17 Soils, geology, groundwater and contamination

This chapter assesses the potential impacts on soils, geology, groundwater and of contamination associated with the Project.

17.1 Introduction

Table 17-1 sets out the SEARs relevant to soils, geology, groundwater and contamination and identifies where the requirements have been addressed in this EIS. These issues are listed under 'Other issues' in the SEARS, and includes reference to the commitments in the Scoping Report (TfNSW, 2019d) for the Project.

Table 17-1 SEARs

SEARs	Where addressed in this EIS
Other Issues	
(Address) *the following issues in accordance with the commitments made in Chapter 9 of the Scoping Report*: *(b) soils, geology, groundwater and contamination*	
The Scoping Report (TfNSW, 2019d) makes the following commitments: A desktop contamination, soils and groundwater assessment will be prepared as part of the EIS and will include: • a review of previous assessments or assessments undertaken as part of the design development	**Section 17.3**
• a review of historical aerial photography of the Project area (to identify potential contamination sources in the area)	**Section 17.3**
• a review of publicly available data (web-based information sources)	**Section 17.3**
• identification of potential receiving groundwater aquifers	**Section 17.3.5**
• qualitative assessment of potential soil and groundwater impacts during construction and operation	**Section 17.4**
• appropriate mitigation measures for managing soils, groundwater and contamination.	**Section 17.5.3**
The following guidelines will be considered during the preparation of the assessment: • *Acid Sulfate Soils Assessment Guidelines* (Acid Sulfate Soil Management Advisory Committee, 1998) • *Managing Urban Stormwater – Soils and Construction* (Landcom, 2004) (referred to as the Blue Book).	**Section 17.4 and Section 17.5**

17.2 Method of assessment

17.2.1 Legislation, guidelines and policies

Legislation, guidelines and policies relevant to this assessment include:

- *Managing Land Contamination: Planning Guidelines SEPP 55 – Remediation of Land* (Department of Urban Affairs and Planning and the Environment Protection Authority, 1998)
- *Acid Sulfate Soils Assessment Guidelines* (ASSMAC, 1998)
- *Australian Standard AS4482:2005 Guide to the investigation and sampling of sites with potentially contaminated soil*
- *Guidelines for Consultants Reporting on Contaminated Sites* (Office of Environment and Heritage, 2011)

- *Contaminated Land Management Act 1997* (NSW)
- *National Environment Protection (Assessment of Site Contamination) Amendment Measure (No.1)* (National Environment Protection Council (NEPC), 2013)
- *Waste Classification Guidelines* (EPA, 2014a)
- *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997* (EPA, 2015a)
- *Managing Urban Stormwater: Soils and Construction Volume 1* (Landcom, 2004) (referred to as the Blue Book) and *Managing Urban Stormwater: Soils and Construction Volume 2A* (DECC, 2008) (referred to as the Blue Book)
- TfNSW *Chemical Storage and Spill Response Guideline* (TfNSW, 2015a)
- TfNSW *Concrete Washout Guideline* (TfNSW, 2015b)
- TfNSW *Water Discharge and Reuse Guideline* (TfNSW, 2015c)
- TfNSW *Water Sensitive Urban Design Guideline* (TfNSW, 2017b).

17.2.2 Methodology

This assessment has used the following approach to understand the existing ground conditions within the Project area:

- a review of the report: *Redfern Station Investigation Works – Contamination Investigation Report* (Jacobs, 2018a) (refer to **Appendix G** of this EIS
- a review of the report: *Redfern Station Investigation Works – Geotechnical Investigation Report* (Jacobs, 2018b) (refer to **Appendix G** of this EIS
- a review of the memorandum: *Memorandum - Redfern Station Upgrade Geotechnical Investigation Report,* dated 08 January 2020 (Aurecon, 2020) (refer to **Appendix G** of this EIS)
- a review of other publicly and readily available data (web-based information sources), including historic photographs.

The reports above provide a summary of the soils, geology and contamination at the Project area. They provide a summary of previous investigations at and around Redfern Station, and include findings from ground investigations within the Project area. The investigations of the Project area were completed between 7 and 28 November 2017 (for the contamination and geotechnical investigation reports), and 14 March, 4-5 April, 20 July and 7-8 December in 2019 (for the memorandum).

The key objectives of the *Contamination Investigation Report* were to "*Assess and describe the nature and extent of contamination (if present) at the site in context of a commercial/industrial land use*" and to "*Provide recommendations for the management of contamination risk (if present) at the site*". The information in these reports has formed the basis for understanding the existing ground conditions for the Project.

The information in these reports has also been used to complete a qualitative assessment of potential soil and groundwater impacts that could occur during construction and operation of the Project. This qualitative assessment has been used to help identify appropriate mitigation measures for managing potential impacts related to soils, groundwater and contamination.

17.3 Existing environment

17.3.1 Site history

The Project area has been part of, or next to, an active railway corridor since the opening of Eveleigh Station in 1884. The Station was opened to serve the new Eveleigh railway workshops as well as the inner-city residential and industrial suburb of Redfern. Given the historical use of Project area as both a station and a rail corridor, as well as surrounding industrial uses, there is potential for contaminants of potential concern to be present within the soils.

17.3.2 Topography

The current ground level at Redfern Station ranges from 24 to 30 metres AHD (Australian Height Datum). Redfern Station is located on a ridgeline which extends generally in an east to west direction with the Main Suburban railway line crossing the ridgeline in a roughly north to south direction. The railway corridor has been cut into the ridgeline creating a low point for the Project area at around 24 metres AHD. This is up to five metres below the natural ground level either side of the railway corridor which is around 28 to 30 metres AHD.

The ridgeline on which Redfern Station is located forms part of the natural boundary between the Blackwattle Bay drainage catchment (which forms part of the Sydney Harbour catchment) to the north, and Alexandra Channel drainage catchment (which forms part of the Botany Bay catchment) to the south. The topography of the wider area generally falls north towards Sydney Harbour to the north of the Project area and south-west towards Botany Bay to the south of the Project area.

17.3.3 Geology

The *1:100,000 Geological Map of Sydney* indicates that the Project area is underlain by the Ashfield Shale unit which is a sequence of the Wianamatta Group. The Ashfield Shale sequence in the area typically comprises interbedded black to dark grey shales, laminites and fine to medium grained sandstones. These materials typically weather to form a residual profile of one to three metres of medium to high plasticity clays (Jacobs, 2018b).

As a part of the contamination investigation (Jacobs, 2018a) and geotechnical investigation (Jacobs, 2018b), six boreholes (Boreholes BH1 to BH6 as shown in **Figure 17-1**) were drilled to depths of between 8.5 metres and 10.4 metres below ground level. An additional four boreholes were also drilled to depths of between 13.61 and 18.72 metres as part of further geotechnical investigations (Aurecon, 2020). The borehole investigations performed across the Project area provide clarity around the underlying subsurface profile. **Table 17-2** specifies the five geotechnical units encountered, in order of increasing depth.

Table 17-2 – Subsurface profile summary (Jacobs, 2018b)

Unit	Origin	Material description	Relevant boreholes
1	Fill	Variable, gravelly/silty clay and gravelly sand, gravel is fine to coarse, sub-angular to angular, clay is medium to high plasticity.	All
2	Residual Soils	Silty clay: typically, very stiff to hard, dry to moist, pale grey and red-brown with ironstone gravel.	All
3A	Shale Bedrock (Class V)[1]	Shale/Interlaminated Siltstone & Sandstone: typically, extremely to very low strength, extremely to highly weathered, highly fractured, grey-brown.	BH3, BH6
3B	Shale Bedrock (Class IV)[1]	Interlaminated Siltstone & Sandstone: typically, low strength, moderately weathered, moderately fractured, grey and dark grey.	BH1, BH2, BH3, BH4, BH5
3C	Shale Bedrock (Class III)[1]	Interlaminated Siltstone & Sandstone: typically, medium to high strength, moderately to slightly weathered, dark grey and pale grey.	BH4, BH5, BH6

Notes:
[1] A classification rock mass undertaken in accordance with the guidelines presented in *Foundations on Sandstone and Shale in the Sydney Basin* (Pells et al, 1998)

17.3.4 Soils

Soil conditions

The soil landscape at the Project area is mapped as being within the Blacktown soil landscape (eSPADE, 2019). The landscape is characterised by gentle undulating rises (slopes less than five per cent) on Wianamatta Group shales and Hawkesbury Sandstone, with local reliefs of up to 30 metres. The soils local to the Project area are mapped as either:

- red and brown residual podzolic soils, shallow to moderately deep (up to 100 centimetres) located on crests, upper slopes and well drained areas
- yellow podzolic soils and soloths, deep (between 150 to 300 centimetres) located on lower slopes and in areas of poor drainage.

Soil samples were collected from each of the boreholes shown in **Figure 17-1** until contact with natural soils and/or bedrock was made, or where there was evidence of potential contamination. Borehole depths for soil samples varied from 0.0 metres to 3.0 metres below ground level. Borehole BH1 was drilled near the end of Platform 1, behind 125-127 Little Eveleigh Street. Boreholes BH2, BH3 and BH4 were drilled within the south west extents of Platforms 3, 4 and 9, respectively. Borehole BH5 was drilled to around five metres to the west of the existing entrance stairs at the northern end of Platform 10. Borehole BH6 was drilled to around 40 metres south east of the Platform 10 building. BH02B was drilled adjacent to the southern side of the tracks (near the proposed Marian Street entrance), and BH03B was drilled adjacent to the northern side of the tracks. BH04B was drilled within the south west extent of Platforms 8 and 9, and BH05 was drilled within the south west extent of Platforms 2 and 3 (both of these were drilled near the proposed alignment of the concourse).

FIGURE 17-1: LOCATION OF THE BOREHOLES BH1 – BH6 (SOURCE: JACOBS, 2018A) AND BH02B – BH05B (SOURCE: AURECON, 2020)

Soil material identified at each borehole is presented in **Table 17-3** and **Table 17-4**.

Table 17-3 Summary of soil material identified within Boreholes BH1 – BH6 (Source: Jacobs, 2018a)

Sample ID	Depth (metres below ground level)	Material description
BH1	0.0 - 0.1	FILL: Gravelly CLAY: Brown, medium plasticity, gravel is fine to coarse, subangular to angular, with a trace of root fibres.
BH1	0.3 - 0.4	FILL: Silty SAND: Brown, fine to medium grained, with a trace of clay and gravel.
BH2	0.8 - 0.9	FILL: Clayey SAND: Brown, fine to medium grained with some medium to coarse, subangular to subrounded gravel.
BH2	1.0 - 1.1	FILL: Clayey SAND: Brown, fine to medium grained with some medium to coarse, subangular to subrounded gravel.
BH2 (Standard Penetration Test (SPT)/3.0)	3.0	Silty CLAY: Grey mottled red-brown, high plasticity with trace of ironstone gravel.
BH3	0.6 - 0.7	FILL: Silty CLAY: Orange-brown and red-brown, high plasticity with trace of sand and fine subangular gravel. At 0.6 metres, buried pavement, around 100 millimetres thick, including asphalt over bricks.
BH3	1.1 - 1.2	FILL: Silty CLAY: Orange-brown and red-brown, high plasticity with a trace of sand and fine subangular gravel.
BH4	0.4	FILL: Gravelly CLAY: Brown, medium plasticity, gravel is fine to coarse, subangular to angular.
BH4	1.5	Silty CLAY: Grey and red-brown, high plasticity with ironstone gravel.
BH5	0.0 - 0.1	FILL: Sandy Gravelly CLAY: Brown and red-brown, low to medium plasticity, gravel is fine to medium.
BH5	0.5 - 0.95	FILL: Sandy Gravelly CLAY: Brown and red-brown, low to medium plasticity, gravel is fine to medium. From 0.5 m, coal layer (100 millimetres). FILL: Silty Sandy CLAY: Brown and red-brown, medium to high plasticity, sand is fine to coarse grained, with a trace of siltstone lenses.
BH6	0.6	FILL: Sandy Clayey GRAVEL: Dark grey and brown, fine to coarse, subanagular to subrounded. At 0.4 metres, some broken bricks. At 0.6 metres, some shale cobbles and boulders up to 300 millimetres.

Table 17-4 Summary of soil material identified within Boreholes BH02B – BH05B (Source: Aurecon, 2020)

Sample ID	Depth (metres below ground level)	Material description
BH02B	0 - 3.0	FILL: SAND: Fine to medium grained, orange.
BH03B	0 – 1.5	FILL: Silty CLAY: medium plasticity, Brown mottled grey, with sand, trace roots.

Sample ID	Depth (metres below ground level)	Material description
BH04B	0.05 – 1.2	FILL: Silty CLAY: medium plasticity, red yellow brown.
BH05B	0 – 1.5	FILL: Sandy CLAY: low to medium plasticity, brown, fine to coarse sand, trace medium to coarse gravel.

Acid Sulfate Soils

Acid Sulfate Soils (ASS) contain sulphides, predominantly iron sulfide. If these soils are exposed to oxygen, the iron sulfides react with the oxygen to form sulfuric acid. These types of soils are common in the coastal areas of NSW. The acid within these soils can cause metals in the soil such as iron to mobilise at toxic levels.

The classification of land under the *Sydney Local Environmental Plan 2012* presents an indication of the likelihood of ASS being encountered. While the majority of the Project area is mapped as not containing ASS (under the *Sydney Local Environmental Plan 2012*), some areas are mapped as Class 5 ASS. These areas include Marian Street and Rosehill Street to the south east of Redfern Station and Little Eveleigh Street up to the boundary of the railway corridor to the north west of Redfern Station. Class 1 areas have the greatest likelihood of occurrence, while Class 5 has the least likelihood of occurrence. ASS are not typically found in Class 5 areas, but certain works in these areas may affect groundwater levels in nearby areas with a higher ASS risk. This is discussed further in **Section 17.4**.

17.3.5 Groundwater

No groundwater was observed within any of the boreholes drilled to depths ranged between 8.50 metres and 18.72 metres. The boreholes were backfilled immediately following drilling and sampling which precluded any longer-term monitoring or observation of groundwater levels.

Real-time water data mapping data is available from WaterNSW. The three closest bores to the Project area that discovered groundwater were located 675 metres north, 715 metres east and 980 metres north west. The distance between these bores and the Project area means that the groundwater levels at these bores are unlikely to be of relevance to the Project.

17.3.6 Contamination

A search of the Contaminated Sites Register and Record of Notices under Section 58 of the *Contaminated Land Management Act 1997* (CLM Act) was undertaken on 15 October 2019. The search identified two registered sites within one kilometre of the Project area that were either regulated or had been notified to the NSW EPA. The location of each of the sites are is described in **Table 17-5**.

Table 17-5 NSW EPA Contaminated Sites Register and Record of Notices

Suburb	Notified site address	Notified site activity	Location in relation to the Project area
Chippendale	33 Wellington Street 77-81 Regent Street	Former site for chemical manufacturing	586 metres north west of the Project area
Alexandria	10-20 Botany Road	Formerly service station (fully redeveloped into residential apartment as of September 2016)	271 metres south east of the Project area

The *Australian Standard AS 4482.1-2005 – Guide to the investigation and sampling of sites with potentially contaminated soil – Non-volatile and semi-volatile compounds* lists the chemicals used by specific industries. This Standard lists the following chemicals that are commonly associated with railway tracks and may be present at Redfern Station:

- hydrocarbons
- arsenic

- phenolics
- heavy metals
- nitrates and ammonia.

The results of the ground investigations detailed in the *Contamination Investigation Report* (Jacobs, 2018a) did not identify contamination which would constrain the current and proposed use of the Project area (i.e. railway station – commercial/industrial land use).

Selected heavy metals and benzo(a)pyrene were detected in a number of samples at concentrations exceeding ecological investigation levels or ecological screening levels (EILs or ESLs) but not health investigation levels (HILs). Copper exceeded EILs at Borehole BH1 and Zinc exceeded EILs at Boreholes BH1 and BH4. Benzo(a)pyrene in BH1/0.0-0.1 (0.87 mg/kg) marginally exceeded the ESL of 0.7 mg/kg.

No potential asbestos containing materials, odorous or discoloured materials were identified in the material recovered from the boreholes. However, due to the historical use of the Project area, the age of structures such as the building at 125-127 Little Eveleigh Street and the presence of fill in a number of locations, it is likely that contaminated material, including asbestos and lead paint, could be present.

17.4 Impact assessment

17.4.1 Construction

The Project would require excavation work and piling for foundations (to a maximum depth of 18 metres). These works would be required to accommodate site establishment and enabling works, demolition/modification works, utility relocations/adjustments, main construction works and roadworks at Little Eveleigh Street and Marian Street. The total estimated volume of spoil to be excavated as part of this process is around 7,090 tonnes. Descriptions of the specific excavation or piling activities that would be undertaken are provided in **Chapter 5** of this EIS, and a further breakdown of the spoil volumes is provided in **Chapter 21** of this EIS.

Potential impacts as they relate to soils, groundwater and contamination are considered below. Potential water quality impacts, including impacts caused by increased sediment loads, are considered in **Chapter 18** of this EIS, air quality (dust) impacts are considered in **Chapter 19** of this EIS, and health and safety risks, including as a result of contamination and hazardous materials, are considered in **Chapter 20** of this EIS.

Soil disturbance, erosion and sedimentation

Construction works, as described in **Chapter 5** of this EIS, would involve the following earthworks:

- piling for foundations to a maximum depth of 18 metres (e.g. for pedestrian bridge works), and to shallower depths for other rail corridor works and overhead wiring footings
- excavation for roadworks at Little Eveleigh Street, Ivy Street, Marian Street and Rosehill Street roadworks (to a depth of around 2.5 metres)
- excavation for proposed car park (to a depth of around two metres)
- excavation for service relocations (to a depth of around three metres).

Excavation and other earthworks, if not adequately managed, could result in the following impacts:

- erosion of exposed soil
- dust generation from excavation and vehicle movements over exposed soil
- cross-contamination of clean spoil
- increase in sediment loads entering the stormwater systems and/or local runoff.

Construction of the Project would also temporarily expose the natural ground surface and sub-surface through activities such as the removal of vegetation, demolition of structures including overhead wiring structures, excavation for footpaths, structures and foundations. The temporary exposure of soil to water runoff and wind could result in increased soil erosion. The construction works may also require

the stockpiling of soils and other materials, which if not managed correctly could also result in the erosion of soils (and other construction materials) by wind or surface water flows, or clean spoil being affected by contaminated material. There is the potential that exposed soils and other unconsolidated materials, (spoil, sand, aggregates etc.), could be transported from the construction sites into surrounding waterways via stormwater runoff.

Given the relatively small areas of surface disturbance anticipated during construction and the overall topography of the Project area, it is expected that soil erosion and runoff could be adequately managed in accordance with the management approaches presented in *Managing Urban Stormwater: Soils and Construction Volume 1* (Landcom, 2004) and *Managing Urban Stormwater: Soils and Construction Volume 2* (Department of Environment and Climate Change, 2008a) (refer to **Section 17.5**). As such significant impacts related to the management of soils and the potential for these impacts to adversely affect soils and groundwater receptors are considered unlikely. Note that potential impacts from soil contamination are addressed further below.

Acid sulfate soils

ASS are unlikely to occur within the Project area and as such the Project is unlikely to impact or be impacted by ASS. Some parts of the Project area are mapped as Class 5 ASS under the *Sydney Local Environmental Plan 2012,* however ASS are not typically found in Class 5 areas. As noted in the *Acid Sulfate Soils Assessment Guidelines* (Acid Sulfate Soil Management Advisory Committee, 1998), areas classified as Class 5 are located within 500 metres of nearby Class 1, 2, 3 or 4 land. Works in a Class 5 area that are likely to lower the water table (typically below one metre AHD) on nearby Class 1, 2, 3 or 4 land may require management.

The limited amount of excavation related to the construction of the Project, the distance from the Project Area to nearby Class 1, 2, 3 or 4 land, and the general absence of groundwater at the Project area, means that it is unlikely that construction of the Project would lower the groundwater table to such an extent that nearby Class 1, 2, 3 or 4 land may be affected.

As such no specific ASS mitigation and management measures are proposed and an acid sulphate soil management plan is not required.

Groundwater

Groundwater was not identified during the ground investigations undertaken, and as such it is not considered a key issue for construction of the Project. Whilst it is unlikely groundwater could be encountered during excavation works or could accumulate in open excavations, measures to manage the dewatering of excavations would be included in the CEMP and are accounted for in **Section 17.5**.

Groundwater could also be impacted by liquid or construction material spills or leaks. Spills or leaks could contaminate both soil and groundwater. Standard construction measures are available to manage this risk, and described in **Section 17.5**.

Contamination

Several ground investigations across the Project area have identified relatively low levels of contamination in the soil and fill materials present. Where contamination is present, the risks associated with most contaminants is low except for Copper, Zinc and benzo(a)pyrene which were all identified in discreet locations exceeding EILs for the heavy metals or the ESL for benzo(a)pyrene. In addition, the historic land use of the Project area, the age of certain buildings requiring modification and the presence of fill means that additional contamination (e.g. asbestos) may be present.

Risks associated with the identified and potential contaminants of concern include:

- direct contact and/or inhalation by site workers, users, neighbours and visitors
- impacts to surrounding environmental receivers (including surrounding ecosystems and flora and fauna, where present)
- mobilisation and migration of surface and subsurface contaminants via runoff and/or subsurface flow, impacting nearby soils (including clean spoil), surface water, and groundwater.

Given the urban context of the Project area and its surrounds it is unlikely that the exceedances of the EILs for Copper, Zinc and ESL for benzo(a)pyrene would result in adverse ecological impacts as a

pathway from these materials to a sensitive ecosystem would be unlikely. Equally as no human health criteria were exceeded it is unlikely that the presence and management of this contamination would result in adverse impacts to on-site workers.

The scale of the Project construction works and the level of contamination identified to date suggests that the risks noted above would be able to be managed and would be acceptable. Measures to test for and contain contaminated materials from the ground and in the buildings are available and widely used. As recommended by the *Contamination Investigation Report* (Jacobs, 2018a), further site investigations would be completed prior to the Project construction works commencing, to confirm the risks present and to develop site specific management responses.

It is likely that where contaminated material is present that this material would be contained and disposed offsite at an appropriately licenced facility by a suitable qualified and/or licenced contractor/s. Measures to excavate, store or contain contaminated material prior to removal from the Project area would be developed depending on the risks posed by the material.

In addition to the risk of encountering insitu contamination, construction of the Project also has the potential to contaminate soils due to accidental spills and leaks of fuel, oils or other hazardous substances used for construction. This risk would be addressed through standard construction mitigation measures. Mitigation and management is discussed further in **Section 17.5**.

17.4.2 Operation

Contamination

The potential for contamination as a result of general maintenance activities is considered to be low, based on the number of vehicles and equipment which would likely be used during maintenance. This impact would be minimised by implementing procedures to manage spills in line with existing Sydney Trains/TfNSW operations.

The risk of contamination of runoff from new hardstand/impervious surfaces introduced by the Project (such as the new car park area at Little Eveleigh Street and concourse roof) is assessed in **Section 18.4.2**.

17.5 Management and mitigation

17.5.1 Overview

A CEMF (refer **Appendix D** of this EIS) describes the approach to environmental management, monitoring and reporting during construction. Specifically, it lists the requirements to be addressed by the construction contractor in developing the CEMP, sub-plans, and other supporting documentation for each specific environmental aspect.

A Soils and Water Management Sub-Plan would be developed for the Project as identified by Section 6.5 of the CEMF.

The performance outcome as well as mitigation measures, including those that would be included in the Soils and Water Management Sub-Plan, are detailed below.

17.5.2 Performance outcomes

The performance outcome for the Project in relation to soils and water includes:

- Risks to human health and ecological receivers are minimised through effective management of soil and contaminated materials.

The Project would be designed, constructed and operated to achieve this performance outcome.

17.5.3 Mitigation measures

A list of mitigation measures which would be implemented during the construction of the Project are provided in **Table 17-6**.

Table 17-6 Mitigation measures

ID	Mitigation measure	Applicable location(s)
Construction		
SC1	A Soils and Water Management Sub-Plan would be developed to manage the soil and water issues relevant to the construction of the Project. This sub-plan would be part of the CEMP. The sub-plan would include detailed erosion and sediment control plans for each work site and would outline which erosion and sediment control measures would be implemented at each location or for specific works. These control measures would align with the management approaches outlined in *Managing Urban Stormwater: Soils and Construction Volume 1* (Landcom, 2004), *Managing Urban Stormwater: Soils and Construction Volume 2A* (DECC, 2008) (referred to as the Blue Book), the *Water Discharge and Reuse Guideline* (TfNSW, 2015c), *Concrete Washout Guideline* (TfNSW, 2015b), *Water Sensitive Urban Design Guideline* (TfNSW, 2017b) and *Chemical Storage and Spill Response Guideline* (TfNSW, 2015a).	Project area
SC2	Prior to construction commencing a detailed contamination assessment would be undertaken within the Project area to confirm whether additional contamination risks are present and to develop site and/or location specific management responses if necessary. Where remediation options are required, they would be identified and selected using a sustainability hierarchy.	Project area
SC3	Hazardous materials surveys would be undertaken during detailed design for all proposed demolition activities, and for utility adjustments as required.	Project area
SC4	Should asbestos be identified (in the hazardous material surveys or otherwise) within excavation areas or in buildings requiring demolition, an Asbestos Management Plan (AMP) would be developed and implemented for the relevant works. The AMP would be prepared by a suitably qualified practitioner and in accordance with relevant guidelines.	Project area
SC5	In the event a remediation action plan is required, it would be developed in accordance with *Managing Land Contamination: Planning Guidelines SEPP 55 – Remediation of Land* (Department of Urban Affairs and Planning and Environment Protection Authority, 1998), and a suitably qualified and experienced contamination advisor would be engaged to audit the works.	Project area
SC6	In the event that indicators of contamination or acid sulfate soils are encountered during construction (such as odours, visually contaminated materials etc.), work in the immediate area would cease, and the finds would be managed in accordance with the unexpected contamination finds procedure.	Project area
SC7	The NSW EPA would be notified in writing of any contamination identified within the Project area, in accordance with the requirements of Section 60 of the *Contaminated Land Management Act 1997*.	Project area

Following the implementation of the management measure above, there would be negligible residual impacts from the Project on soils, geology, groundwater and contamination, and the Project is not expected to contribute to cumulative impacts. Further consideration of cumulative impacts with regard to other environmental aspects of the Project are addressed in **Chapter 23** of this EIS.