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Aboriginal Archaeological and Cultural Heritage Assessment and Heritage Impact Statement

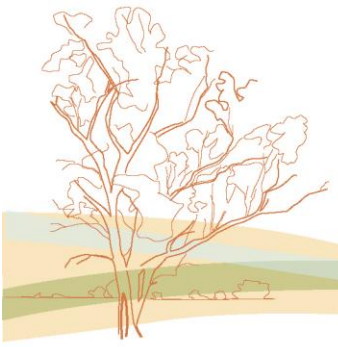
Barangaroo Central
SSD 6617-2014 Remediation Hickson Road Development Application

by

Jillian Comber

Report to Casey & Lowe Pty Ltd
on behalf of Lend Lease Millers Point

August 2015



Executive Summary

The Barangaroo Delivery Authority propose to redevelop Barangaroo at Millers Point. The aim of the redevelopment is to deliver a mixed use development of commercial, retail and residential buildings, as well as the creation of foreshore recreational space. Lend Lease Millers Point is the selected development proponent for Stage 1 of the redevelopment (Barangaroo South).

The BDA is responsible for the remediation of Site Remediation Area within Barangaroo, which is generally located within the Blocks 4 and 5 Remediation Areas and extends eastwards into the Hickson Road Remediation Area. The gazetted area of contamination is generally based on the 1903 plan of the AGL gasworks. Development Application SSD 6617-2014 Remediation and Land Forming Works is proposed to remediate contamination within the Hickson Road part of the Site Remediation Area.

To ensure that the Aboriginal cultural heritage significance of the subject area is not adversely impacted upon by the remediation proposed under Hickson Road Application MP SSD 6617-2014, Casey & Lowe has been engaged by Lend Lease (Millers Point) to prepare a this Aboriginal cultural heritage assessment to accompany a Development Application for Remediation of Hickson Road at Barangaroo South to be submitted to the Minister for Planning pursuant to the Part 4 of the *Environmental Planning and Assessment Act, 1979*.

This report concludes that the subject Site Remediation Area has no Aboriginal archaeological or cultural heritage potential and that either remediation option proposed under SSD 6617-2014 can proceed without any further Aboriginal archaeological assessment, excavation or testing.

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Glossary

- **Block 4 Remediation Area –** Portion of the Declaration Area situated within Barangaroo South.
- ***Block 5 Remediation Area -*** *Portion of the Declaration Area located within Barangaroo Central (including remediation of some land adjacent to the Declaration Area on the west)*
- **EPA –** Environment Protection Authority.
- **EPA Declaration Area –** Remediation Site Declaration 21122.
- **Hickson Road Remediation Area –** Portion of the Declaration Area situated within the Hickson Road reserve.
- **Ex-situ Remediation Methodology –** Excavation of contamination and off-site disposal (with off-site pre-treatment, where required).
- **LLMP –** Lend Lease (Millers Point).
- **RAP –** Remedial Action Plan.
- **Site –** area required for the purpose of the Hickson Road Remediation Development Application identified as:
    - Hickson Road Remediation Area
    - Any other areas of Barangaroo or Hickson Road required for staging and undertaking the remediation and stormwater diversion works.
- **Site Remediation Area –** The Hickson Road Remediation Area (including remediation of some land adjacent to the Declaration Area on the west).
- **VMP –** Voluntary Management Proposal.

1.0 Introduction

1.1 Background

The Barangaroo Delivery Authority (BDA) propose to redevelop the former Patrick Stevedores Container Shipping Terminal which is now known as Barangaroo. Barangaroo is part owned and currently controlled by the Barangaroo Delivery Authority (BDA). Lend Lease Millers Point is the selected development proponent for Stage 1 of the redevelopment (known as Barangaroo South). The aim of the redevelopment is to deliver a mixed use development of commercial, retail and residential buildings, as well as the creation of foreshore recreational space.

The BDA is responsible for the remediation of the Site Remediation Area which consists of the Blocks 4 and 5 Remediation Areas and extends eastwards into the Hickson Road Remediation Area. The BDA have appointed Lend Lease to undertake remediation of the Site Remediation Area Prior to commencement of these remediation works Lend Lease is undertaking detailed assessment and design in order to develop the proposed remediation strategy for the Site Remediation Area.

To ensure that the Aboriginal cultural heritage significance of the Site Remediation Area is not adversely impacted upon by the proposed remediation, Casey & Lowe on behalf of Lend Lease, have commissioned this Aboriginal cultural heritage assessment of the remediation proposed under Development Application SSD 6617-2014. This report is written in response to the Secretary Environmental Assessment Requirements (SEARs) issued in respect of SSD 6617-2014 Remediation Works dated 13 June 2014, specifically SEAR 11 as described below

- *An assessment of the likely impacts of the proposal on any heritage or archaeological items and proposed mitigation and conservation measures.*

The redevelopment of Barangaroo is a "major project" to be determined under Part 4 of the *Environmental Planning & Assessment Act 1979.*

Comber Consultants has been engaged by Lend Lease Millers Point (Lend Lease) to prepare a Aboriginal Archaeological and Cultural Heritage Assessment and Heritage Impact Statement report to accompany a Development Application for Remediation of part of Hickson Road at Millers Point (SSD 6617), to be submitted to the Minister for Planning and Environment pursuant to the Part 4 of the *Environmental Planning and Assessment Act, 1979*. The area of Hickson Road to be remediated is the subject of NSW EPA Remediation Site declaration 21122.

1.2 Location and Site Description

Barangaroo

Barangaroo is located on the north western edge of the Sydney Central Business District, bounded by Sydney Harbour to the west and north, the historic precinct of Millers Point (for the northern half), The Rocks and the Sydney Harbour Bridge approach to the east; and bounded to the south by a range of new development dominated by large CBD commercial tenants.

The 22 ha Barangaroo site is roughly rectangular in shape and has frontage to the harbour foreshore of 1.4km. Hickson Road delineates the eastern boundary.

The Barangaroo Concept Plan (as modified) is the statutory planning approval to guide the urban renewal of Barangaroo and currently provides for the development of mixed use precinct comprising commercial, retail, residential and community development and new public open space / public domain.

The Barangaroo Delivery Authority is the state government authority that manages and delivers the development of Barangaroo.

Figure 1 shows the location of Barangaroo on the 1:250,000 topographic map. Figure 2 shows the location of Barangaroo on the 1:25,000 topographic map. Figure 3 shows the Site Remediation Area.

Hickson Road and adjoining Barangaroo Development

Barangaroo is located on the north western edge of the Sydney Central Business District, bounded by Sydney Harbour to the west and north, the historic precinct of Millers Point (for the northern half), The Rocks and the Sydney Harbour Bridge approach to the east; and bounded to the south by a range of new development dominated by large CBD commercial tenants.

The 22 ha Barangaroo site is roughly rectangular in shape and has frontage to the harbour foreshore of 1.4km. Hickson Road is a public road that is adjacent to the eastern boundary of Barangaroo.

The Barangaroo Delivery Authority is the state government authority that manages and delivers the development of Barangaroo.

Definition of Site for Hickson Road Remediation DA

For the purposes of the Hickson Road Remediation Development Application, the **Site** includes the area of Hickson Road to be remediated (**Site Remediation Area**), plus any adjacent land used for the staging and undertaking of the proposed remediation.

The **Site Remediation Area** comprises the part of Hickson Road within the Declaration Area that requires remediation, per the RAP.

Role of Lend Lease in the Remediation of the Site

Lend Lease has been contracted by the Barangaroo Delivery Authority to undertake remediation of the Declaration Area, which includes the Hickson Road Remediation Area.

Lend Lease has also been appointed by the Barangaroo Delivery Authority as the Proponent to undertake the development for Barangaroo South.

1.3 Remedial Action Plan and Methodology

The proposed remediation of the Declaration Area is detailed in the AECOM Remedial Action Plan (AECOM 2013). This Development Application for Hickson Road Remediation includes the **ex-situ remediation** methodology as detailed in the AECOM RAP.

1.4 Summary of Proposed Works for the Hickson Road Remediation DA

The following summarises the works proposed as part of the Hickson Road Remediation DA, in undertaking the preferred or alternate method as applicable (with final method selected following agreement with the NSW EPA). For both methods, Hickson Road to remain open to traffic, with required temporary road closures/diversion in place during remediation works.

Preferred Method – In-situ Remediation

Undertaking remediation of required Hickson Road areas (including footpath), using **in-situ chemical oxidation / product extraction**. The in-situ remediation method will be SISCO/SEPR (Surfactant enhanced In-Situ Chemical Oxidation and Surfactant Enhanced Product Recovery) or similar in-situ oxidation process.

The in-situ remediation process involves the installation of subsurface wells and piping in Hickson Road, and a temporary staging compound in the road reserve, which facilitate controlled injection of chemical mixtures into the ground, to treat required areas of gasworks contamination in-situ.

Summary works:

a) Localised pruning of street trees where required to facilitate works.
b) Undertake temporary lane / traffic diversion as required during works.
c) Undertake local service diversion or protection as required.
d) Maintain access to 30 and 38 The Bond driveways.
e) Install remediation infrastructure (wells and piping) in Hickson Road.
f) Install temporary remediation compound/staging area in Hickson Road reserve.
g) Install boundary groundwater control walls where required.
h) Undertake in-situ chemical oxidation remediation through controlled injection and extraction.
i) Management of extracted fluids and transfer to on-site water treatment plant, or tankering off-site.
j) If required, undertake localised excavation and off-site disposal (using appropriate odour control).
k) Undertake detailed environmental monitoring (air, noise, water) for duration of works.
l) Validate remediation per RAP, including groundwater monitoring where required.
m) Decommission (cap and leave in-situ) sub-surface well/piping infrastructure.
n) Re-surface required areas of road/pavement.

If the above preferred method is not undertaken, the works for the alternative method below are proposed to be implemented, as part of this DA:

Alternative Method - Ex-situ Remediation

Undertaking remediation through selective excavation of required Hickson Road areas (including footpath), followed by off-site disposal (and treatment where required) of material at licensed facilities, backfilling and re-instatement of road/footpath.

Summary works:

a) Removal of street trees where required to facilitate excavation works
b) Undertake temporary lane / traffic diversion as required during works.
c) Undertake local service diversion or protection as required

d) Maintain access to 30 and 38 The Bond driveways
e) Undertake remediation in 2 main stages (east and west):
    a. Temporarily close one half and undertake remediation, while traffic is diverted to other half.
    b. Following 1st stage, re-instate remediated half, and re-divert traffic to complete remaining stage.
f) Install boundary groundwater control walls, and walls to facilitate staged excavation, where required.
g) Install odour control structures over excavation area (in stages as required).
h) Excavate gasworks contamination in stages where required, from beneath road/footpath.
i) Excavate rock, if required, to facilitate access to deep contamination within annulus trench.
j) Transfer excavation water to Barangaroo water treatment plant, for treatment
k) Transfer excavated material directly off-site to licensed facility for treatment/disposal.
l) Undertake detailed environmental monitoring (eg. air, noise) for duration of works
m) Validate remediation per RAP
n) Backfill excavations with suitable imported fill or suitable excavated material.
o) Decommission odour tents.
p) Re-surface road / pavement.
q) Plant new street trees to replace those removed.
r) Remove temporary traffic diversions.

1.5 Summary Site History and Key Contaminants

The Millers Point gasworks operated on the Declaration Area between 1840 and 1921. The Site has subsequently been used for various activities but predominantly a commercial port facility and public road.

When EPA declared parts of Barangaroo and Hickson Road a "Remediation Site", it described the nature of contamination as gasworks waste, with the following particular substances: polycyclic aromatic hydrocarbons (PAHs); benzene, toluene, ethylbenzene and total xylenes (BTEX); total petroleum hydrocarbons (TPH); ammonia and cyanide.

A Remedial Action Plan (RAP) prepared by AECOM (AECOM 2013) provides more specific details regarding the type, magnitude and location of ground contamination as identified in previous site investigations.

1.6 EPA Declaration Area N21122

In May 2009, the NSW Environment Protection Authority (EPA) determined that a portion of land at Millers Point (part of the Barangaroo Site and an adjacent portion of Hickson Road), was contaminated in such a way as to present a significant risk of harm (SROH) to human health and the environment. As a consequence the EPA declared the area to be a remediation site (Declaration Number 21122; Area Number 3221) under the Contaminated Land Management Act 1997.

The Remediation Site Declaration 21122 indicates that the area of the declaration ('Declaration Area') coincides with the known footprint of the former Millers Point gasworks

facilities. This area is located on part of Barangaroo and part of Hickson Road adjacent to Barangaroo.

In accordance with Declaration Number 21122, the Declaration Area comprises:

- Part Lot 5 and Part Lot 3 DP 876514, Hickson Road, Millers Point, NSW 2000.
- Part of Hickson Road adjacent to:
  - 30-34 Hickson Road (Lot 11, DP1065410)
  - 36 Hickson Road (Lot 5, DP873158)
  - 38 Hickson Road (SP72797) Millers Point

The Barangaroo Delivery Authority has entered into a Voluntary Management Proposal (VMP) with the EPA associated with EPA Declaration Area (Approval No. 20101719). Phase 1 of this VMP involves investigative works and undertaking remedial design to determine and obtain agreement on a proposed remediation methodology. Phase 2 of the VMP will involve the implementation of the agreed remediation works.

An independent, EPA-accredited Site Auditor has been appointed to undertake review of proposed remediation works, and prepare statutory audit statements prior to and following completion of remediation.

For the purposes of planning and staging works, the EPA Declaration Area is divided into 3 areas as follows:

- Block 4 Remediation Area - the part of the Declaration Area on Barangaroo South.
- Block 5 Remediation Area - the part of the Declaration Area on Barangaroo Central.
- Hickson Road Remediation Area - the part of the Declaration Area located on Hickson Road.

This DA is for the Hickson Road Remediation Area only. Remediation for the Block 4 and Block 5 Remediation Areas have been the subject of separate development applications.

Figure 1: Location of Barangaroo circled in yellow.
(1:250,000 Sydney Special ED2 – 1998 topographic map).

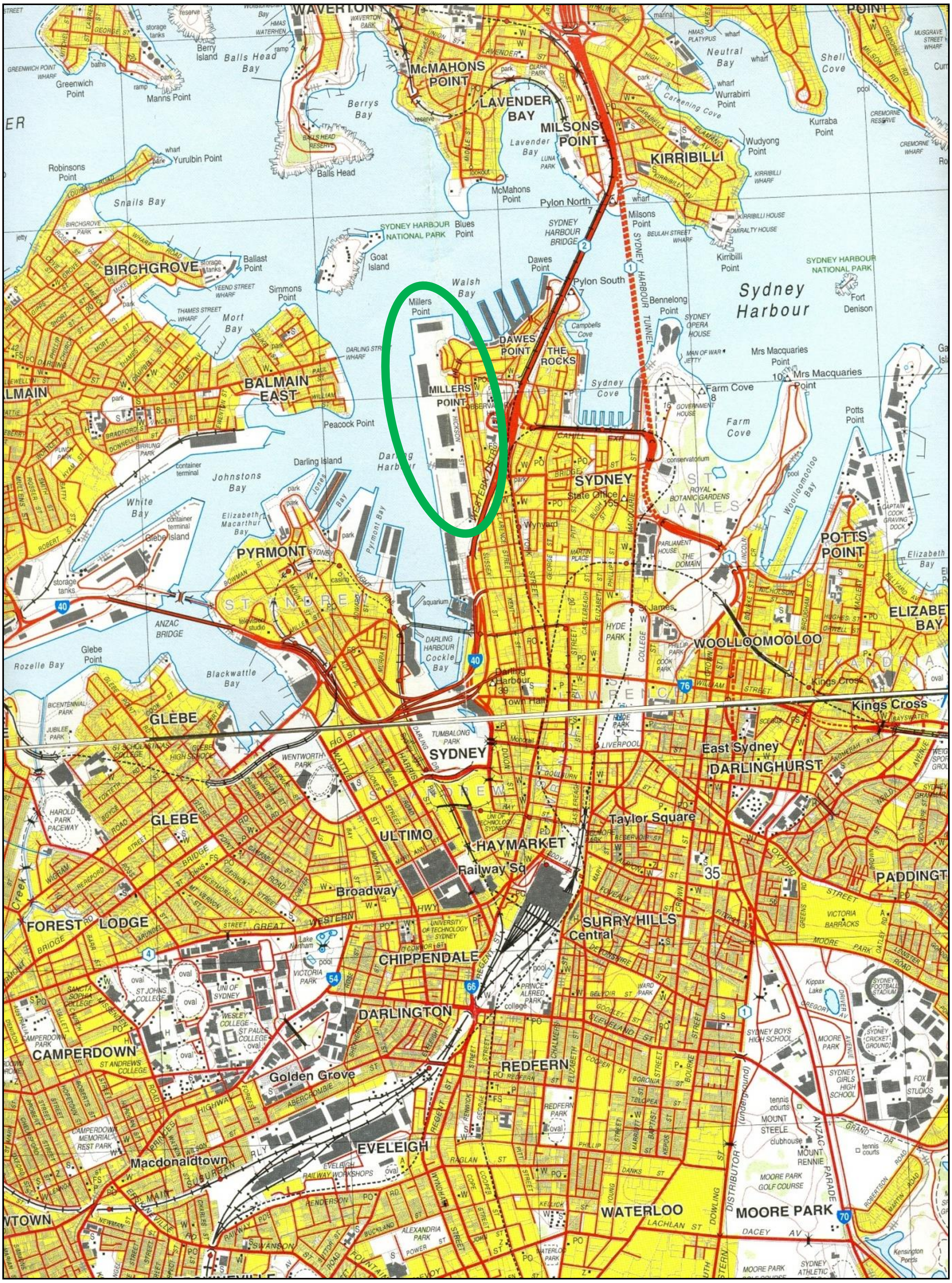

Figure 2: Location of Barangaroo circled in green
(Composite map of the Parramatta River 1:25,000 9130-3N Third Edition topographic map and the Botany Bay 9130-3S Third Edition topographic map).

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Figure 3: Plan showing the EPA Declaration Area, Hickson Road is the subject of the current report.
(plan courtesy of Lend Lease).

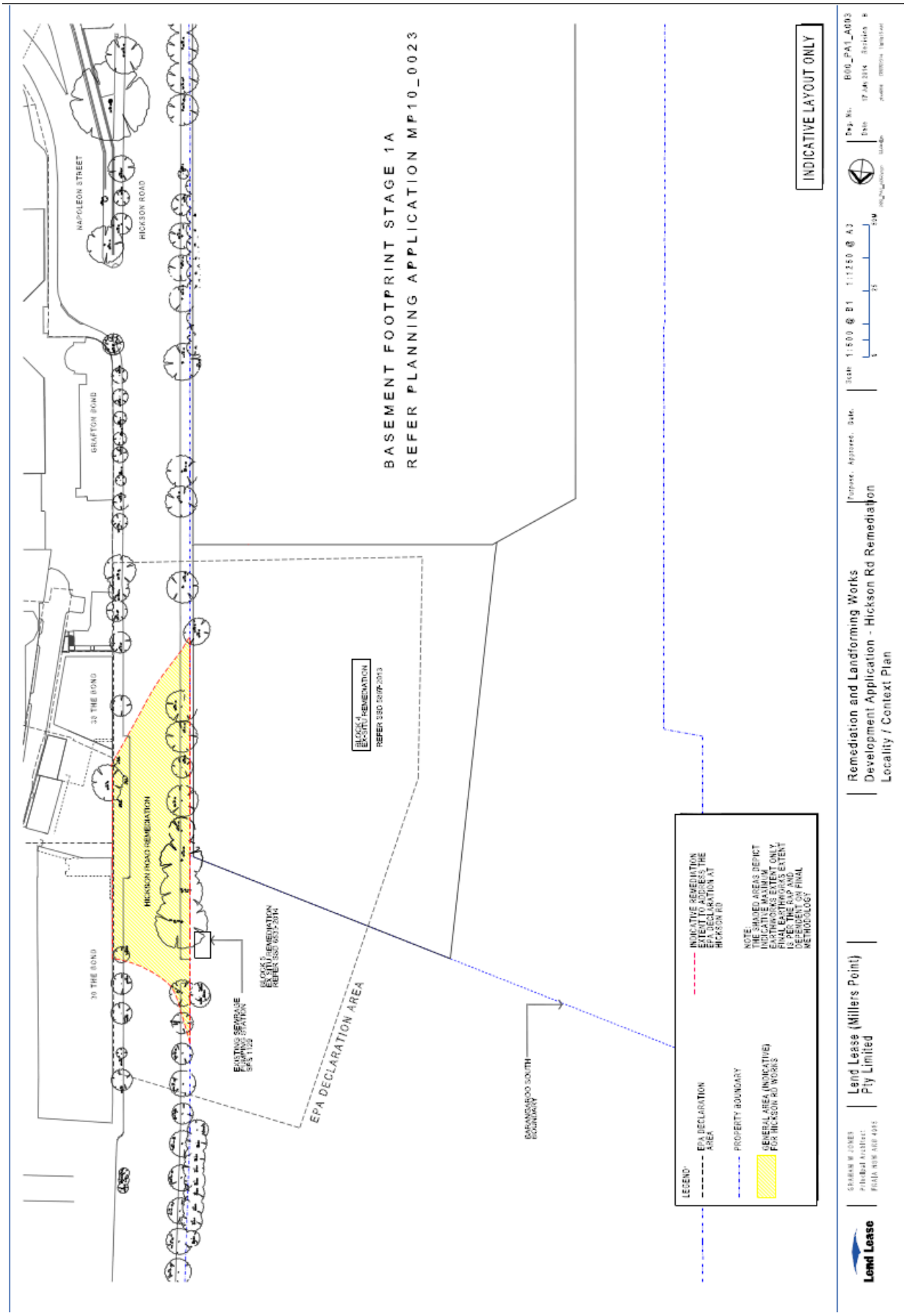

Figure 4: Plan showing the EPA Declaration Area. Lend Lease (Millers Point).

1.7 Planning and Legislative Framework

Barangaroo

The existing planning framework applicable to Barangaroo is established by a range of strategic planning policies and statutory controls, including:

- *State Environmental Planning Policy (Major Projects) 2005* – Schedule 3 Part 12.
- Barangaroo Concept Plan, as approved on 9 February 2007 and modified on 25 September 2007, 16 February 2009 and 11 November 2009.
- *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005* for the water based areas proposed to be included within the Barangaroo South site.

The site is also subject to the provisions of *State Environmental Planning Policy No. 55-Remediation of Land (SEPP 55).*

The Secretary of the Department of Planning has determined that the proposed remediation works for the Site area constitutes a State Significant Development. Approval for the works is therefore being sought from the Minister for Planning under Part 4 of the Environmental Planning and Assessment Act, 1979.

Aboriginal Heritage

The National Parks and Wildlife Act 1974 (NPW Act) provides statutory protection for all Aboriginal artefacts or "Aboriginal objects" within New South Wales. The Department of Environment, Climate Change and Water (DECCW) is the State Government agency responsible for the implementation and management of this Act.

Part 6 of the NPW Act provides provision for the protection of all "Aboriginal objects" which are defined as "any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of ... New South Wales...".

In particular, Section 86 (Part 6 of the NPW Act) states that:

> *A person must not harm or desecrate an object that the person knows is an Aboriginal object.*

Under s86 penalties apply if a person harms or desecrates an Aboriginal object. However, a person may apply for a permit to impact upon an Aboriginal object under s90 of the Act.

Section 90 (Part 6 of the NPW Act) details the provisions for the issue of written consent to impact upon an Aboriginal object. According to DECCW policies, such permission may be issued for research or other purposes, once a detailed assessment of the object has been undertaken which clearly outlines the justification for such disturbance and once satisfactory consultation has been undertaken with the relevant Aboriginal community or people.

If Aboriginal "objects" were to be disturbed during the remediation project, it would normally be necessary to apply for a permit under Part 6 of the Act. However, as the remediation project will be undertaken in accordance with the provisions of Part 4 of the *Environmental Planning and Assessment Act, 1979*, approval from DECCW in respect of Aboriginal Heritage will not be required. It should be noted, however, that the proponent is consulting with DECCW.

1.8 Aims of the report

The consultant was commissioned to:

a) Undertake background research, including a search of the Department of Environment, Climate Change and Water (DECCW)'s Aboriginal Heritage Information Management System (AHIMS);

b) Undertake an archaeological assessment of the subject land to determine whether any Aboriginal sites or places are located within the area of the proposal or have the potential to exist within the study area, and to record any such sites located. Such assessment to be undertaken in partnership with the Metropolitan Local Aboriginal Land Council as detailed in c) below;

c) Consult with the Metropolitan Local Aboriginal Land Council to ascertain Aboriginal concerns and interests in respect of the subject land and the project;

d) Assess the impact of the remediation proposed under Development Application SSD 6617-2014 on Aboriginal cultural heritage and detail Aboriginal views and concerns in respect of the subject project;

e) Provide management recommendations to enable the appropriate management of Aboriginal cultural heritage values within the study area.

2.0 Aboriginal Partnership

Aboriginal culture is dynamic and continuous. It includes the tangible and intangible and links people over time to their community and land. It is important to recognise that Aboriginal people have the right to protect, preserve and promote their cultural heritage. In recognition of that right, the Metropolitan Local Aboriginal Land Council (MLALC) have been invited to take part in the project. The MLALC have been involved in three separate assessments of the Barangaroo site as follows:

- Barangaroo Stage 1 (Comber & Stening July 2010)
- Barangaroo South, SISCO Remediation Pilot Test, Blocks 5 & Hickson Road (Comber September 2010)
- Barangaroo Remediation Development Application (present report)

The MLALC's representative, Mr Allen Madden, undertook a survey and cultural heritage assessment with the Consultant on Friday 16th April 2010.

Prior to the site survey and assessment being undertaken, the Metropolitan Local Aboriginal Land Council were contacted by phone to discuss the Barangaroo Stage 1 project and their participation. Maps were forwarded to MLALC which clearly outlined the location of the development proposed under the masterplan.

A copy of all relevant information and archaeological reports were forwarded to the MLALC for comment. At the completion of that assessment the MLALC provided the letter attached at Appendix A. This letter indicates that they have no objection to the proposed Barangaroo South redevelopment proceeding. They agree to the recommendations contained in the Archaeological and Cultural Heritage Report dated September 2010.

Since that date another Aboriginal Cultural Heritage report was prepared in respect of the SISCO Remediation Pilot Test MP 10 0087 (Comber 2010). Mr Madden provided verbal advice that he had no objection to the SISCO Remediation Pilot Test MP 10 0087, as it would not impact upon any area of Aboriginal cultural heritage significance.

Subsequently this report was prepared in respect of Remediation Development Application SSD 6617-2014. The consultant has discussed the remediation works with Mr Madden by telephone. Mr Madden has advised that he has no objection to either the SISCO Remediation Pilot Test MP 10 0087 or the proposed Site Remediation Area of Development Application SSD 6617-2014. He agrees that the Site Remediation Area does not contain any Aboriginal cultural heritage significance.

Mr Madden agrees that the subject Site Remediation Area has no Aboriginal archaeological or cultural heritage potential and that the remediation proposed under SSD 6617-2014 can proceed without any further Aboriginal archaeological assessment, excavation or testing.

3.0 Environmental Context

3.1 Topography

Barangaroo is located in the central portion of the Sydney Basin. The Sydney Basin is characterised by contrasting landscapes of rugged sandstone escarpments and gently undulating hills over shale (Herbert 1980: 21; Sydney 1:100,000 geological map).

The original topography of the area consisted of a steeply sloping foreshore with a gently rounded top (Austral 2010: 37) and the original shoreline is located in two small sections at the southern end of the study area and a larger portion in the north eastern section of the Barangaroo site.

Today, Barangaroo is the result of European activities including harbour reclamation for the construction of wharves and the construction of the shipping container terminal.

3.2 Geology

The geology of Sydney Harbour consists of the Wianamatta Group of shales which overlies Hawkesbury Sandstone. The Wianamatta Group consists of a lower formation of Ashfield Shale, which grades upwards into a fine sandstone siltstone laminate culminating in the overlying Bringelly Shale (Sydney 1:100,000 geological map).

The Wianamatta Group does not provide a good variety of lithic material suitable for stone tool manufacture. Within the Bringelly Shales are claystones, siltstones and laminate. These thin shales are not strong enough for use in stone tool manufacture. However, the Bringelly Shale also comprises tuff which is a highly siliceous fine grained material suitable for small tool manufacture. In addition the Hawkesbury Sandstone provides materials suitable for the manufacture of ground edge axes and surfaces suitable for engraved art. Hawkesbury Sandstone also weathers into overhangs and shelters suitable for habitation and protection from the elements. The quartz and claystone which weather from the sandstone also provide material for artefact manufacture.

3.3 Vegetation

The vegetation of the Sydney Basin would once have consisted mainly of dry sclerophyll or open woodland on the higher sections where the soils are sandy and well drained, whilst the slopes would have supported an open Sydney Turpentine Ironbark forest. The alluvial soils would have supported a river-flat forest, including various *Eucalypt* species and *Angophoras*. The open woodland species would have included *Eucalyptus siberi* (Silvertop Ash), *Eucalyptus piperita* (Sydney Peppermint), *Eucalyptus sclerophyllia* (Scribbly Gum), plus *Corymbia* with an understorey of *Banksia serrata* (Old Man Banksia), *Banksia spinulosa* (Hairpin Banksia), *Banksia integrifolia* (Coast Banksia) and various *Acacia spp.*, including *Acacia longifolia*. Flowering shrubs would have included *Telopea speciosissima* (Waratah) and *Boronia serrulate* (Native Rose), whilst groundcover species would have included *Grevillia laurfolia* and *Persoonia chamaepitys*. Clumps of *Lomandra longifolia*would also have grown on headland areas. In addition, various heathland communities would have existed along coastal areas (Baker 1986).

Such vegetation would have provided a rich and varied food source. Flowers from the *Eucalyptus* and *Banksias* provide a rich nectar. *Acacia* pods can be eaten and the bark used

medicinally. This vegetation also supported a variety of animal life associated with Aboriginal diet. This included possums, various wallabies and other small marsupials, as well as birds and lizards. Bark and wood suitable for spears, shields, water and/or food vessels (coolamons) and other implements would have been available from large trees. (Low 1989).

However, the urbanisation of the Sydney Basin has ensured that the landscape and its vegetation has been dramatically altered and no longer resembles the pre-contact landscape.

3.4 Current Land Use and Disturbance

Settlement at Barangaroo began early in Sydney's colonial history. The first wharf was constructed in Cockle Bay in 1811 on the order of Governor Macquarie. From the 1830s development of the shoreline to accommodate the shipping industry began and included wharf construction, land reclamation and the quarrying of the sandstone cliffs at the base of Observatory Hill (Casey & Lowe 2010).

Hickson Road is sited on reclaimed land. It was previously the AGL Gasworks from c1842 until c 1918 (Casey & Lowe 2010:20). Geotechnical investigations have identified contamination in association with the former gas works and research and archaeological works have confirmed the importation of fill materials for land reclamation of the existing wharf areas.[1] Full details of the landuse of the site is contained in Casey & Lowe (2010).

The Barangaroo site is now comprised of a bitumen and concrete deck of the former shipping container terminal which overlies portions of the original shoreline in the north and south east of the study area. The remainder of the site overlies reclaimed land. The majority of the shipping container terminal buildings have been removed. To the west of the Barangaroo site is Sydney Harbour, to the north east is Walsh Bay, to the east is Hickson Road, Millers Point and the Rocks, and to the south, the International Passenger Terminal, the King Street Wharf and Darling Harbour.

[1] Casey & Lowe 2012 *Archaeological Excavation, Barangaroo South, Preliminary Results*, report to Lend Lease (Millers Point), http://www.caseyandlowe.com.au/sitebarangaroosouth.htm

4.0 Archaeological Context

4.1 Sydney region

Many surveys have been undertaken in the Sydney region which indicate the richness of the archaeological resources and which provide information about Aboriginal occupation within the region. In particular, Attenbrow (2002) has excavated a range of sites within the Sydney Basin. The aim of her study was to identify local geographic variation and temporal changes in the subsistence patterns and material culture of the people of this area. She excavated sites at Balmoral Beach, Cammeray, Castle Cove, Sugarloaf Point (Lane Cove River), Darling Mills State Forest, Winston Hills, Vaucluse and Cumberland Street in The Rocks. Dates for initial occupation vary from approximately 10,000 years BP at Darling Mills to approximately 450 years BP at Cumberland Street, The Rocks.

The oldest dated occupation for the Sydney region is 15,000 years BP from the Shaws Creek K2 rock shelter on the Nepean River (Kohen 1984; Nanson et al 1987). However these dates must be considered in association with environmental data related to sea level rises. The Sydney region that we know today is vastly different to the landscape of 15,000 years ago.

The period of maximum glaciation was 15,000 – 18,000 years BP. Therefore the date of the K2 rock shelter and Attenbrow's Darling Mills site indicate that Aboriginal people lived throughout a period of extreme environmental change. During this period, sea levels were up to 130m below current levels (Nutley 2006: 1). About 10,000 years ago as temperatures began rising at the end of the last ice age, the polar ice started melting and sea levels rose. The rising sea levels forced people to abandon coastal sites and move inland, with the result that the oldest coastal sites were inundated. By about 6,000 years ago, rising water levels had flooded the coastal plain forming the Sydney landscape that we know today. The vast majority of sites in the Sydney region date to around 5,000 years BP, after sea levels had stabilised. Whilst research into submerged indigenous sites is now being undertaken (Nutley 2006), there are few sites in the Sydney area that are known to date beyond 10,000 years BP. Therefore research undertaken to date has focused on subsistence patterns and cultural change, e.g. Attenbrow (2003).

Attenbrow's (2003) study of the "Sydney region" extended from the eastern coast to the Hawkesbury-Nepean River to the north and west and as far south as Picton (2002: xiii), which includes the resent study area. At the time of publication (2002), Attenbrow noted that approximately 4,340 Aboriginal sites had been registered with DECCW's Aboriginal Heritage Information Management System (AHIMS) in the Sydney region (Attenbrow 2002: 48). Middens and open campsites comprised just over half of the recorded sites (Attenbrow 2002: 48 – 49). From both the archaeological evidence and historical records she noted that the main focus of occupation was "on the valley bottoms and shorelines" (Attenbrow 2002: 47). In addition, the evidence indicates that occupation was greater on the coastal/estuarine environments rather than in the hinterland/freshwater environments and on the Hawkesbury sandstone rather than the Wianamatta shales (Attenbrow 2002: 51). Her work produced a great deal of information in respect of the people of the Sydney region, their social organisation and land use patterns. Her (2002: 152 – 155) analyses indicates that prior to 5,000 years ago occupation in the Sydney region was not intensive and was only by small groups of people. It was not until sea levels stabilised about 5,000 years ago that more intensive occupation began with many open sites being first occupied in the last 1,500 years.

4.2 Sydney Harbour

The ethnographic data (Austal 2010:20) indicates that middens were once prominent around the foreshores of Sydney Harbour. From the early 1800s settlers began using the extensive middens to produce quicklime.

The 1883 publication Aborigines of Australia and the 1880 Journal of the Royal Anthropological Institute recorded a rock engraving at the area now known as Dawes Point Park, approximately 70m to the east of Barangaroo. The engraving was either of a whale or a shark with the figure of a man at its head. This engraving has since been destroyed, probably during the construction of the Sydney Harbour Bridge (AHIMS 45-6-0030).

In 1985 Lampert excavated a midden and camp site at Mort's Bond Store approximately 100m to the east of the study area. The site had been truncated by construction of the building and was in a highly disturbed condition. It contained shell and bone, as well as stone artefacts manufactured from red and grey silcrete, quartz, quartzite and chert. The artefacts were comprised of flakes, flaked pieces and cores. He hypothesised that the stone material was sourced from quarries on the Cumberland Plain (Lampert 1985).

An engraving was recorded "on upright surfaces in creek bed" at Goat Island (AHIMS 45-6-0811). These engravings include a whale, kangaroo and fish. Three disturbed middens have also been recorded on Goat Island (AHIMS 45-6-0811; 45-6-1957; 45-6-2382). Goat Island itself is extremely important, as it was recorded in 1798 as being owned by Bennelong, who played a significant role in early Aboriginal - European relations. It was also recorded as being used by Aboriginal people for imprisonment prior to European settlement. Deputy Judge Advocate David Collins was required by the Colonial Government "to observe, record and if possible reconcile the Aborigines". In 1798 he published details of Bennelong's relationship to Goat Island. This is the first official written account of ownership of land by an Aboriginal person (Gollan 1993).

A midden was recorded at Bennelong Point, approximately 1.25km to the east of Barangaroo. The shell from this midden had been collected by the convicts to burn into lime to provide building mortar (AHIMS 45-6-1615).

Another midden was uncovered during building works near the historic building "Lilyvale" on the corner of Cumberland and Essex Streets, The Rocks, approximately 0.5km east of Barangaroo. It had been highly disturbed by the construction of terrace houses in the 1830s and was subsequently destroyed by the construction of a hotel (AHIMS 45-6-1853).

During historic excavations in relation to the construction of the eastern distributor at Woolloomooloo, an artefact scatter was uncovered. The site was subsequently excavated by Brayshaw (AHIMS 45-6-2580). This site, which was located near a spring, contained four silcrete, four chert, two quartz artefacts plus one quartzite and one chalcedonic silica artefact. They were found at a depth of about one metre in "disturbed topsoil, overlain by fill" (AHIMS 45-6-2580: 2).

During historic excavations in respect of a development located approximately 1.5km to the south east of Barangaroo at William Street, an artefact scatter was uncovered. This was subsequently excavated and the artefacts included fine quartz debitage and cores, silcrete flakes and tuff cores and flakes (AHIMS 45-6-2651).

Development works at Angel Place, approximately 0.8km to the south east of Barangaroo, uncovered stone artefacts. This site was subsequently excavated by Steele who retrieved three broken flaked pieces in "partially disturbed topsoil mixed with alluvial silts" (AHIMS 45-6-2581). Steele also recorded a potential archaeological deposit (PAD) on George Street, opposite Wynyard Station (AHIMS 45-6-2796). Neither his assessment report nor subsequent excavation report were available from DECCW, therefore no further comment about his site can be made.

In 2002 Steele excavated a site on the corner of Broadway and Mountain Streets in relation to the Quadrant Development, approximately 2.5km to the south west of Barangaroo. He uncovered seven quartz and six silcrete artefacts.

Steele (2006) also undertook an assessment and excavations at a development site bound by Kent, Erskine, Napoleon and Sussex Streets, which became known as the KENS site and was located approximately 0.5km to the south east of Barangaroo. Steele retrieved a large assemblage of 952 artefacts which were predominantly manufactured from silcrete with some tuff and quartz artefacts (Steele 2006: 97). He interpreted the site as being occupied between 2,800BP to 1788. This site was located in a similar environmental context to the present study area, i.e. in a coastal environment near an original shoreline.

Archaeological excavations undertaken in 2009 at Darling Walk (Comber & Stening in preparation), approximately 1.7km to the south of Barangaroo, revealed a midden in a highly disturbed context. Ten stone artefacts were located and these comprised silcrete, chert and quartz flakes and flaked pieces. This site was located in a similar environmental context to Barangaroo, being predominantly reclaimed land with a small portion of original shoreline that had been significantly developed.

With the exception of the Darling Harbour midden the majority of these sites have been uncovered during historical archaeological excavations in relation to development proposals. The Darling Harbour midden was excavated as a result of management recommendations from an assessment undertaken (Comber & Stening in prep) prior to development. A few of the sites were recorded at contact. None have been recorded and analysed as a result of a systematic regional assessment. However, all of these sites are located in the coastline/estuarine environment on Hawkesbury Sandstone. These locations confirm Attenbrow's model of coastal occupation, i.e., that occupation was greater in these environments and on the Hawkesbury Sandstone than in the hinterland/freshwater environments.

4.3 The Study Area

A search of the Office of Environment & Heritage (OEH) Aboriginal Heritage Information Management System (AHIMS) indicates that no known Aboriginal sites have previously been recorded within or in the vicinity of the Barangaroo site.

An assessment by Comber & Stening (2010) in respect of the Barangaroo redevelopment, indicated that the present study area, referred to as the DECCW declared contaminated land in the 2010 report and referred to as the Site Remediation Area in the present report, does not contain any known sites and does not contain any Aboriginal cultural heritage significance. However, that report indicated that it is possible that sites might remain on the south-eastern portion in Blocks 2 and 3 of the Barangaroo redevelopment area, near the

location of the original shoreline (see Figure 5). This is outside of the Site Remediation Area, the subject of this report.

4.4 Site Prediction

It is possible that evidence of occupation exists within the south-eastern portion of the Barangaroo South, near the original shoreline in Blocks 2 and 3. However, as the present study area is within reclaimed land it is highly unlikely that sites will exist. In addition the construction of the AGL Gasworks and operation of the Gasworks would have destroyed any evidence of Aboriginal occupation, if it did exist.

5.0 Site Inspection

5.1 Methodology

This project was conducted in three stages, which were background research, site inspection and report production, as detailed below.

Stage 1: Background Research
Prior to the field component of this project, the Aboriginal Heritage Information Management System of the Department of Environment and Climate Change was consulted. Site data, associated documents and archaeological survey reports held in this database were reviewed. Environmental information relating to Aboriginal land use was also researched. Such research facilitated the understanding of the potential nature of the sites and site patterning in the region, which enabled the predictive statement to be made. It also provided an archaeological and environmental context within which a significance assessment could be made if any Aboriginal sites were located during the field survey.

Stage 2: Field Survey
The archaeological site inspection and field assessment was undertaken on Friday 16th April 2010 with the following people present:

- Jillian Comber, Archaeologist, Comber Consultants
- Tory Stening, Archaeologist, Comber Consultants
- Mr Allen Madden, Site Officer, Metropolitan Local Aboriginal Land Council

The nature of the overall Barangaroo development and the contamination was discussed and the whole of the Barangaroo redevelopment area inspected by all of the above on foot. 100% of the study area was inspected. The area inspected included the area of contamination proposed for the SISCO trial and for the proposed remediation project.

Stage 3: Report Preparation
After completing the site inspection, a draft report was prepared and provided to Casey & Lowe, Lend Lease and the Metropolitan Local Aboriginal Land Council. On receipt of their comments this report was finalised and a final copy provided to each of the above.

5.2 Effective Survey Coverage

Ground surface visibility, which refers to the amount of bare ground visible during the field survey, was nil. As previously mentioned the existing site comprises a flat bitumen and concrete deck

The visibility of some site types, such as open artefact scatters, is dependent on ground visibility and exposure. The DECCW's Code of Practice for *Archaeological Investigation of Aboriginal Objects in NSW* suggests that this information is to be presented in a table which quantifies and details the local detectability (DECCW 2010:18).

However as the study area is a bitumen and concrete deck obscuring the original ground surface this table will not be used. As previously stated 100% of the study area was inspected, but no sites were visible.

5.3 Results

No known sites were recorded within the study area. As the study area is developed, there was no surface visibility.

An assessment of the whole of the Barangaroo site (Comber & Stening 2010) indicates the possibility for sub-surface archaeological deposits remaining on the eastern end of the Barangaroo redevelopment area in Blocks 2 and 3.

However, in respect of the present Site Remediation Area it is not expected that sub-surface remains would exist. The present study area is south-west of Hickson Road and the original shoreline. Hickson Road is within reclaimed land (Figure 5) and subsurface deposits are not expected in the reclaimed land.

Therefore, subsurface testing and/or monitoring is not required prior or during the remediation project.

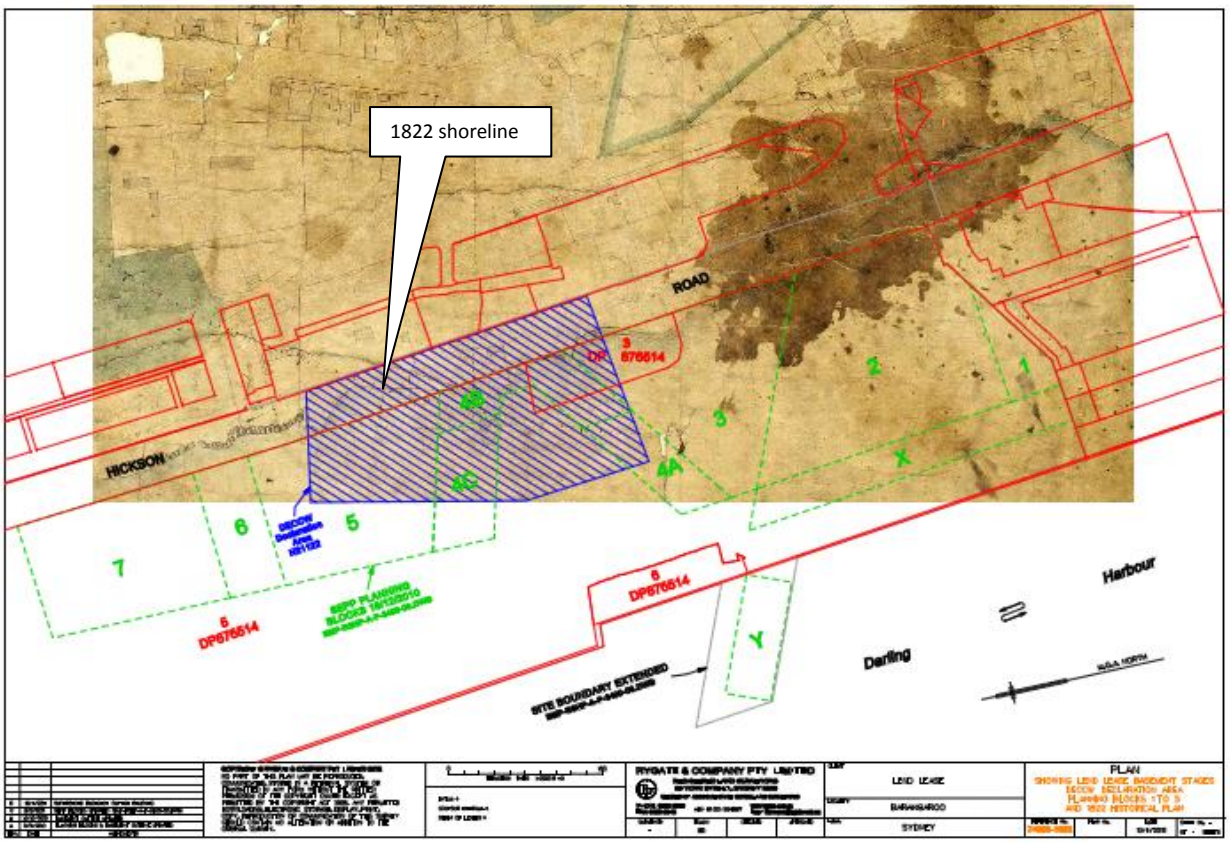

Figure 5: Showing Barangaroo South overlaid on the 1822 map indicating where the original shoreline exists. The Declaration Area is hatched in dark blue and the various blocks are outlined in green. (courtesy Lend Lease)

6.0 Impact from Remediation Action

The BDA and Lend Lease propose to remediate Hickson Road to address NSW EPA Declaration 21122, using:

- Preferred Remediation Method – In-situ Remediation; or
- Alternative Remediation Method - Ex-situ Remediation.

See Figures 6 to 11 for preferred methodology and Table 1.

6.1 Option 1 –Preferred Methodology - In-Situ Remediation –

Summary of Actions

Install below ground wells and piping in Hickson Road, and install above ground, temporary compound in road reserve. Install groundwater control to part 36 Hickson Road boundary.

Undertake in-situ chemical oxidation remediation of Hickson Road, comprising a combination of injection and extraction of fluids from groundwater wells.

Licenses/Approvals

- Obtain all licenses/approvals, including variation to existing Environment Protection License, any waste approvals, conditions of planning approval, etc.

Site Establishment

- Implement temporary traffic diversion as required (incl. temporary removal of street parking).
- Implement pedestrian diversions, where required.
- Local protection/pruning of Hickson Road trees, where required for well installation.
- Install general environmental controls for works (eg. bunding, sediment controls).

Well and Piping Installation – Hickson Road

- Undertake installation generally in two stages – west half and then east half of road. Localised traffic diversion and management on Hickson Road and footpath
- Install groundwater injection or monitoring wells per Preliminary ISCO Remediation Workplan (AECOM 2014) and any modifications as required following the Pilot Trial.
- Anticipated to be approximately 60 wells (50mm diameter) – final quantity subject to selected contractor design.
- Install Soil Vapour Points per the Preliminary ISCO Remediation Workplan (AECOM 2014) and any modifications as required following the Pilot Trial. Anticipated to be approximately 30 soil vapour points. Final quantity subject to selected contractor design.
- Cut pavement and excavate shallow trenches to install required piping to connect wells to central compound area in the Hickson Road reserve.
- Where required, wells and pavement to be re-instated, or road plates as applicable, to allow continued trafficking over. Some temporary traffic diversion may remain around some wells, as required for access and monitoring during works.
- Spoil generated to be transferred off-site for treatment or disposal, following classification
- Excess water to be collected, sampled and transferred for treatment, as required, and disposed accordingly.

Perimeter Retention Wall

- Install groundwater control wall (eg. secant piles) to gasworks structures at 36 Hickson Road boundary.
- Implement odour control per the Preliminary Hickson Road PRW Odour Control Plan.

In-situ Remediation Compound Set-up

- For each remediation stage – east half and then west half –temporary compounds to be set-up in road reserve.
- The temporary compound area within road reserve to be hoarded and fully secured to prevent unauthorised access.
- Appropriate traffic diversions to be in place per the Traffic Impact Assessment and any subsequent, approved Traffic Control Plans.
- Vehicle and pedestrian access to be maintained to 38 Hickson Road, and Sewer Pumping Station 1129.
- Establish plant/equipment, Site accommodation incl. after-hours deliveries for over-sized loads or to minimise peak hour traffic impact.
- Chemical storage, deliveries and use within compound area to be per the Preliminary ISCO Workplan, future detailed contractor design and Dangerous Goods Storage requirements.
- Chemical or extracted liquid storage to be fully bunded as required.
- Soil Vapour extraction system set-up with carbon filters and emissions stack per Environment Protection License requirements.

In-situ Remediation Operation

- Undertake remediation in 2 stages;
    - 1st stage - east half of road/footpath (with traffic diverted to west)
    - 2nd stage – west half of road/footpath (with traffic diverted to east)
- Traffic diversions to maintain vehicle and pedestrian movement along Hickson Road.
- Undertake injection and extraction in required areas, per the AECOM Remedial Action Plan, Preliminary ISCO Workplan, and future detailed contractor design.
- Chemical/materials deliveries to site as required during works.
- Collection of waste soil/material for classification, treatment & disposal off-site
- Transfer of any wastewater to either a storage tank in the compound area, or piped to a temporary waste water treatment plant on the Barangaroo site. Wastewater to be treated in the temporary waste water treatment plant (for subsequent disposal per the EPL), or disposed off-site to a licensed liquid waste facility by licensed tanker trucks.
- Detailed monitoring for the duration of works.

Localised Excavation (if required)

- If required, undertake localised contamination excavation, to supplement in-situ remediation process.
- Any excavation to be undertaken using appropriate odour control.
- All excavated material to be loaded into sealed trucks, and transported off-site to a licensed facility for treatment/disposal.

Hickson Road Validation

- Validate remediation areas per RAP. Includes detailed soil and groundwater sampling.

Remediation Area Decommissioning

- Remove all above ground infrastructure and plant
- Cap all below ground wells/piping and leave in-situ
- Temporary restoration of Hickson Road pavement and footpath where required around wells/piping.
- Remove traffic diversions, and restore regular traffic.

Staging of Ex-Situ Remediation

The following table and plans (Appendix) outline the extent of works required to be undertaken in relation to the remediation. See also Figure 4.

Table 1: Preferred staging for in-situ methodology - indicative (Nov 16 – Aug 18)

In-situ Method			
Indicative Works Staging		**Indicative Duration**	**Summary Works**
Stage 1	Nov 16 – Dec 16	1 month	**Installation – west half** Temporary removal of street parking for works Install wells and infrastructure. Temporary traffic diversions
Stage 2	Jan 17 – Feb 17	2 month	**Installation – east half** Install wells and infrastructure. Install groundwater control walls. Set-up compound in road reserve. Temporary traffic diversions
Stage 3	Mar 17 – Aug 17	6 months	**Remediation – east half** Undertake ISCO remediation
Stage 4	Sep 17 – Feb 18	6 months	**Remediation – west half** Undertake ISCO remediation
Stage 5	Mar 18 – Aug 18	6 months	Validate remediation Decommission wells / Restore road (staged) Re-instate street parking

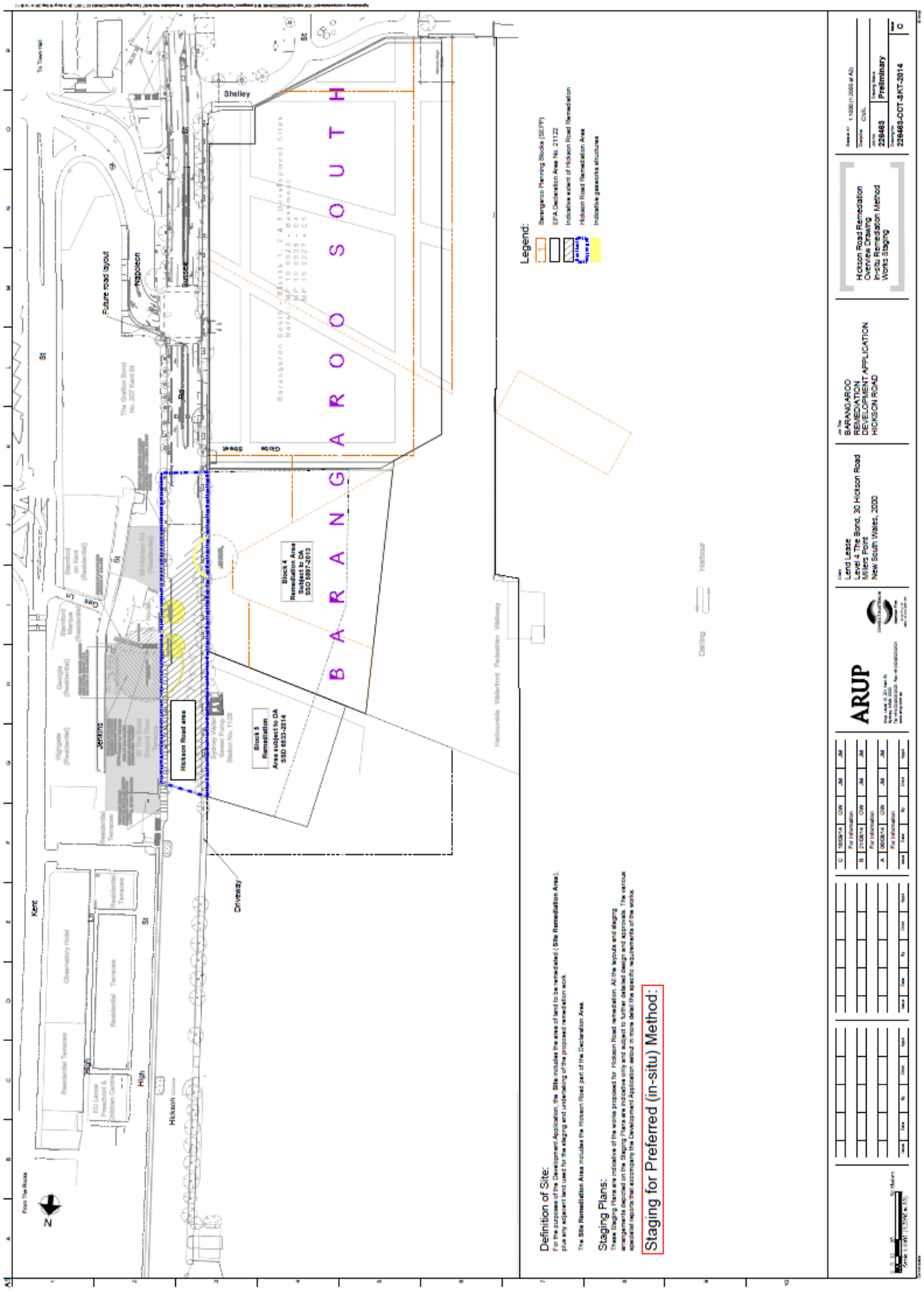

Figure 6: Plan showing the location of in-situ remediation works. Arup for Lend Lease (Millers Point).

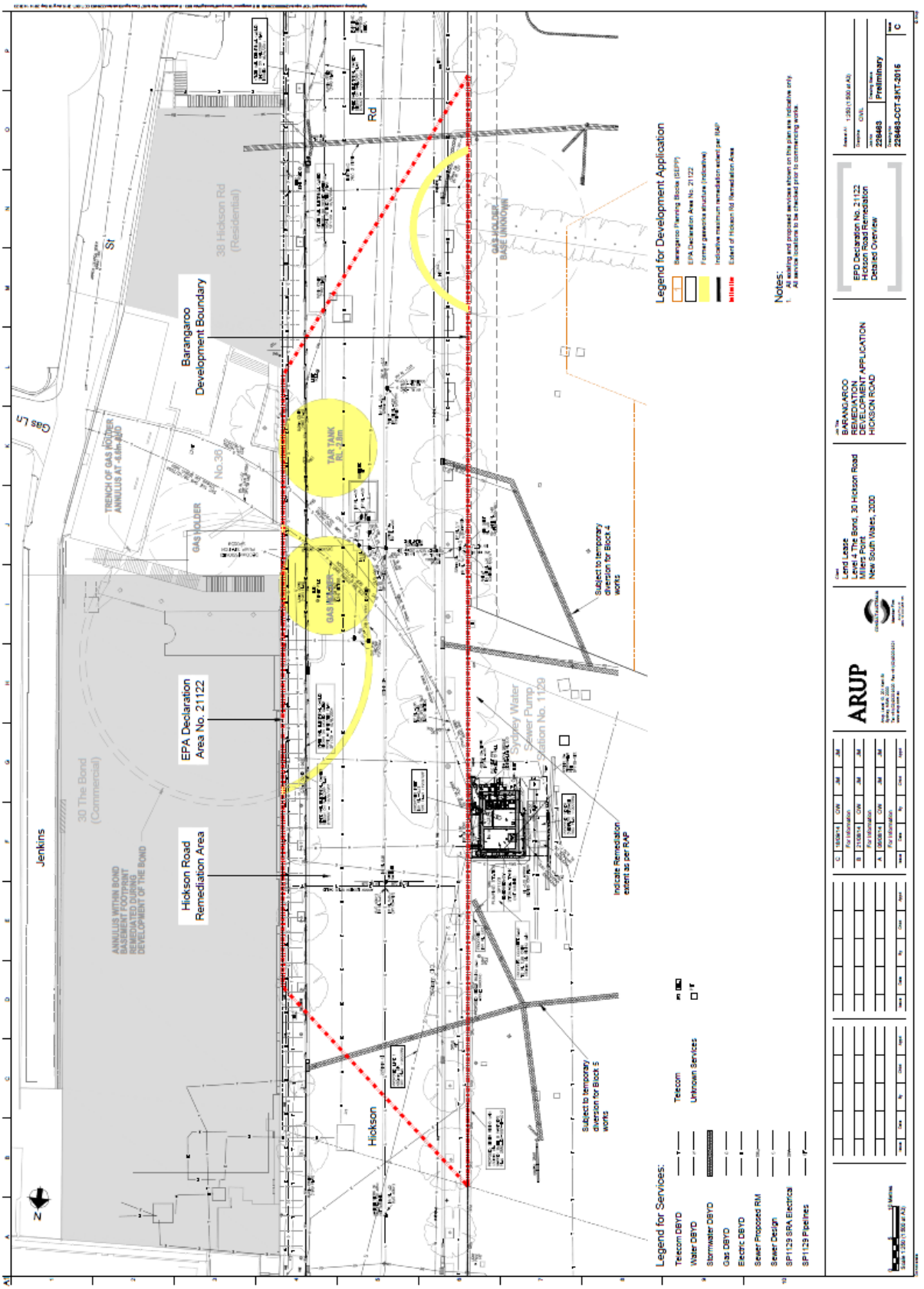

Figure 7: Plan showing the detailed overview of in-situ remediation works. Arup for Lend Lease (Millers Point).

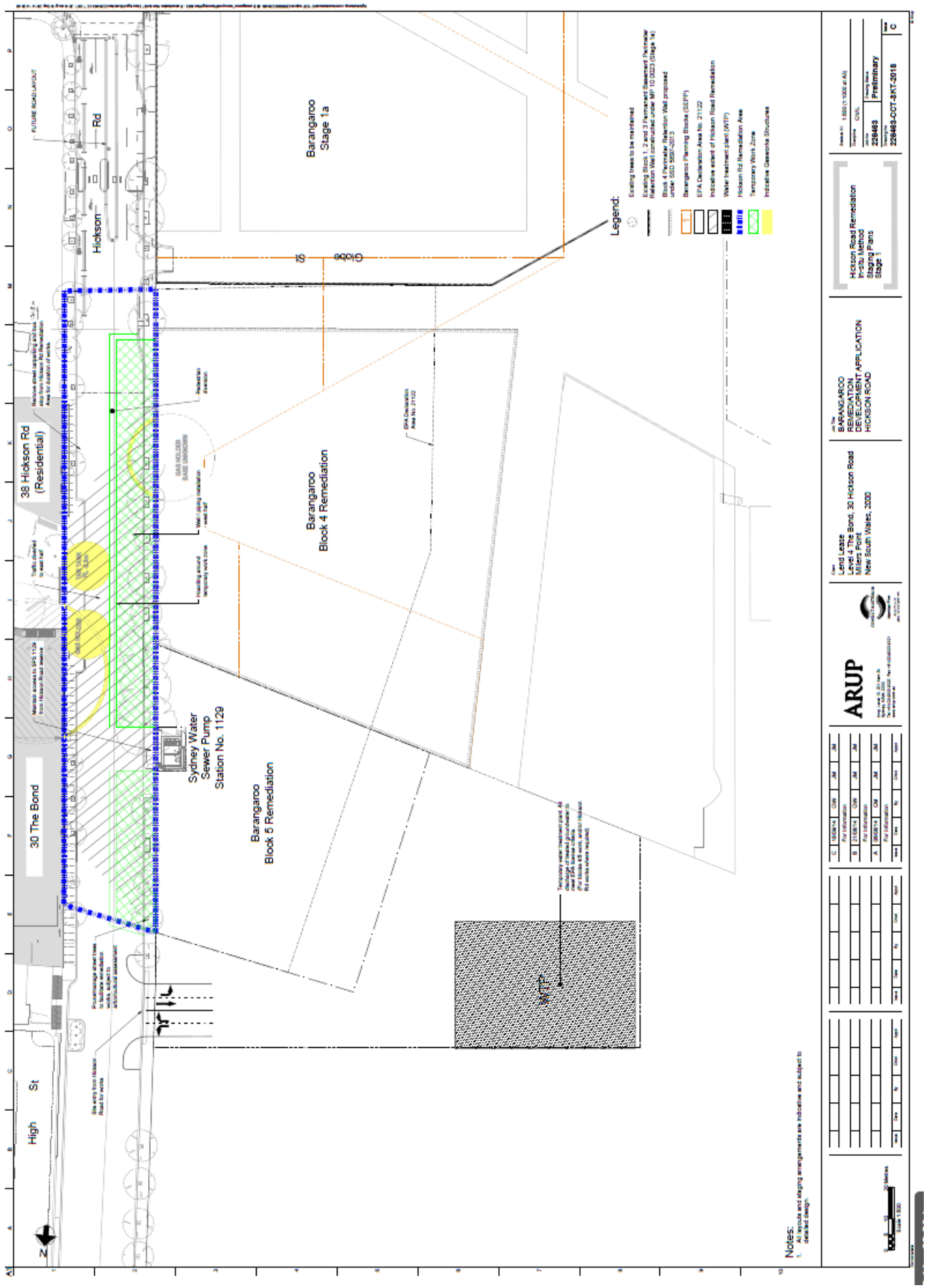

Figure 8: Plan showing Stage 1 of in-situ remediation works. Arup for Lend Lease (Millers Point).

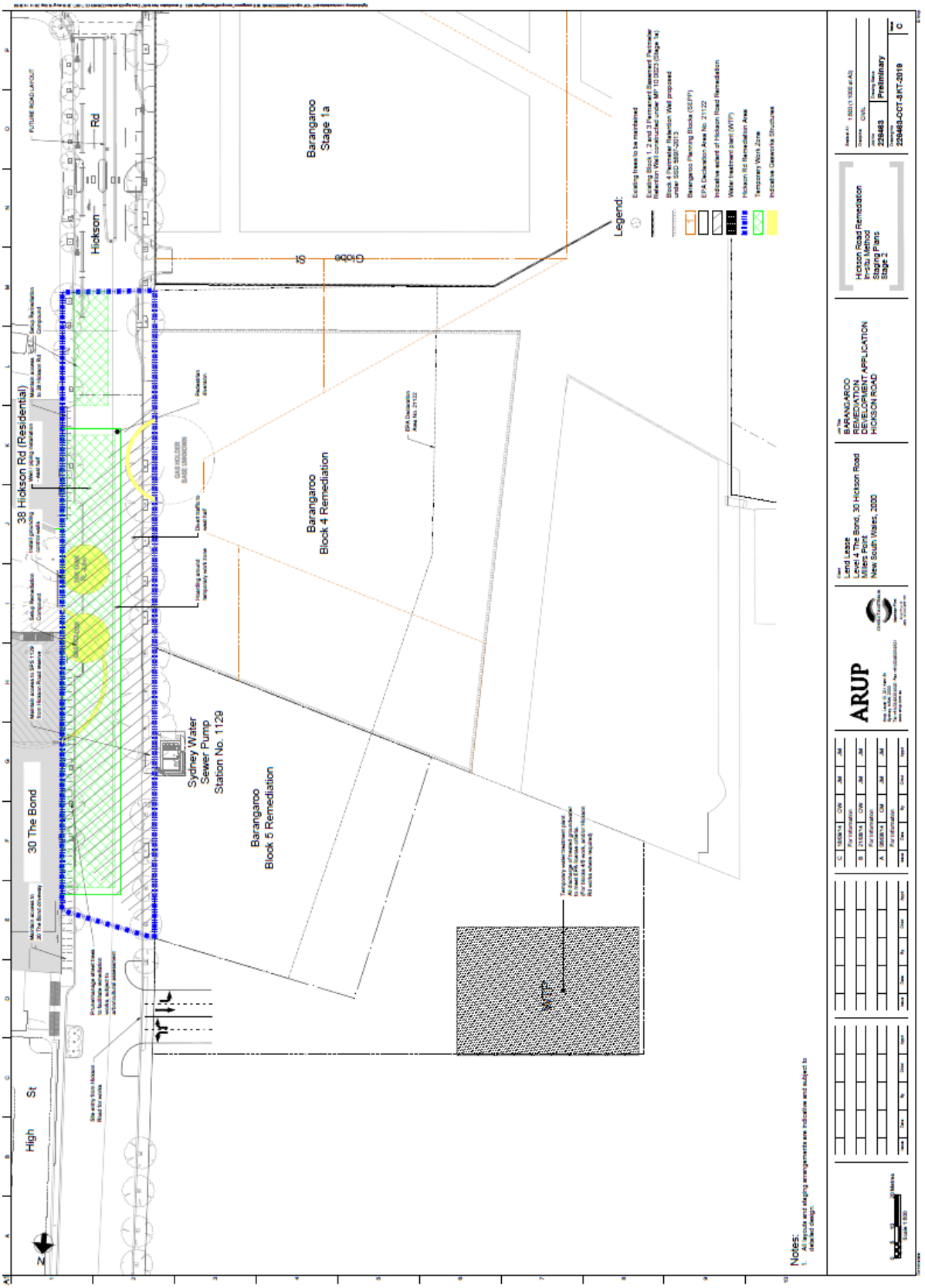

Figure 9: Plan showing the location of Stage 2 works for in-situ remediation. Arup for Lend Lease (Millers Point).

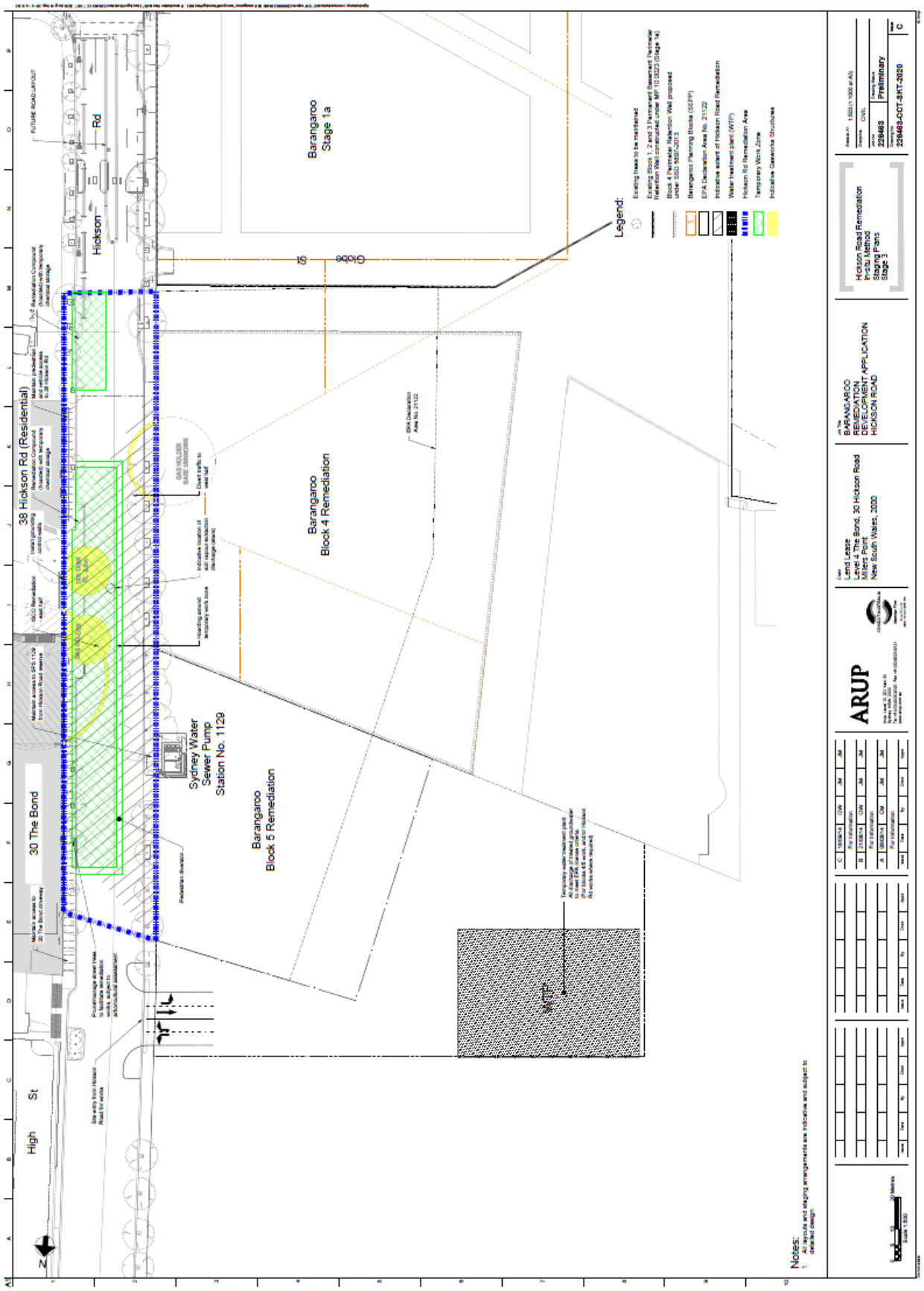

Figure 10: Plan showing location of Stage 3 works. Arup for Lend Lease (Millers Point).

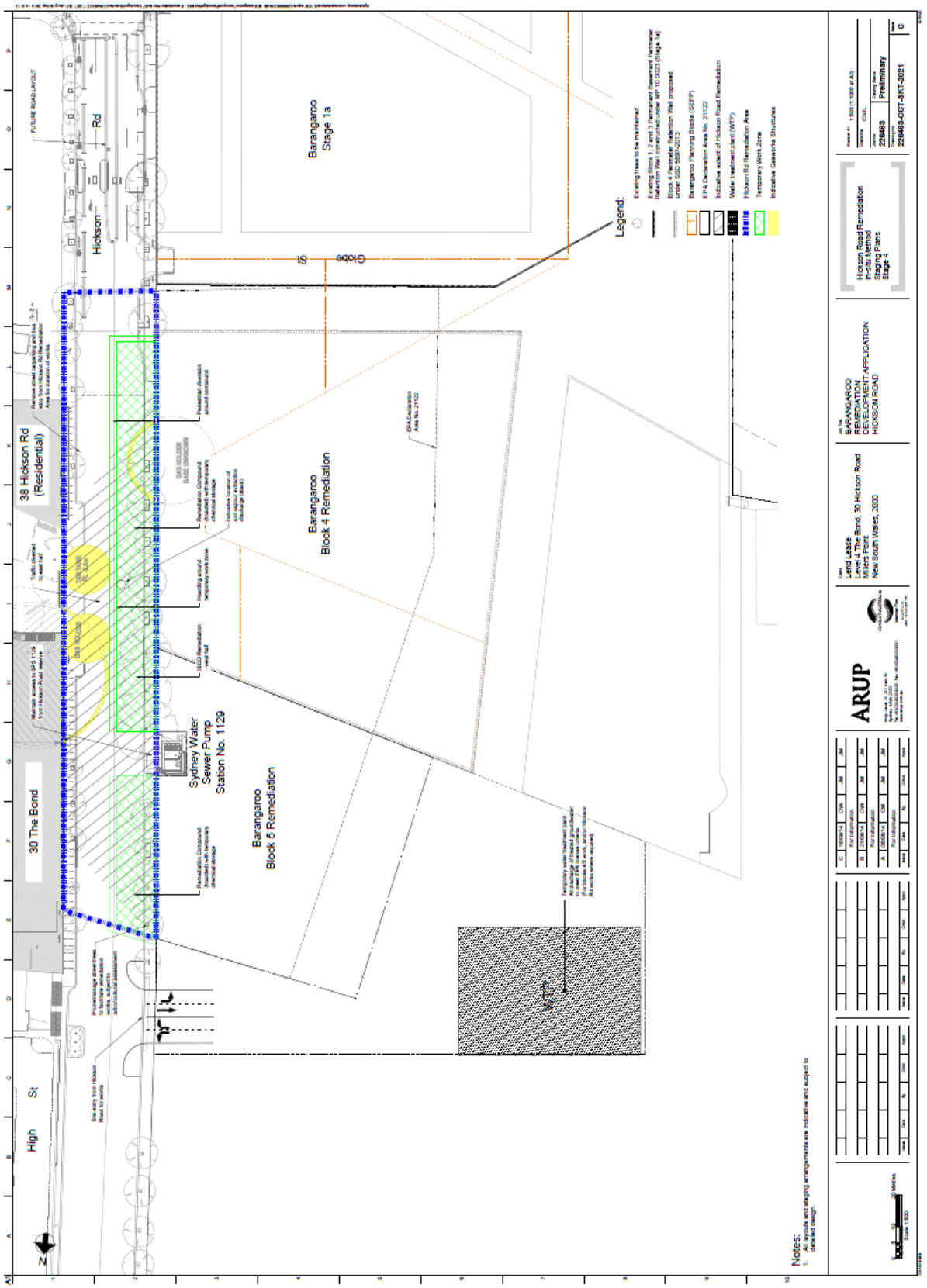

Figure 11: Plan showing location of Stage 4 works. Arup for Lend Lease (Millers Point).

6.2 Option 2 – Alternate Remediation Methodology (Ex-Situ)

Summary of Actions

Undertake ex-situ remediation through excavation of required contamination beneath odour enclosures, and off-site treatment disposal of excavated material. Includes traffic diversion, groundwater control walls, dewatering, water treatment, backfilling and temporary road restoration, see Figures 12, 13, 14.

Licenses/Approvals

- Obtain all licences/approvals, including variation to existing Environment Protection Licence (EPL), any waste approvals, conditions of planning approval, road authority etc.

Site Establishment

- Implement traffic diversions to establish temporary work zones, where remediation and works staging required. Maintain through traffic on Hickson Road at all times.
- Implement pedestrian diversions, as required.
- Undertake remediation in 2 main stages (east and west):
    - 1st stage - Temporarily close one half and undertake remediation, backfilling and re-surfacing, while traffic is diverted to other half.
    - 2nd stage - Following 1st stage (including re-instatement), re-divert traffic and complete remaining stage.
- Install site hoarding/exclusion zones and decontamination areas
- Local protection, pruning or removal of site trees as required, per Arboricultural Impact Assessment
- Install general environmental controls for excavation works (eg. bunding, sediment controls).
- Establish plant/equipment, Site accommodation incl. after-hours deliveries for over-sized loads or to minimise peak hour traffic impact.

Services Diversion

- Temporary diversions or protection of existing services, as required.

Perimeter Retaining Walls

- Install groundwater control wall (eg. secant piles) to gasworks structures at 36 Hickson Road boundary.
- Construct retention walls (eg. secant piles) within Hickson Road to facilitate excavation in controlled stages, as required.
- Implement odour control per the Preliminary Hickson Road PRW Odour Control Plan.
- Temporary ground anchors or associated support structures

Dewatering and water treatment

- Installation of dewatering infrastructure and piping, to transfer dewatered groundwater to a temporary Water Treatment Plant (WTP) on Barangaroo. Include trenching across road (and appropriately restored to allow continued trafficking over).
- Undertake groundwater extraction, transfer water to the WTP, treat water and discharge per EPL requirements
- Where required, highly contaminated liquid waste may be pumped by licensed liquid waste contractors (vacuum truck) and disposed off-site

Construct Excavation Odour Control Structures

- Install temporary odour control structure(s) over required excavation areas, in stages. This may include installation of temporary ground structures (eg. piles/capping beam) and/or perimeter weights as required to provide support.
- Structures to be installed to ensure all odours are contained. Air exhaust system and associated emissions control, air filters/treatment and stack
- Odour control structures may include retractable doors and an air lock system at the entrance/exit to minimise odour emissions.
- Final structures to be subject to future detailed design.

Excavation

- Excavate contaminated soil from Hickson Road, per the AECOM Remedial Action Plan
    - Indicative excavation volume ~ 16,000m3
- Undertake excavation of east & west halves of Hickson Road in stages. All excavation to be undertaken beneath odour control structures.
- Excavation of rock where required to facilitate contamination excavation from historic gasworks structures.
- Temporary odour control structures to be operated to manage and treat exhausted air.
- Vehicles/plant to be decontaminated in wheel wash/cleaning area, prior to moving off-site.
- Conduct detailed monitoring (air, noise, water) through-out works

Soil Treatment / Disposal

- Excavated contaminated material to be transported directly off-site for treatment or disposal in accordance with NSW EPA requirements and waste guidelines. Allowance for temporary stockpiling, as required, to classify or inspect material.
- All material to be transferred in sealed trucks (with odour suppressant foam or similar as required) to mitigate potential odours.
- Hazardous classified material to be transported off-site to a licensed treatment facility for treatment, prior to landfill disposal.

Hickson Road Area Validation

- Validate excavations per RAP – inspections and sampling/testing.

Backfilling and Decommissioning

- Following each excavation stage, decommission temporary odour control structures
- Backfill and compact excavations with suitable imported fill.
- Temporary restoration of road/pavements as required, to match existing.
- Following works, plant new street trees to replace those removed (unless new landscaping requirements are approved generally for Hickson Road, under separate DA/approvals).

Table 2: Alternative Staging Methodology - indicative (Nov 16 – Oct 18)

Ex-situ Method			
Indicative Works Staging		**Indicative Duration**	**Summary Works**
Stage 1	Nov 16 – Feb 17	3 months	**East half – Establish/commissioning** Temporary removal of street parking for works Removal of street trees Divert traffic to west half Service diversion where required Install retention systems Install & commission odour structures. Install Dewatering infrastructure
Stage 2	Mar 17 – Sep 17	6 months	**East half - remediation** Excavate and dispose fill off-site. Dewatering.
Stage 3	Oct 17 – Dec 17	2 months	**East half - remediation** Validate excavations Backfill excavations. Road/footpath restoration Decommission odour structures
Stage 4	Jan 18 – Apr 18	3 month	**West half - Establish/commissioning** Divert traffic to east half Removal of street trees Service diversion where required Adjust existing retention systems Install & commission odour structures. Install Dewatering infrastructure
Stage 5	May 18 –Jul 18	2 months	**West half – remediation** Excavate and dispose fill off-site. Dewatering.
Stage 6	Aug 18 – Oct 18	2 months	**West half – remediation** Validate excavations Backfill excavations. Road/footpath restoration Decommission odour structures Re-instate street parking and trees

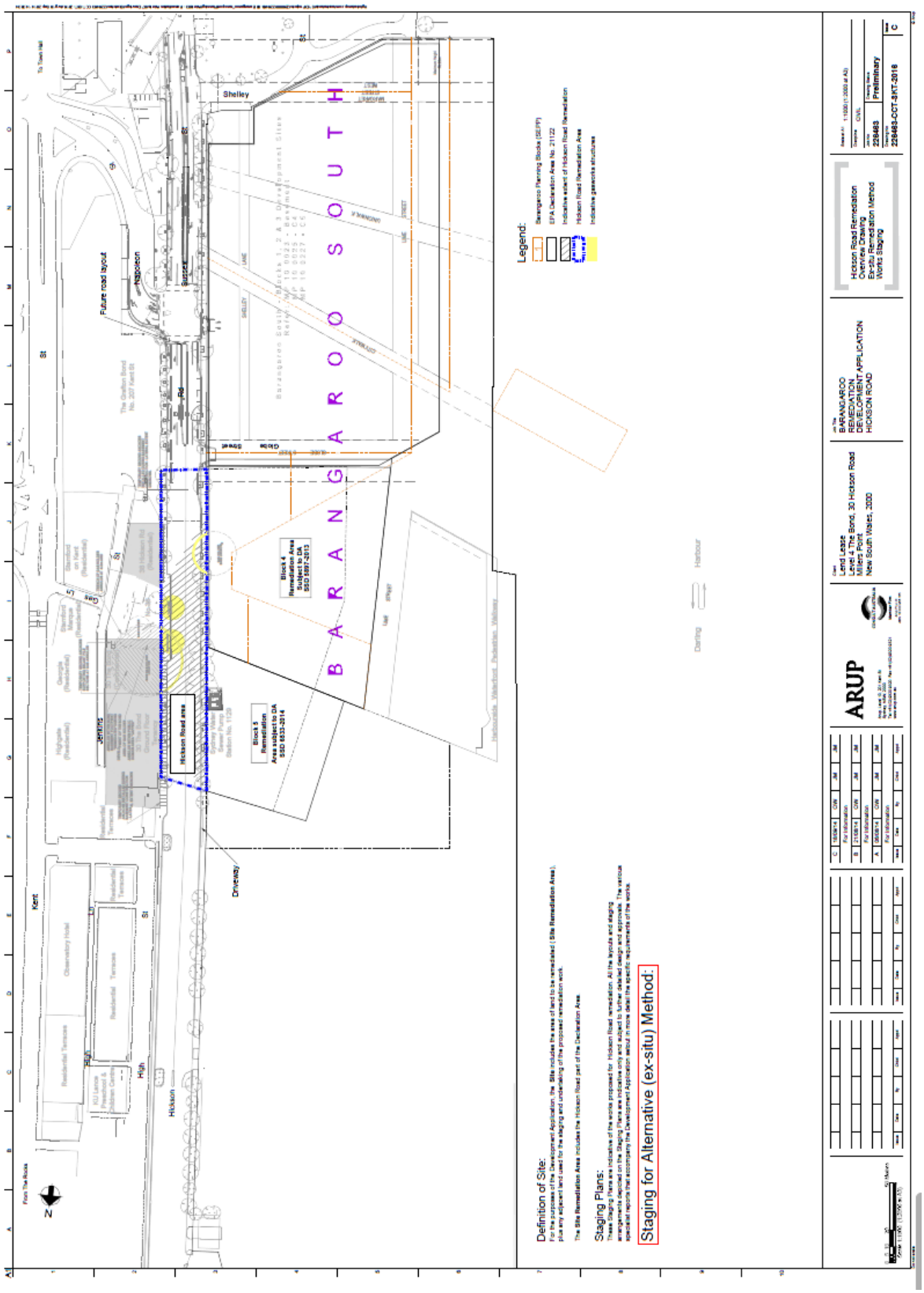

Figure 12: Ex-situ remediation works staging. Arup for Lend Lease (Millers Point).

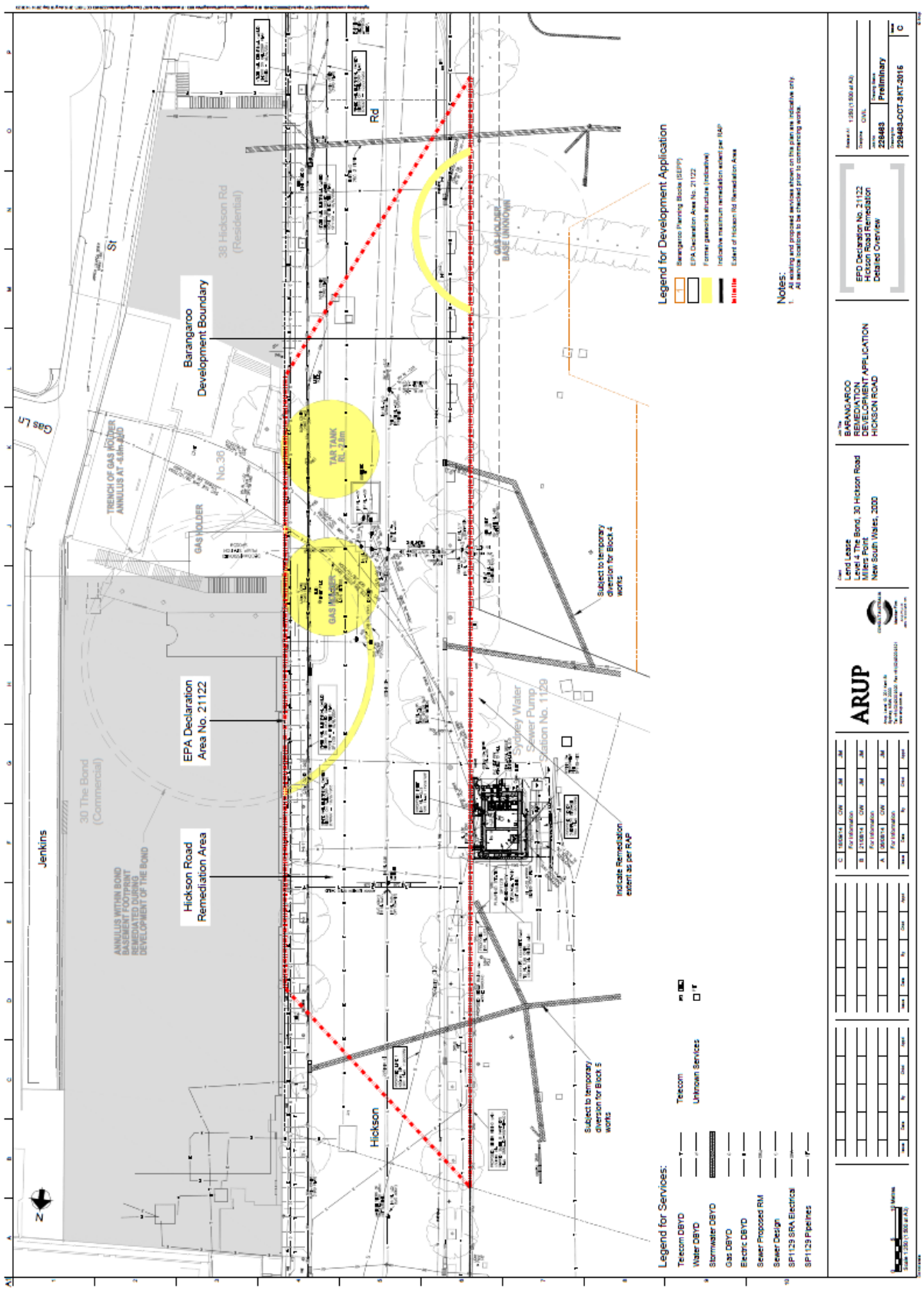

Figure 13: Ex-situ remediation works detailed overview. Arup for Lend Lease (Millers Point).

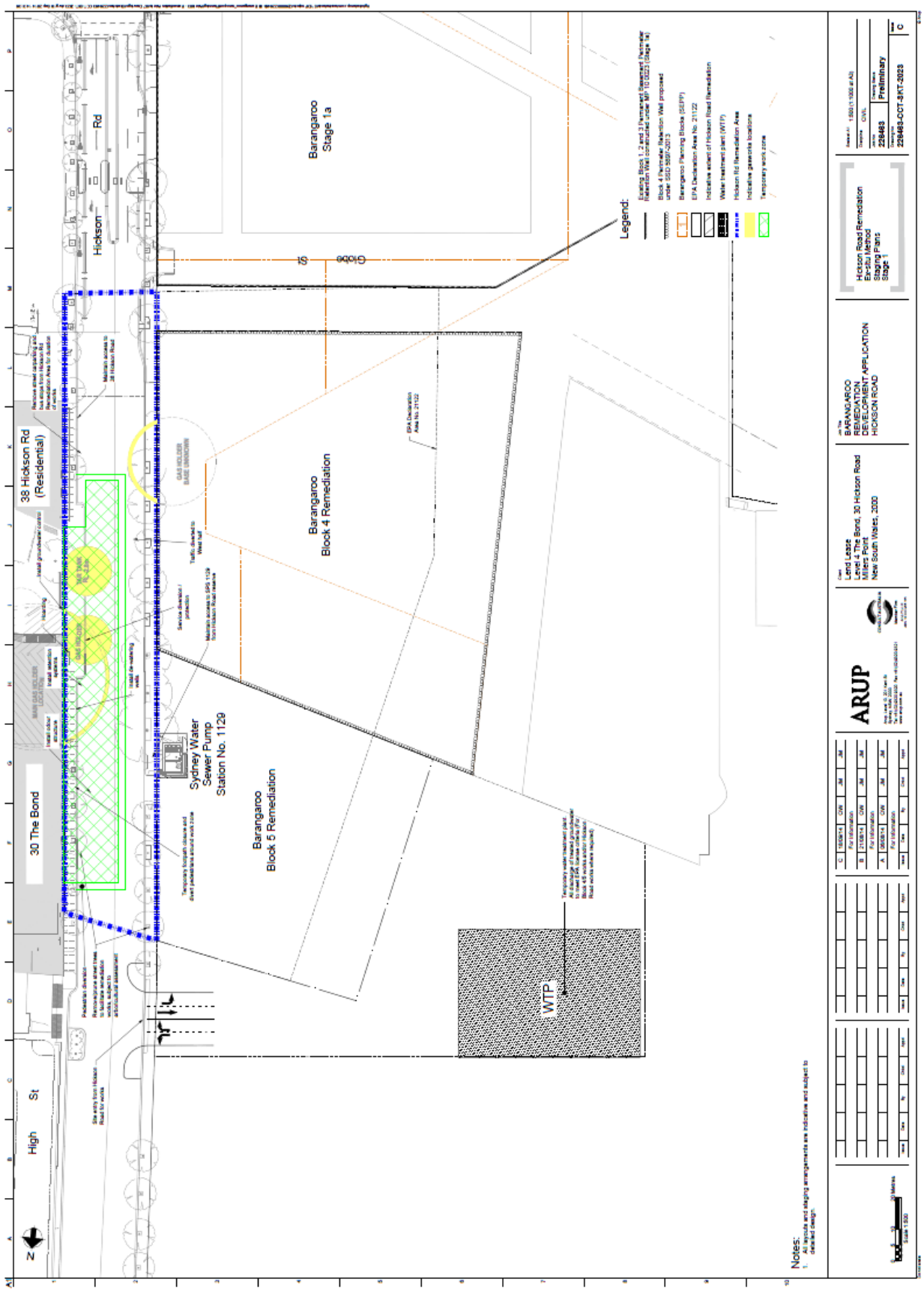

Figure 14: Ex-situ remediation works Stage 1. Arup for Lend Lease (Millers Point).

7.0 Recommendations

The following recommendations are made on the basis of:

- Legal requirements under the terms of the *National Parks and Wildlife Act 1974* (as amended) which states it is an offence to harm or desecrate an Aboriginal object without first gaining the consent of the Director of the NSW Office of Environment and Heritage or obtaining planning approval under Part 4 of the *Environmental Planning and Assessment Act 1979*;

- Discussions with representatives of the Metropolitan Local Aboriginal Land Council;

- Research into the archaeological record for the general area and the Barangaroo site in particular;

- Results of the assessment as outlined in this report.

IT IS THEREFORE RECOMMENDED THAT:

1. There is no objection to the in-situ or ex-situ remediation proposed under Development Application SSD 6617-2014 proceeding.

2. This assessment has indicated that the Site Remediation Area has no archaeological potential or Aboriginal cultural heritage values. The remediation options proposed under SSD 6617-2014 will be undertaken within reclaimed land. Therefore, the remediation proposed under Development Application SSD 6617-2014 can proceed without any further Aboriginal archaeological assessment, excavation, testing or monitoring.

3. If, during the course of the remediation project, any unexpected Aboriginal "objects", artefacts or sites are uncovered, work must cease in the vicinity of that object, artefact or site and further advice sought from the consultant and the Metropolitan Local Aboriginal Land Council.

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Photographs

Photograph 1:
Facing south looking across the area designated for Stage 1 of development. The approximate area of the original shoreline is indicated by the red arrow.

Photograph 2:
Facing east looking across Barangaroo towards Hickson Road. The approximate area of the original shoreline is indicated by the red arrows.

Photograph 3:
Looking south east across Barangaroo towards Hickson Road and the CBD. The area where the original shoreline was is indicated by the arrow.

Photograph 4:
Looking north east across Barangaroo. The location of the area within the original shoreline is indicated by the red arrow.

Photograph 5:
Looking south east towards the southern boundary of Barangaroo.

Photograph 6:
Looking north east at the northern section of Barangaroo. The sandstone outcrop seen in the middle left of the photo is in the region where the original shoreline is located, indicated by the red arrow.

Appendix A

Response from:

Metropolitan Local Aboriginal Land Council

METROPOLITAN LOCAL
ABORIGINAL LAND COUNCIL
P.O. Box 1103 Strawberry Hills, NSW 2012
Telephone: (02) 8394 9666 Fax: (02) 8394 9733
Email: metrolalc@metrolalc.org.au

Wednesday, 23rd June 2010

Tory Stening
Archaeologist/Heritage Specialist
Comber Consultants
99 Edwin Street North
Croydon NSW 2132

Re: Aboriginal Heritage Site Assessment
Barangaroo: Stage 1

Dear Tory

An Aboriginal Heritage Site Assessment was conducted on foot at the above address for the purpose of identifying potential Aboriginal heritage constraints associated with proposed redevelopment of the Barangaroo site.

The site assessment was conducted on the 16th April 2010 with Tory Stening and Jillian Comber Archaeologists of Comber Consultants and myself Allen Madden Cultural representative of the Metropolitan Local Aboriginal Land Council (MLALC).

Prior to work commenced discussions took place between MLALC and Comber Consultants regarding the site assessment and maps were viewed which clearly outlined the location of the proposed development.

A registered search was conducted to identify any known sites within the area, subject to this there are no sites were recorded within or around the vicinity of the development area.

The area surveyed contained flat bitumen and a concrete deck, there were no Aboriginal sites or relics recorded within the study area.

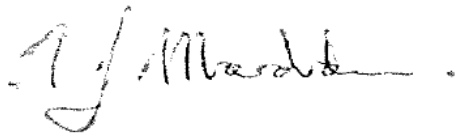
The Aboriginal Archeological & Cultural Heritage Assessment report by Comber Consultants has been reviewed; MLALC is in agreement with the findings in the report and the outlined recommendations for the stage 1 proposed redevelopment.

MLALC has no concerns or objections to stage 1 of proposed redevelopment of the Barangaroo site.

If there are any Aboriginal archaeological sites unearthed during any stages of the development all work is to cease and MLALC and NSW National Parks Wildlife Services are to be contacted immediately.

Should you require any further information please do not hesitate to contact me on 02 8394 9666 or 0411 229 217.

Regards



Allen Madden
MLALC
Cultural Representative