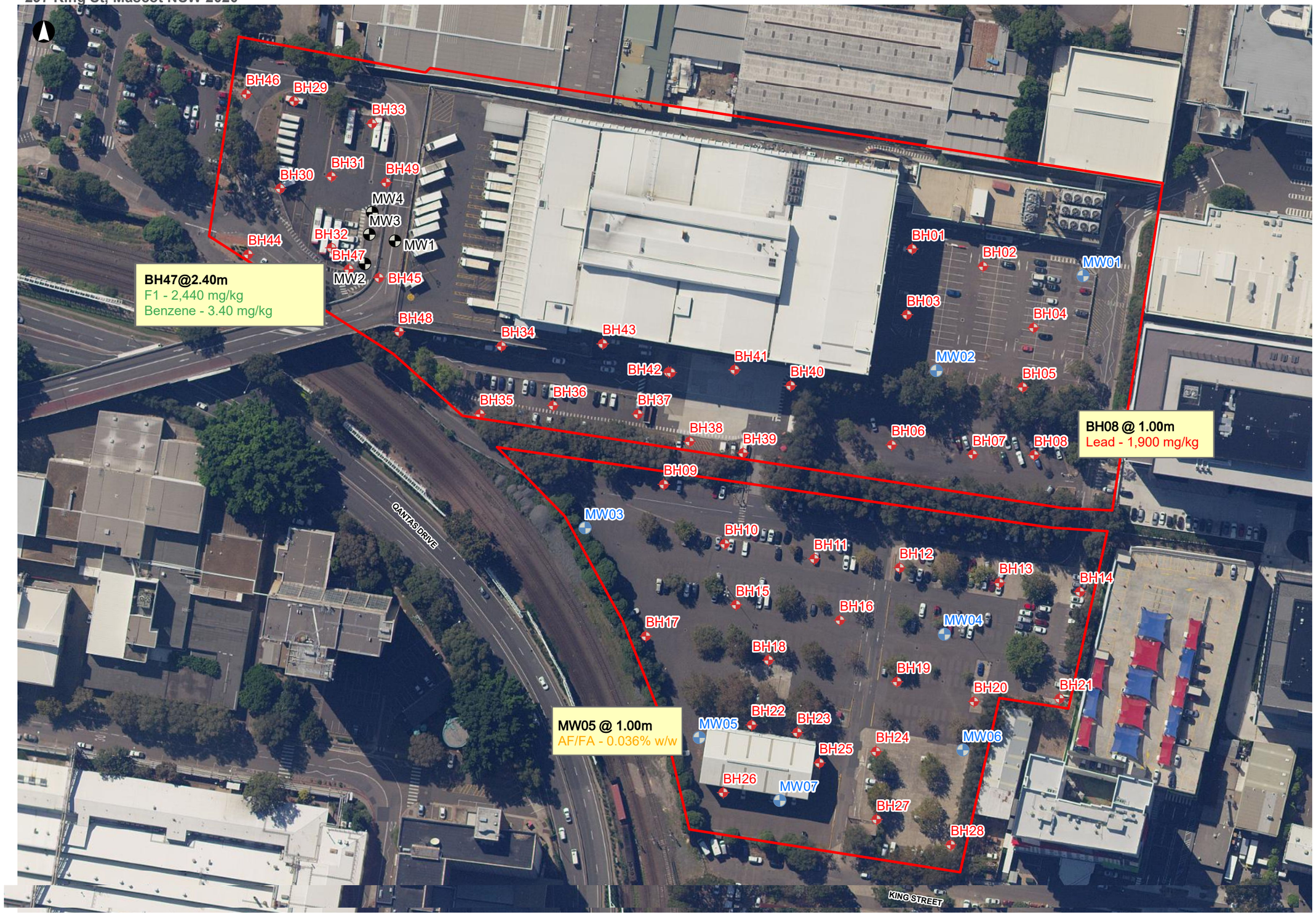

Guideline

NEPM 2013 Commercial / Industrial HIL
Lead - 1500 mg/kg

NEPM 2013 Commercial / Industrial HSL D (Sand)
F1 (2-<4m)- 630 mg/kg
Benzene - 3 mg/kg

NEPM 2013
Asbestos HSL
AF/FA - 0.001% w/w

Legend

Site Boundary

Sampling Locations

Soil Bores

Monitoring Wells

Existing Monitoring Wells (ES, 2013)

1:1,300 at A3

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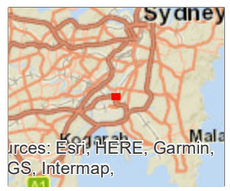

Figure 4a - Soil Exceedances

0 12.5 25 50 75 100
m

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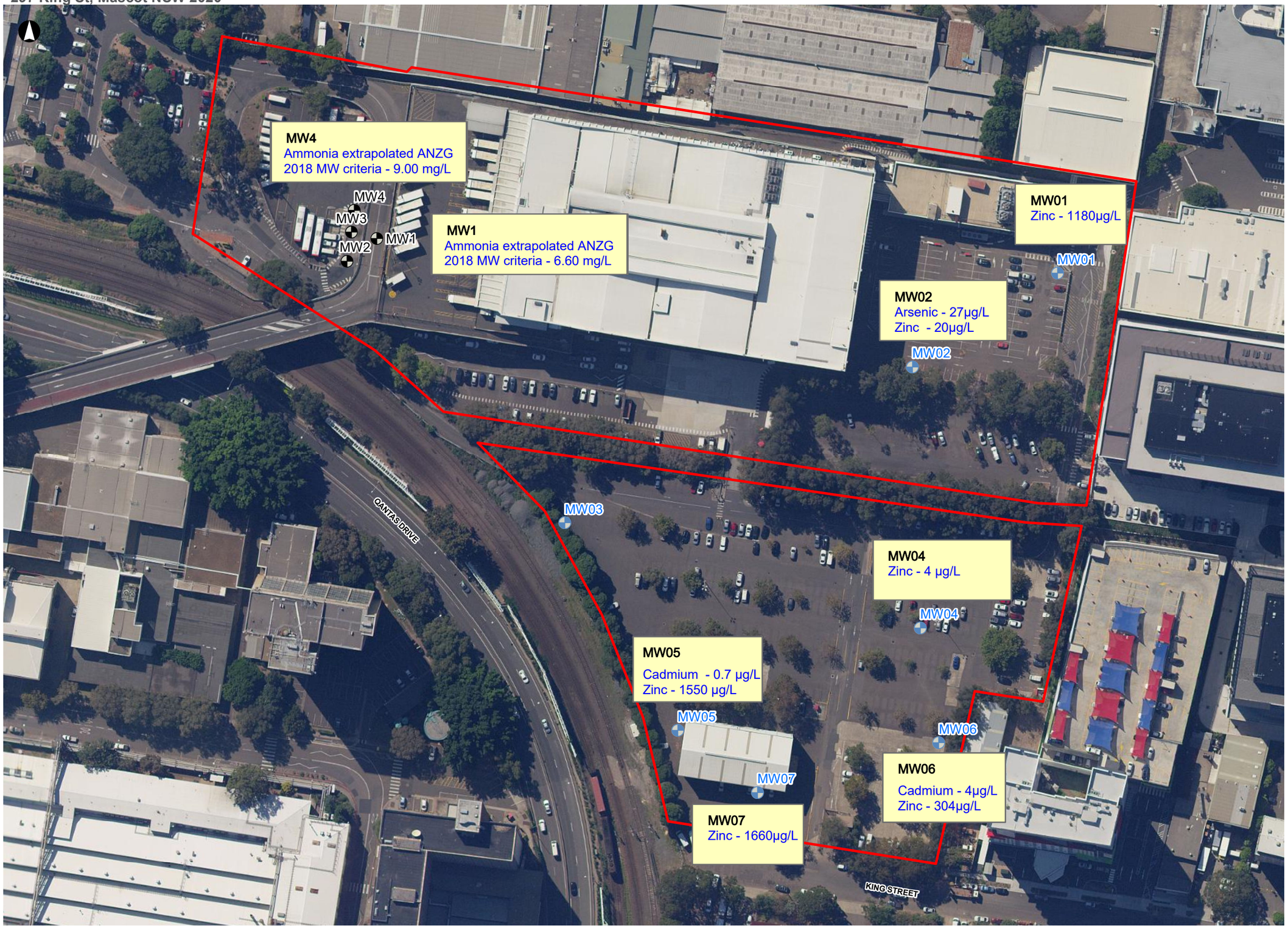
297 King St, Mascot NSW 2020



Guideline

ANZG 2018 Marine Water (95%)
Ammonia as N - 0.91 mg/L
Cadmium - 5.50 µg/L
Copper - 1.30 µg/L
Zinc - 15 µg/L

NEPM 2013 GILs Marine Water
Ammonia as N - 0.91 mg/L
Arsenic - 13 µg/L
Cadmium - 0.70 µg/L
Copper - 1.30 µg/L
Zinc - 15 µg/L

Legend

Site Boundary

Sampling Locations

Monitoring Wells

Existing Monitoring Wells (ES, 2013)

1:1,300 at A3

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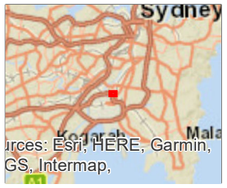

Figure 4b - Groundwater Exceedances

0 12.5 25 50 75 100
m

Date: 15/02/2019 Path: C:\Arc Templates\Temporary Projects\10026439 - King Street North\10026439 - Figure 2 - Sampling Locations_V2.mxd
Created by : Environmental Restoration
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APPENDIX B

Induction Record Sheet

Date	Inductor				Inductee			
	Name	Company	Position	Signature	Name	Company	Position	Signature

APPENDIX C

Asbestos Management Plan

ASBESTOS MANAGEMENT PLAN

Qantas Flight Training Centre and Carpark

297 King St, Mascot NSW 2020

22 MARCH 2019

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QANTAS AIRWAYS LTD
FLIGHT TRAINING CENTRE & CARPARK

ASBESTOS MANAGEMENT PLAN

297 King St, Mascot NSW 2020

Author	James Van Der Helm	
Checker	Loek Munnichs	
Approver	Loek Munnichs	

Report No	10026439 AMP
Date	22/03/2019
Revision Text	R00

This report has been prepared for Qantas Airways Ltd in accordance with the terms and conditions of appointment for Construction Environmental Management Plan (CEMP), Qantas Flight Training Centre and Carpark - 297 King Street, Mascot NSW dated 1st March 2019. Arcadis Australia Pacific Pty Limited (ABN 76 104 485 289) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

REVISIONS

Revision	Date	Description	Prepared by	Approved by
0	14/03/19	Draft AMP for internal review.	JV	LM
R00	22/03/19	Final – AMP	JV	LM

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1 INTRODUCTION

Arcadis Australia Pacific Pty Ltd (Arcadis) was commissioned by Qantas Airways Ltd (Qantas) to prepare an Asbestos Management Plan (AMP) accordance with the technical requirements of the Secretary's Environmental Assessment Requirements (SEARs) and in support of the State Significant Development (SSD) for the development of a new flight training centre at 297 King Street, Mascot, NSW 2020 herein referred to as 'the site'. The location of the subject site is shown on **CEMP Figure 1, Appendix A**.

*This AMP is intended to be included the Construction Environment Management Plan (CEMP) for the site in **Appendix C**. Detailed Site and Project descriptions are included in Section 1.0 of the CEMP main text and are not repeated here.*

1.1 Background

Qantas engaged Arcadis to complete an additional Environmental Site Assessment (ESA) at site. A summary of the ESA findings regarding Asbestos are provided below.

Fill material was generally observed across the site to a maximum depth of 3.50 m below grade.

Asbestos was positively identified in two (2) soil samples (MW5@1.0m and MW4@0.5m) out of the 47 soil samples analysed for asbestos.

Quantification was undertaken on all 47 samples and only in one (1) sample (MW5@1.0m) Asbestos Fines/Fibrous Asbestos (AF/FA) was detected above the detection limit. Asbestos ID and Quantification was undertaken in accordance with AS 4964 – 2004.

The laboratory provided the following comments:

- MW05@1.0m: Mid brown sandy soil plus three fragments of asbestos fibre board approx. 5 x 5 x 4mm plus several asbestos fibre bundles approx. 5 x 1 x 0.5mm; and
- MW04@0.5m: Mid brown sandy soil containing one piece of asbestos cement sheeting approx. 25 x 20 x 5mm;
- BH44 – PACM: One (1) fragment of asbestos cement sheeting approximately 35x20x5mm.

The asbestos AF/FA concentration in MW5@1.0m was 0.036 %w/w (criteria is 0.001 %w/w). The majority of the AF/FA in this samples is due to 3 pieces of ACM <7.0 mm. The type of Asbestos analysed in this sample is Chrysotile. Whilst referring to the 2009 WA Asbestos guidelines, no distinction has been made between the different types of asbestos and the potential health impacts posed by different asbestos minerals, such as chrysotile and crocidolite, and fibre dimensions can be treated as equivalent.

However, EnHealth (2005) provides reference to Hodgson and Darnton (2000) who reviewed several occupational cohorts and concluded that the risk of mesothelioma for chrysotile, amosite and crocidolite is 1:100:500 respectively (i.e. the risk from crocidolite could be 500 times higher than for chrysotile). Other estimates of increased mesothelioma risk from mixed amphibole exposure are variable (3–5, 15 and 30 times the risk from chrysotile alone) (Berman et al., 1995; Churg, 1988).

Based on the following, Arcadis is of the opinion that Asbestos is not a Chemical of Concern (CoPC) for this site and that asbestos remediation is not warranted.

- Asbestos (mostly ACM) was only detected in 2 out of 47 samples;

- The least toxic form of asbestos (Chrysotile) was found to be present in the AF/FA sample; and
- Currently the locations where asbestos was detected are covered by hard stand and there are no immediate human health risks.

Arcadis (2019) recommended preparation of an AMP (this Plan) that is to be implemented during construction phase. If excavation in proximity to MW04 and MW05 (plus unexpected finds) is required and the material requires disposal, the waste should be classified as Special Waste in accordance the NSW EPA Waste Classification Guidelines. This material needs to be kept separate from other excavation material and validation (from a waste classification perspective) might be required to show that all asbestos material has been segregated. These works should be undertaken by a Class A Asbestos removalist.

The AMP provides guidance to appropriately manage any spoil that is excavated during construction of the pool and lift well excavations, service and utilities trenches and building footings.

1.2 Asbestos Containing Material

Asbestos is a term for a group of six naturally occurring mineral fibres belonging to two groups:

- Serpentine Group – comprised of only chrysotile (white asbestos); and
- Amphibole Group – comprised of anthophyllite, amosite (brown asbestos or grey asbestos), crocidolite (blue asbestos), tremolite, and actinolite.

Most Asbestos Containing Materials (ACM) found in the urban environment come in the form of bonded (non-Friable) or commonly referred to as 'Fibro'. When bonded materials are exposed to certain conditions, the bonding agent (usually cement) can breakdown causing the bonded ACM to become friable. Asbestos only poses a risk to human health when asbestos fibres are made airborne and inhaled or ingested. When asbestos is bound in a matrix such as a cement or resin, it is not readily made airborne except through substantial physical damage. Severe weathering or damage (including by vehicle movements) to bonded ACM may also result in the formation of friable asbestos (comprising fibrous asbestos (FA) and asbestos fines (AF)).

The Work Health and Safety (WHS) Regulations require that, where asbestos is identified as contaminating a workplace, a register and asbestos management plan be created for the site.

The management and remediation of sites contaminated with asbestos from demolition works is a specialised task. In some instances, site remediation may entail removal of asbestos and ACM from the site; in other cases, this may not be practicable, and other management strategies should be used. Engaging specialists who may include (Class A) asbestos removalists is highly recommended for all but the most minor works associated with the demolition of structures containing ACM.

- A person with management or control of a workplace must ensure a written asbestos management plan (AMP) is prepared for the workplace if asbestos or ACM has been identified or assumed present or is likely to be present from time to time at the workplace. The asbestos management plan must be maintained to ensure the information is up-to-date.

1.3 Site Identification

Refer to *Table 1.3* below for the relevant site identification details.

Table 1.3: Site identification details

Site Characteristics	Details
Street Address	297 King St, Mascot NSW 2020
Lot and Deposited Plan	Lot 133 DP 659434; Lot B DP 164829; Lot 1 DP 202747; Lot 4 DP 234489; and Lots 2-5 DP 234489.
Local Government Area	Bayside Council
Land Use Information	IN1 – General Industrial' under the Botany Bay Local Environmental Plan 2013
Site Coordinates to the approximate centre of the site (Geographic)	Latitude: -33.926712 Longitude: 151.184601
Site Area	5.417 ha

1.4 Project Overview

Arcadis understands the Project is comprised of the following:

- Qantas Group Flight Training Centre will occupy the southern portion of the site; and
- Car Park (13 level multi-deck) located to the north-east of the flight training centre and adjacent the existing Qantas catering facility and tri-generation plant.

Additional detail about the Project is provided in Section 1.0 of the CEMP.

The adopted asbestos management strategy for the Project is:

- Excavation, segregation, stockpiling and validation of soils excavated in the vicinity of MW05@1.0m and MW04@0.5m (assuming excavation in proximity to these locations is required);
- Waste Classification of stockpiled spoil (potentially impacted soils);
- Transport of asbestos contaminated spoil material by an appropriately licensed contractor; and
- Offsite disposal of asbestos contaminated soils to an appropriately licensed facility.

1.5 Objectives

This AMP has been prepared to comply with Council requirements and assist Qantas and any sub-contractors with the management of the asbestos within any spoil excavated during the construction and excavations for the pool, lift wells, services and utilities trenches, footings and foundations.

Based on Arcadis (2019), excavation works in asbestos contaminated materials will be required in the vicinity of MW05@1.0m and MW04@0.5m.

If, during other excavation works, asbestos is found, the Unexpected Finds Protocol will be activated and excavation works should comply with this AMP.

2 LEGISLATION AND GUIDELINES

All works on the site must be undertaken with all due regard to the environment and to statutory requirements. Work on site is to comply with the requirements of the following NSW legislation and guidelines:

- WorkSafe Australia; How to manage and control asbestos in the workplace - Code of Practice, 2018;
- WorkSafe Australia; How to safely remove asbestos - Code of Practice (2018);
  - The Codes of Practice are approved code of practice under section 274 of the Work Health and Safety Act (the WHS Act);
  - Adopted in full by WorkCover NSW;
- Protection of the Environment (Operations) Act 1997;
- Protection of the Environment Operations (Waste) Regulation 2014;
- NSW Environment Protection Authority (2014) Waste Classification Guidelines;
- NSW Safework (2014) 'Managing asbestos in or on soil';
- National Environment Protection (Assessment of Site Contamination) Measure 1999 amended May 2013 (ASC NEPM 2013).

According to The Work Health and Safety **Act 2011** (the **WHS** Act) Section 47 - *The WHS Act requires the person conducting a business or undertaking to consult, so far as is reasonably practicable, with workers who carry out work who are (or are likely to be) directly affected by a work health and safety matter*.

The presence of asbestos on the site and the existence of an AMP are to be explained to all site workers as part of the general site induction, and not only to those who may be completing asbestos related works.

Note that, discussion of asbestos issues in the induction is not to inform workers how to do work related to asbestos, as they are required to be licenced, rather it is to inform all workers that:

- Asbestos exists within the soils on the site;
- The requirements for works requiring the penetration of surfaces (E.g. drilling or cutting into existing surfaces);
- Intrusive earthworks or surface disturbance in areas of the site where asbestos has been identified;
- A copy of the AMP is to be maintained on site during the course of site works/operations.

3 ROLES AND RESPONSIBILITIES

A guide to the roles and responsibilities of the stakeholders is presented in the following sections.

3.1 Project Manager

The Qantas nominated Project Manager (PM may be the construction contractor) who is responsible for the daily operations of the site, will be responsible for the implementation, maintenance and compliance with the requirements of this AMP. The PM or equivalent representative will be responsible for the following:

- Ensuring that all contractors who will undertake work on the site are inducted and understand the potential contamination issues related to the site.
- Maintaining the following records during the life of the project:
  - Details of all inducted personnel approved to undertake work on the site. As outlined in Section 5.2;
  - Records of unexpected finds on the site;
  - Assessment reports for the classification of soil (e.g. application for the disposal of soil as waste);
  - Records of approvals to remove or dispose soil from the site;
  - Soil tracking information for material that is either removed from the site or brought to the site for use.

3.2 Site Workers / Sub-Contractors

Any sub-contractors engaged to conduct work on the site will be required to comply with the AMP by:

- Ensuring they are inducted and where appropriate understand the requirements of the AMP;
  - See Section 2 of the AMP for guidance as to the need to refer to the AMP;
- Report to Qantas PM any occurrences of material suspected of containing asbestos; and
- Undertake tasks as required by Qantas.

3.3 Environmental Consultant

A suitably qualified environmental consultant should be available to provide advice and support should material considered to be potential ACM be encountered. The primary responsibilities of the environmental consultant are as follows:

- When required, undertake an assessment of risk for material suspected of being ACM or contaminated by asbestos this may include;
  - A Safe Work Method Statement (SWMS), Work Method Statement (WMS), Job Safety & Environment Analysis (JSEA) and Job Safety Analysis (JSA) are documents that describe how work is to be carried out safely. Some states and territories often use JSA or JSEA to describe a SWMS (which is used in NSW).
- Provide advice to Qantas PM with regards to the management or disposal of contaminated soil. This may include recommendations for further assessment or disposal of contaminated material in accordance with Section 4.2 and Section 4.3 of this AMP.

- When ACM is suspected, the material is to be sampled and tested, and then treated appropriately as a result of the testing.
- In the case that offsite disposal is either required or desirable, the environmental consultant shall:
  - Undertake sampling as required for the classification of contaminated material in accordance with the relevant legislation and guidelines;
  - Prepare correspondence for submission to Council and/or the Auditor (if required) for the removal of soil from the site.

3.4 Licenced Asbestos Contractor

In accordance with the WHS Regulation 458:

> A person conducting a business or undertaking who commissions the removal of asbestos at the workplace must ensure asbestos removal work is carried out only by a licensed asbestos removalist who is appropriately licensed to carry out the work, unless specified in the WHS Regulations that a licence is not required.

There are two types of licences: Class A and Class B, refer Table 3.4 below. The type of licence required will depend on the type and quantity of asbestos or ACM that is being removed at a workplace.

Table 3.4: Asbestos licences

Type of Licence	What asbestos can be removed?
Class A	Can remove any amount or quantity of asbestos or ACM, including: • Any amount of friable asbestos or ACM • Any amount of Asbestos-contaminated dust or debris (ACD) • Any amount of non-friable asbestos or ACM
Class B	Can remove • Any amount of non-friable asbestos or ACM Note: A Class B licence is required for removal of more than 10 m^2 of non-friable asbestos or ACM but the licence holder can also be removed up to 10 m^2 of non-friable asbestos or ACM. • ACD associated with the removal of non-friable asbestos or ACM. Note: A Class B licence is required for removal of ACD associated with the removal of more than 10 m^2 of non-friable asbestos or ACM but the licence holder can also remove ACD associated with removal of up to 10 m^2 of non-friable asbestos or ACM.
No Licence Required	Can remove: • Up to 10 m^2 of non-friable asbestos or ACM • ACD that is: – Associated with the removal of less than 10 m^2 of non-friable asbestos or ACM – Not associated with the removal of friable or non-friable asbestos and is only a minor contamination.

Examples of tasks which typically do and do not require an appropriate licence are provided in Section 1.2 of the WorkSafe Australia; How to safely remove asbestos - Code of Practice, 2018.

3.5 Reviewing the Asbestos Management Plan

According to the requirements of the WHS Regulation 430, Qantas must ensure the AMP is reviewed and, if necessary, revised at least once every five years or when:

- there is a review of the asbestos register or a control measure;
- asbestos is removed from or disturbed, sealed or enclosed at the workplace (e.g. after the proposed demolition of existing buildings on Site);
- the plan is no longer adequate for managing asbestos or ACM at the workplace;
- A health and safety representative requests a review if they reasonably believe that any of the matters listed in the above points affects or may affect the health and safety of a member of their work group and the asbestos management plan was not adequately reviewed.

Based on Arcadis (2019), excavation works of asbestos contaminated soils may be required in the vicinity of MW05@1.0m and MW04@0.5m (*plus unexpected finds*). Depending on the desired management strategy, this AMP is no longer applicable after excavation works in the vicinity of known ACM contamination is completed or after known ACM hotspots have been excavated, validated and backfilled.

3.6 Accessing the Asbestos Management Plan

According the requirements of WHS Regulation 429, Qantas PM must ensure the AMP is readily accessible to:

- Workers who have carried out, carry out or intend to carry out work at the Site;
- Health and safety representatives who represent workers that carry out or intend to carry out work at the Site;
- A person conducting a business or undertaking who has carried out, carries out or intends to carry out work at the Site; and
- A person conducting a business or undertaking who has required, requires or intends to require work to be carried out at the Site.

The AMP should be kept at the Site to ensure it is accessible.

4 ENVIRONMENTAL MANAGEMENT

4.1 Identification of Additional Material Suspected of Containing Asbestos

Asbestos or ACM have been detected in fill material at the Site with the distribution of the contamination likely to be isolated and difficult to assess given the site history (i.e. importation of filling of unknown origin). In addition, fill materials were observed to contain anthropogenic inclusions and former demolition activities have occurred at the site. The potential for additional ACM, therefore, cannot be discounted in fill materials across the site.

Should additional material be encountered that is suspected of containing asbestos or other unexpected finds, then work must stop immediately, and Qantas PM be informed of the presence of the material. The following actions are to be undertaken:

- In accordance with WHS Regulation 422, a person with management or control of a workplace must:
  - assume the material is asbestos or ACM if it cannot be identified but a competent person reasonably believes it is asbestos or ACM; and
  - assume asbestos is present if part of the workplace is inaccessible and it is likely to contain asbestos or ACM.
- It is not necessary to engage a competent person to identify asbestos if the person with management or control of the workplace assumes that asbestos is present or if that person has reasonable grounds to believe that asbestos is not present;
- Material that is suspected of containing asbestos must be labelled or signposted as contaminated with asbestos. Signs notifying site workers of the presence of asbestos must be placed on barricades around the area if uncontrolled, to limit the potential for inadvertent exposure;
- All suspicious material must be assumed to contain asbestos until it has been proven otherwise by laboratory analysis; and
- Once positively identified all suspicious material and other unexpected finds are to be surveyed and logged in an Unexpected Finds Register.

5 HEALTH AND SAFETY MANAGEMENT

5.1 AMP Audience and Availability

This AMP provides guidance for safe work practices to protect against possible adverse exposure to occurrences of possible ACM on the site. The AMP is to be made freely available to all Qantas PM site staff and sub-contractors whom may come into contact with ACM during their work on the site.

5.2 AMP Induction Requirements

Prior to commencing intrusive works or works likely to disturb structures or surfaces on the site, in areas identified within the areas of known asbestos contamination (MW05, MW04 plus unexpected finds), all workers must be familiarised with the requirements the AMP.

The initial induction for staff of Qantas PM and other key contractor personnel must be done prior to commencing earthworks or demolition work on the site.

As a minimum the induction must outline the following topics:

- Details of the project;
- Brief history of the site;
- The possibility of contamination being present;
- How to identify material suspected of containing contamination;
- Procedures in the event suspicious material is encountered;
- Requirement for approval from the appropriate regulatory authority to remove any material from the site.

Records of personnel inducted into the AMP must be maintained by Qantas PM, until the conclusion of the closure works.

5.3 Personal Protective Equipment

PPE plays a major role in the protection against exposure to asbestos. The following PPE would be required when working / excavation occurs in the known Asbestos areas (MW05, MW04 plus unexpected finds). The recommended PPE that to all workers whose work has the potential to result in contact with ACM includes:

- Safety glasses;
- Safety boots;
- Coveralls / long-sleeved short and long pants;
- Protective gloves;
- Dust masks to protect against inhalation of dusts and asbestos fibres (for example a Class P2 or P3 mask conforming to AS/NZS 1716:2003 ‘Respiratory Protection Devices’;
- Single use disposable coverall suit for protection against asbestos fibres.

It is the responsibility of the person in control of the site to ensure that workers on the site have the appropriate PPE and that it is used when necessary. PPE must be inspected for damage, correctly fitted, cleaned and maintained.

Note that additional PPE to that listed above may also be required for specific occupational tasks, and / or in the event that potential ACM is encountered. For the

latter, specific task specific guidance regarding additional PPE is to be provided by a licensed asbestos assessor.

5.4 Records

Detailed records must be kept regarding implementation of the AMP. Qantas PM and their sub-contractors will maintain relevant records, including but not necessarily limited to the following:

- Records regarding correspondence relating to notification of site access issues including;
  - unauthorised access to site;
  - workers undertaking tasks without the proper induction; and/or
  - workers undertaking tasks without the appropriate licencing;
- Records regarding AMP familiarisation including:
  - Who has been familiarised with the requirements of the EMP including their signature confirming their understanding of the AMP requirements;
  - The name of their employer / organisation;
  - When the person was trained;
  - The name, signature and employer / organisation of the Supervisor who is confirming the AMP familiarisation has taken place; and
  - Copies of any training certificates applicable to the type of work to be conducted at the site, conducted by the worker as it pertains to the requirements of the AMP.
- Records regarding maintenance and / or construction workers undertaking works with the potential to disturb soil (for example, names of contractors, personnel and companies, type and date of work, locations and depths, confirmation of asbestos awareness course training);
- Details of any potential ACM observed which is not recorded on the Site Asbestos Register and associated follow-up actions;
- Details of any environmental issues / complaints associated with any works pertaining to ACM or potential ACM (irrespective of the form of the communication), including the name and contact details of the person making the complaint, date and time of the complaint, and the associated corrective measures.
- This information may be recorded as part of an existing complaint process.

The complaint register along with all records are to be maintained on the Site and be available for inspection by the Regulator.

5.5 Managing of Risks

Non-friable asbestos, previously referred to as ‘bonded asbestos’, in sound condition represents a low human health risk. However, friable asbestos materials or damaged, crumbling bonded asbestos, have the potential to generate, or be associated with, free asbestos fibres and therefore must be carefully managed to minimise the release of asbestos fibres into the air. Non-friable asbestos is asbestos bound in a matrix such as cement or resin. Fibro is the most common form of non-friable asbestos. When in a sound condition, the potential for these materials to release fibres is relatively low.

Friable asbestos is usually in the form of loose asbestos that is not bound together. The most common forms of friable asbestos are thermal lagging used on steam

pipes, boilers, as fire protection, ceiling insulation and the like, and raw asbestos waste from asbestos products manufacturing. Friable asbestos can usually be broken up or crumbled using hand pressure to generate free fibres. If it is disturbed, friable asbestos has the potential to generate significant quantities of airborne fibres, and because of this requires a high level of control.

5.6 Procedure for Management of Bonded ACM

Only workers who have been appropriately trained in asbestos removal techniques, that include identification, safe handling and suitable control measures, may conduct asbestos removal work or asbestos related work at a workplace. SafeWork Australia has published 'How to safely remove asbestos code of practice' (2018) which provides additional information on safety standards when removing asbestos.

For non-friable asbestos totaling greater than the equivalent of 10 m^2 of fibro sheet or fragments, only a class A or B asbestos removal licence holder may conduct the asbestos removal work. If there is uncertainty about the quantity of asbestos material, a licensed removalists (Class A) must be engaged. All workers involved in removing fragments of non-friable asbestos constituting a total of greater than 10 m^2 of fibro, must hold current certification showing that they have successfully completed the approved non-friable removal course.

The following procedures must be followed to effectively manage the handling and movement of asbestos impacted soils (if encountered):

- Set up of exclusion zone around asbestos impacted areas including visible signage notifying workers of the presence of asbestos within the area;
- Site inductions for workers conducting non-asbestos related work and workers handling the asbestos impacted materials or surface ACM;
- Emu bob (hand-picking) to the remove ACM fragments from the surface by suitably qualified asbestos personal/contractor or personnel trained to handle ACM removal;
- All ACM should be double bagged in plastic bags identified with Asbestos labelling clearly marked on the outside;
- Suitable PPE including dust masks that conform to the Australian/New Zealand Standard 1715 Selection, Use and Maintenance of Respiratory Protective Equipment (usually a class P2 twin strap disposable respirator is appropriate for asbestos) must be worn along with cut resistant gloves. Disposable coveralls should be used to prevent the contamination of clothing and footwear. All PPE should be a 'wear once only' usage. Keep the respirator on until the work session has been completed, the cleaning is done, and contaminated clothing and PPE has been removed, bagged and sealed;
- Any machinery (i.e. excavators and / or trucks) that are required to conduct work on the site will need to be enclosed (windows wound to the full up position) with re-circulatory positive pressure cab-. Movement outside of the vehicle should be conducted with the required PPE. Equipment and PPE must be handled as outlined in Section 5.3;
- Excavation of service trenches or other earth disturbing activities should have the additional procedures undertaken;
  - Air monitoring during removal of asbestos impacted soils;
    - Excavation of asbestos impacted soils to below desired level of finished redevelopment by Class-B licensed removalists;
    - Movement of impacted materials directly from work zone via tip truck to an approved EPA licenced landfill. No long-term stockpiling of impacted soils is permitted. Stockpiling of impacted soils, unless conducted on

appropriately sealed ground requires additional sampling of the stockpile footprint to ascertain that no residual impacted soils are present onsite;

- Wetting down of materials during excavation / demolition works, transportation, backfilling and surrounding areas while excavation of impacted soils occurs; and
- Decontamination area for workers and vehicles.

5.7 Procedure for Management of Friable ACM

The following procedures must be followed to effectively manage the relocation of friable asbestos impacted soils:

- Isolate and secure the area by installing warning signs and a temporary barricade (e.g. marker tape) around the affected area to prevent anyone from accidentally disturbing the materials and generating airborne asbestos fibres to minimise the release of fibres into the air keep soil / material damp (but not flooded); and, if it is safe to do so, cover the area with plastic sheeting;
- Engage an independent expert as soon as practicable to provide specialist advice on how to manage the situation.

Material identified or appears to have undergone some weathering, should be considered as 'potential friable asbestos' as any further weathering of the boned ACM fragments may cause the material to be classified as 'friable'. The procedures mentioned in the above dot points may not need to be conducted if the material is immediately removed by a licensed removalist (Class A).

In NSW, only Class A asbestos removal licence holders are permitted to conduct asbestos removal work or asbestos related work that involves friable asbestos. All workers involved in friable asbestos removal work must hold current certification in relation to the approved friable removal course.

Where friable asbestos is present only a licensed asbestos assessor may undertake air monitoring, risk assessments and issue clearance certificates for removal work.

The following procedures must be followed to effectively manage the relocation of asbestos impacted soils during excavation of service trenches or other earth disturbing activities such as excavation near known asbestos contamination:

- Air monitoring during removal of asbestos impacted materials;
- Excavation of asbestos impacted soils to between 0.5 -1.0 m below desired level of finished redevelopment by Class-A licensed removalists:
- Movement of impacted materials directly from work zone via tip truck to an approved EPA licenced landfill. No long-term stockpiling of impacted soils is permitted. Stockpiling of impacted soils, unless conducted on appropriately sealed ground requires additional sampling of the stockpile footprint to ascertain that no residual impacted soils are present onsite;
- Wetting down of materials during excavation / demolition works, transportation, backfilling and surrounding areas whist excavation of impacted soils occurs; and
- Decontamination area for workers and vehicles refer to Section 7.4.

5.8 Procedure for the Disposal of ACM Material

Asbestos waste must be disposed in accordance with the regulatory requirements under clause 42 of the Protection of the Operations (Waste) Regulation 2014 which apply to asbestos waste and includes:

- Asbestos waste stored onsite prior to disposal must be done so in an environmentally safe manner;
- Non-friable asbestos must be securely packaged at all times;
- Friable asbestos (if encountered) must be kept in a sealed container;
- Asbestos contaminated soil must be wetted down;
- All asbestos waste must be transported in a covered, leak-proof vehicle (applicable to asbestos impacted soil);
  - This requirement should be adopted for both onsite and offsite transport of asbestos waste;
- Asbestos waste can be disposed of:
  - Onsite if regulatory and development approval is secured prior to the disposal; or
  - at a landfill site that can lawfully receive this waste. It is recommended that the landfill is contacted beforehand to find out if the facility can receive the waste and whether there may be any special requirements;
- It is illegal to dispose of asbestos waste in domestic garbage bags;
- It is illegal to re-use, recycle or dump asbestos waste.

If friable asbestos waste requires disposal, then only a person with a Class A removal license is permitted to remove the waste material and air monitoring will be required to be undertaken by a licensed asbestos assessor.

If more than 100 kg of asbestos waste or 10 m^2 of asbestos sheeting is proposed to be removed from the Site, then information is to be provided to the EPA, under the NSW EPA Asbestos and Waste Tyre Guidelines 2015. This guideline contains the legal requirements that consignors, transporters and occupiers of premises must meet in addition to the Waste Regulations.

It is recommended that the requirements provided within the guidelines for the offsite transport and disposal of asbestos or other waste types are similarly adopted, <u>as appropriate</u>, as best practice for management of the onsite transport and disposal of asbestos and inert wastes.

From the guidelines, the following requirements for transporting Asbestos Waste are noted:

- A transporter of Asbestos Waste must be registered as a transporter of Asbestos Waste on WasteLocate before any transport of Asbestos Waste is to occur.
- The transporter of Asbestos Waste must provide the following information to the NSW EPA upon registration on WasteLocate (https://wastelocate.epa.nsw.gov.au) no later than on delivery of its first load of Asbestos Waste to the receiving facility:
  - Name and address of the transporter;
  - Mobile telephone number of the transporter's registered driver*;
  - Email address of the transporter;
  - Trading name or agency name of the transporter;
  - Drivers licence number of the transporter's registered driver*;
  - Postal address of the transporter, if different from address;
  - Primary telephone number of transporter;

  - The Australian Business Number (ABN) for the transporting company (if the entity has an ABN); and
  - WorkCover licence number of the transporter, if held.
- The transporter of a load of Asbestos Waste must provide the following information to the NSW EPA by using WasteLocate before the transportation of any load of Asbestos Waste:
  - The type of Asbestos Waste in the load;
  - vehicle registration;
  - number of the vehicle driven by the transporter's registered driver for the specific consignment.

6 HEALTH & SAFETY (ASBESTOS MATERIAL ASSESSMENT AND REMOVAL)

This section describes the process that should be considered prior to undertaking any earthworks. ACM at the site requires careful management in order to mitigate potential health risks to occupants of the site.

6.1 Potential Exposure Pathways

Workers involved in disturbing the known impacted soil, and surrounding stakeholders, could be exposed by:

- Respiration of dust or potential fibres generated from the soil;
- Dermal contact with asbestos contaminated soils;
- Ingestion of asbestos contaminated soils; and
- Possible secondary exposure from contaminated equipment or clothing.

Planning of the earthworks involving exposure and / or disturbance of ACM impacted soils in the vicinity of MW05 and MW04 (plus unexpected finds) and implementation of appropriate health and safety measures, will minimise the potential for contact with contaminated materials through the above listed pathways.

All machinery (i.e. excavators and / or trucks) that are required to conduct work on or pass over the site will need to be enclosed (windows wound to the full up position) with re-circulatory positive pressure cab. Movement outside of the vehicle should be conducted with the required PPE. Equipment and PPE must be handled as outlined in Section 5.3 and 7.4 unless done in a designated clean area of the site.

6.2 Training Requirements

If not already covered in the general site induction the person in control of the site must ensure that information, training and instruction provided to a worker is suitable and adequate, having regard to:

- The nature of the work carried out by the worker;
- The nature of the risks associated with the work at the time the information, training or instruction is provided; and
- The control measures implemented.

The person in control of the site must, so far as is reasonably practicable, ensure the information, training and instruction is provided in a way that is readily understandable by any person to whom it is provided.

The person in control of the site must ensure workers who they reasonably believe may be involved in asbestos removal work in the workplace or the carrying out of asbestos-related work are trained in the identification, safe handling and suitable control measures for ACM, Friable Asbestos (FA) and Asbestos Fines (AF).

This training should include the following topics:

- Purpose of the training;
- Health risks of asbestos;
- Types, uses and likely presence of asbestos in the workplace;
- The worker's roles and responsibilities under the asbestos management plan;
- Where the AMP is located, how it can be accessed and how to understand the information contained in it;

- Processes and safe work procedures to be followed to prevent exposure, including exposure from any accidental release of airborne asbestos;
- Where applicable, the correct use of PPE including respiratory protective equipment (RPE);
- The implementation of control measures and safe work methods to eliminate or minimise;
- The risks associated with asbestos to limit the exposure to workers and other persons;
- Exposure standard and control levels for asbestos; and
- Purpose of any exposure monitoring or health monitoring that may occur.

The training for earthworks contractors is more general than the training that a worker undertaking asbestos removal work would receive. Further information on these specific training requirements is available in the Code of Practice: How to Safely Remove Asbestos (2018). Records of all training must be kept while the worker is carrying out the work and for five years after the day the worker stops carrying out the work. These records must also be available for inspection by the regulator.

6.2.1 Worker Induction

The person in control of the site will work with contractors to ensure a site-specific induction is provided for all workers before starting work.

This induction must outline:

- The expectations outlined in this AMP, including all policies and procedures;
- The emergency meeting point;
- The site rules;
- The facilities;
- Any site-specific hazards; and
- High risk construction work activities.

6.2.2 Worker Training

The person in control of the site will:

- Ensure workers are trained and competent for the work to be carried out;
- Ensure workers are trained to deal with any risks associated with the work and understand the control measures in place;
- Ensure all workers have had relevant white card training (or other appropriate training from another jurisdiction);
- Ensure on-site training and supervision is provided;
- Organise external training for specific tasks where required;
- Seek high risk licences for all high-risk work and maintain a register of licences; and
- Communicate with other contractors to ensure their workers are appropriately trained and competent.

6.3 Required Preparation Works

Prior to exposing and/or disturbing the known or potential ACM impacted soils by intrusive earthworks or excavation works, the following activities should be carried out and implemented by the party responsible for the disturbance to soil in the affected areas:

- Notification to the person in control of the site to discuss the scope of works to be undertaken, the likelihood of generating dust, excess spoil or waste and the management of this material;
- Ensure contractors / workers are aware of the potential for asbestos contaminated materials to be encountered;
- Setup of work area, and exclusion zone including appropriate signage and barriers;
- Assess proposed scope of works to minimise the requirement to expose and / or excavate asbestos contaminated materials;
- Ensure contractors / workers, where any works involving asbestos contaminated materials is expected or identified, are supervised by an appropriately qualified person as required by the relevant legislation (i.e. Class-A or Class-B licensed contractor);
- Preparation of a specific occupational health and safety plan that caters for the proposed activities / works including the provision of PPE (refer to Section 5.3);
- Consideration and/or preparation of a Dust Management Plan to mitigate/minimise dust generation;
- Consideration of the equipment used to minimise potential soil exposure and dust generation;
- Preparation of a specific environmental protection plan including soil, water and air management protocols;
- Preparation of a methodology for managing excavated soil; and
- Contingency planning to include encountering other suspected asbestos impacted material other than that expected.

It is noted that the information provided in this AMP, although it may be common to other tasks, is generally limited to managing works associated with the disturbance of the known and potentially impacted ACM soils. Planning and implementation of earthworks will also need to consider other environmental, health and safety risks associated with the specific task to be undertaken at that specific location.

6.4 Health and Air Monitoring

Health and air monitoring must be undertaken when a worker is at risk of exposure due to work that is not licensed asbestos removal work. The need for health and air monitoring of these workers should be determined on the basis of the potential for exposure, frequency of potential exposure and duration of the work being undertaken.

Consideration must be given to the worker's demographic, medical and occupational history and records of the worker's personal exposure. The health and air monitoring must include a physical examination of the worker with emphasis on the respiratory system, including standardised respiratory function tests, unless another form of health and air monitoring is recommended by a registered medical practitioner.

Workers must be informed of any health and air monitoring requirements before the worker carries out work that may expose them to asbestos.

All areas or equipment with asbestos or ACM in situ should be assessed by a competent person to determine the appropriate inspection periods to ensure risk

controls are effective. Inspection periods are to be identified and organised by the principal contractor responsible for the area.

Air monitoring for asbestos exposure may be required as result of the assessment and should be conducted by a competent person in accordance with *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition* [NOHSC:3003(2005)].

6.4.1 Air Monitoring During ACM Works

Air monitoring at a total of 3 to 5 air monitoring points is required for excavation works in the known asbestos contaminated areas (MW05, MW04 plus unexpected finds). This monitoring should be conducted by a competent person in accordance with the guidance note mentioned above.

6.4.2 Airborne Asbestos Exposure Standard

Exposure standards set out the airborne concentrations of asbestos, which should not damage the health of workers. The exposure standards for asbestos are:

- Amosite (brown asbestos) 0.1 f/mL (Fibres per millilitre of air);
- Crocidolite (blue asbestos) 0.1 f/mL; and
- Chrysotile (white asbestos) 0.1 f/mL.

Any situations or areas which exceed the asbestos exposure standard are to be controlled to eliminate or minimise risk of exposure.

6.5 Disposal of Excess Spoil

If material is to be disposed to landfill, the assessment and classification and subsequent disposal must be in accordance with the applicable NSW EPA (2014) *Waste Classification Guidelines, Part 1: Classifying Waste*. This may involve analytical testing for the site chemicals of concern. Provisions for temporary storage of excess spoil in an environmentally responsible manner prior to disposal must be undertaken, including:

- Dust suppression;
- Placement of material on a sealed or plastic lined surface;
- Covering of all excavated/stockpiled material; and
- Construction of sediment retention features around stockpiled materials.

The procedure for the disposal of ACM material is covered in Section 5.8 and the requirements of offsite disposal and waste tracking will also need to meet the requirements outlined in the AMP.

6.6 Re-Instatement of Excavations

Following any excavation works including service trenched and footings that involve the disturbance of known and/or potentially impacted ACM soils which are to remain in-situ, the excavation should be reinstated using the following capping methodology:

- the excavation and removal of the impacted soil to a minimum depth to the *below* desired elevation;
- Installation of a geo-textile marker layer within the service trench/footing and extend at least 0.5m beyond the impacted filling along the sides;
- Capping to a minimum thickness of 10 cm; and

Depending on the site management strategy ultimately applied, excavate hotspots for offsite disposal verses known hotspots left undisturbed insitu, a Validation Report should be prepared and / or the EMP updated to show how as built drawings are situated in relation to known / historic ACM contamination. Reports or plan updates are to be prepared by a suitable qualified environmental professional.

7 HEALTH AND SAFETY (EARTHWORKS & EXCAVATION WORKS)

Prior to the performance of any on-site activities involving disturbance of the materials within the affected areas, a detailed management plan should be prepared by the party responsible for managing the works that cause disturbance to soil within the affected areas of the site.

The management plan should be available for review by all stakeholders. The management plan should identify area of works and clean/dirty areas.

7.1 Personal Protective Equipment

PPE shall be used, maintained and disposed of in accordance with Section 5.3 of this AMP.

7.2 Safe Work

To avoid any adverse impacts to site personnel, the minimum PPE requirements given in Section 5.3 should be adhered to at all times within the identified 'working' area. Any disposable "dirty" PPE shall be removed, double bagged and disposed to an appropriately licensed landfill.

On leaving the designated ACM impacted working area, all personnel should remove and dispose of their PPE wash their hands and face thoroughly, including prior to using the toilet, smoking, eating or drinking.

7.3 Onsite Management

The overall objectives of the strategy to be adopted for management of ACM contaminated soils at the affected areas are:

- Ensure all works involving the disturbance of the ACM contaminated soils are conducted under the supervision of a suitably qualified Class A or Class B asbestos licensed contractor;
- Ensure all soil are wetted to reduce the potential generation of dust;
- Minimise erosion at the site, including erosion of soils exposed during excavation and demolition works;
- Protect nearby receiving environments from potential contamination;
- Prevent the re-contamination of areas in which excavation works have been completed via migration of surface water;
- To comply with all regulatory requirements; and
- To facilitate the implementation of the excavation and / or decommissioning programs.

7.3.1 Soil Management

The specific objective of the management of soils relates to the minimisation of cross-contamination to other areas of the site. Measures that can assist in this aspect of site management include, but are not limited to:

- Ensure contaminated site plant are decontaminated prior to commencing work in clean soil;
- Signs and record keeping should indicate the origin and location of contaminated materials;
- No stockpiling of impacted soils (where possible) to prevent cross contamination of clean soils.

- Direct transport form contaminated area to burial site;
- Wetted down area during excavation and dumping with in burial pits;
- Use appropriate waste receptacles for maintenance waste;
- Minimisation of areas of exposed soils, wherever possible, by staging the works, or covering with geotextile warning layer;
- Validated areas should be isolated to prevent cross contamination; and
- Routine site inspections.

7.3.2 Air Quality Management

Earthworks and excavations procedures have the potential to generate significant amounts of dust including free asbestos fibre. Possible dust-generating activities include the mechanical screening of soil and major earth excavations and vehicle movement. The generation of dust should be minimised and meet relevant air quality standards as specified in the NOHSC:1003 (1995) *Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment*.

Dust control measures that may need to be instigated include:

- Minimising volume and area of disturbance;
- Treatment of soil with an appropriate wetting agent before disturbance;
- Using dust suppression during excavation and covers on soil stockpiles;
- Installing wind barriers;
- Using sheltered areas wherever possible;
- Minimising access to contaminated areas, especially by vehicles;
- Monitoring meteorological conditions and modifying or stopping work when they are adverse;
- Regulating the speed of vehicles;
- Implementing a community dust complaint and response system.

Air monitoring when disturbing the soils across the site should be implemented. Any air monitoring of asbestos should be performed in accordance with the NOHSC:3003 (2005) *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres*.

Air monitoring up and down wind of the asbestos impacted area at the exclusion zone boundary should be implemented (with air monitoring filters to be situated within 10 m of the location of asbestos removal work) in conjunction with secondary monitoring locations at the site shed whilst moving or disturbing asbestos impacted soils.

7.4 Decontamination

Decontamination for the work area, workers, PPE and tools used in asbestos removal work is an important process in eliminating or minimising exposure to airborne asbestos fibres, particularly to persons outside the asbestos removal work area. The code of practice list two types of decontamination procedures that may be used:

Wet decontamination, or **wet wiping**, involves the use of damp rags to wipe down contaminated areas. Cleaning rags should only be used once, although they may be re-folded to expose a clean surface. The rags should be used flat and should not be wadded. If a bucket of water is used, the rags should not be re-wetted in the bucket, as this will contaminate the water. Care should be taken to avoid any potential electrical hazards when using this procedure.

Dry decontamination should be only used where wet methods are not suitable or pose a risk because of other hazards such as electricity or slipping. Dry decontamination procedures include carefully rolling or folding up and sealing plastic sheeting and/or vacuuming the asbestos work area with an asbestos vacuum cleaner. Large pieces of asbestos debris should be wetted and picked up by hand rather than vacuumed.

7.4.1 Decontamination of Tools, Equipment, or Machines

All tools / equipment used during earthworks / excavations of asbestos impacted soils should be fully dismantled (where appropriate), cleaned under controlled conditions and decontaminated using either the wet or dry decontamination procedures before they are removed from the removal work area. The method chosen will depend on its practicality, the level of contamination and the presence of any electrical / mechanical hazards.

If tools cannot be decontaminated in the asbestos impacted work area, or are to be reused at another asbestos impacted work area, they should be:

- Tagged to indicate asbestos contamination; and
- Double bagged in asbestos labelled bags before removing from the asbestos removal work area.

The bags containing the tools must remain sealed until decontamination or the commencement of the next asbestos maintenance or service task where the equipment can be taken into the removal work area and reused under full control conditions.

PPE should be worn when opening the bag to clean or reuse the equipment or tools, and decontamination should only be performed in a controlled environment.

In some circumstances, it may be better to dispose of contaminated tools and equipment, depending on the level of contamination and the ease of replacement.

All machinery (i.e. excavators and / or trucks) that are required to conduct work on or pass over the site will need to be enclosed (windows wound to the full up position) with re-circulatory air functioning working. Movement outside of the vehicle should be conducted with the required PPE unless done in a designated clean area of the site.

All machines used during earthworks / excavations of asbestos impacted soils should be fully dismantled (where appropriate), cleaned under controlled conditions and decontaminated using either the wet or dry decontamination procedures before they are removed from the removal work area. The method chosen will depend on its practicality, the level of contamination and the presence of any electrical / mechanical hazards.

7.4.2 Personal Decontamination Procedures

Personal decontamination involves the removal of all visible asbestos dust/residue from PPE and RPE. Personal decontamination must be undertaken each time a worker leaves the asbestos removal work area and at the completion of the asbestos maintenance or service work. Personal decontamination should be done within the asbestos removal work area to avoid recontamination. Personal decontamination should be carried out where a decontamination unit is not necessary such as during minor or small-scale removal and maintenance work.

Asbestos-contaminated PPE must not be transported outside the asbestos removal work area except for disposal purposes. Before work clothes and footwear worn during asbestos removal work are removed from the asbestos removal work area for any reason, they should be thoroughly vacuumed with an asbestos vacuum cleaner to remove any asbestos fibres and the footwear should also be wet wiped.

PPE should be used until all contaminated disposable coveralls and clothing has been vacuum cleaned and/or removed and bagged for disposal and personal washing has

been completed. Any PPE used while carrying out asbestos removal work must not be taken home by a worker.

Personal hygiene and careful washing are essential. Particular attention should be paid to the hands, fingernails, face and head. Personal Decontamination procedures are provided in Table 7.4, below.

Table 7.4: Personal Decontamination (SafeWork Australia, October 2018)

Personal Decontamination
• Remove any visible asbestos dust/residue from protective clothing using an asbestos vacuum cleaner or wiping down with damp cloths. Do not reuse or resoak damp cloths. • Carefully remove disposable protective clothing and place into bags (RPE must still be worn). • Place cloths into disposal plastic bags (200 µm thick). • Take disposable coveralls off and place into disposal bags (RPE must still be worn). • Use damp cloths to wipe down footwear and place cloths into disposal bag. • Seal all plastic bags with duct tape and place each into a second plastic bag. • Seal this second plastic bag and label/mark as ‘Asbestos Waste’. • Use damp rags to wipe external surfaces of the disposal bags to remove any dust before it is removed from the asbestos removal work area. • Remove PPE and double bag, seal with duct tape and mark as ‘Asbestos Waste’. • Remove non-disposable PPE and place in container labelled as containing asbestos. • Remove RPE and double bag, seal with duct tape and mark as ‘Asbestos Waste’. • Ensure the outside of the bags are decontaminated by using a damp cloth. • Place the damp cloth into disposable bags. • Dispose of asbestos waste at the appropriate waste facility

10 VARIATIONS TO THE AMP

Should site conditions change which require an amendment to the AMP, then the variations should be completed by a suitably qualified environmental consultant.

Any variations to the AMP must be documented, Qantas PM and their nominated representative will be responsible to ensure all revisions to the AMP are appropriately distributed.

11 REFERENCES

Arcadis (2019). Environmental Site Assessment (ESA), January 2019.

Arcadis (2019). Remediation Action Plan (RAP), February 2019.

Arcadis (2019). Construction Environmental Management Plan (CEMP) March 2019.

National Environment Protection Council (NEPC, 10th December 1999) as amended 11th April 2013, *National Environment Protection (Assessment of Site Contamination) Measure* [NEPM].

Code of Practice for the Safe Removal of Asbestos 2nd Edition [NOHSC:2002(2005)]

NSW Office of Environment & Heritage (NSW OEH, August 2011) *Guidelines for Consultants Reporting on Contaminated Sites.*

New South Wales Environment Protection Authority (NSW EPA, November 2014) *Waste classification guidelines Part 1: Classifying waste*

WorkSafe Australia; How to safely remove asbestos - Code of Practice, 2018;

Protection of the Environment (Operations) Act 1997;

Protection of the Environment Operations (Waste) Regulation 2014; and

NSW WorkCover (2014) *Managing Asbestos in or on Soil.*

Work Health and Safety Regulation 2011.

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APPENDIX D

Templates and Forms

- Excavated Material Tracking Form;
- Material Tracking Sheet;
- Stockpiled Material Reuse Form;
- Waste Tracking Form; and
- Waste Classification Form.

EXCAVATED MATERIAL TRACKING FORM

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Stockpile ID_____ Form No._____ of_____

Material excavated from_____

_____ Date Excavated_____

Material Type Soil ☐ Rock ☐ Building Debris ☐ Waste ☐ Asbestos ☐

If material is a mixture, has it been separated into material types? Yes ☐ No ☐

Material for stockpiling inspected by (Name & Date)_____

If to be stockpiled, has signage been prepared? Yes ☐ No ☐

Estimated volume (m^3)_____ Has stockpile area been prepared? Yes ☐ No ☐

Stockpile area will be required to be prepared according to the material suitability (see below).

Material assessed as suitable for: Stockpiling ☐ Landfarming ☐ Disposal ☐

If material is intended for disposal it will be required to be classified and tracked under a separate Waste Tracking Form in accordance with the NSW EPA (2014) Waste Classification Guidelines

Is stockpiled material intended for Onsite reuse ☐ Recycling ☐

Transport & delivery to S/pile area observed by (Name & Date)_____

Has material been sampled? Yes ☐ No ☐

Have samples been submitted to lab? Yes ☐ No ☐

Date last samples submitted_____ Date last results received_____

Samples analysed for TRH ☐ BTEXN ☐ PAH ☐ Metals (x8) ☐
Asbestos ☐ Other_____

Samples exceed adopted SAC TRH ☐ BTEXN ☐ PAH ☐ Metals (x8) ☐
Asbestos ☐ Other_____

If samples exceed for metals, has leaching potential been assessed? TCLP ☐

Is material ready for reuse? Yes ☐ No ☐

If material is being reused on site it will be required to be tracked under a separate Soil Reuse Tracking Form

The information above is verified by (Name & Signature)_____

Date_____

EXCAVATED MATERIAL TRACKING FORM

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Stockpile ID _____ Form No._____ of _____

Material excavated from _____

_____ Date Excavated _____

Material Type Soil ☐ Rock ☐ Building Debris ☐ Waste ☐ Asbestos ☐

If material is a mixture, has it been separated into material types? Yes ☐ No ☐

Material for stockpiling inspected by (Name & Date) _____

If to be stockpiled, has signage been prepared? Yes ☐ No ☐

Estimated volume (m^3) _____ Has stockpile area been prepared? Yes ☐ No ☐

Stockpile area will be required to be prepared according to the material suitability (see below).

Material assessed as suitable for: Stockpiling ☐ Landfarming ☐ Disposal ☐

If material is intended for disposal it will be required to be classified and tracked under a separate Waste Tracking Form in accordance with the NSW EPA (2014) Waste Classification Guidelines

Is stockpiled material intended for Onsite reuse ☐ Recycling ☐

Transport & delivery to S/pile area observed by (Name & Date) _____

Has material been sampled? Yes ☐ No ☐

Have samples been submitted to lab? Yes ☐ No ☐

Date last samples submitted _____ Date last results received _____

Samples analysed for TRH ☐ BTEXN ☐ PAH ☐ Metals (x8) ☐
Asbestos ☐ Other _____

Samples exceed adopted SAC TRH ☐ BTEXN ☐ PAH ☐ Metals (x8) ☐
Asbestos ☐ Other _____

If samples exceed for metals, has leaching potential been assessed? TCLP ☐

Is material ready for reuse? Yes ☐ No ☐

If material is being reused on site it will be required to be tracked under a separate Soil Reuse Tracking Form

The information above is verified by (Name & Signature) _____

Date _____

STOCKPILED MATERIAL REUSE FORM

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Stockpile ID _____ Form No._____ of _____

Estimated volume (m^3) _____ Material Type Soil ☐ Rock ☐

Material to be reused in area _____

_____ Date/s Placed _____

Material observed placed by (Name & Date/s) _____

Coordinates of proposed reuse area _____ _____

_____ _____

_____ _____

_____ _____

_____ _____

Depths below finished design level at which material has been placed (m) _____ to _____

Method of placement _____

Placed as engineered fill? Yes ☐ No ☐

If Yes, is material intended to support infrastructure and/or traffic? Yes ☐ No ☐

If Yes, provide description of infrastructure _____

_____

Material used as cover for waste emplacement cell/s? Yes ☐ No ☐

If Yes, what is the Cell ID?_____

Notes:

The information above is verified as correct by (Name & Signature) _____

Date _____

WASTE TRACKING FORM

Developed in accordance with the requirements of NSW EPA Waste Classification Guidelines – Part 1: Classifying Waste (Nov 2014).

Waste ID_____ Form No._____ of_____

Waste description_____

_____ Date_____

Has a Waste Classification form been completed? Yes ☐ No ☐

Waste Classification _____

Has the receiving entity been contacted? Yes ☐ No ☐

Has the receiving entity confirmed they are licenced to receive the waste? Yes ☐ No ☐

Has a copy of the Waste classification form and applicable laboratory certificate of analysis been send to the receiving entity? Yes ☐ No ☐

Has the receiving entity confirmed they are willing to receive the waste? Yes ☐ No ☐

Details of Receiving Site

Name _____

Address _____

Phone _____

Fax _____

Email _____

Contact Name _____

EPA Licence No. _____

Waste Tracking Details

Date	Time	Vehicle Registration	Weighbridge Receipt No	Weighbridge tonnage

WASTE TRACKING FORM

Date	Time	Vehicle Registration	Weighbridge Receipt No	Weighbridge tonnage

The information above is verified by (Name) _____

(Signature)_____

Date_____

Contact Number_____

Email address_____

WASTE CLASSIFICATION FORM

ARCADIS Design & Consultancy for natural and built assets

Developed in accordance with the requirements of NSW EPA Waste Classification Guidelines – Part 1: Classifying Waste (Nov 2014).

Waste ID_____ Form No._____ of_____

Waste description_____

_____ Date classified_____

Estimated volume? _____m^3 or T or L Has the waste hierarchy been applied? Yes ☐ No ☐

If yes – proceed to classification, Steps 1-6 (as appropriate)

Step 1: Is the waste **Special Waste**? Yes ☐ No ☐ If so, what type?_____

If not, proceed to Step 2.

Step 2: Is the waste **Liquid Waste**? Yes ☐ No ☐ If not, proceed to Step 3.

Step 3: Is the waste **Pre-classified Waste**? Yes ☐ No ☐ If not, proceed to Step 4.

Step 4: Is the waste **Hazardous Waste**? Yes ☐ No ☐

If yes, what ToDG Code/s apply?_____ If not, proceed to Step 5.

Step 5: Has chemical assessment been completed? Yes ☐ No ☐

Frequency of sampling:_____ per m3 or T Certificate/s of Analysis ID_____

A copy of the nominated certificate/s of Analysis (CoA) will be required to accompany this form for off-site disposal.

Analytical Suite: *Metals* (As, Cd, Cr, Hg, Ni, Pb, Zn) – delete as appropriate SCC ☐ TCLP ☐

Other metals (list) _____ SCC ☐ TCLP ☐

Benzene SCC ☐ TCLP ☐ *Toluene* SCC ☐ TCLP ☐

Ethylbenzene SCC ☐ TCLP ☐ *Xylenes* SCC ☐ TCLP ☐

OCPs SCC ☐ TCLP ☐ *OPPs* SCC ☐ TCLP ☐

Other chemicals (list) _____

_____ SCC ☐ TCLP ☐

SCC only *PAHs* ☐ *TPHs* ☐ *PCBs* ☐

Moderately Harmful Pesticides ☐ *Scheduled Chemicals* ☐

Step 6: Waste is classified as: **General Solid Waste** ☐ or **Restricted Solid Waste** ☐

Waste is Putrescible ☐ or Non-putrescible ☐

If Non-putrescible is the waste entirely inert? Yes ☐ No ☐

WASTE CLASSIFICATION FORM

If inert is the waste to be classified as **Inert Waste**? Yes ☐ No ☐

Additional Notes:

_____

_____

_____

_____

_____

In accordance with the requirements of NSW EPA Waste Classification Guidelines – Part 1: Classifying Waste (Nov 2014) and based on observations made and where applicable, the results of chemical assessment, the material assessed on this form for the purposes of waste disposal, is considered to be classified as:

Special Waste ☐

Liquid Waste ☐

Pre-classified Waste ☐

Hazardous Waste ☐

General Solid Waste ☐ (Putrescible ☐ or Non-putrescible ☐)

Restricted Solid Waste ☐ (Putrescible ☐ or Non-putrescible ☐)

Inert Waste ☐

The information above is verified by (Name) _____

(Signature)_____

Date_____

Contact Number_____

Email address_____

ARCADIS Design & Consultancy for natural and built assets