Appendix C

Lend Lease Development Plans

Appendix D

Ex-Situ Remediation Works

1.0 Ex-Situ Remediation Works

1.1 Introduction

As described by **Section 8.0**, CIM has not been identified within the Site based on the previous intrusive investigations undertaken within the Site. **Section 21.7** present contingency actions that will be implemented in the event that:

- CIM requiring remediation is identified as an outcome of the additional validation works in Area A as detailed in **Section 16.4.1**; and/or
- treatment of excavated material as necessary to facilitate disposal to landfill.

This Appendix describes, in addition to the general excavation and materials management outlined in **Section 13.0** this section outlines the proposed additional controls that will be implemented to manage materials that require treatment at the Site as well as outlining the proposed treatment methodology.

1.2 Remediation Enclosure and Emissions Control System

It is proposed that ex-situ treatment of material excavated during the remediation works (if required by the additional validation sampling) will be conducted by an appropriately licenced off-site facility prior to disposal to landfill (refer to AECOM, 2015 for further details). In the unlikely event that on-site treatment is preferred, an on-site treatment facility (potentially including an RE and associated ECS, if required) will be established in a central location (approved by the BDA) and potentially coordinated with the remediation works to be undertaken within the adjacent Block 4 (as described by the *VMP/Block 4 RAP* (AECOM, 2013a).

Operation of the RE (and ECS if required) would be in accordance with operation and maintenance management systems developed on completion of the final system design. An overview of the controls to be designed as part of the RE and ECS system is provided in **Section 1.4.3** below.

1.3 Ex-situ Stabilisation Trials

The following section describes bench scale trials that were undertaken for the purpose of assessing the suitability (or otherwise) of ex-situ stabilisation for treatment of gasworks related impacted material from the Barangaroo site.

1.3.1 Introduction

Enviropacific Services Pty Limited (EPS) conducted a series of Ex-situ Stabilisation Trials to assess the feasibility of treating the PAH and TPH impacted material from the Site to a standard which would facilitate either disposal to landfill or reuse at Headland Park. These works are detailed in the *Ex-situ Stabilisation Trials – DECC Declaration Area, Barangaroo* (Enviropacific Services, 2012).

The stabilisation trials were conducted on bulk soil samples obtained from test pits excavated in Blocks 4 and 5 and a coal tar collected from the offsite Hickson Road tar tank (BH53) in February 2010. The test pits were excavated in areas identified by historic investigations as containing gasworks contamination.

Four types of material were targeted for the *Ex-situ Stabilisation Pilot Trial* based on field observations:

- Lightly impacted material (LI);
- Moderately impacted material (MI);
- Heavy impacted material (HI); and
- Coal tar material (CT).

The main contaminants of concern considered by the trial were PAH and TPH. PAH, including benzo(a)pyrene (BaP), and TPH are also the contaminants on which waste classification of the material is determined as per the *Waste Classification Guidelines* (NSW EPA, 2014).

1.3.2 Methodology

After collection, the bulk soil samples within each material type were composited, air-dried and mechanically mixed in order to achieve a homogeneous starting material for the stabilisation trials.

The laboratory analysis (total concentrations) indicated that all untreated material (LI, MI, HI and CT) would be classified as hazardous waste, according to the *Waste Classification Guidelines* (NSW EPA, 2014). This classification is based largely on exceedances of the specific contaminant concentration 2 (SCC 2) criteria of 23 mg/kg for BaP. The material types were identified as: LI = 29.6 mg/kg, MI = 70.6 mg/kg, HI = 234 mg/kg, CT = 194 mg/kg). The analytical results indicate that total BaP concentrations in the coal tar sample are lower than in the highly impacted material, which may be a result of the higher water content of the coal tar sample.

Leachate tests were also performed on the untreated soil samples. The leachate tests included:

- Toxicity Characteristic Leaching Procedure (TCLP);
- Australian Standard Leaching Procedure (ASLP); and
- Multiple Extraction Procedure (MEP).

The four material types were subjected to a range of treatment regimes. The treated samples were then subject to leachate testing (TCLP, ASLP and MEP) as well as being assessed for unconfined compressive strength (UCS).

1.3.3 Discussion of Results

The general effect of treatment on contaminant leachate concentrations (compared to untreated soil leachate concentrations) and UCS are summarised following:

- Addition of Portland cement (PC) - leachate contaminant concentrations either showed no reduction or an increase. The UCS showed an increase to > 1 MPa with 5% PC (LI, MI) and with 10% PC (HI);
- Addition of 10% fly-ash - no significant effect on leachate concentrations was reported. An UCS of 3.1 MPa was achieved with the addition of 10% PC (the UCS was not determined on the fly-ash alone treatment); and
- Addition of the chemical fixative, RemBind-FO1 - a significant reduction in leachate contaminant concentrations was reported (5% RemBind-FO achieved an 80% reduction in ASLP concentrations and a 50% reduction in TCLP concentrations). The UCS of the RemBind-FO/PC blend was significantly lower than PC alone (HI material treated with 5% RemBind-FO 10% PC had a UCS of 0.4 MPa compared to a USC of 1.1 MPa for HI material treated with 10% PC alone).

The treatment trials indicated that the optimum pre-treatment with respect to leachate contaminant reduction would be the addition of 5% RemBind-FO. RemBind-FO treatment was only trialled on the HI material, however, a reduction in leachate concentrations would be expected similarly with the LI and MI material.

Conversely, the optimum pre-treatment for achieving the NSW EPA General Immobilisation Approval specification for UCS of greater than 1 MPa would be 5%PC for LI and MI materials and 10%PC for HI material.

1.3.4 Conclusions and Recommendations

Waste can be disposed of to a NSW EPA Licensed Landfill subject to classification of the material in accordance with the *Waste Classification Guidelines* (NSW EPA, 2014). Based on the SCC BaP criteria the material would be classified as Hazardous Waste, however, the NSW EPA General Immobilisation Approval # 2005/14 (IA) provides specific requirements for the stabilisation of coal tar contaminated soil for the purpose of disposal to an off-site NSW EPA licensed landfill facility.

The IA specifies that if the total concentrations are within specified criteria and a UCS of greater than 1 MPa is achieved, the treated soil can be assessed on TCLP leachability alone. Of the key contaminants of concern, the waste guidelines include a TCLP leachability criterion for BaP only. Based on the TCLP BaP concentrations (below the analytical detection limit for all material), the material (LI, MI, HI and CT) would be classified as General Solid Waste, providing the minimum UCS requirement is met. A UCS of greater than 1 MPa, could be achieved by the following treatments:

[1] RemBind-FO is a proprietary product developed by Ziltek Pty Ltd for the chemical fixation and stabilisation of hazardous waste.

- Material classified as LI and MI: 5% cement;
- Material classified as HI: 10% cement; and
- Material classified as CT: 40% - 80% fly-ash, 10% cement.

As described above, the TCLP BaP concentrations were all reported below the laboratory LOR. Therefore, these treatments would also be expected to achieve the required leachate criteria prescribed by the *Waste Classification Guidelines* (NSW EPA, 2014).

The final fly-ash percentage for the treatment of coal tar impacted material will depend on the consistency of the material and the amount of fly-ash required to achieve a spadeable consistency. EPS anticipated that the UCS requirement for CT would likely be met with a 40% -50% fly-ash treatment.

1.4 Treatment Operations – Ex-situ Stabilisation

1.4.1 Background

The contingency actions described by **Section 20.7** include nomination of ex-situ stabilisation as the preferred remedial technologies for ex-situ treatment of material (including SPGWT / CIM) which requires treatment prior its offsite disposal (if required).

This section describes the methodologies to be employed for preparing and treating materials using ex situ stabilisation onsite (if required, refer to **Section 1.2**). Materials requiring treatment may also be treated at an offsite facility in accordance with applicable regulations and NSW EPA requirements.

1.4.2 Pre-Treatment of Materials

If onsite treatment works are conducted, pre-treatment works, if required, will be undertaken in two stages.

- Initially, the excavated material may be blended at the excavation face to make the material 'spadeable' (as detailed in **Section 13.7.3**); and
- Material requiring treatment will be transported to the RE, where further screening and testing of this material will take place.

The material will be stockpiled in the RE using a front end loader before undergoing secondary screening through a screen to achieve a grade of 40 mm minus. This is the minimum size requirement for material to feed into a pug mill. All screened overburden material will be set aside into type for potential crushing/recycling. The screening of the contaminated material will achieve a relatively homogenous feed material prior to being loaded into the feed hopper of the pug mill and minimise the quantity of material which requires treatment.

1.4.3 Remediation Enclosure and Emission Control System

As described by **Section 1.2**, ex-situ stabilisation equipment may be enclosed within a RE. The purpose of the RE is to control emissions during remediation treatment activities and ensure these emissions are vented to atmosphere through an ECS. Operation of the RE and associated ECS will be in accordance with operation and maintenance management systems developed on completion of the final design of the system. An overview of the controls to be designed into the system is provided below:

- The RE will be a clear span shed constructed of a steel frame with metal sheeting (or equivalent). The building will be sized to contain a screen and pugmill and have sufficient room for truck access, machinery and stockpiles. It will include doors, lights, electrical, adjustable louvers and other ancillary facilities that are required for safe and efficient operation.
- The building will contain approximately a 2-3 day working inventory of feed soil plus a sufficient buffer for soil curing and other pre-treatment activities. This inventory volume is designed to provide adequate storage capacity to feed the treatment plant during periods when unforeseen conditions interfere with normal excavation activities.
- ECS will consist of a ductwork system, induced draft fan, particulate control device, activated carbon adsorption system and stack. The ECS would be designed with sufficient capacity to provide a safe working environment within the RE.

- The final design of the RE will be developed prior to the start of the remediation works. The structure is likely to include a negative pressure working enclosure with an air-lock doorway and an air extraction system for the control of odours and diesel exhaust.
- The air exhausted from the RE will first pass through a particulate control device (bag-house or pleated paper filter system) to remove fugitive dust. The particulate control system will include a system to remove particulates from the filter media. Dust removed will be collected in enclosed drums or hoppers.
- After the exhaust gas exits the particulate filter, it will pass through an activated carbon adsorption system. The activated carbon system will be equipped with a number of monitoring ports. A monitoring protocol will be developed for the various ports along the activated carbon adsorption system. This protocol will form the basis for deciding when activated carbon beds need to be replaced. Air would be exhausted to the atmosphere via a stack.
- Emissions from the ECS stack will be required to be licensed as part of the EPL for the Barangaroo site (refer to **Section 12.1.1**).

1.4.4 Pug Mill Treatment Plant

Ex situ stabilisation is intended to be accomplished by using a pugmill fed by a loader/excavator. The nature and quantity of agents used for stabilisation was the subject of a stabilisation trial.

The pugmill mixing chamber and computer controlled weight cells will allow the complete mixing of the additives with the soil matrix. A pugmill has been selected in recognition that the NSW EPA prefers aggressive mixing techniques (such as a pugmill) because they provide for complete mixing of the materials.

Analytical results will be used to demonstrate that the treated material is suitable for disposal to an appropriately licensed off-site landfill (in accordance with the *Waste Classification Guidelines* (NSW EPA, 2014).

Pug mill plants typically have a rated capacity of 600-1,000 tons per hour. This rate will vary depending on the physical properties of the soil, amount and type of additive, and the desired production rate.

The type of treatment plant will be based on the final design by the treatment contractor. Below is a description of the potential major components that may comprise a plant system.

Self-erecting Silo

The silo is filled pneumatically from bulk tankers. Additives such as cement, fly ash, lime and bentonite are blown into the silo.

The silo is equipped with a dust control system.

Material feed hopper

This hopper is fed with the soil(s) to be processed. It may be divided so as to accommodate two types of soil or aggregate. The hopper and may be fed one of three ways. First, a front-end loader can feed the hopper directly by building a ramp perpendicular to the hopper. Second, material may be conveyed into the hopper. Third, a screen can process directly into the hopper.

Twin shaft paddle pugmill

The pugmill is designed to achieve a violent mixing action throughout its length resulting in a well-mixed homogeneous product. This type of mixing, with no slump or low moisture products, is more effective than a drum type mixer that merely folds the product.

Hydrostatic cleated belt additive feeder

The additive is fed to the pugmill at the beginning of the mixing operation by means of the computer controlled cleated belt. Accuracies of better than plus/minus 2% of the design proportioning of the additive are achieved.

Water tank

The water requirement is determined by the mix design and the native water in the material to be mixed. Water is fed from an outside source into the plant's onboard water tanks. This water is fed at the design rate into the mixing chamber by two hydraulic pumps which are computer controlled.

Discharge belt

The mixed product is discharged from the pugmill on this conveyor belt. The finished product is continuously and cumulatively weighted on a Ramsey belt scale.

Gob Hopper

The gob hopper is utilized to interrupt the continuous flow of mixed material allowing trucks to enter and exit the loading area. If trucks are used to transport the mixed material away from the plant, the direction of travel of the trucks should be with the driver's side closest to the plant so that he/she may see the plant operator. The gob hopper maybe left open continuously so that a conveyor may be used to remove the finished product from the mixing plant.

Particulate Additive

Fine particulate additives such as cement, fly ash, lime and bentonite are pneumatically transferred from bulk tankers and stored in the self-erecting silo. If more than one type of additive is required, an optional self-erecting auxiliary silo may be set up next to the plant. The silos are equipped with negative pressure dust control systems, which filter and evacuate the pressurized air entering the silo. This process maintains constant silo pressure so as not to affect the consistency of the feeder.

Mixing Chamber

All ingredients enter simultaneously at the beginning of the mixing chamber allowing them maximum mixing time. The mixing chamber houses an interlaced twin shaft variable speed paddle pugmill designed to achieve a violent mixing action throughout its length resulting in a well-mixed homogeneous product. This type of mixing, with no slump or low moisture products, is greatly more effective and efficient than a drum type mixer that merely folds the product.

Control System

The Programmable Logic Controller and colour active matrix Operator Interface is directed by control software. Designed for harsh industrial environments, this versatile and reliable system has extensive self-diagnostics and is completely modular, making diagnosing and repairing problems as easy as plugging in a new module.

The software provides fully automated plant control and monitoring of all plant systems including engine, flow meters, sensors and switches. Displays indicate all flow rates, set points, feeder speeds, totals and status of all feeds and processes. All critical mechanical systems are monitored to alleviate damage and prevent down time. Inventory of fine particulate and admixture are computed and tracked.

1.4.5 Treated Soil

The RE will have a base capacity to stockpile between 2-3 days of treated soils from the pug mill. Treated materials stored in this area will undergo validation testing and classification to determine whether the treatment process has been effective. Materials that have not been treated to an acceptable level will be retreated.

Stockpiles would be then moved outside of the RE to a main stockpile area. Where required, stockpiles will be managed in accordance with the requirements of **Section 13.7.7**.

AECOM

Attachment 3: AECOM (2016b) *Watermans Quay RAP Addendum*

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney NSW 2000
PO Box Q410
QVB Post Office NSW 1230
Australia
www.aecom.com

+61 2 8934 0000 tel
+61 2 8934 0001 fax
ABN 20 093 846 925

Mark Burns
Environment Manager, Barangaroo South
Lend Lease (Millers Point) Pty Ltd
30 The Bond, 30 Hickson Road, Millers Point

19 April 2016

Dear Mark

VMP/Block 4 Remedial Action Plan Addendum - Part Stage 1B Public Domain (Watermans Quay), Hickson Road, Millers Point, Barangaroo South

1.0 Introduction

This Remedial Action Plan (RAP) Addendum has been prepared by AECOM Australia Pty Limited (AECOM) for Lend Lease (Millers Point) Pty Ltd (Lend Lease) in relation to that portion of the proposed Watermans Quay located between Stage 1A and the southern alignment of the proposed Stage 1B basement groundwater retention wall. The proposed Watermans Quay has previously been referred to as 'Globe Street' (a term no longer used). This area of land is variously referred to as the 'Block 4 Services Zone' and the Stage 1B Basement Stormwater Construction Area. It is noted that the southern portion of the proposed Watermans Quay is located above the Stage 1A basement.

For the purpose of this letter, the area between the Stage 1A and Stage 1B basements is referred to as 'Study Area' – refer to the **Figure 1** provided in **Attachment 1** which is based on Figure F5 from the *Remedial Action Plan, NSW EPA Declared Remediation Site 21122 and Block 4 (Stage 1b) Development Works, Barangaroo, Millers Point, NSW* (AECOM, 2013c) (here-in referred to as the VMP/Block 4 RAP). The area to which the *VMP/Block 4 RAP* (AECOM, 2013c) applies is referred to as 'the Site'.

1.1 Background

The Remediation and Landforming Works Development Application SSD 5897-2013 sought consent for remediation of Block 4 of Barangaroo South, including construction of retention wall systems and associated stormwater diversion works. In particular, SSD 5897-2013 sought consent for the remediation works to be completed in accordance with the *VMP/Block 4 RAP* (AECOM, 2013c) subject to the following changes:

- The alignment and depth of the proposed Block 4 basement would be different to that described in the *VMP/Block 4 RAP* (AECOM, 2013c); and
- The Block 4 Remediation Works would be completed prior to remediation in Block 5 and Hickson Road (within the NSW EPA Declared Remediation Site 21122).

These changes were considered by the letter *Remediation and Landforming Works Development Application (SSD 5897-2013), Adjustment in Block 4 Basement Area and Remediation Staging – Barangaroo, Hickson Road, Millers Point, NSW* (AECOM, 2013c) (here-in referred to as the *Block 4 Adjustment Letter*) - refer to **Attachment 2**. The *Block 4 Adjustment Letter* (AECOM, 2013d) concluded (among other things), that:

- the proposed changes to the alignment and depth of the Block 4 basement could be suitably managed by the contingency measures detailed in the *VMP/Block 4 RAP* (AECOM, 2013c); and
- the proposed staging of the remediation works could be suitably managed by the existing provisions of the *VMP/Block 4 RAP* (AECOM, 2013c).

The proposed changes to the alignment and depth of the Block 4 basement that were described by SSD 5897-2013 included movement of the southern alignment of the Stage 1b basement groundwater retention wall approximately 8 m north of the alignment anticipated by the *VMP/Block 4 RAP* (AECOM, 2013c) such that a strip of land will remain outside the basement groundwater retention wall systems between the Stage 1a and Stage 1b basements. Under the scope of work proposed by SSD 5897-2013, the Study Area would be remediated to a standard suitable for the EPA Declaration to be revoked (that is to a standard suitable for the current land use).

The *Block 4 Adjustment Letter* (AECOM, 2013d) noted that Section 23.12.4 and 23.12.5 of the *VMP/Block 4 RAP* (AECOM, 2013c) described contingency measures that should be undertaken if the Study Area is to be

remediated to a standard suitable for a particular future land use. However, the *Block 4 Adjustment Letter* (AECOM, 2013c) concluded that because the Study Area was not proposed to be remediated to a standard suitable for a future land use under SSD 5897-2013, this was not required as part of the development application.

Section 1.6 of the *VMP/Block 4 RAP* (AECOM, 2013c) states that:

> *if the final development design is changed in a way which affects the assumptions of the Declaration Site HHERA (AECOM, 2011) and Declaration Site HHERA Letter (AECOM, 2012b) and this RAP, an Addendum will be prepared, as required, and submitted to the NSW EPA Accredited Site Auditor for approval.*

It is understood that Lend Lease now requires that the Study Area between the Stage 1A and Stage 1B basements (including soil and groundwater that would remain outside the southern Stage 1B retention wall, refer to **Figure 1**) be remediated for the proposed future land use. Hence, this Addendum has been prepared to:

- Implement of the contingency measures described by Section 23.12.4 and 12.12.5 of the *VMP/Block 4 RAP* (AECOM, 2013c); and
- Assess whether the Block 4 VMP Remediation Works recommended in the *VMP/Block 4 RAP* (AECOM, 2013c) is also protective of the proposed future land use within the Study Area and the environment.

1.2 Proposed Remediation Works

The remediation works described by the *VMP/Block 4 RAP* (AECOM, 2013c) include:

- the **VMP Remediation Works** - which are those works required such that the NSW EPA's declaration of the Declaration Area as a Remediation Site (Declaration Number 21122; Area Number 3221) can be revoked; and
- the **Block 4 Development Remediation Works** - which are those works required to remediate the Site (including the Study Area) to a standard suitable for the proposed development works (i.e. construction of a basement and overlying land uses [including commercial, retail, high density residential and public open space]).

It is noted that the VMP Remediation Works (and the *HHERA - VMP Remediation Works Area [Addressing the NSW EPA Remediation Site Declaration 21122 Millers Point]* [AECOM, 2012c] on which it is based) are based on consideration of the Chemicals of Potential Concern (CoPC) listed in the NSW EPA Declaration (Declaration Number 21122; Area Number 3221). These CoPC are:

- polycyclic aromatic hydrocarbons (PAHs);
- benzene, toluene, ethylene and xylene (BTEX);
- total petroleum hydrocarbon (TPH);
- ammonia;
- phenol and
- cyanide.

In contrast the Block 4 Development Remediation Works are based on the CoPC developed by the *Declaration Site HHERA* (AECOM, 2011) in relation to the proposed future land use. The 'Additional CoPC' considered by the *Declaration Site HHERA* (AECOM, 2011), over and above those considered for development of the extent of the VMP Remediation Works are:

- Aniline;
- Dibenzofuran;
- 2-Methylnaphthalene;
- 3&4-Methylphenol;
- Phenol;
- Styrene;
- 1,2,4-Trimethylbenzene; and
- Asbestos.

It is noted that the *VMP HHERA* (AECOM, 2012c) did not consider asbestos as a CoPC because:

- from the perspective of the VMP Remediation Works, the CoPC assessed were limited to those defined within the NSW EPA Declaration (as agreed with the NSW EPA) (as above); and
- From the perspective of the Block 4 Development Remediation Works, it was assumed that all unsaturated soils would be removed from the Site as part of the development and as such, assessment of asbestos in the unsaturated soils was not required.

2.0 Objectives

The objectives of this letter are to confirm whether the remediation works proposed at the Study Area as part of SSD 5897-2013 (i.e. VMP Remediation Works):

- will achieve a standard suitable for the proposed future land use; and
- will also be suitably protective of the environment (i.e. groundwater within the Study Area's fill material) in the context of the future development use.

3.0 Scope of Works

To meet the objectives of this letter, the following scope of work was undertaken:

- Confirmation of the future land uses proposed at the Study Area and whether they are consistent with the land uses contemplated by the *VMP/Block 4 RAP* (AECOM, 2013c) in relation to the:
    - VMP Remediation Works; and
    - Block 4 Development Remediation Works.
- Review of any additional groundwater analytical data from monitoring undertaken by Lend Lease (i.e. in association with dewatering operations for the Stage 1a basement) that might be considered representative of groundwater quality within the Study Area;
- Review of the available soil and groundwater analytical data, for contaminants of concern not contemplated by the NSW EPA Declaration (as discussed in **Section 2.0**), within (or considered to be representative of) the Study Area and consideration of whether the reported concentrations are likely to represent:
    - An unacceptable risk to the environment based on:
        - Comparison of relevant groundwater analytical results to the Marine Water Quality Criteria (as defined by the *VMP/Block 4 RAP* [AECOM, 2013c]);
        - Consideration of the results of leachate analysis (if available) and the potential for soil contamination to impact groundwater;
        - Consideration of the distribution of reported soil contamination relative to marine sediment, the saturated and unsaturated zones and the nearest sensitive receptor; and
        - Consideration of the potential for contaminant flux based on the *Groundwater Discharge Study* (AECOM, 2010), *Contaminant Mass Flux Study* (AECOM, 2012) and *Additional Groundwater Monitoring Study* (AECOM, 2013a) as described by Section 6.6.5 of the *VMP/Block 4 RAP* (AECOM, 2013c).
    - An unacceptable risk to human health based on:
        - Comparison of relevant soil and groundwater analysis results with the relevant Site Specific Target Criteria (SSTCs).
- A preliminary review of the available soil and groundwater results for the presence of Separate Phase Gasworks Waste and Tar (SPGWT) adjacent to the southern Stage 1B Perimeter Retention Wall (PRW); and
- Confirm whether the VMP Remediation Extent within the Study Area, as described by the *VMP/Block 4 RAP* (AECOM, 2013c), is considered to be protective of the proposed future land use and the environment.

4.0 Overview of Proposed Development

The development works contemplated by SSD 6960 within the Study Area are summarised as follows (refer to **Figure 1**, **Attachment 1**):

- construction of services including excavation to a depth of less than approximately 2.7 m below ground level (bgl, as required for the provision of services from Stage 1A to the proposed Stage 1B basement and construction of a new stormwater pipe - see below); and
- future land uses within the Study Area including:
  - public open space in the form of the Watermans Quay roadway built on grade; and
  - a new stormwater pipe line constructed beneath the Watermans Quay roadway (running from Hickson Road to Stage 1C (located west of Block 4), refer to **Figure 1**).

It is understood that:

- the southern Stage 1B PRW will have the same design and performance as the other Stage 1B PRWs and will comply with the key assumptions detailed in Section 7.2.3 of the *VMP/Block 4 RAP* (AECOM, 2013c). As such, the Stage 1B PRW will effectively isolate soil and groundwater contamination from north of the Study Area; and
- material used to backfill around the proposed stormwater pipe will comprise Suitable Fill (as defined in Section 5.13.3 of the *VMP/Block 4 RAP* (AECOM, 2013c]) compacted, as appropriate, to support the pipe. As such, construction of the stormwater pipe is not considered to represent a future preferential pathway for the movement of groundwater through the Study Area.

5.0 VMP/Block 4 Remedial Action Plan

The *VMP/Block 4 RAP* (AECOM, 2013c) was previously prepared to describe (among other things) remediation works required to facilitate the proposed Block 4 Development Works which include the Stage 1B Basement (i.e. the Block 4 Development Remediation Works).

The *VMP/Block 4 RAP* (AECOM, 2013c) also describes VMP Remediation Works required to facilitate removal of the current EPA Declaration from (among other areas) Block 4 (including the Study Area).

The *VMP/Block 4 RAP* (AECOM, 2013c) was approved under delegation by the Minister of Planning as part of Development Application SSD 5897 (dated 10 November 2014).

5.1 Proposed Land Uses (Block 4 Development Area)

Section 4.1 of the *VMP/Block 4 RAP* (AECOM, 2013c) describes the Block 4 development land uses as incorporating *a mixture of commercial, retail and high density residential and public open space (incorporating roads, community and related land uses) overlying the Block 4 basement.* On this basis, construction of the proposed Watermans Quay roadway (built on grade) within the Study Area is not consistent with the proposed Block 4 future land uses envisaged by the *VMP/Block 4 RAP* (AECOM, 2013c).

Section 1.6 of the *VMP/Block 4 RAP* (AECOM, 2013c) describes the land uses on which the VMP Remediation Works are based as *of limited use with the majority of the Area being vacant, paved open space area*. Section 4.1 of the *VMP/Block 4 RAP* (AECOM, 2013c) describes the land use scenarios adopted for development of the VMP Remediation Extent as paved recreation, unpaved recreation and intrusive maintenance worker. On this basis, construction of the proposed Watermans Quay roadway (built on grade) within the Study Area is consistent with the land uses on which the VMP Remediation Works envisaged by the *VMP/Block 4 RAP* (AECOM, 2013c) are based.

However, as noted by **Section 1.2**, the CoPC considered as the basis of the VMP Remediation Works does not include all CoPC considered applicable to the proposed future land uses. Therefore, an assessment of whether the reported soil and groundwater concentrations of the additional COPCs represent a risk to human health or the environment is required.

5.2 Contingency Actions

Sections 23.12.4 and 23.12.5 of the *VMP/Block 4 RAP* (AECOM, 2013c) describe contingency actions designed to assess the suitability of fill material and groundwater that would remain outside the southern Stage 1B retention wall in the event that the alignment of the Block 4 basement is changed.

As described by **Section 1.1**, the alignment of the southern Block 4 basement wall (as originally included in SSD 5897-2013) was moved from that described by the *VMP/Block 4 RAP* (AECOM, 2013c) . **Section 7.0** of this RAP Addendum implements the contingency measures referenced above and, in particular, considers whether the material that will remain outside the southern Stage 1B retention wall will present an unacceptable risk to the human health and the environment. In particular, the contingency measures outlined in Sections 23.12.5 of the *VMP/Block 4 RAP* (AECOM, 2013c) have been implemented to assess whether:

- The proposed VMP Remediation Works proposed for the Study Area are appropriately protective of the environment; and
- Confirmed Impacted Material (CIM) is present within the Study Area which would warrant remediation.

6.0 Remediation Goals

The following sections summarise development of the SSTC for soil and groundwater which are specific to:

- the proposed land uses at the Study Area as detailed in **Section 4.0**; and
- the Additional CoPC detailed in **Section 1.2**.

6.1 Land Use Scenarios Applicable to the Study Area

The land uses which are considered to be relevant to the proposed landuses at the Study Area (as described in **Section 4.0**) are:

- **Scenario 3** - unpaved public domain / open space;
- **Scenario 4** - paved public domain / open space; and
- **Scenario 6** - short term ground-intrusive maintenance.

6.2 Derivation of SSTCs for the Study Area

The soil analytical results (unsaturated and saturated) at the Study Area and in adjacent areas are presented in **Table T1**, **Attachment 3**. As required by the *Declaration Site HHERA* (AECOM, 2011), the unsaturated soil results have been compared to a hybrid criteria based on adoption of the lowest of the SSTC for the three applicable land use Scenarios as described in **Section 6.1**. That is, where more than one SSTC is applicable, the lowest SSTC has been adopted to derive the hybrid criteria for the Study Area.

The same approach has also been undertaken for the derivation of appropriate hybrid groundwater criteria based on adoption of the lowest of the SSTC for the three applicable land use Scenarios (refer to **Table T2**, **Attachment 3**.

Asbestos SSTCs which were derived in the *ORWS Asbestos HHERA* (AECOM, 2013d) will also be implemented for the unsaturated soils in the Study Area. Asbestos reported to be present in soils within the ORWS Area comprised predominately bonded Asbestos Containing Material (ACM) and the potential for asbestos fibre (AF) generation was considered to be minimal. It has been assumed that asbestos which may be present within the Study Area is likely to be similar – that is predominantly bonded ACM.

The asbestos SSTCs are summarised by **Table 1** below. The asbestos SSTCs are to be applied in addition to other applicable SSTCs (as discussed above).

Table 1 Summary of Asbestos SSTC

Exposure Scenario	Asbestos Site Specific Target Criteria
Intrusive Maintenance Worker [2]	0.05 % w/w [1]
Suitable Fill [3]	No Visible Asbestos

Notes:

1) To be measured in accordance with the methodology described by Schedule B2 of the *NEPM* (NEPC, 2013);
2) The intrusive maintenance worker exposure scenario is applicable to soil in areas used for paved or unpaved public domain / open space at depths:
   a) below the 0.5 m thick Suitable Fill;
   b) up to approximately 3.0 m below the final development level (which is understood will be at least 1 m above the current ground surface); and
   c) above the groundwater table.
3) 'Suitable Fill' of 0.5 metres will be placed in open space areas. All Suitable Fill will be imported to the Study Area and is defined as:
   a) virgin excavated natural material (VENM);

b) soil which contains contaminant concentrations below the Terrestrial Soil Criteria (developed for the maintenance of plant health and human health); and
c) Soil which is visually free of bonded ACM.

6.3 Marine Water Quality Criteria (MWQC)

As discussed in Section 7.1.3 of the *VMP/Block 4 RAP* (AECOM, 2013c), the Marine Water Quality Criteria (MWQC) have been adopted at the down hydraulic gradient Declaration Area boundary as suitable screening criteria that are protective of the environment including: groundwater dependant ecosystems which may be present down-hydraulic gradient of the Declaration Area boundary currently or in the future; and, ultimately Darling Harbour. Consequently, the Remediation Goals detailed in the *VMP/Block 4 RAP* (AECOM, 2013c) included removal / remediation of soil, to the extent practicable *such that groundwater quality within fill material leaving the Declaration Area (measured at the down hydraulic gradient Declaration Area boundary) approaches the MWQC*.

7.0 Review of Available Contamination Data

7.1 Distribution of Separate Phase Gasworks Waste and Tar (SPGWT)

No SPGWT has been identified to be present in the fill material within the Study Area. As such, and based on consideration of contaminant mass flux (as discussed in Section 6.6.5 of the *VMP/Block 4 RAP* [AECOM, 2013c]), SPGWT is not considered to represent an unacceptable risk to human health or the environment at the Study Area.

As detailed in the Table 8 of the *VMP/Block 4 RAP* (AECOM, 2013c), SPGWT was identified to be present within the underlying natural marine sediments at sampling location BH408 (located adjacent to the Study Area to the north) at a depth ranging between 8.0 and 9.4 metres below ground level (bedrock was encountered at this location at a depth of 9.4 m bgl). These impacts appear to be localised as they were not identified at neighbouring borehole locations BH114 and BH409 (refer to **Figure 1**).

Based on the presence of SPGWT in the BH408 area at relatively shallow depths, the SPGWT impacts in the BH408 area were included within the 'VMP Remediation Extent' (refer to Section 8.5.1 of the *VMP/Block 4 RAP* [AECOM, 2013c]) and will be remediated as part of the VMP Remediation Works.

As per Section 7.2.3 of *VMP/Block 4 RAP* (AECOM, 2013c), it is assumed *that tar will be removed from the immediate vicinity of outer basement walls to the extent practicable*. An assessment of whether SPGWT is present adjacent to the eastern, northern and western Stage 1B PRWs is included in Section 9.2.2.3 of the *VMP/Block 4 RAP* (AECOM, 2013c). The alignment of these three sections of the Stage 1B PRW remain unchanged from the *VMP/Block 4 RAP* (AECOM, 2013c). A preliminary review of the soil and groundwater analytical data adjacent to the southern Stage 1B retention wall has been undertaken as follows. The sampling density across the Study Area is considered adequate for preliminary review purposes although some data gaps of up to 30 m are present in the western area.

- Sampling location BH36 - a tarry odour was also noted in natural marine sediments at a depth of 14.5-15 m bgl (Relative Level -12.25-12.75 m Australian Height Datum) at sampling location BH36 (bedrock was present at 15 m bgl). This observation may be indicative of SPGWT. No odours were observed in the fill material overlying the natural marine sediments. While this impact (if present) would be at a depth below the proposed VMP Remediation Works (remediation to 10 m bgl), it would coincide with the approximate depth of the base of the proposed Stage 1B basement excavation (RL -13.65 m AHD or approximately 16 m bgl). However, it is noted that this excavation level includes the lower basement slab thickness, with the top of the lower basement slab being RL-11.2 m AHD. Accordingly, the potential SPGWT at BH36 appears to be deeper than the slab level of the lowermost basement floor (approximately 2.5 m thick including the main slab, drainage layers and wearing course), and so is potentially not adjacent to the outer southern Stage 1B retention wall; and
- Sampling location BH408 - as described above, the SPGWT identified at this location would be appropriately removed as part of the as part of the VMP Remediation Works and would not present an unacceptable risk to the Stage 1B basement occupants.

It is recommended that, in the absence of any additional data, that the presence or absence of SPGWT in the vicinity of the southern Stage 1B PRW in the western portion (i.e. west of the VMP Remediation Extent) be verified by additional assessment undertaken as part of future validation works by the Stage 1B validation consultant. This further assessment would include relevant information obtained during construction of the southern Stage 1B retention wall.

7.2 Soil Analytical Results

7.2.1 Protection of Human Health (Soil)

The unsaturated and saturated soil results from the Study Area have been compared to the risk based remediation (SSTC) criteria developed for the Study Area (refer to **Table T1**, **Attachment 3**) for CoPC other than asbestos. There is considered to be a sufficient soil analytical data to appropriately characterise (both laterally and vertically) CoPC concentrations within the Study Area's fill material.

The soil analytical results indicate that all CoPC concentrations are significantly less than the SSTC. In particular all Additional CoPC concentrations were reported to be less than the laboratory limit of reporting (LOR) with the exception with one phenol result (0.01 mg/kg) in sample BH409_3.7-4.0. Consequently, the soils at the Study Area are considered to be suitably protective of human health for future users of the Study Area (based on the proposed future land uses described in **Section 4.0**).

7.2.2 Protection of Human Health (Asbestos in Soil)

Based on review of the available analytical data within the Study Area, it is considered that there is insufficient data to characterise the presence (or absence) of asbestos in unsaturated soils. Therefore, it is recommended that validation testing be conducted to assess the presence (or absence) of asbestos within the unsaturated soils at the Study Area (in that portion which won't be excavated by the stormwater construction works) and to facilitate comparison against the asbestos SSTCs for the purpose of assessing risk to human health. Refer to **Section 8.0** for further details.

7.2.3 Protection of the Environment (Soil)

Table 2 presents a summary of the Additional CoPC concentrations reported in fill materials (which may remain as an ongoing source of contamination to groundwater quality at the western edge of the Study Area). **Table 2** includes analytical data for:

- fill materials only (based on negligible flux from the underlying natural marine sediments, refer to Section 6.6.5 of the *VMP/Block 4 RAP* (AECOM, 2013c); and
- the Additional COPCs as discussed in **Section 1.2** (with the exception of asbestos that does not represent a risk to the environment).

Table 2 Soil Analytical Results - Summary of the Additional COPCs in the Study Area's Fill Materials

CoPC (mg/kg)	Number		Concentration		Mean (Standard Deviation)
	Results	Detections	Min	Max	
Aniline	1	0	<0.5	<0.5	0.5 (0)
Dibenzofuran	1	0	<0.5	<0.5	0.5 (0)
Phenol	8	1	<0.01	0.01	0.19 (0.11)
2-methylnapthalene	4	0	<0.5	<0.5	0.5 (0)
3&4-methylphenol	6	0	<0.5	<0.5	0.5 (0)
1,2,4-trimethylbenzene	1	0	<0.5	<0.5	0.5 (0)
Styrene	1	0	<0.5	<0.5	0.5 (0)

Based on the mean concentrations summarised in **Table 2** it is considered that fill materials within the Study Area have not been significantly impacted by the Additional CoPC and are considered unlikely to impact groundwater quality at the down-hydraulic boundary.

7.3 Groundwater Analytical Results

The groundwater analytical data assessed herein is based on that presented in the *VMP/Block 4 RAP* (AECOM, 2013c). Whilst more recent groundwater analytical data was generated in association with dewatering for the Stage 1A basement construction, this additional data was not considered to be of suitable quality to allow specific assessment of groundwater conditions within the Study Area. As such, it is not assessed further herein.

7.3.1 Protection of Human Health (Groundwater)

The groundwater results considered representative of the Study Area have been compared to the groundwater SSTC in **Table T2**, **Attachment 3** (refer to **Section 6.2**). This included the groundwater results from monitoring well locations MW22, MW45 and MW209. The well construction details for these wells are provided in Table T2, **Attachment 3**. The results indicate that all CoPC were reported a concentrations significantly less than the groundwater criteria and typically less than the laboratory Limit of Reporting.

It is further noted that groundwater concentrations from groundwater monitoring wells across the Declaration Area (as detailed in Table T10 and T11 of the *VMP/Block 4 RAP* [AECOM, 2013c]) were also generally less than the groundwater SSTC. The only exception to this is those groundwater monitoring wells that were installed within the areas of historic gasworks infrastructure (where SPGWT is known to be present).

The groundwater results in **Table T2** indicate that all reported contaminant concentrations for the Additional CoPC are reported to be significantly less than the groundwater SSTC.

7.3.2 Protection of the Environment (Groundwater)

The groundwater results in **Table T2** indicate that all reported contaminant concentrations for the Additional CoPC are reported to be less than the laboratory LOR and less than the corresponding MWQC criteria. The only exception to this is at MW209, which was screened within both the fill materials and the natural marine sediments/bedrock and therefore is not considered representative of groundwater quality within the fill material..

7.4 Contaminant Mass Distribution

Based on the available borehole data obtained from the previous site investigations, the volume of fill material present within the Study Area, and which will remain *in situ* at completion of the VMP Remediation Works, is estimated to be in the order of 6,200 m^3. In the context of the contaminant mass calculations detailed in Section 6.4 of the *VMP Remediation Extent* report (AECOM, 2013b), the volume of fill (and contaminant mass) at the Study Area, which could represent a potential ongoing source of impact to the environment, is relatively minor when compared to the volume of fill (and contaminant mass) which was estimated to be present between the Declaration Area and Darling Harbour (i.e. will remain in place following completion of the VMP Remediation Works).

The estimated volume of fill that will remain in-situ outside the Declaration Area following completion of the VMP Remediation Works (referred to by Section 6.4.2 of the *VMP Remediation Extent* report [AECOM, 2013b] as Zone 3 and 4[1]) was estimated to be in the order of 423,000 m^3. As such, the additional volume of fill material which will remain *in situ* outside the Stage 1B PRW represents an approximate increase of 1.5% of the fill material located to the west of the Declaration Area.

The contaminant mass for key COPCs[2] naphthalene and TPH C_{10}-C_{14} estimated to be present in the Study Area's fill material is compared to the contaminant mass estimated to remain in the Zone 3 and 4 fill materials in **Table T3**, **Attachment 3**. The calculations have been undertaken using the same approach as adopted in the *VMP Remediation Extent* report (AECOM, 2013b) and indicate that:

- The estimated contaminant mass of naphthalene present in the Study Area's fill material (which would remain *in situ* outside the Stage 1B PRW) represents an approximate 0.07% increase of the naphthalene contaminant mass in the Zone 3 and 4 fill materials; and
- The estimated contaminant mass of TPH C_{10}-C_{14} present in the Study Area's fill material (which would remain *in situ* outside the Stage 1B PRW) represents an approximate 0.3% increase of the TPH C_{10}-C_{14} contaminant mass in the Zone 3 and 4 fill materials.

The above calculations indicate that the increase in contaminant mass within the Study Area fill material that will result from the changed Stage 1B basement alignment is negligible in the context of the contaminant mass present in the Zone 3 and 4. Consequently, remediation of the Study Area, over and above that already required as part of the VMP Remediation Work would provide a negligible increased protection to the environment.

The *VMP Remediation Extent* report (AECOM, 2013b) demonstrated that if the remediation works described by the *VMP/Block 4 RAP* (AECOM, 2013b) are completed, the residual gasworks related contamination that will

[1] Zone 2 (the area within the Declaration Area that is outside the VMP Remediation Extent) has been conservatively excluded from the calculations on the basis that it will be contained within the Stage 1B basement and therefore not accessible to the environment.

[2] The *VMP Remediation Extent* report (AECOM, 2013b) concluded that naphthalene and TPH C_{10}-C_{14} were the key CoPCs at the Site as they were estimated to have the largest volume of contaminant mass at the Site and the groundwater results indicated that naphthalene and TPH C_{10}-C_{14} concentrations generally exceed the Marine Water Quality Criteria by the largest order of magnitude across the Site.

remain *in situ* down-hydraulic gradient of the Declaration Area (i.e. the Zone 3 and 4 fill materials discussed above) will not represent an unacceptable risk to the environment.

Consequently, given the relatively small volume of fill material and contaminant mass present at the Study Area and located outside the Stage 1B PRW, the Study Area is unlikely to have a significant future impact on groundwater quality migrating from the Declaration Area and ultimately discharging to Darling Harbour (following completion of the VMP Remediation Works).

7.5 Change to the Groundwater Flow Regime

Based on the available historical investigation data for the Study Area (as provided in various reports by AECOM, ERM and others), the movement of groundwater within the Study Area, between the Stage 1A and Stage 1B basements, is not considered to present a significant contamination risk to the proposed future land use and down-hydraulic gradient areas because:

- The area located to the east of the Study Area (within Hickson Road) is not within the VMP Remediation Extent and the groundwater in this area does not require remediation.
- Bedrock east of the Study Area is known to be very shallow (approximately 0.6 m bgl at TBH09, refer to **Figure 1**). Therefore, groundwater flow at the eastern end of the Study Area (i.e. adjacent to the TBH09 area) is likely to be low and restricted to relatively minor flows through the relatively impermeable sandstone bedrock and is not likely to produce significant groundwater flows through the Study Area (i.e. groundwater flows from east to west);
- The area of the Study Area is relatively small (approximately 920 m^2 compared to a total area of 21,000 m^2 Declaration Area) and therefore the potential contaminant mass flux through this area would be small; and
- Terrestrial groundwater flow across the Study Area from the east will be low as a result of the up gradient urban catchment for groundwater recharge (i.e. comprising generally impermeable hard stand urban areas) and the underlying sandstone bedrock. In particular, the majority of rainfall becomes surface water runoff due to the presence of pavements and buildings, leaving little water to infiltrate and recharge the groundwater system at the Study Area.

It is anticipated that the Additional CoPC concentrations will continue to decrease over time once the VMP Remediation Works are completed and Stage 1B Basement is constructed (as required for completion of the Block 4 Development Works). As illustrated by the contaminant flux modelling (AECOM, 2013a), undertaken in support of the *VMP Remediation Extent* report (AECOM, 2013b]), the reduction in contaminant mass that is expected to occur as a result of the proposed VMP Remediation Works will result in a significant improvement to groundwater quality in the fill material (between 250% and 380%).

8.0 Validation Works

8.1 Southern Stage 1B PRW Alignment

To further assess the potential SPGWT impacts in the BH36 area (as discussed in **Section 7.1**), future validation investigations are recommended in the western portion of the Stage 1B PRW as it will not be possible to visually assess the presence/absence of SPGWT in the materials behind the Stage 1B PRW following construction. If SPGWT is confirmed to be present during these works, the following Contingency measures of the *VMP/Block 4 RAP* (AECOM, 2013b) will be implemented as required:

- Section 23.5 of the *VMP/Block 4 RAP* (AECOM, 2013b) - if SPGWT is identified outside and/or below the proposed VMP Remediation Works, an assessment of whether the SPGWT represents an unacceptable risk and can be practicably remediation will be undertaken; and
- Section 23.11 of the *VMP/Block 4 RAP* (AECOM, 2013b) - if SPGWT is identified to be present in the bedrock various engineering mitigation measures will be considered.

8.2 Asbestos in Unsaturated Soils

As described by **Section 7.2.2**, additional validation sampling of the unsaturated soils that will remain within the Study Area following development is required to characterise the presence (or absence of asbestos) and confirm that any asbestos present does not represent an unacceptable risk to human health.

The additional validation sampling of unsaturated soils will involve:

- Collection of validation soil samples at a sampling density of one sample location per 20 m grid interval:
- Soil samples will be collected from test pits to allow the collection of bulk samples as required for analysis of the gravimetric content of bonded ACM;
- Soil samples will collected from within the unsaturated zone at depths of approximately 0.5 and 1.5 m bgl;
- Soil samples will be biased toward those zones considered most likely to be impacted based on field observations (including visual/olfactory observations and PID readings); and
- All soil samples will be analysed for asbestos based on measurement of the gravimetric content of bonded ACM in soil as described by Schedule B1 of the NEPM (NEPC, 2013), to allow appropriate comparison to the asbestos SSTCs (refer to **Section 6.2**).

Based on the results of the additional validation sampling, an assessment of whether CIM is present within the unsaturated soils within the Study Area will be undertaken based on comparison of the reported concentrations against the asbestos SSTC. These works will be undertaken in consultation with the NSW EPA Accredited Site Auditor and will be detailed in a Progressive Validation Report to be issued to the NSW EPA Accredited Site Auditor.

If CIM is identified by the additional validation sampling based on the presence of asbestos at concentrations greater than the asbestos SSTC, additional delineation works may be required to appropriately characterise the vertical and horizontal extent of the impacts and to define remediation requirements. If required, these delineation and remediation works would be conducted in consultation with the NSW EPA Accredited Site Auditor.

The above validation works will be further detailed in a Validation SAQP to be prepared in accordance with Section 19.2.3 of the *VMP/Block 4 RAP* (AECOM, 2013c).

9.0 Conclusions

In conclusion, AECOM considers that:

- Soil and groundwater data from within and in the vicinity of the Study Area is adequate for assessment of whether the fill materials and groundwater are suitable for the proposed future land use and are adequately protective of the environment. The only exceptions to this are:
    - Future validation data is required to confirm the absence of SPGWT adjacent to the new alignment of the southern Stage 1B basement wall in the western portion (i.e. west of the VMP Remediation Extent). Additional validation (as discussed in **Section 8.0**) is recommended to address this data gap; and
    - Insufficient asbestos in soils analytical data in unsaturated soil within the Study Area. Additional validation testing (as discussed in **Section 8.0**) is recommended to address this data gap.

    The scope of work required for these additional validation works will be detailed in a Validation SAQP to be prepared in accordance with Section 19.2.3 of the *VMP/Block 4 RAP* (AECOM, 2013c).
- The land uses considered for the VMP Remediation Works are consistent with the proposed land uses within the Study Area and therefore, the Study Area is considered protective of human health and the environment for those CoPC assessed by the *VMP HHERA* (AECOM, 2012c) (refer to **Section 1.2**);
- Further assessment of whether the concentrations of the Additional CoPC assessed by the *Declaration Site HHERA* (AECOM, 2011) are similarly protective of human health and the environment has been undertaken as part of this Addendum in accordance with the contingency measures described by Sections 23.12.4 and 23.12.5 of the *VMP HHERA* (AECOM, 2012c) and *VMP/Block 4 RAP* (AECOM, 2013b);
- **Protection of human health**:
    - Comparison of the Additional CoPC soil and groundwater analytical results considered representative of the Study Area to the soil and groundwater SSTCs relevant to the proposed future land uses, indicates that all Additional CoPC concentrations are less than the relevant SSTCs.
    - Therefore, pending the results of the future validation sampling (refer to **Section 8.0**), soil and groundwater concentrations at the Study Area are not considered to pose an unacceptable risk to human health in the context of the proposed future land uses.

- **Protection of the environment** - the fill material and groundwater that will remain within the Study Area after completion of the VMP Remediation Works (as described in **Section 7.0**) are considered to be protective of the environment based on the following:
    - SPGWT has not been identified to be present in the Study Area fill material;
    - The concentrations of Additional COPCs reported in the Study Area fill material are less than the soil SSTC and are not considered to be representative of an ongoing source of groundwater contamination which would present a significant ongoing risk to the environment;
    - The concentrations of Additional COPCs reported in groundwater within the Declaration Area were generally either less than the laboratory LOR or less than the corresponding MWQC criteria;
    - It is anticipated that the Additional CoPC concentrations will continue to decrease over time once the VMP Remediation Works are completed and Stage 1B Basement is constructed. Contaminant flux modelling (AECOM, 2013a) previously undertaken, demonstrated that the reduction in contaminant mass that is expected to occur as a result of the proposed VMP Remediation Works will result in a significant improvement to groundwater quality in the fill material (between 250% and 380%);
    - The volume and contaminant mass of key COPCs (naphthalene and TPH C_{10}-C_{14}) that is estimated to remain within the Study Area fill material relative to that which will otherwise remain following completion of the VMP Remediation Works (i.e. within Zone 3 and 4 fill materials as defined by the *VMP Remediation Extent* report [AECOM, 2013b]) is very small and unlikely to impact on the environment;
    - Based on the available historical investigation data for the Study Area, the movement of groundwater and associated contaminant flux within the Study Area is small and will not present a significant contamination risk to the proposed future land use and the environment in down-hydraulic gradient areas; and
    - The proposed development works at the Study Area will involve the partial excavation of the Study Area's fill materials to a depth of 2.7 m bgl and backfilling around the stormwater pipe with Suitable Fill validated in accordance with the *VMP/Block 4 RAP* (AECOM, 2013b). The use of Suitable Fill at the Study Area will further reduce the contaminant mass at the Study Area which will ultimately improve groundwater quality ultimately migrating to the west (across the down-gradient hydraulic Declaration Area boundary).

Based on the above information, it is concluded that:

- Validation sampling is required to:
    - Confirm the absence (or otherwise) of SPGWT adjacent to the new alignment of the southern Stage 1B PRW; and
    - Characterise asbestos concentrations within unsaturated soil in the Study Area and facilitate an assessment of resultant risk to human health.
- Subject to the outcome of the above validation sampling, completion of the proposed VMP Remediation Works within the Study Area (as detailed in Section 6.8.1 of the *VMP/Block 4 RAP* [AECOM, 2013c]) will render the Study Area:
    - suitable for the proposed future land uses within the Study Area as described by SSD 6690 (specifically paved recreation landuse as a publically accessible roadway); and
    - protective of the environment.
- The *VMP/Block 4 RAP* (AECOM, 2013c) is appropriate to manage the VMP Remediation Works including remediation of the Study Area and does not require amendment;
- The contingency measures detailed in Sections 23.12.4 and 23.12.5 of the *VMP/Block 4 RAP* (AECOM, 2013c) have been appropriately implemented via the preparation of this RAP Addendum; and
- Subject to the outcome of the above validation sampling, additional remediation of the Study Area (i.e. in addition to the VMP Remediation Works) is not required for the proposed development land uses described in **Section 4.0**.

10.0 References

AECOM, 2010. *Groundwater Discharge Study, Stage 1 Barangaroo Development*. 3 November 2010.

AECOM, 2011. *HHERA, Declaration Site (Development Works) Remediation Works Area - Barangaroo*. 9 June.

AECOM, 2012a. *Contaminant Flux and Discharge estimations for natural residual soil and marine sediments, EPA Declaration Area 21122 and adjacent areas of Barangaroo South and Barangaroo Central*. 14 March.

AECOM, 2012b. *HHERA - Declaration Site, Barangaroo. Assessment of the Implications of the Revised Basement Design*. 3 July.

AECOM, 2012c. *HHERA – VMP Remediation Works Area (Addressing the NSW EPA Remediation Site Declaration 21122 Millers Point)*. 25 October.

AECOM, 2013a. *Additional Groundwater Modelling to Supplement Contaminant Flux and Discharge Estimates for Natural Soils and Marine Sediments for EPA Declaration Area 21122*. 12 March 2012.

AECOM, 2013b. *VMP Remediation Extent, VMP Remediation Works Area, (Parts of Barangaroo and Hickson Road), Millers Point, NSW*. 23 July 2013.

AECOM, 2013c. *Remedial Action Plan, NSW EPA Declared Remediation Site 21122 and Block 4 (Stage 1b) Development Works, Barangaroo, Millers Point, NSW*. 24 July.

AECOM, 2013d. *Remediation and Landforming Works Development Application (SSD 5897-2013), Adjustment in Block 4 Basement Area and Remediation Staging – Barangaroo, Hickson Road, Millers Point, NSW.* 10 September.

AECOM, 2013d. *Addendum to Human Health and Ecological Risk Assessment. Other Remediation Works (South) Area, Barangaroo. 16 October.*

AECOM, 2015. *Draft RAP, Barangaroo South Stage 1B Waterfront Public Domain*. 23 July.

Yours faithfully,

Andrew Rolfe
Principal Scientist
andrew.rolfe@aecom.com

Mobile: +61 418 601 363
Direct Dial: +61 2 8295 1149

Michael Jones
Technical Director - Environment
Michael.A.Jones@aecom.com

Mobile: +61 428 532 255
Direct Dial: +61 2 8934 0397

Attachment 1: Site Plan

Attachment 2: *Block 4 Adjustment Letter* (AECOM, 2013d)

Attachment 3: Summary Tables:

Table T1 - Applicable ORWN Services Zone and Block 4 Services Zone Soil Analytical Results

Table T2 - Applicable ORWN Interim Public Domain Soil Analytical Results

Table T3 - Comparison of Study Area contaminant mass to Zone 3 & 4 (Fill Material only)

Attachment 1: Site Plan

Figure 1

Last modified: 23 Jul 13 - 14:47

Cad ref: P:\60153531_Barangaroo_S_ICLS_CADD\S3 Working\Drg\Figures\60247139-drg-20-RAPC_F5.dwg

N

30-34 HICKSON ROAD
LOT 2 DP 873158

SMALL GASHOLDER

MAIN GASHOLDER ANNULUS

36 HICKSON ROAD
LOT 3 DP 873158

38 HICKSON ROAD
LOT 3 DP 873158

HICKSON ROAD

METER HOUSE

1870 GASHOLDER

CONDENSERS

PURIFIERS

ENGINE HOUSE

PURIFYING SHEDS 3

1868 RETORT HOUSE EXTENSION

RETORT HOUSE

BLOCK 5

BLOCK 4

BARANGAROO CENTRAL (PART)

ORWN AREA

ORWS RAP AREA

ORWS BASEMENT CURRENTLY UNDER CONSTRUCTION

APPROXIMATE EXTENT OF VMP REMEDIATION WORKS

EXTENT OF LEND LEASE STAGE 1B BASEMENT

VMP / BLOCK 4 RAP (AECOM, 2013) BOUNDARY - RED DASHED LINE

'THE STUDY AREA' - Watermans Quay

- COFFEY BOREHOLE LOCATION
- COFFEY GROUNDWATER WELL LOCATION
- ERM BOREHOLE LOCATION
- ERM GROUNDWATER MONITORING WELL LOCATION
- AECOM BOREHOLE LOCATION
- AECOM GROUNDWATER MONITORING WELL LOCATION
- AECOM SOIL VAPOUR LOCATION
- AECOM INTERTIDAL WELL LOCATION
- OTHER REMEDIATION WORKS (NORTH) AREA AND SITE BOUNDARY
- DECLARATION AREA BOUNDARY
- THE SITE BOUNDARY
- APPROXIMATE EXTENT OF FORMER GASWORKS FEATURES
- PROPOSED BASEMENT GROUNDWATER RETENTION WALL SYSTEM (BLOCK 4 AND 5)
- EXISTING ORWS BASEMENT GROUNDWATER RETENTION WALL SYSTEM
- BLOCK 4 AND 5 BOUNDARIES
- EXISTING CAISSON WALL
- MONITORING WELL DISCUSSED IN LETTER TEXT

This drawing is confidential and shall only be used for the purposes of this project.

REVISIONS

No.	BY	DATE	DESCRIPTION	APPD
04	PAS	23.07.13	FINAL ISSUE	AR
03	PAS	20.06.13	DRAFT ISSUE	AR
02	PAS	18.03.13	DRAFT ISSUE	AR
01	TT	12.09.12	DRAFT ISSUED	DM

SCALES: 5 0 5 10 15m; 1:1000 A3

THE SIGNING OF THIS TITLE BLOCK CONFIRMS THE DESIGN AND DRAFTING OF THIS PROJECT HAVE BEEN PREPARED AND CHECKED IN ACCORDANCE WITH THE AECOM QUALITY ASSURANCE SYSTEM TO ISO 9001:2000

DESIGNED	KM	CHECKED	AR
DRAWN	TT	CHECKED	JA
APPROVED	AR	DATE	23.07.13

CONTRACTOR:

DESIGNER: AECOM

AECOM Australia Pty Ltd A.B.N. 20 093 846 925

CLIENT:

STAGE 1B SEPP 55 LETTER, BARANGAROO

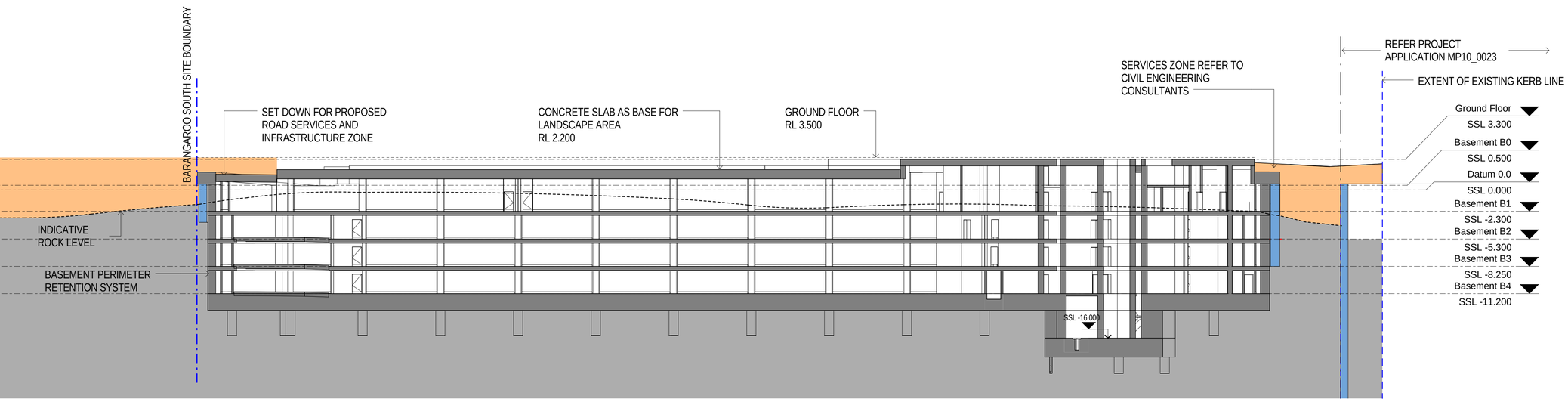
FIGURE 1
SITE PLAN AND SAMPLING LOCATION

STATUS: FINAL

DRAWING NO: 60247139-DRG-20-RAPC-F5

REV: 04

KEY PLAN



lendlease
ONE SYDNEY HARBOUR
BARANGAROO

PRINCIPAL ARCHITECT:
RPBW
RENZO PIANO BUILDING WORKSHOP
Via P.P. Rubens 29, 16158 Genova - Italy
Emanuela Baglietto | Nominated Architect
NSW ARB 9512

EXECUTIVE ARCHITECT:
Lend Lease Design
ABN 97 000 098 162
30 The Bond, 30 Hickson Road
Millers Point, NSW, 2000
Stephanie Smith | Nominated Architect
NSW ARB 6480

STAGE 1B BASEMENT SSD6960
SECTION 01

Scale 1 : 250 @ A1 Scale 1:500 @ A3

0 25M

Checked:
Graham Jones
16.07.2015
Approved:
Stephanie Smith
16.07.2015

Drawing: BB2 _PA2_A300
Date: 16 July 2015 Revision: A
DEVELOPMENT APPLICATION

Attachment 2: *Block 4 Adjustment Letter* (AECOM, 2013d)

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney NSW 2000
PO Box Q410
QVB Post Office NSW 1230
Australia
www.aecom.com

+61 2 8934 0000 tel
+61 2 8934 0001 fax
ABN 20 093 846 925

10 September 2013

Mark Burns
Environment Manager
Barangaroo South | Lend Lease
30 The Bond, 30 Hickson Road, Millers Point, NSW

Dear Mark

Remediation and Landforming Works Development Application (SSD 5897-2013), Adjustment in Block 4 Basement Area and Remediation Staging - Barangaroo, Hickson Road, Millers Point, NSW

1.0 Introduction

This letter has been prepared by AECOM Australia Pty Limited (AECOM) for Lend Lease (Millers Point) Pty Ltd (Lend Lease) to support the Remediation and Landforming Works Development Application (DA SSD 5897-2013) prepared by Lend Lease. SSD 5897-2013 seeks consent for remediation of Block 4 of Barangaroo South and some associated stormwater diversion works.

The remediation of Block 4 will be undertaken in accordance with the *Remedial Action Plan, NSW EPA Declared Remediation Site 21122 and Block 4 (Stage 1b) Development Works, Barangaroo, Millers Point, NSW* (RAP, AECOM, 2013) (here-in referred to as the *VMP/Block 4 RAP)*. With respect to the *VMP Block 4 RAP* (AECOM, 2103), it is noted that:

- the alignment and depth of the proposed Block 4 basement area described by DA SSD 5897-2013 has been adjusted from that described in the *VMP Block 4 RAP* (AECOM, 2103). These adjustments are described in **Section 2.0**; and
- the Block 4 Remediation Works are proposed to be undertaken prior to the remediation work in Block 5 and Hickson Road (within the New South Wales Environment Protection Authority [NSW EPA] Declared Remediation Site 21122 [here-in referred to as the EPA Declaration Area]). The proposed staging of remediation works is described in **Section 3.0**.

The objective of this letter is therefore to confirm that:

- the proposed adjustments to the Block 4 basement area (i.e. the basement groundwater retention wall system and the basement excavation depth) as described by DA SSD 5897-2013 can be suitably managed by the *VMP/Block 4 RAP* (AECOM, 2013).
- staged remediation of Block 4 followed by Block 5 and Hickson Rd (within the EPA Declaration Area):
    - is consistent with the approved *VMP/Block 4 RAP* (AECOM, 2013) and can be suitably managed by the *VMP/Block 4 RAP* (AECOM, 2013);
    - will not adversely affect groundwater migration from the area up hydraulic gradient of Block 4 (including within Hickson Road).
- amendment of the *VMP/Block 4 RAP* (AECOM, 2013) is not required to facilitate the proposed adjustments to the Block 4 basement area and the proposed staging of remediation works in Block 4, Block 5 and Hickson Road.

With respect to the remediation works described by the *VMP/Block 4 RAP* (AECOM, 2013), DA SSD 5897-2013 will seek consent for:

- Remediation of Block 4 such that the NSW EPA Declaration can be revoked (also referred to by the *VMP/Block 4 RAP* [AECOM, 2013] as the 'VMP Remediation Works'); and
- Remediation of the area of the proposed Block 4 basement (i.e. within the retention wall system proposed by DA SSD 5897-2013) to a standard that is suitable for the proposed development (also referred to by the *VMP/Block 4 RAP* [AECOM, 2013] as the 'Block 4 Development Remediation Works').

2.0 Proposed Block 4 Basement Adjustments

The proposed adjustments to the Block 4 basement design (relative to the *VMP/Block 4 RAP* [AECOM, 2013]), as detailed in the Lend Lease development plans DA SSD 5897-2013 (refer to **Attachment 1**), are:

- the southern Block 4 retention wall system will be constructed approximately 13 m to the north of the location noted in the *VMP/Block 4 RAP* (AECOM, 2013). The *VMP/Block 4 RAP* (AECOM, 2013) envisaged that the wall would be constructed adjacent to the adjacent Stage 1a basement groundwater retention wall; and
- excavation for the Block 4 basement will extend to a depth of approximately 18 m below ground level (bgl) or Relative Level (RL) -15.6 m Australian Height Datum (AHD). The *VMP/Block 4 RAP* envisaged that the typical depth of the Block 4 basement would be approximately 8 m bgl (RL -5.6 m AHD).

Figure 1 (attached to this letter) shows:

- the adjusted alignment of the southern Block 4 perimeter retention wall;
- the adjusted basement excavation depth; and
- the proposed extent of remediation within saturated soils required to facilitate revoking of the NSW EPA Declaration (as presented in the *VMP/Block 4 RAP* [AECOM, 2013]) (the VMP Remediation Extent).

The remediation works contemplated by DA SSD 5897-2013 are:

- Block 4 Development Remediation Works to be undertaken in accordance with the *VMP/Block 4 RAP* (AECOM, 2013) within the adjusted footprint of the Block 4 basement (as shown on **Figure 1**); and
- VMP Remediation Works to be undertaken in accordance with the *VMP/Block 4 RAP* (AECOM, 2013) within Block 4.

3.0 Proposed Staging of Remediation Works

It is proposed that the remediation works to be undertaken within Block 4 as described by DA SSD 5897-2013 will be undertaken prior to the remediation work in Block 5 and Hickson Road (within the EPA Declaration Area).

Separate Development Applications will be prepared with respect to:

- Remediation for potential future land uses (if required), of the area Block 4 to the south of the adjusted footprint of the Block 4 basement; and
- Remediation of those parts of Block 5 and Hickson Road that are within the EPA Declaration Area.

4.0 VMP/Block 4 RAP

4.1 Contingency Measures Applicable to Basement Design Changes

The *VMP/Block 4 RAP* (AECOM, 2013) acknowledges that, at the time of writing, the Block 4 basement and retention wall system were subject to ongoing refinement and development as part of the Lend Lease design process. In recognition of this, the *VMP/Block 4 RAP* (AECOM, 2013) includes contingency measures/responses which should be implemented in the event that the Block 4 basement design is modified from the assumptions in the *VMP/Block 4 RAP* (AECOM, 2013). In particular, the following sections of the *VMP/Block 4 RAP* (AECOM, 2013) are relevant to the design adjustments described by **Section 2.0**:

- Section 23.12.1 contemplates a potential increase in basement excavation depth (refer to **Section 4.1.1**); and
- Section 23.12.5 contemplates changes to the lateral alignment of the southern Block 4 basement groundwater retention wall system which may result in material remaining within Block 4 but outside the retention wall system (refer to **Section 4.1.2**).

The following sections implement the contingency measures/responses required by the *VMP/Block 4 RAP* (AECOM, 2013), as described above, based on the basement design adjustments described by **Section 2.0**. Reference is also made to Sections 19.5.3 and 19.5.4 of the *VMP/Block 4 RAP* (AECOM, 2013) which describe the soil validation requirements associated with the Block 4 Development Works.

4.1.1 Increase in Basement Depth

Section 23.12.1 of the *VMP/Block 4 RAP* (AECOM, 2013) states that increasing the depth of the Block 4 basement will not affect the extent of remediation required or the preferred remediation strategy.

It is noted that, based on available borehole and analytical data in Block 4, the adjusted (increased) basement excavation depth will require excavation of the majority of fill material and natural marine sediments and will likely extend into bedrock. Separate Phase Gasworks Waste and Tar (SPGWT[1]) has been identified to be present at depth in the western portion of Block 4 below the depth of the previously proposed basement (refer to Table 8 of the *VMP/Block 4 RAP* [AECOM, 2013]). Remediation of these impacts was not considered warranted because the SPGWT was reported within marine sediments (which have been demonstrated to have negligible contaminant flux with the overlying fill) and/or was present at depths significantly below the proposed basement. The increase in basement excavation depth will result in excavation of these SPGWT impacts and therefore result in a greater contaminant mass being removed from the Site than anticipated by the *VMP/Block 4 RAP* (AECOM, 2013).

Implementation of the validation requirements detailed in Section 19.5.3 of the *VMP/Block 4 RAP* (AECOM, 2013) will ensure that SPGWT is not present in proximity to the base of the Block 4 basement. In the event that SPGWT impacts are present in the bedrock base of the adjusted (deeper) Block 4 basement, the contingency measures described by Section 23.11 of the *VMP/Block 4 RAP* (AECOM, 2013) would be implemented.

4.1.2 Changes to the Alignment of the Southern Block 4 Basement Groundwater Retention Wall System

The change in alignment of the southern Block 4 retention wall system (as described in **Section 2.0**) will result in material remaining within Block 4 outside (south of) the alignment of the retention wall system.

Section 23.12.5 of the *VMP/Block 4 RAP* (AECOM, 2013) states that if the southern Block 4 retention wall system is off-set from the existing Stage 1a northern retention wall, the measures described by Section 23.12.4 of the *VMP/Block 4 RAP* (AECOM, 2013), in relation to changes to the alignment of the northern Block 4 wall, would be undertaken. The measures described by Section 23.12.4 of the *VMP/Block 4 RAP* (AECOM, 2013) include development of additional remediation criteria for material remaining within Block 4 outside the alignment of the retention wall system.

Section 23.12.4 and Section 23.12.5 of the *VMP/Block 4 RAP* (AECOM, 2013) describe contingency measures that should be undertaken if the area remaining within Block 4 outside the alignment of the retention wall system is to be remediated to a standard suitable for a particular future land use. However, the following is noted:

- DA SSD 5897- 2013 includes remediation of areas to a standard suitable for future land use within the Block 4 retention wall system only (in addition to remediation to a standard suitable for the EPA Declaration to be revoked); and
- DA SSD 5897-2013 includes remediation of the area within Block 4 that is outside the retention wall system only to a standard suitable for the EPA Declaration to be revoked (that is to a standard suitable for the current land use). This portion of land is not proposed to be remediated to a standard suitable for future land use as part of DA SSD 5897-2013.

As such, the contingency measures described by Section 23.12.4 and Section 23.12.5 of the *VMP/Block 4 RAP* (AECOM, 2013) are not relevant to DA SSD 5897-2013.

The extent of remediation that will be undertaken within the area of Block 4 that is outside the retention wall system will be consistent with the VMP Remediation Works extent of remediation as shown on **Figure 1**.

---

[1] For the purposes of this letter, SPGWT refers to:

- Tar Containing Materials (TCM) which are defined as described below; and
- Dense Non Aqueous Phase Liquids (DNAPLs).

The presence or otherwise of TCM is based on comparison of observed site conditions and analytical data to the following criteria:

- Greater than 10% visible coal tar (where coal tar is a phase separated hydrocarbon by-product from coal gasification); and/or
- Contaminant concentrations exceeding the following limits:
  - Polycyclic Aromatic Hydrocarbons (PAHs): 2,000 mg/kg; or
  - Benzo(a)Pyrene (B(a)P): 150 mg/kg.

Remediation, if required, of the area outside the Block 4 retention wall system for future land use will be the subject of a separate Development Application.

Section 19.5.4 of the *VMP/Block 4 RAP* (AECOM, 2013) acknowledges that it will not be possible to directly validate that materials remaining in the Block 4 basement excavation walls are free from SPGWT due to the presence of excavation retention cut-off walls that will be required to support the excavation. Section 19.5.4 of *VMP/Block 4 RAP* (AECOM, 2013) also demonstrates that SPGWT identified by previous investigations in the vicinity of the wall does not represent an unacceptable risk to human health.

With respect to the area within Block 4 outside the alignment of the retention wall system, SPGWT has been identified outside the adjusted wall alignment at the following location:

- BH408 - SPGWT was observed within the natural marine sediments between a depth of 8.0 and 9.4 m bgl (the depth of the underlying bedrock).

As detailed in Section 8.5.1 of the *VMP/Block 4 RAP* (AECOM, 2013), the SPGWT in the vicinity of BH408 will be removed as part of the VMP Remediation Works that will be undertaken within this area under DA SSD 5897-2013.

4.2 Staging of the Remediation Works

The *VMP/Block 4 RAP* (AECOM, 2013) contemplated that the required remediation works might be staged to occur sequentially as part of the progressing development works. In particular, Section 1.8 of the *VMP/Block 4 RAP* (AECOM, 2013) anticipated that the development and construction sequence and methodology may require that:

- remediation of key site areas (for example Block 4, Block 5 and Hickson Road) be completed and validated (including the preparation of Site Audit Statements) separately, in sequence; and
- remediation within key site areas (for example within Block 4) may be staged.

The following sections of the *VMP/Block 4 RAP* (AECOM, 2013) are relevant to the management of staged remediation works described by **Section 3.0**:

- Section 19.2.1 specifically describes the principles for the validation of staged remediation works including the preparation of a Validation Sampling Analysis and Quality Plan(s) (SAQP) and staged preparation of Site Audit Statements;
- Section 19.2.3 mandates the requirement for preparation of a Validation Sampling Analysis and Quality Plan (SAQP) that is specific to each stage of the remediation works. The Validation SAQP will describe the specific requirements for demonstrating that the remediation works have been undertaken in accordance with the requirements of the *VMP/Block 4 RAP* (AECOM, 2013);
- Section 19.5.4 provides specific contingency measures to be implemented to facilitate validation of the Block 4 basement walls in the vicinity of the 1870 gasholder annulus in the event that remediation and validation of Block 4 is required prior to remediation and validation of Hickson Road. These contingency measures are further discussed in **Section 4.2.1** and
- Section 23.10 contemplates the potential for changes to the Barangaroo development strategy to affect the proposed remediation works as described by the *VMP/Block 4 RAP* (AECOM, 2013). The proposed staged remediation as described by **Section 3.0** does not constitute a significant change to the Barangaroo development strategy and will not change the remediation works as described by the *VMP/Block 4 RAP* (AECOM, 2013). As such, the contingency measures described by Section 23.10 of the *VMP/Block 4 RAP* (AECOM, 2013) are not considered relevant to DA SSD 5897-2013.

4.2.1 Validation of the Block 4 Basement Wall

As described by **Section 3.0**, the proposed staged remediation will result in remediation of Block 4 prior to remediation of Hickson Road. It is noted that the alignment of the proposed Block 4 basement wall passes through the inferred location of the 1870 gasholder annulus. As a consequence, it is possible that part of the 1870 gasholder annulus within Hickson Road may not have been remediated prior to construction of the Block 4 Basement Wall. In consideration of this, the following contingency measures are proposed by Section 19.5.4 of the *VMP/Block 4 RAP* (AECOM, 2013):

1) Remediation of SPGWT within the 1870 gasholder in Hickson Rd prior to validation of Block 4; or

2) Further assessment of whether the presence of SPGWT within the 1870 gasholder in Hickson Road represents an unacceptable risk to human health or the environment. This assessment would be undertaken in consultation with the Site Auditor and may consider:

   - the outcomes of additional investigations undertaken to more accurately delineate the presence of SPGWT within the gasholder and the gasholder design (for example, the gasholder is thought to consist of an annulus excavated into rock); and,
   - the design and construction methodology of the retention wall (including how the retention wall will be constructed within the gasholder annulus).

As described by **Section 3.0**, remediation of Hickson Road (including that portion of the 1870 gasholder within Hickson Road) (and Block 5 within the EPA Declaration Area) will be the subject of a separate DA. Therefore, it is anticipated that further assessment work will be undertaken as part of remediation validation works, in consultation with the Site Auditor, to assess whether the presence of SPGWT within the 1870 gasholder in Hickson Road represents an unacceptable risk to human health or the environment. This further assessment will be undertaken prior to final validation of the remediation work to be undertaken within Block 4.

5.0 Up-hydraulic Groundwater Conditions

Based on the available data for the EPA Declaration Area (including Hickson Road which is located up-hydraulic gradient of Block 4), it is considered that the proposed staged remediation works (refer to **Section 3.0**) will not adversely impact on the groundwater regime within other areas of the EPA Declaration Area (Block 5 and Hickson Rd). This conclusion is based on the following considerations.

- Groundwater flow in and around the proposed Block 4 basement (and the adjacent Stage 1a basement) is tidally influenced. The amount of seawater infiltrating into the site twice per day with the incoming tide is far greater than the amount of terrestrial groundwater flowing onto the site from up gradient areas in the fill material, natural sediments and sandstone bedrock. Terrestrial groundwater flow around the proposed Block 4 basement (and the adjacent Stage 1a basement) from Hickson Road will be low because of the following limiting factors:
  - the nature of the up gradient urban catchment for groundwater recharge. That is, the majority of rainfall becomes surface water runoff due to the presence of pavements and buildings, leaving little water to infiltrate and recharge the groundwater system; and
  - the relatively impermeable nature of the sandstone bedrock which restricts groundwater flow.
- The highest concentrations of groundwater contamination currently present within the EPA Declaration Area are present within the proposed Block 4 basement. As such, they will be subject to remediation in accordance with the *VMP/Block 4 RAP* (AECOM, 2013) as described by **Section 3.0**. Therefore, the groundwater quality within the EPA Declaration Area would be expected to improve as a consequence of the proposed remediation works; and
- The migration of groundwater contamination in Block 5 and those areas of Hickson Road that are up-hydraulic gradient of Hickson Road will not change significantly because of the construction of the Block 4 basement for the following reasons:
  - Overall groundwater flow is towards Darling Harbour, not towards the proposed Block 4 basement; and
  - Although terrestrial groundwater flow around the proposed Block 4 basement may flow into the Block 5, the flux will be low as discussed above. Therefore, this flow will not result in an appreciable additional migration of contamination.

6.0 Conclusions

Based on the information described above, the following conclusions can be made:

- The proposed Block 4 basement area included in DA SSD 5897-2013 is contemplated by and can be suitably managed by the contingency measures detailed in the *VMP/Block 4 RAP* (AECOM, 2013);
- The proposed staging of the VMP Remediation Works is consistent with and can be suitably managed by the existing provisions of the *VMP/Block 4 RAP* (AECOM, 2013);
- The proposed staging of the VMP Remediation will not adversely affect groundwater migration from the area up-hydraulic gradient of Block 4; and

- Notwithstanding the proposed adjustments to the Block 4 basement area (relative to the *VMP/Block 4 RAP* ([AECOM, 2013]) and staging of the VMP Remediation Works:
    - implementation of the VMP Remediation Works described by the *VMP/Block 4 RAP* (AECOM, 2013) within Block 4 will facilitate revoking of the NSW EPA Declaration from Block 4; and
    - implementation of the Block 4 Development Remediation Works described by the *VMP/Block 4 RAP* (AECOM, 2013) within the adjusted Block 4 basement in DA SSD 5897-2013 will facilitate the proposed future land use within the adjusted Block 4 basement area.

Based on these conclusions, it is out opinion that amendment of the *VMP/Block 4 RAP* (AECOM, 2013) is not required for DA SSD 5897-2013.

Yours faithfully

Michael Jones
Technical Director - Environment
michael.a.jones@aecom.com

Mobile: +61 428 532 255
Direct Dial: +61 2 8934 0397

Brad Eismen
Technical Director - Environment
brad.eismen@aecom.com

Mobile: +61 410 431 637
Direct Dial: +61 2 8934 0231
Direct Fax: +61 2 8934 0001

encl: Figure 1
Attachment 1 - Lend Lease development plans (26 August 2013)

Last modified: 09 Aug 13 - 14:10

Cad ref: P:\60153531_Barangaroo_S_IC\5. CADD\5.3 Working Dirg\Figures\60247139-drg-20-RAPC_MOD-F1.dwg

LEGEND:

- DECLARATION AREA BOUNDARY
- OTHER REMEDIATION WORKS (NORTH) BOUNDARY
- THE SITE BOUNDARY
- APPROXIMATE EXTENT OF FORMER GASWORKS FEATURES
- PROPOSED BASEMENT GROUNDWATER RETENTION WALL SYSTEM (BLOCK 4)
- EXISTING ORWS BASEMENT GROUNDWATER RETENTION WALL SYSTEM
- BLOCK 4 BASEMENT EXCAVATION TO APPROX. RL -15.6m AHD
- PROPOSED REMEDIATION EXTENT (TAKEN FROM THE VMP/BLOCK 4 REMEDIATION ACTION PLAN
- BLOCK 4 AND 5 BOUNDARIES
- EXISTING CAISSON WALL

HICKSON ROAD

30-34 HICKSON ROAD LOT 2 DP 873158

36 HICKSON ROAD LOT 3 DP 873158

38 HICKSON ROAD LOT 3 DP 873158

JENKINS STREET

BLOCK 5

BLOCK 4

ORWS RAP AREA

BARANGAROO CENTRAL (PART)

ORWN AREA

FOR INFORMATION ONLY

This drawing is confidential and shall only be used for the purposes of this project.

REVISIONS				
01	PAS	09.08.13	DRAFT ISSUE	AR
No.	BY	DATE	DESCRIPTION	APPD

SCALES: 5 0 5 10 15m; 1:1000 A3

THE SIGNING OF THIS TITLE BLOCK CONFIRMS THE DESIGN AND DRAFTING OF THIS PROJECT HAVE BEEN PREPARED AND CHECKED IN ACCORDANCE WITH THE AECOM QUALITY ASSURANCE SYSTEM TO ISO 9001-2000

DESIGNED	KM	CHECKED	AR
DRAWN	PAS	CHECKED	
APPROVED		DATE	

CONTRACTOR:

DESIGNER: AECOM

AECOM Australia Pty Ltd A.B.N. 20 093 846 925

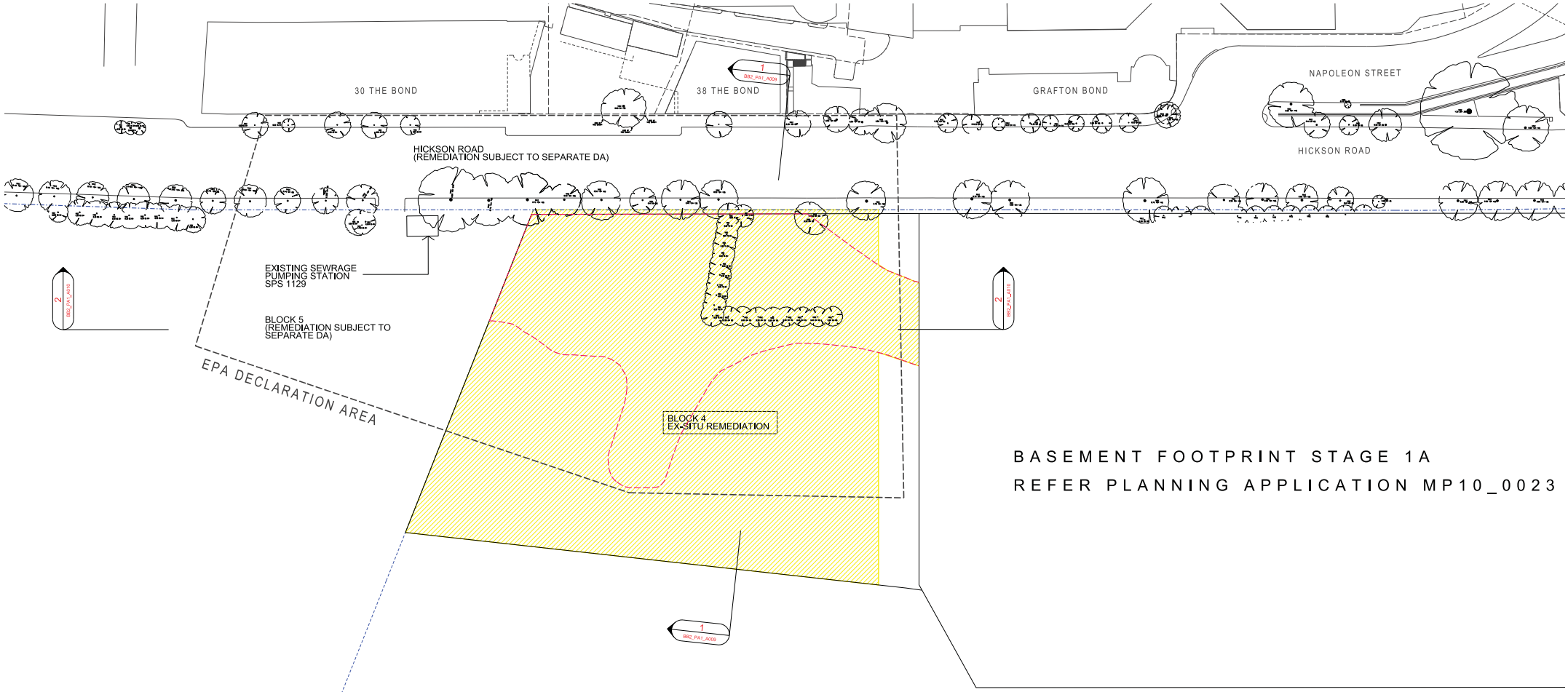
REMEDIATION AND LANDFORMING WORKS, BARANGAROO

FIGURE 1: REMEDIATION AND LANDFORMING WORKS DEVELOPMENT APPLICATION (SSD 5897-2013) PROPOSED BASEMENT - BLOCK 4

STATUS: DRAFT

DRAWING NO: 60247139-DRG-20-RAPC-MOD-F1

REV: 01



LEGEND:

- EPA DECLARATION AREA
- PROPERTY BOUNDARY
- EX-SITU REMEDIATION (INDICATIVE) FOR SSD 5897-2013
- INDICATIVE REMEDIATION EXTENT TO ADDRESS THE EPA DECLARATION AT BLOCK 4

NOTE:
THE SHADED AREAS DEPICT GENERAL METHODOLOGY ONLY. FINAL REMEDIATION EXTENT IS PER THE RAP.

INDICATIVE LAYOUT ONLY

Lend Lease

GRAHAM W JONES
Principal Architect
FRAIA NSW ARB 4005

Lend Lease (Millers Point) Pty Limited

Remediation and Land Forming Works
Development Application SSD 5897-2013
Locality / Context Plan

Purpose: Approved: Date:

Scale 1:500 @ B1 1:1250 @ A3

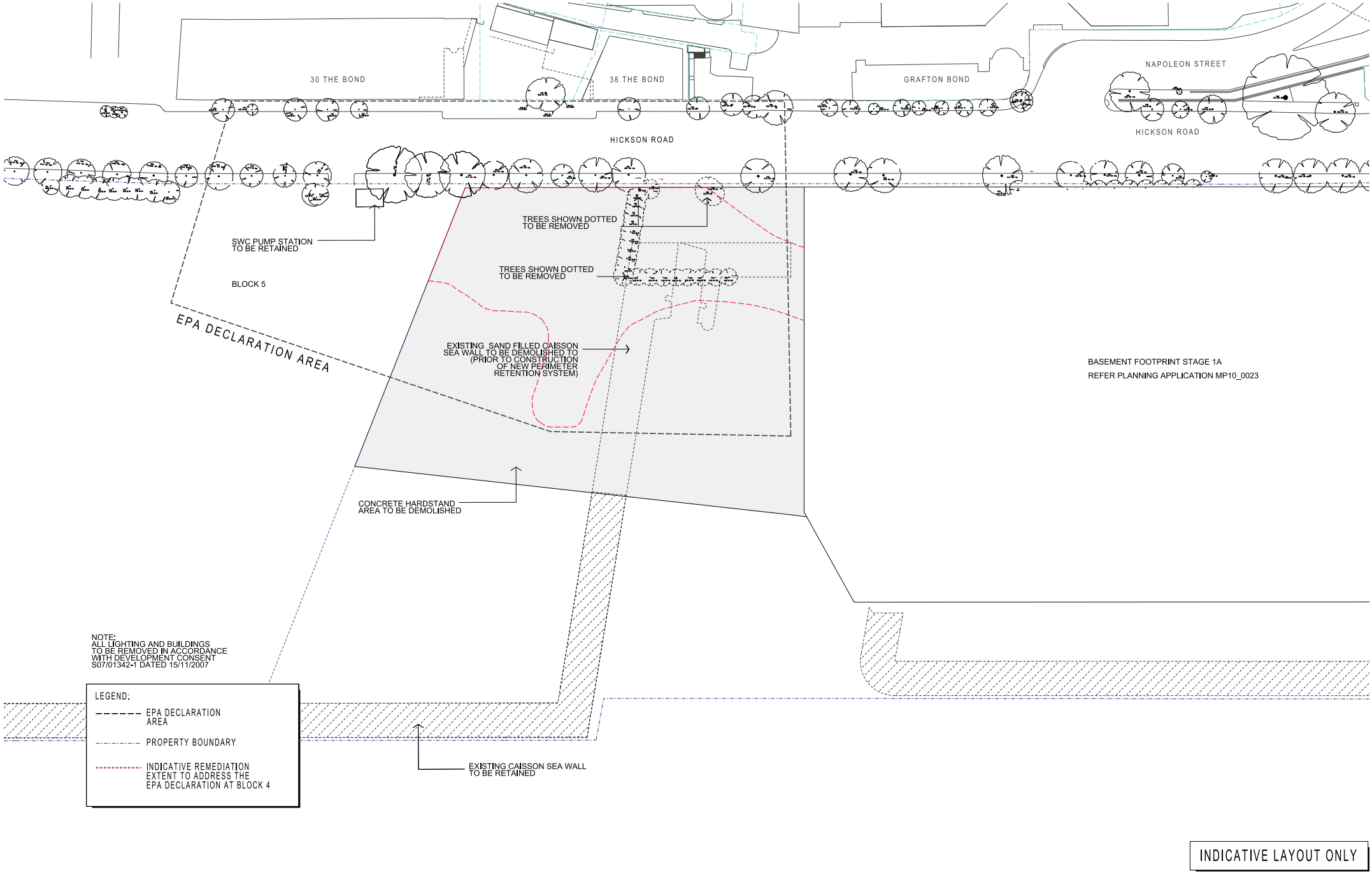
0 25 50M

Scale

Drawing No. BB2_PA1_A003

Date 26/07/13 Revision A

B1B_PA1_A003_A.dgn LLdesign zave400 26/08/2013 9:28:52 AM



INDICATIVE LAYOUT ONLY

Lend Lease

GRAHAM W JONES
Principal Architect
FRAIA NSW ARB 4005

Lend Lease (Millers Point) Pty Limited

Remediation and Land Forming Works
Development Application SSD 5897-2013
Demolition Plan

Purpose: Approved: Date:

Scale 1:500 @ B1 1:1250 @ A3

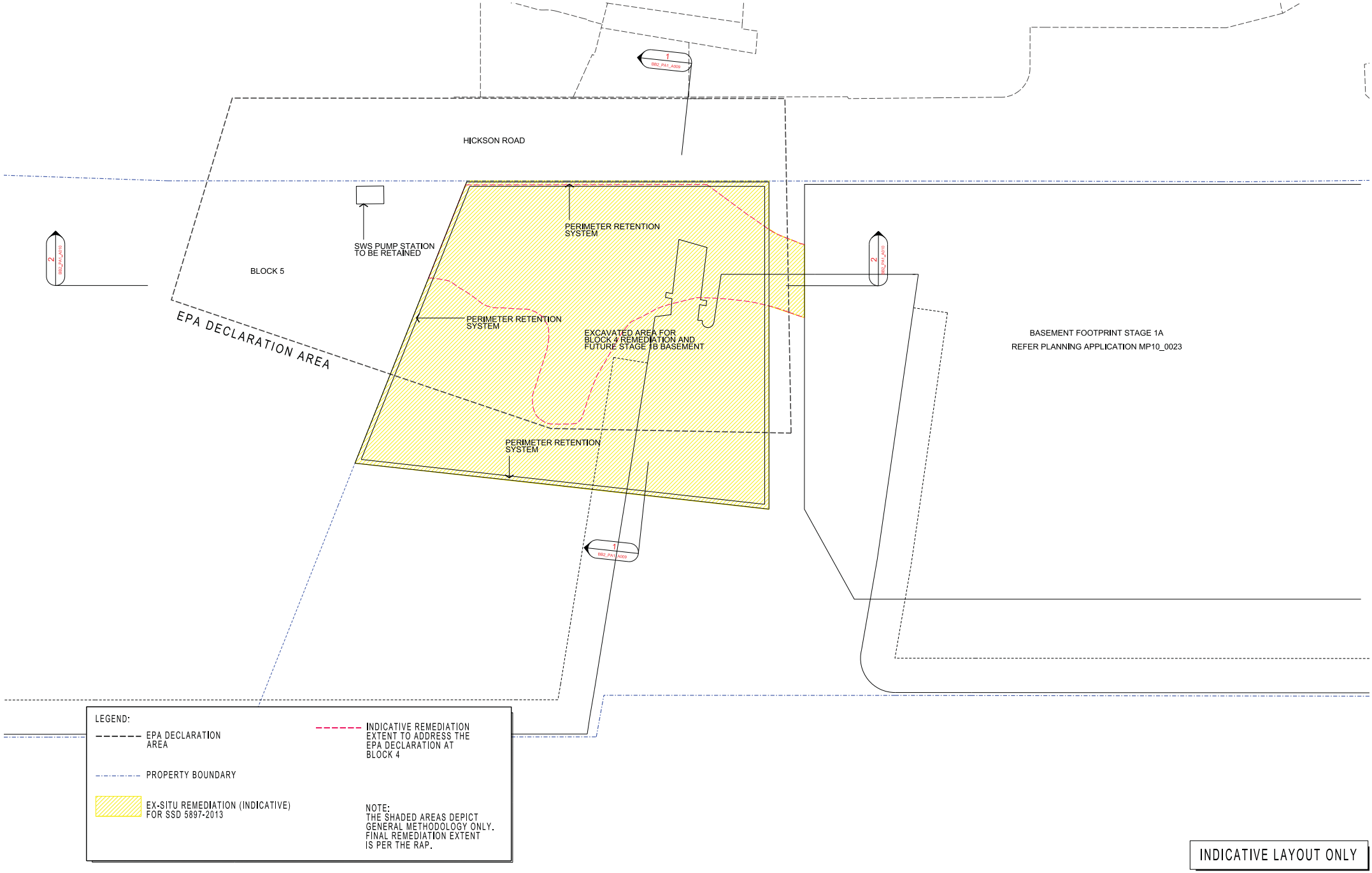
0 25 50M

Scale

Drawing No. BB2_PA1_A004

Date 26/07/13 Revision A

B1B_PA1_A004_A.dgn LLdesign zave400 26/06/2013 9:35:57 AM



Lend Lease

GRAHAM W JONES
Principal Architect
FRAIA NSW ARB 4005

Lend Lease (Millers Point) Pty Limited

Remediation and Land Forming Works
Development Application SSD 5897-2013
Permanent Retaining Wall Plan

Purpose: Approved: Date:

Scale 1:500 @ B1 1:1250 @ A3

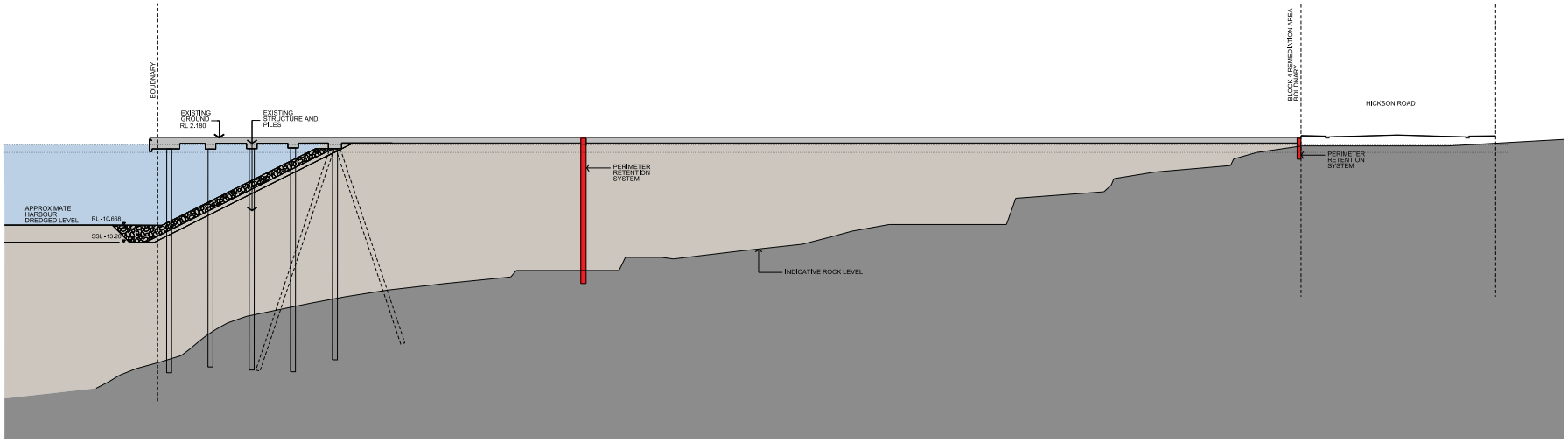
0 25 50M

Scale

Drawing No. BB2_PA1_A005

Date 26/07/13 Revision A

B1B_PA1_A005_A.dgn LLdesign zave400 26/06/2013 9:40:37 AM



CROSS SECTION 1-1

INDICATIVE LAYOUT ONLY

Lend Lease

GRAHAM W JONES
Principal Architect
FRAIA NSW ARB 4005

Lend Lease (Millers Point) Pty Limited

Remediation and Land Forming Works
Development Application SSD 5897-2013
Cross Section 1-1

Purpose: Approved: Date:

Scale 1:300 @ B1 1:750 @ A3

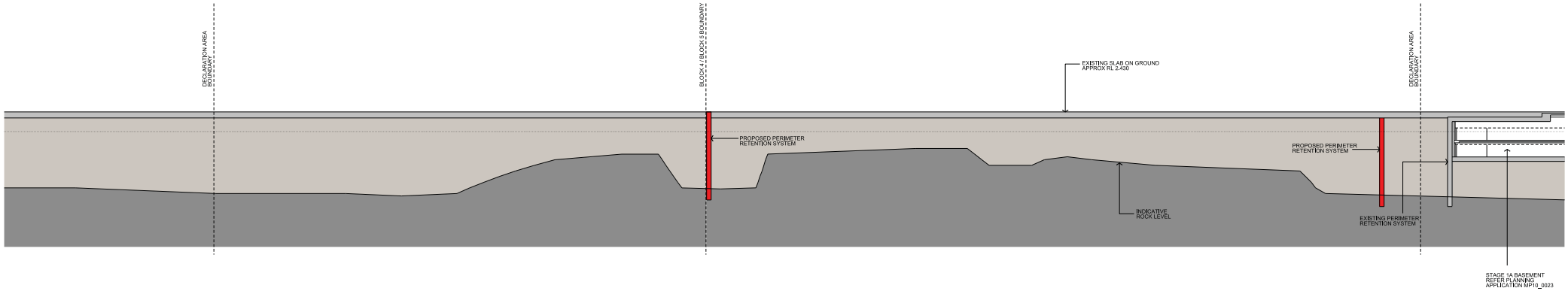
0 15 30M

Scale

Drawing No. BB2_PA1_A006

Date 26/07/13 Revision A

B1B_PA1_A006_A.dgn LLdesign zave400 26/06/2013 8:42:18 AM



CROSS SECTION 2-2

INDICATIVE LAYOUT ONLY

Lend Lease

GRAHAM W JONES
Principal Architect
FRAIA NSW ARB 4005

Lend Lease (Millers Point) Pty Limited

Remediation and Land Forming Works
Development Application SSD 5897-2013
Longitudinal Section 2-2

Purpose: Approved: Date:

Scale 1:300 @ B1 1:750 @ A3

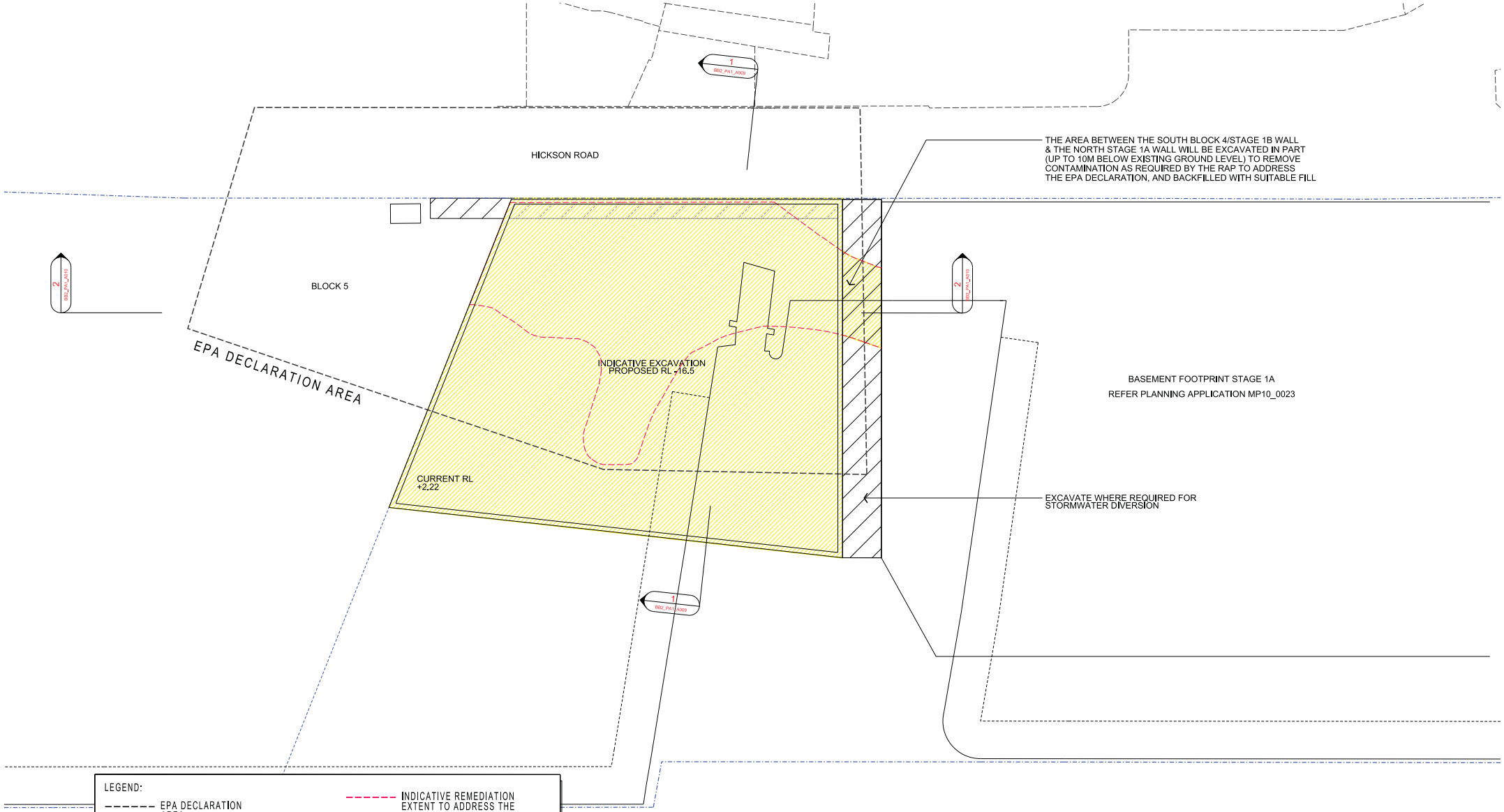
0 15 30M

Scale

Drawing No. BB2_PA1_A007

Date 26/07/13 Revision A

B1B_PA1_A007_A.dgn LLdesign zave400 26/08/2013 9:44:40 AM



NOTE:

INDICATIVE PROPOSED CUT FOR WORKS - 150,000 m³

INDICATIVE PROPOSED FILL FOR WORKS - 3,000 m³

INDICATIVE LAYOUT ONLY

Lend Lease

GRAHAM W JONES
Principal Architect
FRAIA NSW ARB 4005

Lend Lease (Millers Point) Pty Limited

Remediation and Land Forming Works
Development Application SSD 5897-2013
Earthworks Drawing

Purpose: Approved: Date:

Scale 1:500 @ B1 1:1250 @ A3

0 25 50M

Scale

Drawing No. BB2_PA1_A008

Date 26/07/13 Revision A

B1B_PA1_A008_A.dgn LLdesign zave400 26/08/2013 9:45:34 AM

Attachment 3: Summary Tables

Location	BH035	BH035	AECOM_BH33	AECOM_BH33	AECOM_BH36	AECOM_BH36	AECOM_BH36	AECOM_BH36	AECOM_BH37	AECOM_BH37	AECOM_BH37	AECOM_BH41	AECOM_BH41	AECOM_BH41
Sample Field ID	BH035_0.3-0.5	BH035_4.0-4.5	BH33_0.75-0.85	BH33_5.0-5.2	BH36_1.0-1.2	BH36_2.5-2.9	BH36_4.0-4.4	BH36-0.07-0.1	BH37_0.06-0.1	BH37_2.5-2.7	BH37_5.5-5.7	BH41_0.07-0.1	BH41_1.0-1.4	BH41_4.0-4.4
Sample Depth (m)	0.3-0.5	4.0-4.5	0.75-0.85	5-5.2	1-1.2	2.5-2.9	4-4.4	0.7-0.1	0.06-0.1	2.5-2.7	5.5-5.7	0.07-0.1	1-1.4	4-4.4
Matrix	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Area	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services
Sample Date	18/05/2006	18/05/2006	2/12/2010	2/12/2010	3/03/2010	3/03/2010	3/03/2010	19/02/2010	17/02/2010	17/02/2010	18/02/2010	19/02/2010	4/03/2010	4/03/2010

Chem_Group	ChemName	output unit	EQL	ASC NEPM (NEPC, 2013) EIL	Hybrid Criteria, Declaration Site HHERA (2011)													
Metals	Arsenic	mg/kg	4	**160**		<5	<5	<5	6	<5	-	<5	<5	<5	<5	<5	<5	7	<5
	Barium	mg/kg	10			-	-	-	-	10	-	30	20	20	<10	30	20	510	20
	Beryllium	mg/kg	1			-	-	-	-	<1	-	<1	<1	<1	<1	<1	<1	1	<1
	Cadmium	mg/kg	0.5			<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	<1
	Chromium	mg/kg	1		180,000	2	16	8	10	8	-	7	2	2	5	8	2	11	7
	Chromium (hexavalent)	mg/kg	0.5		950	-	-	-	-	-	-	-	-	-	-	<0.5	-	<0.5	-
	Cobalt	mg/kg	2			-	-	-	-	<2	-	<2	12	12	<2	3	13	13	4
	Copper	mg/kg	1			212	10	264	12	<5	-	<5	256	225	23	<5	356	11	<5
	Iron	mg/kg	50			-	-	-	-	-	-	-	-	-	-	8730	-	38,400	-
	Lead	mg/kg	1	**1800**	15,000	7	18	6	36	17	-	9	6	6	9	20	7	17	8
	Manganese	mg/kg	5			-	-	-	-	43	-	73	753	768	9	125	852	682	215
	Mercury	mg/kg	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Nickel	mg/kg	1			6	33	10	12	<2	-	2	7	7	<2	5	11	21	5
	Vanadium	mg/kg	5		22,000	-	-	-	-	12	-	12	119	125	8	15	127	22	10
	Zinc	mg/kg	1			48	38	50	77	14	-	17	51	47	11	28	54	94	34
PAHs	CPAH (TEF)	mg/kg			67	-	-	-	<1.21	<1.21	-	<1.11	-	-	-	<1.21	-	<1.21	<1.21
	PAH (ESDAT TOTAL)	mg/kg				-	-	-	<8	<8	-	<7	-	-	-	<8	-	<8	<8
	PAH (total, NSW Waste 20	mg/kg				-	-	-	<8	<8	-	<7	-	-	-	<8	-	<8	<8
	Sum of 10 PAHs	mg/kg				-	-	-	<5	<5	-	<4	-	-	-	<5	-	<5	<5
	Sum of 5 PAHs	mg/kg				-	-	-	<3	<3	-	<3	-	-	-	<3	-	<3	<3
	2-chloronaphthalene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	2-methylnaphthalene	mg/kg	0.5		5400	-	-	-	-	<0.5	-	<0.5	-	-	-	-	-	<0.5	<0.5
	3-methylcholanthrene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Acenaphthene	mg/kg	0.1			-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	Acenaphthylene	mg/kg	0.1			-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	Acetophenone	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Anthracene	mg/kg	0.1			-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	Benz(a)anthracene	mg/kg	0.1			-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	Benzo(a) pyrene	mg/kg	0.05			-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	Benzo(b)&(k)fluoranthene	mg/kg	0.2			-	-	-	-	-	-	<1	-	-	-	-	-	-	-
	Benzo(b)fluoranthene	mg/kg	0.5			-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	-	<0.5	<0.5
	Benzo(g,h,i)perylene	mg/kg	0.1			-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	Benzo(k)fluoranthene	mg/kg	0.5			-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	-	<0.5	<0.5
	Chrysene	mg/kg	0.1			-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	Dibenz(a,h)anthracene	mg/kg	0.1			-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	Fluoranthene	mg/kg	0.1			-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	Fluorene	mg/kg	0.1			-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1			-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	Naphthalene	mg/kg	0.1	**370**		-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	CPAH (ESDAT)	mg/kg				-	-	-	<4	<4	-	<3	-	-	-	<4	-	<4	<4
	PAHs (Sum of total)	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenanthrene	mg/kg	0.1			-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	Pyrene	mg/kg	0.1			-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
Phenols	2,4-dimethylphenol	mg/kg	0.01			-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	2-methylphenol	mg/kg	0.01			-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	2-nitrophenol	mg/kg	0.01			-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	3-&4-methylphenol	mg/kg	0.5			-	-	-	<1	<1	-	<0.5	-	-	-	<1	-	<1	<1
	3-Methylphenol	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-chloro-3-methylphenol	mg/kg	0.01			-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	4-methylphenol	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-nitrophenol	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenol	mg/kg	0.01			-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	Phenolics Total	mg/kg				-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH	TPH C15-C36	mg/kg				<200	<200	<200	<200	<200	-	<200	-	-	-	<200	-	<200	<200
	TPH C6 - C9	mg/kg	2			<10	<10	<10	<10	<10	-	<10	-	-	-	<10	-	<10	<10
	TPH C10 - C14	mg/kg	50		90,000	<50	<50	<50	<50	<50	-	<50	-	-	-	<50	-	<50	<50
	TPH C15-C28	mg/kg	100			<100	<100	<100	<100	<100	-	<100	-	-	-	<100	-	<100	<100
	TPH C29-C36	mg/kg	100			<100	<100	<100	<100	<100	-	<100	-	-	-	<100	-	<100	<100
	TPH C6 - C9	mg/kg	2			<10	<10	<10	<10	<10	-	<10	-	-	-	<10	-	<10	<10
	TPH+C10 - C36 (Sum of to	mg/kg	50			<50	<50	<50	<50	<50	-	<50	-	-	-	<50	-	<50	<50
1. CAHs	Tetrachloroethene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Trichloroethene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	cis-1,2-dichloroethene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Vinyl chloride	mg/kg	5			-	-	-	-	-	-	<5	-	-	-	-	-	-	-
Asbestos	Asbestos fibres	-	0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	weight of sample	g	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Borehole	PID	ppm				-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sample Recovery	%				-	-	-	-	-	-	-	-	-	-	-	-	-	-
	SPT Blows	blows				-	-	-	-	-	-	-	-	-	-	-	-	-	-
BTEX	Total Xylene (ESDAT)	mg/kg	0.15			<1	<1	<1	<1	<1	-	<1	-	-	-	<1	-	<1	<1
	Benzene	mg/kg	0.2		190	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	-	-	<0.2	-	<0.2	<0.2
	Ethylbenzene	mg/kg	0.2			<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	Toluene	mg/kg	0.2			<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	Xylene (m & p)	mg/kg	0.2			<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5

Location	BH035	BH035	AECOM_BH33	AECOM_BH33	AECOM_BH36	AECOM_BH36	AECOM_BH36	AECOM_BH36	AECOM_BH37	AECOM_BH37	AECOM_BH37	AECOM_BH41	AECOM_BH41	AECOM_BH41
Sample Field ID	BH035_ 0.3-0.5	BH035_ 4.0-4.5	BH33_0.75-0.85	BH33_5.0-5.2	BH36_1.0-1.2	BH36_2.5-2.9	BH36_4.0-4.4	BH36-0.07-0.1	BH37_0.06-0.1	BH37_2.5-2.7	BH37_5.5-5.7	BH41_0.07-0.1	BH41_1.0-1.4	BH41_4.0-4.4
Sample Depth (m)	0.3-0.5	4.0-4.5	0.75-0.85	5-5.2	1-1.2	2.5-2.9	4-4.4	0.7-0.1	0.06-0.1	2.5-2.7	5.5-5.7	0.07-0.1	1-1.4	4-4.4
Matrix	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Area	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services
Sample Date	18/05/2006	18/05/2006	2/12/2010	2/12/2010	3/03/2010	3/03/2010	3/03/2010	19/02/2010	17/02/2010	17/02/2010	18/02/2010	19/02/2010	4/03/2010	4/03/2010

Chem_Group	ChemName	output unit	EQL	ASC NEPM (NEPC, 2013) EIL	Hybrid Criteria, Declaration Site HHERA (2011)													
	Xylene (o)	mg/kg	0.2			<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
Cyanides	Cyanide (WAD)	mg/kg	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Herbicides	Diallate	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
Inorganics	Ammonia as N	mg/kg	20			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cyanide (Free)	mg/kg	1			-	-	-	<1	-	-	-	-	-	-	-	-	-	-
	Cyanide Total	mg/kg	1			-	-	-	-	-	-	<1	-	-	-	<1	-	<1	<1
	pH (Final)	pH	0.1			-	-	-	-	4.8	9.5	-	-	-	-	4.8 - 7.4	-	4.9 - 9.5	-
	pH (Initial)	pH_Units	0.1			-	-	-	-	9.2	-	-	-	-	-	5.4	-	9.3	-
	Moisture	PERCENT	0.1			-	-	4.2	15.4	8.1	-	14	9.1	8	26.4	18.3	8.7	9.2	22.4
	Moisture Content (dried @	%	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	pH (Lab)	pH_Units	0.1			-	-	-	7.8	8.9	-	-	-	-	-	5.4	-	8.5	-
	pH (after HCL)	pH	0.1			-	-	-	-	1.7	-	-	-	-	-	1.6	-	1.8	-
	Sulphate	mg/kg	100			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TOC	%	0.5			-	-	-	-	-	-	-	-	-	-	-	-	0.8	<0.5
	Weak Acid Dissociable Cy	mg/kg	1			-	-	-	<1	-	-	<1	-	-	-	-	-	<1	<1
Organochlorine	4,4-DDE	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	a-BHC	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Aldrin	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Aldrin + Dieldrin	mg/kg				-	-	-	-	-	-	<1	-	-	-	-	-	-	-
	b-BHC	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	cis-Chlordane	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	d-BHC	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	DDD	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	DDT	mg/kg	0.2			-	-	-	-	-	-	<1	-	-	-	-	-	-	-
	DDT+DDE+DDD	mg/kg				-	-	-	-	-	-	<2	-	-	-	-	-	-	-
	Dieldrin	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Endosulfan I	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Endosulfan II	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Endosulfan sulphate	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Endrin	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Endrin aldehyde	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endrin ketone	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	g-BHC (Lindane)	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Heptachlor	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Heptachlor epoxide	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Hexachlorobenzene	mg/kg	0.05			-	-	-	-	-	-	<1	-	-	-	-	-	-	-
	Methoxychlor	mg/kg	0.2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	trans-chlordane	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Organophosphc	Azinophos methyl	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bromophos-ethyl	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Carbophenothion	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorfenvinphos	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Chlorpyrifos	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Chlorpyrifos-methyl	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	cis-Isosafrole	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Diazinon	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Dichlorvos	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Dimethoate	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Ethion	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Ethyl methanesulfonate	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Fenthion	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Malathion	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Methyl methanesulfonate	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Methyl parathion	mg/kg	0.2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Monocrotophos	mg/kg	0.2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pirimphos-ethyl	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Prothiofos	mg/kg	0.05			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Safrole	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	trans-Isosafrole	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
other	Plasticiser Compounds	mg/kg				-	-	-	-	-	-	<5	-	-	-	-	-	-	-
	Scheduled chemicals (NSV	mg/kg				-	-	-	<2	<2	-	<10.5	-	-	-	<2	-	<2	<2
	Organic Matter	%	0.5			-	-	-	-	-	-	-	-	-	-	-	-	1.5	0.6
	Total BTEX	mg/kg	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pesticides	Pesticides (total, NSW Wa	mg/kg				-	-	-	<0.5	<0.5	-	<4	-	-	-	<0.5	-	<0.5	<0.5
	Demeton-S-methyl	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fenamiphos	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Parathion	mg/kg	0.2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polychlorinated	PCBs (Sum of total)	mg/kg	0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
SPOCAS	Acid Reacted Calcium	%	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	acidity - Acid Reacted Calc	mole H+/t	10			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	acidity - Acid Reacted Mag	mole H+/t	10			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	acidity - Peroxide Oxidisab	mole H+/t	10			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ANC Fineness Factor	-	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Calcium in Peroxide	%	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Location	BH035	BH035	AECOM_BH33	AECOM_BH33	AECOM_BH36	AECOM_BH36	AECOM_BH36	AECOM_BH36	AECOM_BH37	AECOM_BH37	AECOM_BH37	AECOM_BH41	AECOM_BH41	AECOM_BH41
Sample Field ID	BH035_0.3-0.5	BH035_4.0-4.5	BH33_0.75-0.85	BH33_5.0-5.2	BH36_1.0-1.2	BH36_2.5-2.9	BH36_4.0-4.4	BH36-0.07-0.1	BH37_0.06-0.1	BH37_2.5-2.7	BH37_5.5-5.7	BH41_0.07-0.1	BH41_1.0-1.4	BH41_4.0-4.4
Sample Depth (m)	0.3-0.5	4.0-4.5	0.75-0.85	5-5.2	1-1.2	2.5-2.9	4-4.4	0.7-0.1	0.06-0.1	2.5-2.7	5.5-5.7	0.07-0.1	1-1.4	4-4.4
Matrix	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Area	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services
Sample Date	18/05/2006	18/05/2006	2/12/2010	2/12/2010	3/03/2010	3/03/2010	3/03/2010	19/02/2010	17/02/2010	17/02/2010	18/02/2010	19/02/2010	4/03/2010	4/03/2010

Chem_Group	ChemName	output unit	EQL	ASC NEPM (NEPC, 2013) EIL	Hybrid Criteria, Declaration Site HHERA (2011)														
	KCl Extractable Calcium	%	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	KCl Extractable Magnesium	%	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Liming Rate	kg CaCO	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Magnesium in Peroxide	%	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Net Acidity (acidity units)	mole H+/t	10			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Net Acidity (sulfur units)	%S	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Peroxide Oxidisable Sulfur	%	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	pH (KCl)	pH Unit	0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	pH (Ox)	pH Unit	0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	sulfidic - Acid Reacted Cal	% S	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	sulfidic - Acid Reacted Ma	%S	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	sulfidic - Titratable Actual A	%S	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	sulfidic - Titratable Peroxid	%S	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	sulfidic - Titratable Sulfidic	%S	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sulfur in Peroxide	%	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Titratable Actual Acidity	mole H+/t	2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
SVOCs	1,2,4,5-tetrachlorobenzene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	1,3,5-Trichlorobenzene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	1,3,5-Trinitrobenzene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	1-naphthylamine	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	2-(acetylamino) fluorene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	2,3,4,6-tetrachlorophenol	mg/kg	0.01			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	2,4,5-trichlorophenol	mg/kg	0.01			-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	2,4,6-trichlorophenol	mg/kg	0.01			-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	2,4-dichlorophenol	mg/kg	0.01			-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	2,4-Dinitrotoluene	mg/kg	0.5			-	-	-	-	-	-	<1	-	-	-	-	-	-	-
	2,6-dichlorophenol	mg/kg	0.01			-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	2,6-dinitrotoluene	mg/kg	0.5			-	-	-	-	-	-	<1	-	-	-	-	-	-	-
	2-chlorophenol	mg/kg	0.01			-	-	-	<0.5	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	<0.5
	Methyl Ethyl Ketone	mg/kg	5			-	-	-	-	-	-	<5	-	-	-	-	-	-	-
	2-hexanone (MBK)	mg/kg	5			-	-	-	-	-	-	<5	-	-	-	-	-	-	-
	2-nitroaniline	mg/kg	0.5			-	-	-	-	-	-	<1	-	-	-	-	-	-	-
	2-Picoline	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	3,3-Dichlorobenzidine	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	3-nitroaniline	mg/kg	0.5			-	-	-	-	-	-	<1	-	-	-	-	-	-	-
	4-(dimethylamino) azoben	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	4-aminobiphenyl	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	4-bromophenyl phenyl ethe	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	4-chloroaniline	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	4-chlorophenyl phenyl ethe	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	4-nitroaniline	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	4-Nitroquinoline-N-oxide	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	2-methyl-5-nitroaniline	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	7,12-dimethylbenz(a)anthr	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Aniline	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Azobenzene	mg/kg	1			-	-	-	-	-	-	<1	-	-	-	-	-	-	-
	Bis(2-chloroethoxy) metha	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Bis(2-chloroisopropyl) ethe	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Bis(2-ethylhexyl) phthalate	mg/kg	0.5			-	-	-	-	-	-	<5	-	-	-	-	-	-	-
	Butyl benzyl phthalate	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Carbazole	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Chlorobenzilate	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Dibenzofuran	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Diethylphthalate	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Dimethyl phthalate	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Di-n-butyl phthalate	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Di-n-octyl phthalate	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Hexachlorocyclopentadien	mg/kg	0.5			-	-	-	-	-	-	<2.5	-	-	-	-	-	-	-
	Hexachloroethane	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Hexachlorophene	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexachloropropene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Methapyrilene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Nitrobenzene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	N-Nitrosodiphenyl & Diphe	mg/kg	0.5			-	-	-	-	-	-	<1	-	-	-	-	-	-	-
	N-nitrosodiethylamine	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	N-nitrosodi-n-butylamine	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	N-nitrosodi-n-propylamine	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	N-Nitrosomethylethylamine	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	N-nitrosomorpholine	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	N-nitrosopiperidine	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	N-nitrosopyrrolidine	mg/kg	0.5			-	-	-	-	-	-	<1	-	-	-	-	-	-	-
	Pentachlorobenzene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Pentachloronitrobenzene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
	Pentachlorophenol	mg/kg	0.01			-	-	-	<2	<2	-	<1	-	-	-	<2	-	<2	<2

Location	BH035	BH035	AECOM_BH33	AECOM_BH33	AECOM_BH36	AECOM_BH36	AECOM_BH36	AECOM_BH36	AECOM_BH37	AECOM_BH37	AECOM_BH37	AECOM_BH41	AECOM_BH41	AECOM_BH41
Sample Field ID	BH035_0.3-0.5	BH035_4.0-4.5	BH33_0.75-0.85	BH33_5.0-5.2	BH36_1.0-1.2	BH36_2.5-2.9	BH36_4.0-4.4	BH36-0.07-0.1	BH37_0.06-0.1	BH37_2.5-2.7	BH37_5.5-5.7	BH41_0.07-0.1	BH41_1.0-1.4	BH41_4.0-4.4
Sample Depth (m)	0.3-0.5	4.0-4.5	0.75-0.85	5-5.2	1-1.2	2.5-2.9	4-4.4	0.7-0.1	0.06-0.1	2.5-2.7	5.5-5.7	0.07-0.1	1-1.4	4-4.4
Matrix	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Area	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services
Sample Date	18/05/2006	18/05/2006	2/12/2010	2/12/2010	3/03/2010	3/03/2010	3/03/2010	19/02/2010	17/02/2010	17/02/2010	18/02/2010	19/02/2010	4/03/2010	4/03/2010

Chem_Group	ChemName	output unit	EQL	ASC NEPM (NEPC, 2013) EIL	Hybrid Criteria, Declaration Site HHERA (2011)													
	Phenacetin	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
VOCs	1,1,1,2-tetrachloroethane	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	1,1,1-trichloroethane	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	1,1,2,2-tetrachloroethane	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	1,1,2-trichloroethane	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	1,1-dichloroethane	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	1,1-dichloroethene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	1,1-dichloropropene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	1,2,3-trichlorobenzene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	1,2,3-trichloropropane	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	1,2,4-trichlorobenzene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	1,2,4-trimethylbenzene	mg/kg	0.5		370	-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	1,2-dibromo-3-chloropropa	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	1,2-dibromoethane	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-
	1,2-dichlorobenzene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	1,2-dichloroethane	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	1,2-dichloropropane	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	1,3,5-trimethylbenzene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	1,3-dichlorobenzene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	1,3-dichloropropane	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	1,4-dichlorobenzene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	2,2-dichloropropane	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	2-chlorotoluene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	4-chlorotoluene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	4-Methyl-2-pentanone	mg/kg	5			-	-	-	-	-	-	<5	-	-	-	-	-	-
	Bromobenzene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	Bromodichloromethane	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	Bromoform	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	Bromomethane	mg/kg	5			-	-	-	-	-	-	<5	-	-	-	-	-	-
	Carbon disulfide	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	Carbon tetrachloride	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	Chlorobenzene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	Chlorodibromomethane	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	Chloroethane	mg/kg	5			-	-	-	-	-	-	<5	-	-	-	-	-	-
	Chloroform	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	Chloromethane	mg/kg	5			-	-	-	-	-	-	<5	-	-	-	-	-	-
	cis-1,3-dichloropropene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	cis-1,4-Dichloro-2-butene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	Dibromomethane	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	Dichlorodifluoromethane	mg/kg	5			-	-	-	-	-	-	<5	-	-	-	-	-	-
	Hexachlorobutadiene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	Iodomethane	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	Isophorone	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	Isopropylbenzene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	n-butylbenzene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	n-propylbenzene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	Pentachloroethane	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	p-isopropyltoluene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	sec-butylbenzene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	Styrene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	tert-butylbenzene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	trans-1,2-dichloroethene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	trans-1,3-dichloropropene	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	trans-1,4-Dichloro-2-buten	mg/kg	0.5			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
	Trichlorofluoromethane	mg/kg	5			-	-	-	-	-	-	<5	-	-	-	-	-	-
	Vinyl acetate	mg/kg	5			-	-	-	-	-	-	<5	-	-	-	-	-	-

NOTES:
EIL - Ecological Investigation Level
HIL - Health Investigation Level
* CRC Care (2011) Health Screening Level - Direct Contact
Sample collected from natural marine sediments
Highlighted COPC - a corresponding MWQC relates to this COPC (refer to Table T2)
COPC Highlighted COPC - an 'Additional COPC'
Highlighted samples - indicates indicative material to be partly removed as part of excavations to 2.7 m bgl

Location	BH109	BH109	BH113	BH113	BH114	BH114	BH159	BH159	BH211	BH211	BH211	BH408	BH409	BH409
Sample Field ID	BH109 0.3_0.5	BH109 3.0_3.45	BH113 1.5_1.95	BH113 3.0_3.45	BH114 0.3_0.5	BH114 3.0_3.45	BH159_0.25-0.35	D1408-8	BH211_14 - 14.45	BH211_15.5 - 15.6_2(	BH211_16.05 - 16.15	BH408_2.0-2.4	BH409_3.7-4.0	BH409_5.0-5.3
Sample Depth (m)	0.3-0.5	3-3.45	1.5-1.95	3-3.45	0.3-0.5	3-3.45		0.25-0.35	14-14.45	15.5-15.6	16.05-16.15	2-2.4	3.7-4	5-5.3
Matrix	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Natural Clayey Sand	Natural Sandstone	Fill	Fill	Natural Sand
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Interlab_D	Normal	Normal	Normal	Normal	Normal	Normal
Area	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services				Block 4 Services	Block 4 Services	Block 4 Services
Sample Date	27/06/2006	27/06/2006	27/06/2006	27/06/2006	28/06/2006	28/06/2006	14/08/2006	14/08/2006		26/03/2008	26/03/2008	14/02/2011	14/02/2011	14/02/2011

Chem_Group	ChemName	output unit	EQL	ASC NEPM (NEPC, 2013) EIL	Hybrid Criteria, Declaration Site HHERA (2011)													
Metals	Arsenic	mg/kg	4	**160**		<5	<5	<5	5	<5	6	-	-	<5	11	<5	<5	<5	22
	Barium	mg/kg	10			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Beryllium	mg/kg	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cadmium	mg/kg	0.5			<1	<1	<1	<1	<1	<1	-	-	<1	<1	<1	<1	<1	<1
	Chromium	mg/kg	1		180,000	3	41	10	33	4	37	-	-	6	13	21	8	15	7
	Chromium (hexavalent)	mg/kg	0.5		950	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cobalt	mg/kg	2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Copper	mg/kg	1			225	20	<5	12	198	12	-	-	<5	<5	<5	36	<5	<5
	Iron	mg/kg	50			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lead	mg/kg	1	**1800**	15,000	12	14	9	17	15	15	-	-	8	5	7	10	6	<5
	Manganese	mg/kg	5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mercury	mg/kg	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Nickel	mg/kg	1			6	8	4	8	5	7	-	-	5	<2	2	8	<2	3
	Vanadium	mg/kg	5		22,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Zinc	mg/kg	1			53	34	21	52	54	47	-	-	28	<5	12	30	8	7
PAHs	CPAH (TEF)	mg/kg			67	<1.21	<1.21	<1.21	0.878	2.225	<1.21	<1.21	<1.11	-	-	-	9.097	<1.21	0.06
	PAH (ESDAT TOTAL)	mg/kg				<8	<8	<8	9.2	15	<8	<8	<7	<8	19.45	<8	74.5	<8	56.7
	PAH (total, NSW Waste 20	mg/kg				<8	<8	<8	9.2	15	<8	<8	<7	<8	19.45	<8	74.5	<8	56.7
	Sum of 10 PAHs	mg/kg				<5	<5	<5	6.8	14	<5	<5	<4	-	-	-	62.2	<5	3.6
	Sum of 5 PAHs	mg/kg				<3	<3	<3	2.4	1	<3	<3	<3	-	-	-	12.3	<3	53.1
	2-chloronaphthalene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2-methylnaphthalene	mg/kg	0.5		5400	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3-methylcholanthrene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthene	mg/kg	0.1			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5.6
	Acenaphthylene	mg/kg	0.1			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.9	<0.5	2.2	<0.5	2.8
	Acetophenone	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Anthracene	mg/kg	0.1			<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	1.4	<0.5	3.5	<0.5	1.9
	Benz(a)anthracene	mg/kg	0.1			<0.5	<0.5	<0.5	0.9	1.2	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	6.2	<0.5	0.6
	Benzo(a) pyrene	mg/kg	0.05			<0.5	<0.5	<0.5	0.7	1.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6.3	<0.5	<0.5
	Benzo(b)&(k)fluoranthene	mg/kg	0.2			-	-	-	-	-	-	-	<1	<1	<1	<1	-	-	-
	Benzo(b)fluoranthene	mg/kg	0.5			<0.5	<0.5	<0.5	0.8	2	<0.5	<0.5	-	-	-	-	7.1	<0.5	<0.5
	Benzo(g,h,i)perylene	mg/kg	0.1			<0.5	<0.5	<0.5	<0.5	1.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	4.5	<0.5	<0.5
	Benzo(k)fluoranthene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	0.9	<0.5	<0.5	-	-	-	-	3.1	<0.5	<0.5
	Chrysene	mg/kg	0.1			<0.5	<0.5	<0.5	0.8	1.2	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	5.2	<0.5	<0.5
	Dibenz(a,h)anthracene	mg/kg	0.1			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5
	Fluoranthene	mg/kg	0.1			<0.5	<0.5	<0.5	1.8	2.3	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	12.6	<0.5	1.2
	Fluorene	mg/kg	0.1			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	<0.5	<0.5	2.2
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1			<0.5	<0.5	<0.5	<0.5	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.6	<0.5	<0.5
	Naphthalene	mg/kg	0.1	**370**		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5.2	<0.5	<0.5	<0.5	33.8
	CPAH (ESDAT)	mg/kg				<4	<4	<4	3.2	9.2	<4	<4	<3	<3	<3	<3	36.7	<4	0.6
	PAHs (Sum of total)	mg/kg	0.5			-	-	-	9.2	24.2	-	-	-	-	-	-	111.2	-	57.3
	Phenanthrene	mg/kg	0.1			<0.5	<0.5	<0.5	1.8	1	<0.5	<0.5	<0.5	<0.5	3.6	<0.5	6.6	<0.5	6.8
	Pyrene	mg/kg	0.1			<0.5	<0.5	<0.5	1.8	2.5	<0.5	<0.5	<0.5	<0.5	1.8	<0.5	12.9	<0.5	1.8
Phenols	2,4-dimethylphenol	mg/kg	0.01			-	-	-	-	-	-	-	-	<0.5	0.6	<0.5	0.03	<0.01	-
	2-methylphenol	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-	0.02	<0.01	-
	2-nitrophenol	mg/kg	0.01			-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.01	<0.01	-
	3-&4-methylphenol	mg/kg	0.5			-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	-	-	-
	3-Methylphenol	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-	0.02	<0.01	-
	4-chloro-3-methylphenol	mg/kg	0.01			-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.01	<0.01	-
	4-methylphenol	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-	0.02	<0.01	-
	4-nitrophenol	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-	<0.01	<0.01	-
	Phenol	mg/kg	0.01			-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.01	0.01	-
	Phenolics Total	mg/kg				-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH	TPH C15-C36	mg/kg				<200	130	<200	1010	340	980	1230	280	-	-	-	450	<200	180
	TPH C6 - C9	mg/kg	2			<2	<2	<2	<2	<2	<2	<2	<10	<10	19	<10	<10	<10	12
	TPH C10 - C14	mg/kg	50		90,000	<50	<50	<50	70	<50	60	<50	<50	<50	<50	<50	<50	<50	150
	TPH C15-C28	mg/kg	100			<100	<100	<100	540	130	620	270	<100	<100	<100	<100	190	<100	180
	TPH C29-C36	mg/kg	100			<100	130	<100	470	210	360	960	280	<100	<100	<100	260	<100	<100
	TPH C6 - C9	mg/kg	2			<2	<2	<2	<2	<2	<2	<2	<10	<10	<10	<10	<10	<10	12
	TPH+C10 - C36 (Sum of to	mg/kg	50			<250	130	<250	1080	340	1040	1230	280	<250	<250	<250	450	<50	330
1. CAHs	Tetrachloroethene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trichloroethene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	cis-1,2-dichloroethene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Vinyl chloride	mg/kg	5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos	Asbestos fibres	-	0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	weight of sample	g	0.01			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Borehole	PID	ppm				-	-	-	-	-	-	-	-	-	318	274	-	-	-
	Sample Recovery	%				-	-	-	-	-	-	-	-	100	-	-	-	-	-
	SPT Blows	blows				-	-	-	-	-	-	-	-	-	33	-	-	-	-
BTEX	Total Xylene (ESDAT)	mg/kg	0.15			<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	0.3	<1.5 - 0	-	5.1	-	<1	<1	2.9
	Benzene	mg/kg	0.2		190	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	3.4	<0.2	<0.2	<0.2	1.8
	Ethylbenzene	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	3.5
	Toluene	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	5.5	<0.5	<0.5	<0.5	<0.5
	Xylene (m & p)	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.3	<1	<0.5	3.3	<0.5	<0.5	<0.5	1.1

Location	BH109	BH109	BH113	BH113	BH114	BH114	BH159	BH159	BH211	BH211	BH211	BH408	BH409	BH409
Sample Field ID	BH109 0.3_0.5	BH109 3.0_3.45	BH113 1.5_1.95	BH113 3.0_3.45	BH114 0.3_0.5	BH114 3.0_3.45	BH159_0.25-0.35	D1408-8	BH211_14 - 14.45	BH211_15.5 - 15.6_2	BH211_16.05 - 16.15	BH408_2.0-2.4	BH409_3.7-4.0	BH409_5.0-5.3
Sample Depth (m)	0.3-0.5	3-3.45	1.5-1.95	3-3.45	0.3-0.5	3-3.45		0.25-0.35	14-14.45	15.5-15.6	16.05-16.15	2-2.4	3.7-4	5-5.3
Matrix	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Natural Clayey Sand	Natural Sandstone	Fill	Fill	Natural Sand
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Interlab_D	Normal	Normal	Normal	Normal	Normal	Normal
Area	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services				Block 4 Services	Block 4 Services	Block 4 Services
Sample Date	27/06/2006	27/06/2006	27/06/2006	27/06/2006	28/06/2006	28/06/2006	14/08/2006	14/08/2006		26/03/2008	26/03/2008	14/02/2011	14/02/2011	14/02/2011
Chem_Group	ChemName	output unit	EQL	ASC NEPM (NEPC, 2013) EIL	Hybrid Criteria, Declaration Site HHERA (2011)											
	Xylene (o)	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	1.8	<0.5	<0.5	<0.5	1.8
Cyanides	Cyanide (WAD)	mg/kg	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Herbicides	Diallate	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inorganics	Ammonia as N	mg/kg	20			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cyanide (Free)	mg/kg	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cyanide Total	mg/kg	1			<1	<1	<1	1	<1	<1	<1	-	-	-	-	-	-	-
	pH (Final)	pH	0.1			-	-	-	-	-	-	-	-	-	-	-	6.7	4.9 - 8.6	-
	pH (Initial)	pH_Units	0.1			-	-	-	-	-	-	-	-	-	-	-	-	8.8	-
	Moisture	PERCENT	0.1			-	-	-	-	-	-	-	2	-	-	-	12.7 - 12.8	16.7 - 17	31.2
	Moisture Content (dried @	%	1			4.7	8.9	8.2	11.3	3.5	11	2.4	-	-	-	-	-	-	-
	pH (Lab)	pH_Units	0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	pH (after HCL)	pH	0.1			-	-	-	-	-	-	-	-	-	-	-	-	1.6	-
	Sulphate	mg/kg	100			<100	130	<100	320	150	160	210	-	-	-	-	-	-	-
	TOC	%	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Weak Acid Dissociable Cy	mg/kg	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Organochlorine	4,4-DDE	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	a-BHC	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aldrin	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aldrin + Dieldrin	mg/kg				-	-	-	-	-	-	-	-	-	-	-	-	-	-
	b-BHC	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	cis-Chlordane	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	d-BHC	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DDD	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DDT	mg/kg	0.2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DDT+DDE+DDD	mg/kg				-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dieldrin	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan I	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan II	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan sulphate	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endrin	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endrin aldehyde	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endrin ketone	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	g-BHC (Lindane)	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Heptachlor	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Heptachlor epoxide	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexachlorobenzene	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Methoxychlor	mg/kg	0.2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	trans-chlordane	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Organophosphc	Azinophos methyl	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bromophos-ethyl	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Carbophenothion	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorfenvinphos	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorpyrifos	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorpyrifos-methyl	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	cis-Isosafrole	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Diazinon	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dichlorvos	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dimethoate	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ethion	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ethyl methanesulfonate	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fenthion	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Malathion	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Methyl methanesulfonate	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Methyl parathion	mg/kg	0.2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Monocrotophos	mg/kg	0.2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pirimphos-ethyl	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Prothiofos	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Safrole	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	trans-Isosafrole	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
other	Plasticiser Compounds	mg/kg				-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Scheduled chemicals (NSV	mg/kg				-	-	-	-	-	-	-	-	-	-	-	<0.03	<0.03	-
	Organic Matter	%	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total BTEX	mg/kg	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pesticides	Pesticides (total, NSW Wa	mg/kg				-	-	-	-	-	-	-	-	-	-	-	<0.01	<0.01	-
	Demeton-S-methyl	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fenamiphos	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Parathion	mg/kg	0.2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polychlorinated	PCBs (Sum of total)	mg/kg	0.1			<0.1	<0.1	<0.1	<0.1	<0.3	<0.1	-	-	-	<0.1	-	-	-	-
SPOCAS	Acid Reacted Calcium	%	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	acidity - Acid Reacted Calc	mole H+/t	10			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	acidity - Acid Reacted Mag	mole H+/t	10			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	acidity - Peroxide Oxidisab	mole H+/t	10			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ANC Fineness Factor	-	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Calcium in Peroxide	%	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Location	BH109	BH109	BH113	BH113	BH114	BH114	BH159	BH159	BH211	BH211	BH211	BH408	BH409	BH409
Sample Field ID	BH109 0.3_0.5	BH109 3.0_3.45	BH113 1.5_1.95	BH113 3.0_3.45	BH114 0.3_0.5	BH114 3.0_3.45	BH159_0.25-0.35	D1408-8	BH211_14 - 14.45	BH211_15.5 - 15.6_2(	BH211_16.05 - 16.15	BH408_2.0-2.4	BH409_3.7-4.0	BH409_5.0-5.3
Sample Depth (m)	0.3-0.5	3-3.45	1.5-1.95	3-3.45	0.3-0.5	3-3.45		0.25-0.35	14-14.45	15.5-15.6	16.05-16.15	2-2.4	3.7-4	5-5.3
Matrix	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Natural Clayey Sand	Natural Sandstone	Fill	Fill	Natural Sand
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Interlab_D	Normal	Normal	Normal	Normal	Normal	Normal
Area	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services				Block 4 Services	Block 4 Services	Block 4 Services
Sample Date	27/06/2006	27/06/2006	27/06/2006	27/06/2006	28/06/2006	28/06/2006	14/08/2006	14/08/2006		26/03/2008	26/03/2008	14/02/2011	14/02/2011	14/02/2011
Chem_Group	ChemName	output unit	EQL	ASC NEPM (NEPC, 2013) EIL	Hybrid Criteria, Declaration Site HHERA (2011)											
	KCl Extractable Calcium	%	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	KCl Extractable Magnesiur	%	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Liming Rate	kg CaCO	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Magnesium in Peroxide	%	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Net Acidity (acidity units)	mole H+/t	10			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Net Acidity (sulfur units)	%S	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Peroxide Oxidisable Sulfur	%	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	pH (KCl)	pH Unit	0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	pH (Ox)	pH Unit	0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	sulfidic - Acid Reacted Cal	% S	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	sulfidic - Acid Reacted Ma	%S	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	sulfidic - Titratable Actual A	%S	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	sulfidic - Titratable Peroxid	%S	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	sulfidic - Titratable Sulfidic	%S	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sulfur in Peroxide	%	0.02			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Titratable Actual Acidity	mole H+/t	2			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SVOCs	1,2,4,5-tetrachlorobenzene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,3,5-Trichlorobenzene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,3,5-Trinitrobenzene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1-naphthylamine	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2-(acetylamino) fluorene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2,3,4,6-tetrachlorophenol	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-	-	<0.01	<0.01	-
	2,4,5-trichlorophenol	mg/kg	0.01			-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.01	<0.01	<0.01	-
	2,4,6-trichlorophenol	mg/kg	0.01			-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.01	<0.01	<0.01	-
	2,4-dichlorophenol	mg/kg	0.01			-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.01	<0.01	<0.01	-
	2,4-Dinitrotoluene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2,6-dichlorophenol	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-	-	<0.01	<0.01	-
	2,6-dinitrotoluene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2-chlorophenol	mg/kg	0.01			-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.01	<0.01	<0.01	-
	Methyl Ethyl Ketone	mg/kg	5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2-hexanone (MBK)	mg/kg	5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2-nitroaniline	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2-Picoline	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3,3-Dichlorobenzidine	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3-nitroaniline	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-(dimethylamino) azoben	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-aminobiphenyl	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-bromophenyl phenyl ethe	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-chloroaniline	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-chlorophenyl phenyl ethe	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-nitroaniline	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-Nitroquinoline-N-oxide	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2-methyl-5-nitroaniline	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7,12-dimethylbenz(a)anthr	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aniline	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Azobenzene	mg/kg	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bis(2-chloroethoxy) metha	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bis(2-chloroisopropyl) ethe	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bis(2-ethylhexyl) phthalate	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Butyl benzyl phthalate	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Carbazole	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorobenzilate	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dibenzofuran	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Diethylphthalate	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dimethyl phthalate	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Di-n-butyl phthalate	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Di-n-octyl phthalate	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexachlorocyclopentadien	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexachloroethane	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexachlorophene	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-	-	<0.01	<0.01	-
	Hexachloropropene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Methapyrilene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nitrobenzene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	N-Nitrosodiphenyl & Diphe	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	N-nitrosodiethylamine	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	N-nitrosodi-n-butylamine	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	N-nitrosodi-n-propylamine	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	N-Nitrosomethylethylamine	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	N-nitrosomorpholine	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	N-nitrosopiperidine	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	N-nitrosopyrrolidine	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pentachlorobenzene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pentachloronitrobenzene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pentachlorophenol	mg/kg	0.01			-	-	-	-	-	-	-	-	<2	<2	<2	<0.01	<0.01	-	

Location	BH109	BH109	BH113	BH113	BH114	BH114	BH159	BH159	BH211	BH211	BH211	BH408	BH409	BH409
Sample Field ID	BH109 0.3_0.5	BH109 3.0_3.45	BH113 1.5_1.95	BH113 3.0_3.45	BH114 0.3_0.5	BH114 3.0_3.45	BH159_0.25-0.35	D1408-8	BH211_14 - 14.45	BH211_15.5 - 15.6_2(	BH211_16.05 - 16.15	BH408_2.0-2.4	BH409_3.7-4.0	BH409_5.0-5.3
Sample Depth (m)	0.3-0.5	3-3.45	1.5-1.95	3-3.45	0.3-0.5	3-3.45		0.25-0.35	14-14.45	15.5-15.6	16.05-16.15	2-2.4	3.7-4	5-5.3
Matrix	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Natural Clayey Sand	Natural Sandstone	Fill	Fill	Natural Sand
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Interlab_D	Normal	Normal	Normal	Normal	Normal	Normal
Area	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services				Block 4 Services	Block 4 Services	Block 4 Services
Sample Date	27/06/2006	27/06/2006	27/06/2006	27/06/2006	28/06/2006	28/06/2006	14/08/2006	14/08/2006		26/03/2008	26/03/2008	14/02/2011	14/02/2011	14/02/2011

Chem_Group	ChemName	output unit	EQL	ASC NEPM (NEPC, 2013) EIL	Hybrid Criteria, Declaration Site HHERA (2011)														
	Phenacetin	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOCs	1,1,1,2-tetrachloroethane	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,1,1-trichloroethane	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,1,2,2-tetrachloroethane	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,1,2-trichloroethane	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,1-dichloroethane	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,1-dichloroethene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,1-dichloropropene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,2,3-trichlorobenzene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,2,3-trichloropropane	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,2,4-trichlorobenzene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,2,4-trimethylbenzene	mg/kg	0.5		370	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,2-dibromo-3-chloropropa	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,2-dibromoethane	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,2-dichlorobenzene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,2-dichloroethane	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,2-dichloropropane	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,3,5-trimethylbenzene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,3-dichlorobenzene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,3-dichloropropane	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,4-dichlorobenzene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2,2-dichloropropane	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2-chlorotoluene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-chlorotoluene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-Methyl-2-pentanone	mg/kg	5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bromobenzene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bromodichloromethane	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bromoform	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bromomethane	mg/kg	5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Carbon disulfide	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Carbon tetrachloride	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorobenzene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorodibromomethane	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chloroethane	mg/kg	5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chloroform	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chloromethane	mg/kg	5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	cis-1,3-dichloropropene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	cis-1,4-Dichloro-2-butene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dibromomethane	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dichlorodifluoromethane	mg/kg	5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexachlorobutadiene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Iodomethane	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Isophorone	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Isopropylbenzene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	n-butylbenzene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	n-propylbenzene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pentachloroethane	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	p-isopropyltoluene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	sec-butylbenzene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Styrene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	tert-butylbenzene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	trans-1,2-dichloroethene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	trans-1,3-dichloropropene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	trans-1,4-Dichloro-2-buten	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trichlorofluoromethane	mg/kg	5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Vinyl acetate	mg/kg	5			-	-	-	-	-	-	-	-	-	-	-	-	-	-

NOTES:
EIL - Ecological Investigation Level
HIL - Health Investigation Level
* CRC Care (2011) Health Screening Level - Direct Contact
Sample collected from natural marine sediments
Highlighted COPC - a corresponding MWQC relates to this COPC (refer to Table T2)
COPC Highlighted COPC - an 'Additional COPC'
Highlighted samples - indicates indicative material to be partly removed as part of excavations to 2.7 m bgl

Location	TBH01	TBH01	TBH01
Sample Field ID	DUP 01	TBH01_0.43-0.5	TRIP01
Sample Depth (m)	0.43-0.5	0.43-0.5	0.43-0.5
Matrix	Fill	Fill	Fill
Sample Type	Field_D	Normal	Interlab_D
Area	Block 4 Services	Block 4 Services	Block 4 Services
Sample Date	5/02/2011	5/02/2011	5/02/2011

Chem_Group	ChemName	output unit	EQL	ASC NEPM (NEPC, 2013) EIL	Hybrid Criteria, Declaration Site HHERA (2011)			
Metals	Arsenic	mg/kg	4	**160**		<5	<5	2.4
	Barium	mg/kg	10			-	-	-
	Beryllium	mg/kg	1			-	-	-
	Cadmium	mg/kg	0.5			<1	<1	<0.5
	Chromium	mg/kg	1		180,000	16	12	10
	Chromium (hexavalent)	mg/kg	0.5		950	-	-	-
	Cobalt	mg/kg	2			-	-	-
	Copper	mg/kg	1			12	11	31
	Iron	mg/kg	50			-	-	-
	Lead	mg/kg	1	**1800**	15,000	71	103	120
	Manganese	mg/kg	5			-	-	-
	Mercury	mg/kg	0.1			<0.1	0.2	<0.1
	Nickel	mg/kg	1			4	4	<5
	Vanadium	mg/kg	5		22,000	-	-	-
	Zinc	mg/kg	1			24	30	25
PAHs	CPAH (TEF)	mg/kg			67	<1.21	2.22	1.154
	PAH (ESDAT TOTAL)	mg/kg				1.4	16.5	6.2
	PAH (total, NSW Waste 20	mg/kg				1.4	16.5	6.2
	Sum of 10 PAHs	mg/kg				1.4	14.8	6.2
	Sum of 5 PAHs	mg/kg				<3	1.7	<3
	2-chloronaphthalene	mg/kg	0.5			-	-	-
	2-methylnaphthalene	mg/kg	0.5		5400	-	-	-
	3-methylcholanthrene	mg/kg	0.5			-	-	-
	Acenaphthene	mg/kg	0.1			<0.5	<0.5	<0.5
	Acenaphthylene	mg/kg	0.1			<0.5	<0.5	<0.5
	Acetophenone	mg/kg	0.5			-	-	-
	Anthracene	mg/kg	0.1			<0.5	0.5	<0.5
	Benz(a)anthracene	mg/kg	0.1			<0.5	1.9	0.8
	Benzo(a) pyrene	mg/kg	0.05			<0.5	1.7	1
	Benzo(b)&(k)fluoranthene	mg/kg	0.2			-	-	1.7
	Benzo(b)fluoranthene	mg/kg	0.5			<0.5	1.8	-
	Benzo(g,h,i)perylene	mg/kg	0.1			<0.5	0.6	0.7
	Benzo(k)fluoranthene	mg/kg	0.5			<0.5	0.7	-
	Chrysene	mg/kg	0.1			<0.5	1.4	0.7
	Dibenz(a,h)anthracene	mg/kg	0.1			<0.5	<0.5	<0.5
	Fluoranthene	mg/kg	0.1			0.7	3.1	1.3
	Fluorene	mg/kg	0.1			<0.5	<0.5	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1			<0.5	0.6	0.6
	Naphthalene	mg/kg	0.1	**370**		<0.5	<0.5	<0.5
	CPAH (ESDAT)	mg/kg				<4	8.7	3.8
	PAHs (Sum of total)	mg/kg	0.5			1.4	25.2	7.9
	Phenanthrene	mg/kg	0.1			<0.5	1.2	<0.5
	Pyrene	mg/kg	0.1			0.7	3	1.1
Phenols	2,4-dimethylphenol	mg/kg	0.01			-	-	-
	2-methylphenol	mg/kg	0.01			-	-	-
	2-nitrophenol	mg/kg	0.01			-	-	-
	3-&4-methylphenol	mg/kg	0.5			-	-	-
	3-Methylphenol	mg/kg	0.01			-	-	-
	4-chloro-3-methylphenol	mg/kg	0.01			-	-	-
	4-methylphenol	mg/kg	0.01			-	-	-
	4-nitrophenol	mg/kg	0.01			-	-	-
	Phenol	mg/kg	0.01			-	-	-
	Phenolics Total	mg/kg				-	-	-
TPH	TPH C15-C36	mg/kg				<200	<200	<200
	TPH C6 - C9	mg/kg	2			<10	<10	<10
	TPH C10 - C14	mg/kg	50		90,000	<50	<50	<50
	TPH C15-C28	mg/kg	100			<100	<100	<100
	TPH C29-C36	mg/kg	100			<100	<100	<100
	TPH C6 - C9	mg/kg	2			<10	<10	<10
	TPH+C10 - C36 (Sum of to	mg/kg	50			<50	<50	<100
1. CAHs	Tetrachloroethene	mg/kg	0.5			-	-	-
	Trichloroethene	mg/kg	0.5			-	-	-
	cis-1,2-dichloroethene	mg/kg	0.5			-	-	-
	Vinyl chloride	mg/kg	5			-	-	-
Asbestos	Asbestos fibres	-	0.1			-	-	-
	weight of sample	g	0.01			-	-	-
Borehole	PID	ppm				-	-	-
	Sample Recovery	%				-	-	-
	SPT Blows	blows				-	-	-
BTEX	Total Xylene (ESDAT)	mg/kg	0.15			<1	<1	<0.15
	Benzene	mg/kg	0.2		190	<0.2	<0.2	<0.5
	Ethylbenzene	mg/kg	0.2			<0.5	<0.5	<0.5
	Toluene	mg/kg	0.2			<0.5	<0.5	<0.5
	Xylene (m & p)	mg/kg	0.2			<0.5	<0.5	<1

Location	TBH01	TBH01	TBH01
Sample Field ID	DUP 01	TBH01_0.43-0.5	TRIP01
Sample Depth (m)	0.43-0.5	0.43-0.5	0.43-0.5
Matrix	Fill	Fill	Fill
Sample Type	Field_D	Normal	Interlab_D
Area	Block 4 Services	Block 4 Services	Block 4 Services
Sample Date	5/02/2011	5/02/2011	5/02/2011

Chem_Group	ChemName	output unit	EQL	ASC NEPM (NEPC, 2013) EIL	Hybrid Criteria, Declaration Site HHERA (2011)			
	Xylene (o)	mg/kg	0.2			<0.5	<0.5	<0.5
Cyanides	Cyanide (WAD)	mg/kg	1			-	-	-
Herbicides	Diallate	mg/kg	0.5			-	-	-
Inorganics	Ammonia as N	mg/kg	20			-	-	-
	Cyanide (Free)	mg/kg	1			-	-	-
	Cyanide Total	mg/kg	1			-	-	-
	pH (Final)	pH	0.1			-	-	-
	pH (Initial)	pH_Units	0.1			-	-	-
	Moisture	PERCEN	0.1			13.4	12.4	-
	Moisture Content (dried @	%	1			-	-	17
	pH (Lab)	pH_Units	0.1			-	-	-
	pH (after HCL)	pH	0.1			-	-	-
	Sulphate	mg/kg	100			-	-	-
	TOC	%	0.5			-	-	-
	Weak Acid Dissociable Cy	mg/kg	1			-	-	-
Organochlorine	4,4-DDE	mg/kg	0.05			-	-	-
	a-BHC	mg/kg	0.05			-	-	-
	Aldrin	mg/kg	0.05			-	-	-
	Aldrin + Dieldrin	mg/kg				-	-	-
	b-BHC	mg/kg	0.05			-	-	-
	cis-Chlordane	mg/kg	0.05			-	-	-
	d-BHC	mg/kg	0.05			-	-	-
	DDD	mg/kg	0.05			-	-	-
	DDT	mg/kg	0.2			-	-	-
	DDT+DDE+DDD	mg/kg				-	-	-
	Dieldrin	mg/kg	0.05			-	-	-
	Endosulfan I	mg/kg	0.05			-	-	-
	Endosulfan II	mg/kg	0.05			-	-	-
	Endosulfan sulphate	mg/kg	0.05			-	-	-
	Endrin	mg/kg	0.05			-	-	-
	Endrin aldehyde	mg/kg	0.05			-	-	-
	Endrin ketone	mg/kg	0.05			-	-	-
	g-BHC (Lindane)	mg/kg	0.05			-	-	-
	Heptachlor	mg/kg	0.05			-	-	-
	Heptachlor epoxide	mg/kg	0.05			-	-	-
	Hexachlorobenzene	mg/kg	0.05			-	-	-
	Methoxychlor	mg/kg	0.2			-	-	-
	trans-chlordane	mg/kg	0.05			-	-	-
Organophospho	Azinophos methyl	mg/kg	0.05			-	-	-
	Bromophos-ethyl	mg/kg	0.05			-	-	-
	Carbophenothion	mg/kg	0.05			-	-	-
	Chlorfenvinphos	mg/kg	0.05			-	-	-
	Chlorpyrifos	mg/kg	0.05			-	-	-
	Chlorpyrifos-methyl	mg/kg	0.05			-	-	-
	cis-Isosafrole	mg/kg	0.5			-	-	-
	Diazinon	mg/kg	0.05			-	-	-
	Dichlorvos	mg/kg	0.05			-	-	-
	Dimethoate	mg/kg	0.05			-	-	-
	Ethion	mg/kg	0.05			-	-	-
	Ethyl methanesulfonate	mg/kg	0.5			-	-	-
	Fenthion	mg/kg	0.05			-	-	-
	Malathion	mg/kg	0.05			-	-	-
	Methyl methanesulfonate	mg/kg	0.5			-	-	-
	Methyl parathion	mg/kg	0.2			-	-	-
	Monocrotophos	mg/kg	0.2			-	-	-
	Pirimphos-ethyl	mg/kg	0.05			-	-	-
	Prothiofos	mg/kg	0.05			-	-	-
	Safrole	mg/kg	0.5			-	-	-
	trans-Isosafrole	mg/kg	0.5			-	-	-
other	Plasticiser Compounds	mg/kg				-	-	-
	Scheduled chemicals (NSV	mg/kg				-	-	-
	Organic Matter	%	0.5			-	-	-
	Total BTEX	mg/kg	1			-	-	<1
Pesticides	Pesticides (total, NSW Wa	mg/kg				-	-	-
	Demeton-S-methyl	mg/kg	0.05			-	-	-
	Fenamiphos	mg/kg	0.05			-	-	-
	Parathion	mg/kg	0.2			-	-	-
Polychlorinated	PCBs (Sum of total)	mg/kg	0.1			-	-	-
SPOCAS	Acid Reacted Calcium	%	0.02			-	-	-
	acidity - Acid Reacted Cal	mole H+/t	10			-	-	-
	acidity - Acid Reacted Mag	mole H+/t	10			-	-	-
	acidity - Peroxide Oxidisab	mole H+/t	10			-	-	-
	ANC Fineness Factor	-	0.5			-	-	-
	Calcium in Peroxide	%	0.02			-	-	-

Location	TBH01	TBH01	TBH01
Sample Field ID	DUP 01	TBH01_0.43-0.5	TRIP01
Sample Depth (m)	0.43-0.5	0.43-0.5	0.43-0.5
Matrix	Fill	Fill	Fill
Sample Type	Field_D	Normal	Interlab_D
Area	Block 4 Services	Block 4 Services	Block 4 Services
Sample Date	5/02/2011	5/02/2011	5/02/2011

Chem_Group	ChemName	output unit	EQL	ASC NEPM (NEPC, 2013) EIL	Hybrid Criteria, Declaration Site HHERA (2011)			
	KCl Extractable Calcium	%	0.02			-	-	-
	KCl Extractable Magnesiur	%	0.02			-	-	-
	Liming Rate	kg CaCO	1			-	-	-
	Magnesium in Peroxide	%	0.02			-	-	-
	Net Acidity (acidity units)	mole H+/t	10			-	-	-
	Net Acidity (sulfur units)	%S	0.02			-	-	-
	Peroxide Oxidisable Sulfur	%	0.02			-	-	-
	pH (KCl)	pH Unit	0.1			-	-	-
	pH (Ox)	pH Unit	0.1			-	-	-
	sulfidic - Acid Reacted Cal	% S	0.02			-	-	-
	sulfidic - Acid Reacted Ma	%S	0.02			-	-	-
	sulfidic - Titratable Actual A	%S	0.02			-	-	-
	sulfidic - Titratable Peroxid	%S	0.02			-	-	-
	sulfidic - Titratable Sulfidic	%S	0.02			-	-	-
	Sulfur in Peroxide	%	0.02			-	-	-
	Titratable Actual Acidity	mole H+/t	2			-	-	-
SVOCs	1,2,4,5-tetrachlorobenzene	mg/kg	0.5			-	-	-
	1,3,5-Trichlorobenzene	mg/kg	0.5			-	-	-
	1,3,5-Trinitrobenzene	mg/kg	0.5			-	-	-
	1-naphthylamine	mg/kg	0.5			-	-	-
	2-(acetylamino) fluorene	mg/kg	0.5			-	-	-
	2,3,4,6-tetrachlorophenol	mg/kg	0.01			-	-	-
	2,4,5-trichlorophenol	mg/kg	0.01			-	-	-
	2,4,6-trichlorophenol	mg/kg	0.01			-	-	-
	2,4-dichlorophenol	mg/kg	0.01			-	-	-
	2,4-Dinitrotoluene	mg/kg	0.5			-	-	-
	2,6-dichlorophenol	mg/kg	0.01			-	-	-
	2,6-dinitrotoluene	mg/kg	0.5			-	-	-
	2-chlorophenol	mg/kg	0.01			-	-	-
	Methyl Ethyl Ketone	mg/kg	5			-	-	-
	2-hexanone (MBK)	mg/kg	5			-	-	-
	2-nitroaniline	mg/kg	0.5			-	-	-
	2-Picoline	mg/kg	0.5			-	-	-
	3,3-Dichlorobenzidine	mg/kg	0.5			-	-	-
	3-nitroaniline	mg/kg	0.5			-	-	-
	4-(dimethylamino) azoben	mg/kg	0.5			-	-	-
	4-aminobiphenyl	mg/kg	0.5			-	-	-
	4-bromophenyl phenyl ethe	mg/kg	0.5			-	-	-
	4-chloroaniline	mg/kg	0.5			-	-	-
	4-chlorophenyl phenyl ethe	mg/kg	0.5			-	-	-
	4-nitroaniline	mg/kg	0.5			-	-	-
	4-Nitroquinoline-N-oxide	mg/kg	0.5			-	-	-
	2-methyl-5-nitroaniline	mg/kg	0.5			-	-	-
	7,12-dimethylbenz(a)anthr	mg/kg	0.5			-	-	-
	Aniline	mg/kg	0.5			-	-	-
	Azobenzene	mg/kg	1			-	-	-
	Bis(2-chloroethoxy) metha	mg/kg	0.5			-	-	-
	Bis(2-chloroisopropyl) ethe	mg/kg	0.5			-	-	-
	Bis(2-ethylhexyl) phthalate	mg/kg	0.5			-	-	-
	Butyl benzyl phthalate	mg/kg	0.5			-	-	-
	Carbazole	mg/kg	0.5			-	-	-
	Chlorobenzilate	mg/kg	0.5			-	-	-
	Dibenzofuran	mg/kg	0.5			-	-	-
	Diethylphthalate	mg/kg	0.5			-	-	-
	Dimethyl phthalate	mg/kg	0.5			-	-	-
	Di-n-butyl phthalate	mg/kg	0.5			-	-	-
	Di-n-octyl phthalate	mg/kg	0.5			-	-	-
	Hexachlorocyclopentadien	mg/kg	0.5			-	-	-
	Hexachloroethane	mg/kg	0.5			-	-	-
	Hexachlorophene	mg/kg	0.01			-	-	-
	Hexachloropropene	mg/kg	0.5			-	-	-
	Methapyrilene	mg/kg	0.5			-	-	-
	Nitrobenzene	mg/kg	0.5			-	-	-
	N-Nitrosodiphenyl & Diphe	mg/kg	0.5			-	-	-
	N-nitrosodiethylamine	mg/kg	0.5			-	-	-
	N-nitrosodi-n-butylamine	mg/kg	0.5			-	-	-
	N-nitrosodi-n-propylamine	mg/kg	0.5			-	-	-
	N-Nitrosomethylethylamine	mg/kg	0.5			-	-	-
	N-nitrosomorpholine	mg/kg	0.5			-	-	-
	N-nitrosopiperidine	mg/kg	0.5			-	-	-
	N-nitrosopyrrolidine	mg/kg	0.5			-	-	-
	Pentachlorobenzene	mg/kg	0.5			-	-	-
	Pentachloronitrobenzene	mg/kg	0.5			-	-	-
	Pentachlorophenol	mg/kg	0.01			-	-	-

Location	TBH01	TBH01	TBH01
Sample Field ID	DUP 01	TBH01_0.43-0.5	TRIP01
Sample Depth (m)	0.43-0.5	0.43-0.5	0.43-0.5
Matrix	Fill	Fill	Fill
Sample Type	Field_D	Normal	Interlab_D
Area	Block 4 Services	Block 4 Services	Block 4 Services
Sample Date	5/02/2011	5/02/2011	5/02/2011

Chem_Group	ChemName	output unit	EQL	ASC NEPM (NEPC, 2013) EIL	Hybrid Criteria, Declaration Site HHERA (2011)			
	Phenacetin	mg/kg	0.5			-	-	-
VOCs	1,1,1,2-tetrachloroethane	mg/kg	0.5			-	-	-
	1,1,1-trichloroethane	mg/kg	0.5			-	-	-
	1,1,2,2-tetrachloroethane	mg/kg	0.5			-	-	-
	1,1,2-trichloroethane	mg/kg	0.5			-	-	-
	1,1-dichloroethane	mg/kg	0.5			-	-	-
	1,1-dichloroethene	mg/kg	0.5			-	-	-
	1,1-dichloropropene	mg/kg	0.5			-	-	-
	1,2,3-trichlorobenzene	mg/kg	0.5			-	-	-
	1,2,3-trichloropropane	mg/kg	0.5			-	-	-
	1,2,4-trichlorobenzene	mg/kg	0.5			-	-	-
	1,2,4-trimethylbenzene	mg/kg	0.5		370	-	-	-
	1,2-dibromo-3-chloropropa	mg/kg	0.5			-	-	-
	1,2-dibromoethane	mg/kg	0.5			-	-	-
	1,2-dichlorobenzene	mg/kg	0.5			-	-	-
	1,2-dichloroethane	mg/kg	0.5			-	-	-
	1,2-dichloropropane	mg/kg	0.5			-	-	-
	1,3,5-trimethylbenzene	mg/kg	0.5			-	-	-
	1,3-dichlorobenzene	mg/kg	0.5			-	-	-
	1,3-dichloropropane	mg/kg	0.5			-	-	-
	1,4-dichlorobenzene	mg/kg	0.5			-	-	-
	2,2-dichloropropane	mg/kg	0.5			-	-	-
	2-chlorotoluene	mg/kg	0.5			-	-	-
	4-chlorotoluene	mg/kg	0.5			-	-	-
	4-Methyl-2-pentanone	mg/kg	5			-	-	-
	Bromobenzene	mg/kg	0.5			-	-	-
	Bromodichloromethane	mg/kg	0.5			-	-	-
	Bromoform	mg/kg	0.5			-	-	-
	Bromomethane	mg/kg	5			-	-	-
	Carbon disulfide	mg/kg	0.5			-	-	-
	Carbon tetrachloride	mg/kg	0.5			-	-	-
	Chlorobenzene	mg/kg	0.5			-	-	-
	Chlorodibromomethane	mg/kg	0.5			-	-	-
	Chloroethane	mg/kg	5			-	-	-
	Chloroform	mg/kg	0.5			-	-	-
	Chloromethane	mg/kg	5			-	-	-
	cis-1,3-dichloropropene	mg/kg	0.5			-	-	-
	cis-1,4-Dichloro-2-butene	mg/kg	0.5			-	-	-
	Dibromomethane	mg/kg	0.5			-	-	-
	Dichlorodifluoromethane	mg/kg	5			-	-	-
	Hexachlorobutadiene	mg/kg	0.5			-	-	-
	Iodomethane	mg/kg	0.5			-	-	-
	Isophorone	mg/kg	0.5			-	-	-
	Isopropylbenzene	mg/kg	0.5			-	-	-
	n-butylbenzene	mg/kg	0.5			-	-	-
	n-propylbenzene	mg/kg	0.5			-	-	-
	Pentachloroethane	mg/kg	0.5			-	-	-
	p-isopropyltoluene	mg/kg	0.5			-	-	-
	sec-butylbenzene	mg/kg	0.5			-	-	-
	Styrene	mg/kg	0.5			-	-	-
	tert-butylbenzene	mg/kg	0.5			-	-	-
	trans-1,2-dichloroethene	mg/kg	0.5			-	-	-
	trans-1,3-dichloropropene	mg/kg	0.5			-	-	-
	trans-1,4-Dichloro-2-buten	mg/kg	0.5			-	-	-
	Trichlorofluoromethane	mg/kg	5			-	-	-
	Vinyl acetate	mg/kg	5			-	-	-

NOTES:
EIL - Ecological Investigation Level
HIL - Health Investigation Level
* CRC Care (2011) Health Screening Level - Direct Contact

Sample collected from natural marine sediments

Highlighted COPC - a corresponding MWQC relates to this COPC (refer to Table T2)

COPC Highlighted COPC - an 'Additional COPC'

Highlighted samples - indicates indicative material to be partly removed as part of excavations to 2.7 m bgl

Field_ID	D01_120508	MW209	MW209	MW209	MW209 FILTRATE	MW22	MW22	MW22	MW45
Location_Code	BH209	BH209	BH209	BH209	BH209	BH116	BH116	BH116	AECOM_BH45
Well	MW209	MW209	MW209	MW209	MW209	MW22	MW22	MW22	MW45
Sampled_Date_Time	12/05/2008	12/05/2008	16/03/2010	28/02/2011	28/02/2011	17/07/2006	7/05/2008	15/03/2010	19/03/2010
Sample_Type	Interlab_D	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Lab_Report_Number	37583	ES0806635	ES1004956	ES1104220	ES1104220	ES0608744	ES0806416	ES1004782	ES1005244
Monitoring well screening details	Screened within fill, clay and bedrock to 8.7m					Screened within fill only to 9m			Screened within fill, sand and rock to 12.7m

Chem_Group	ChemName	output unit	EQL	MWQC	Hydrid criteria, PDA HHERA (2012)								
	Pronamide	µg/L	2			-	-	<2	-	-	-	-	<2	<2
PAHs	CPAH (TEF)	µg/L				<22.2	<4.356	3.2	0.9	<0.192	<1.92	<1.92	<4.44	<4.44
	PAH (ESDAT TOTAL)	µg/L				267	281.3	753	26.6	2	14.9	<15.5	<28	8
	PAH (total, NSW Waste 2008)	µg/L				177	281.3	753	26.6	2	14.9	<15.5	<28	8
	Sum of 10 PAHs	µg/L				<80	6.7	15	4.8	<0.95	<9.5	<9.5	<16	<16
	Sum of 5 PAHs	µg/L				177	274.6	738	21.8	2	14.9	<6	<12	8
	2-chloronaphthalene	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	2-methylnaphthalene	µg/L	0.1	**2.1**	38,000	-	-	**14**	-	<0.1	-	-	<2	<2
	3-methylcholanthrene	µg/L	0.1			-	-	<2	-	<0.1	-	-	<2	<2
	Acenaphthene	µg/L	0.1	**5.8**		<10	**8.1**	**7**	1.8	<0.1	1.2	<1	<2	<2
	Acenaphthylene	µg/L	0.1	**5.8**	57,000	**37**	**50**	**26**	**6.2**	<0.1	1.1	<1	<2	<2
	Acetophenone	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	Anthracene	µg/L	0.1	**0.01**		<10	**5.6**	**4**	**1**	<0.1	<1	<1	<2	<2
	Benz(a)anthracene	µg/L	0.1	**0.01**	570,000	<10	<1.8	**2**	**1**	<0.1	<1	<1	<2	<2
	Benzo(a) pyrene	µg/L	0.05	**0.1**		<10	<1.8	**3**	**0.8**	<0.05	<0.5	<0.5	<2	<2
	Benzo(b)&(k)fluoranthene	µg/L	4	**0.01**		<20	-	<4	-	-	-	-	<4	<4
	Benzo(b)fluoranthene	µg/L	0.1	**0.01**		-	<1.8	-	<1	<0.1	<1	<1	-	-
	Benzo(g,h,i)perylene	µg/L	0.1	**0.001**		<10	<1.8	<2	<1	<0.1	<1	<1	<2	<2
	Benzo(k)fluoranthene	µg/L	0.1	**0.01**		-	<1.8	-	<1	<0.1	<1	<1	-	-
	Chrysene	µg/L	0.1	**0.001**		<10	<1.8	<2	<1	<0.1	<1	<1	<2	<2
	Dibenz(a,h)anthracene	µg/L	0.1	**0.1**		<10	<1.8	<2	<1	<0.1	<1	<1	<2	<2
	Fluoranthene	µg/L	0.1	**1**		<10	**3.2**	**4**	**1.2**	<0.1	<1	<1	<2	<2
	Fluorene	µg/L	0.1	**3**		**17**	**18.9**	**10**	<1	<0.1	1.4	<1	<2	<2
	Indeno(1,2,3-c,d)pyrene	µg/L	0.1	**0.01**		<10	<1.8	<2	<1	<0.1	<1	<1	<2	<2
	Naphthalene	µg/L	0.1	**70**	30,000	**108**	**175**	**677**	10.8	2	9.9	<1	<2	8
	Phenanthrene	µg/L	0.1	**0.6**		**15**	**17**	**14**	**2**	<0.1	**1.3**	<1	<2	<2
	Pyrene	µg/L	0.1	**0.025**		<10	**3.5**	**6**	**1.8**	<0.1	<1	<1	<2	<2
	PAHs (Sum of total)	µg/L	2			177	-	753	-	-	-	-	<2	8
Phenols	2,4-dimethylphenol	µg/L	0.1	**2**	720,000	**697**	**466**	**10**	1.2	0.4	-	<1	<2	<2
	2-methylphenol	µg/L	0.1	**13**	4,900,000	**1230**	**591**	6	<1	0.6	-	<1	<2	<2
	2-nitrophenol	µg/L	0.1			<20	<1.8	<2	<1	<0.2	-	<1	<2	<2
	3-&4-methylphenol	µg/L	2	**13**	270,000	**618**	**328**	<4	<2	-	-	<2	<4	<4
	3-Methylphenol	µg/L	0.1	**13**		-	-	-	-	0.5	-	-	-	-
	4-chloro-3-methylphenol	µg/L	0.05			<20	<1.8	<2	<1	<0.1	-	<1	<2	<2
	4-methylphenol	µg/L	0.1	**13**		-	-	-	-	<0.2	-	-	-	-
	4-nitrophenol	µg/L	0.1			-	-	-	-	<0.2	-	-	-	-
	Phenol	µg/L	0.1	**400**	23,000,000	234	115	<2	<1	1.1	-	<1	<2	<2
	Phenolics Total	mg/L				2.779	-	-	-	-	-	-	-	-
TPH	TRH C6-C9	mg/L	0.02		1400	5.4	8.15	1.38	0.1	-	0.03	0.03	<0.02	<0.02
	TRH C10-C14	mg/L	0.05	**0.04**	21	**5.39**	**7.98**	**2.23**	**0.1**	-	**0.09**	**0.1**	<0.05	<0.05
	TRH C15-C28	mg/L	0.1		220	1	1.9	1	0.22	-	0.4	0.2	<0.1	<0.1
	TRH C29-C36	mg/L	0.05		250	0.7	<0.05	0.16	<0.05	-	<0.05	<0.05	<0.05	<0.05
	TRH C10-36 (Total)	mg/L	0.05			7.09	9.88	3.39	0.32	-	0.49	0.3	<0.05	<0.05
1. CAHs	Tetrachloroethene	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	Trichloroethene	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	cis-1,2-dichloroethene	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	Vinyl chloride	ug/L	50			-	-	<200	-	-	-	-	<50	<50
BTEX	Benzene	ug/L	1	**700**	3400	**2780**	**2370**	**772**	56	-	5	2	<1	<1
	Ethylbenzene	ug/L	2	**80**	210,000	**123**	**118**	**149**	15	-	<2	<2	<2	<2
	Toluene	ug/L	2	**180**	760,000	**1520**	**1700**	48	5	-	4	<5	<5	<5
	Xylene (m & p)	ug/L	2	**75**		**372**	**380**	**76**	8	-	2	<2	<2	<2
	Xylene (o)	ug/L	2	**75**		**657**	**275**	**104**	10	-	<2	<2	<2	<2
	Total Xylene (ESDAT)	ug/L				1029	655	180	18	-	2	<4	<4	<4
Inorganics	Alkalinity as CaCO3	mg/L	1			-	230	280	-	-	-	233	191	44
	Ammonia as N	mg/L	0.01	**0.91**	15,000	**13.1**	**12**	**7.48**	-	-	-	**1.24**	**2.7**	<0.1
	Anions Total	mg/L	0.01			-	506	567	-	-	-	544	627	524
	Bicarbonate	mg/L	1			-	230	-	-	-	-	233	-	-
	Bicarbonate as CaCO3	mg/L	1			-	-	280	-	-	-	-	191	44
	Alkalinity (Bicarbonate as CaCO	mg/L	1			-	-	280	-	-	-	-	-	-
	Alkalinity (Carbonate as CaCO3	mg/L	1			-	-	<1	-	-	-	-	-	-
	Carbonate	mg/L	1			-	<1	<1	-	-	-	<1	<1	<1
	Cations Total	meq/L	0.01			-	459	568	-	-	-	515	632	556
	Chloride	mg/L	0.5			18,600	15,800	18,500	-	-	-	17,300	20,500	17,000
	Cyanide (Free)	mg/L	0.004	**0.004**		-	-	<0.004	<0.004	-	-	-	-	<0.004
	Cyanide Total	mg/L	0.004	**0.004**		**0.8**	**0.469**	-	-	-	**0.014**	<0.004	-	-
	Ferrous Iron	mg/L	0.05			-	-	9.52	-	-	-	-	3.56	-
	Fluoride	mg/L	0.02			-	-	-	-	-	-	-	-	0.4
	Hydroxide Alkalinity as CaCO3	mg/L	1			-	<1	<1	-	-	-	<1	<1	<1
	Ionic Balance	%	0.01			-	4.89	0.12	-	-	-	2.8	0.37	3.03
	Nitrate (as N)	mg/L	0.01			-	-	0.1	-	-	-	-	<0.01	0.03
	Nitrite (as N)	mg/L	0.01			-	-	<0.01	-	-	-	-	<0.01	<0.01
	Nitrogen (Total Oxidised)	mg/L	0.01			-	-	0.1	-	-	-	-	<0.01	0.03
	pH (Lab)	pH_Units	0.01			-	-	7.1	-	-	-	-	7.24	6.25
	Reactive Phosphorus as P	mg/L	0.01			-	-	-	-	-	-	-	-	<0.01
	Sulphate	mg/L	0.5			2160	2690	1900	-	-	2140	2480	2220	2100
	Sulphur as S	mg/L	1			-	-	645	-	-	-	-	-	588
	TOC	mg/L	1			-	-	9	-	-	-	-	3	3
	Hardness as CaCO3	mg/L	1			-	-	5530	-	-	-	-	-	-
	Weak Acid Dissociable Cyanide	mg/L	0.004			-	-	<0.004	<0.004	-	-	-	-	<0.004
Metals	Aluminium (Filtered)	mg/L	0.01			-	-	-	0.01	-	-	-	-	-
	Antimony (Filtered)	µg/L	0.5			-	-	-	<0.5	-	-	-	-	-
	Arsenic (Filtered)	µg/L	0.5	**2.3**	380,000	<25	<0.5	**2.9**	1.1	-	<1	0.5	<0.5	1.1
	Barium (Filtered)	mg/L	0.001			-	-	0.083	0.048	-	-	-	0.061	0.062
	Beryllium (Filtered)	µg/L	0.1			-	-	0.2	0.1	-	-	-	<0.1	0.1
	Cadmium (Filtered)	µg/L	0.1	**0.7**	15,000	<1	0.2	0.4	0.5	-	<0.1	0.6	<0.2	**11.5**
	Calcium	mg/L	1			441	380	-	-	-	-	412	-	-
	Calcium (Filtered)	mg/L	1			-	-	383	-	-	-	-	412	588
	Chromium (Filtered)	µg/L	0.5	**27.4**	8,400,000	<5	<0.5	10.2	<0.5	-	<1	<0.5	<0.5	<0.5
	Chromium (hexavalent)	mg/L	0.002	**0.0044**	7.6	-	-	**0.005**	-	-	-	-	<0.002	<0.002
	Cobalt (Filtered)	µg/L	0.2	**1**	260,000	-	-	**1.3**	0.3	-	-	-	<0.2	**8**
	Copper (Filtered)	µg/L	1	**1.3**		<10	<1	<1	<1	-	<1	<1	<1	<1
	Iron (Filtered)	mg/L	0.05			-	-	10	-	-	-	-	3.3	187
	Lead (Filtered)	µg/L	0.2	**4.4**	1,100,000	<1	<0.2	**17.6**	<0.2	-	<0.2	<0.2	0.2	0.2
	Magnesium	mg/L	1			1200	1080	-	-	-	-	1120	-	-
	Magnesium (Filtered)	mg/L	1			-	-	1110	-	-	-	-	1230	1120
	Manganese (Filtered)	mg/L	0.0005		2400	-	-	0.0492	0.018	-	-	-	0.269	4.89
	Mercury (Filtered)	µg/L	0.1	**0.1**		<0.2	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1
	Nickel (Filtered)	µg/L	0.5	**70**	350,000	38	60.9	20.6	55.7	-	4	47.4	<0.5	36
	Potassium	mg/L	1			383	418	-	-	-	-	274	-	-
	Potassium (Filtered)	mg/L	1			-	-	353	-	-	-	-	357	259
	Selenium (Filtered)	µg/L	2			-	-	-	<2	-	-	-	-	-
	Silver (Filtered)	µg/L	0.1			-	-	-	0.3	-	-	-	-	-
	Sodium	mg/L	1			9590	7830	-	-	-	-	9080	-	-
	Sodium (Filtered)	mg/L	1			-	-	10,300	-	-	-	-	11,500	9850
	Vanadium (Filtered)	µg/L	0.5	**100**	960,000	-	-	22.8	1	-	-	-	<0.5	<0.5
	Zinc (Filtered)	mg/L	0.005	**0.015**		<0.02	0.009	**0.613**	0.006	-	**0.024**	0.011	0.008	0.014
Inorganic	Alkalinity	mg/L	5			230	-	-	-	-	-	-	-	-
	Electrical conductivity *(lab)	uS/cm				-	-	-	-	-	-	-	-	-
SVOCs	1,3,5-Trinitrobenzene	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	1-naphthylamine	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	2-(acetylamino) fluorene	µg/L	0.1			-	-	<2	-	<0.1	-	-	<2	<2

Field_ID	D01_120508	MW209	MW209	MW209	MW209 FILTRATE	MW22	MW22	MW22	MW45
Location_Code	BH209	BH209	BH209	BH209	BH209	BH116	BH116	BH116	AECOM_BH45
Well	MW209	MW209	MW209	MW209	MW209	MW22	MW22	MW22	MW45
Sampled_Date_Time	12/05/2008	12/05/2008	16/03/2010	28/02/2011	28/02/2011	17/07/2006	7/05/2008	15/03/2010	19/03/2010
Sample_Type	Interlab_D	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Lab_Report_Number	37583	ES0806635	ES1004956	ES1104220	ES1104220	ES0608744	ES0806416	ES1004782	ES1005244
Monitoring well screening details	Screened within fill, clay and bedrock to 8.7m					Screened within fill only to 9m			Screened within fill, sand and rock to 12.7m

Chem_Group	ChemName	output unit	EQL	MWQC	Hydrid criteria, PDA HHERA (2012)									
	2,3,4,6-tetrachlorophenol	µg/L	0.1			-	-	-	-	<0.2	-	-	-	-
	2,4,5-trichlorophenol	µg/L	0.1			<20	<1.8	<2	<1	<0.2	-	<1	<2	<2
	2,4,6-trichlorophenol	µg/L	0.1			<20	<1.8	<2	<1	<0.2	-	<1	<2	<2
	2,4-dichlorophenol	µg/L	0.1			<20	<1.8	<2	<1	<0.2	-	<1	<2	<2
	2,4-Dinitrotoluene	µg/L	4			-	-	<4	-	-	-	-	<4	<4
	2,6-dichlorophenol	µg/L	0.1			-	<1.8	<2	<1	<0.2	-	<1	<2	<2
	2,6-dinitrotoluene	µg/L	4			-	-	<4	-	-	-	-	<4	<4
	2-chlorophenol	µg/L	0.05			<20	<1.8	<2	<1	<0.1	-	<1	<2	<2
	Methyl Ethyl Ketone	µg/L	50			-	-	<200	-	-	-	-	<50	<50
	2-hexanone (MBK)	µg/L	50			-	-	<200	-	-	-	-	<50	<50
	2-nitroaniline	µg/L	4			-	-	<4	-	-	-	-	<4	<4
	2-Picoline	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	3,3-Dichlorobenzidine	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	3-nitroaniline	µg/L	4			-	-	<4	-	-	-	-	<4	<4
	4-(dimethylamino) azobenzene	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	4-aminobiphenyl	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	4-bromophenyl phenyl ether	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	4-chloroaniline	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	4-chlorophenyl phenyl ether	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	4-nitroaniline	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	4-Nitroquinoline-N-oxide	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	2-methyl-5-nitroaniline	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	7,12-dimethylbenz(a)anthracene	µg/L	0.1			-	-	<2	-	<0.1	-	-	<2	<2
	Aniline	µg/L	2		980,000	-	-	<2	-	-	-	-	<2	<2
	Azobenzene	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	Benzo(e)pyrene	µg/L	0.1			-	-	-	-	<0.1	-	-	-	-
	Bis(2-chloroethoxy) methane	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	Bis(2-chloroisopropyl) ether	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	Bis(2-ethylhexyl) phthalate	µg/L	20			-	-	20	-	-	-	-	<20	<20
	Butyl benzyl phthalate	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	Carbazole	µg/L	2			-	-	4	-	-	-	-	<2	<2
	Chlorobenzilate	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	Coronene	µg/L	0.1			-	-	-	-	<0.1	-	-	-	-
	Dibenzofuran	µg/L	2	**3.7**		-	-	3	-	-	-	-	<2	<2
	Diethylphthalate	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	Dimethyl phthalate	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	Di-n-butyl phthalate	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	Di-n-octyl phthalate	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	Hexachlorocyclopentadiene	µg/L	10			-	-	<10	-	-	-	-	<10	<10
	Hexachloroethane	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	Hexachlorophene	µg/L	0.1			-	-	-	-	<0.2	-	-	-	-
	Hexachloropropene	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	Methapyrilene	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	Nitrobenzene	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	N-Nitrosodiphenyl & Diphenylan	µg/L	4			-	-	<4	-	-	-	-	<4	<4
	N-nitrosodiethylamine	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	N-nitrosodi-n-butylamine	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	N-nitrosodi-n-propylamine	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	N-Nitrosomethylethylamine	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	N-nitrosomorpholine	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	N-nitrosopiperidine	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	N-nitrosopyrrolidine	µg/L	4			-	-	<4	-	-	-	-	<4	<4
	Pentachlorobenzene	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	Pentachloronitrobenzene	µg/L	2			-	-	<2	-	-	-	-	<2	<2
	Pentachlorophenol	µg/L	0.05	**22**		<100	<3.7	<4	<2	<0.1	-	<2	<4	<4
	Perylene	µg/L	0.1			-	-	-	-	<0.1	-	-	-	-
	Phenacetin	µg/L	2			-	-	<2	-	-	-	-	<2	<2
VOCs	1,1,1,2-tetrachloroethane	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	1,1,1-trichloroethane	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	1,1,2,2-tetrachloroethane	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	1,1,2-trichloroethane	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	1,1-dichloroethane	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	1,1-dichloroethene	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	1,1-dichloropropene	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	1,2,3-trichlorobenzene	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	1,2,3-trichloropropane	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	1,2,4-trichlorobenzene	ug/L	2			-	-	<2	-	-	-	-	<2	<2
	1,2,4-trimethylbenzene	ug/L	5			-	-	36	-	-	-	-	<5	<5
	1,2-dibromo-3-chloropropane	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	1,2-dibromoethane	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	1,2-dichlorobenzene	ug/L	2			-	-	<2	-	-	-	-	<2	<2
	1,2-dichloroethane	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	1,2-dichloropropane	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	1,3,5-trimethylbenzene	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	1,3-dichlorobenzene	ug/L	2			-	-	<2	-	-	-	-	<2	<2
	1,3-dichloropropane	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	1,4-dichlorobenzene	ug/L	2			-	-	<2	-	-	-	-	<2	<2
	2,2-dichloropropane	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	2-chlorotoluene	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	4-chlorotoluene	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	4-Methyl-2-pentanone	ug/L	50			-	-	<200	-	-	-	-	<50	<50
	Bromobenzene	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	Bromodichloromethane	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	Bromoform	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	Bromomethane	ug/L	50			-	-	<200	-	-	-	-	<50	<50
	Carbon disulfide	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	Carbon tetrachloride	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	Chlorobenzene	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	Chlorodibromomethane	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	Chloroethane	ug/L	50			-	-	<200	-	-	-	-	<50	<50
	Chloroform	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	Chloromethane	ug/L	50			-	-	<200	-	-	-	-	<50	<50
	cis-1,3-dichloropropene	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	cis-1,4-Dichloro-2-butene	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	Dibromomethane	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	Dichlorodifluoromethane	ug/L	50			-	-	<200	-	-	-	-	<50	<50
	Hexachlorobutadiene	ug/L	2			-	-	<2	-	-	-	-	<2	<2
	Iodomethane	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	Isophorone	ug/L	2			-	-	<2	-	-	-	-	<2	<2
	Isopropylbenzene	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	n-butylbenzene	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	n-propylbenzene	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	Pentachloroethane	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	p-isopropyltoluene	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	sec-butylbenzene	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	Styrene	ug/L	5	**72**	88,000	-	-	<20	-	-	-	-	<5	<5
	tert-butylbenzene	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	trans-1,2-dichloroethene	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	trans-1,3-dichloropropene	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	trans-1,4-Dichloro-2-butene	ug/L	5			-	-	<20	-	-	-	-	<5	<5
	Trichlorofluoromethane	ug/L	50			-	-	<200	-	-	-	-	<50	<50
	Vinyl acetate	ug/L	50			-	-	<200	-	-	-	-	<50	<50

Table T3 - Comparison of Study Area contaminant mass to Zone 3 & 4 (Fill Material only)
RAP Addendum - Stage 1B Public Domain (Watermans Quay)
Lend lease

Site Area	COPC	Ave. concentration (mg/kg)	Estimated volume (m^3)	Weight (T)	Weight (kg)	Total contaminant mass (mg/kg)	Total contaminant mass (kg)	% of total contaminant mass in Zone 3, 4 and the Study Area's fill material
Zone 3 - Off Site upper fill within 20m of Declaration Area								
	Naphthalene	5.5	53,920	107,840	107,840,000	593,120,000	593.1	13.9%
	TPH C_{10} - C_{14}	61	53,920	107,840	107,840,000	6,578,240,000	6,578.2	22.9%
Zone 3 - Off Site lower fill within 20m of Declaration Area								
	Naphthalene	41	8,800	17,600	17,600,000	721,600,000	721.6	16.9%
	TPH C_{10} - C_{14}	38	8,800	17,600	17,600,000	668,800,000	668.8	2.3%
Zone 4 - Off Site upper fill outside 20m of Declaration Area								
	Naphthalene	1.2	309,920	619,840	619,840,000	743,808,000	743.8	17.4%
	TPH C_{10} - C_{14}	30	309,920	619,840	619,840,000	18,595,200,000	18,595.2	64.7%
Zone 4 - Off Site lower fill outside 20m of Declaration Area								
	Naphthalene	22	50,400	100,800	100,800,000	2,217,600,000	2,217.6	51.8%
	TPH C_{10} - C_{14}	25	50,400	100,800	100,800,000	2,520,000,000	2,520.0	8.8%
					Sub-total	**Naphthalene**	**4,276.1**	
					Sub-total	**TPH C_{10} - C_{14}**	**28,362.2**	
The Study Area (including upper and lower fill materials)								
	Naphthalene	0.25	6,200	12,400	12,400,000	3,100,000	3.1	0.07%
	TPH C_{10} - C_{14}	29	6,200	12,400	12,400,000	359,600,000	359.6	1.3%
			Sum of Zone 2, 3 and the Study Area			**Naphthalene**	**4,279.2**	
			Sum of Zone 2, 3 and the Study Area			**TPH C_{10} - C_{14}**	**28,721.8**	

Notes: The Zone 3 and 4 volume and contaminant mass calculations are taken from the *VMP Remediation Extent* report (AECOM, 2013b)

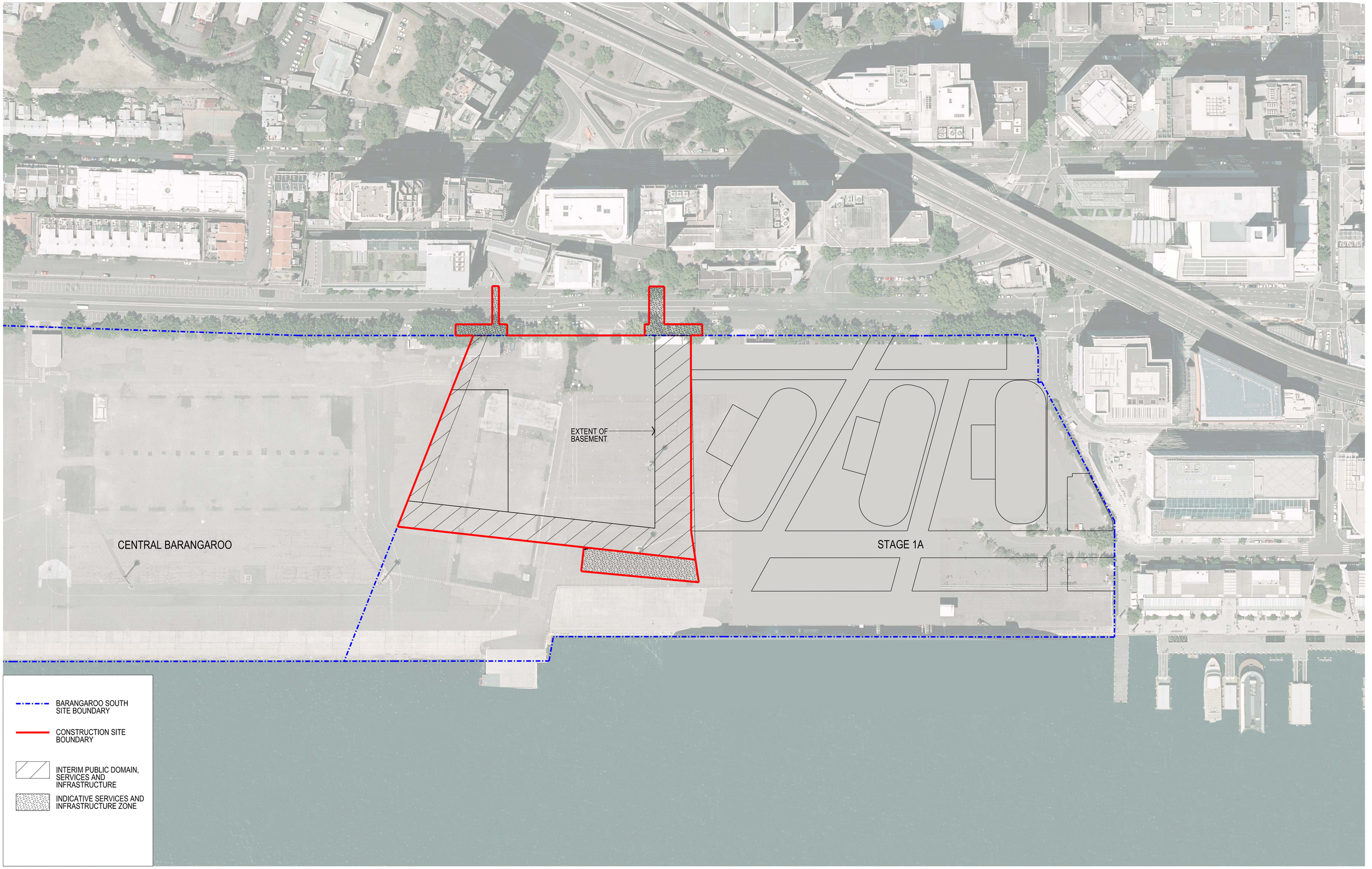
Attachment 4: Lendlease Development Plans

ONE SYDNEY HARBOUR
BARANGAROO SOUTH

Stage 1B Basement SSD6960
Development Application

ARCHITECTURAL DRAWINGS

BB2 _PA2_A000	TITLE SHEET
BB2 _PA2_A001	AERIAL LOCATION PLAN
BB2 _PA2_A002	SURVEY PLAN
BB2 _PA2_A003	DEMOLITION, EXCAVATION & SERVICES ZONE PLAN
BB2 _PA2_A100	BASEMENT PLAN LEVEL B0
BB2 _PA2_A101	BASEMENT PLAN LEVEL B1
BB2 _PA2_A102	BASEMENT PLAN LEVEL B2
BB2 _PA2_A103	BASEMENT PLAN LEVEL B3
BB2 _PA2_A104	BASEMENT PLAN LEVEL B4
BB2 _PA2_A105	BASEMENT PLAN LEVEL B5
BB2 _PA2_A300	SECTION 01
BB2 _PA2_A301	SECTION 02
BB2 _PA2_A302	SECTION 03
BB2 _PA2_A303	SECTION 04
BB2 _PA2_A400	BUILDING ELEMENTS - GROUND FLOOR
BB2 _PA2_A401	BUILDING ELEMENTS - PODIUM P1
BB2 _PA2_A402	BUILDING ELEMENTS - PODIUM P2
BB2 _PA2_A501	BUILDING ELEMENTS - ELEVATIONS



lendlease
ONE SYDNEY HARBOUR
BARANGAROO

PRINCIPAL ARCHITECT:
RPBW
RENZO PIANO BUILDING WORKSHOP
Via P.P. Rubens 29, 16158 Genova - Italy
Emanuela Baglietto | Nominated Architect
NSW ARB 9512

EXECUTIVE ARCHITECT:
Lend Lease Design
ABN 97 000 098 162
30 The Bond, 30 Hickson Road,
Millers Point, NSW, 2000
Stephanie Smith | Nominated Architect
NSW ARB 6480

STAGE 1B BASEMENT SSD6960
AERIAL LOCATION PLAN

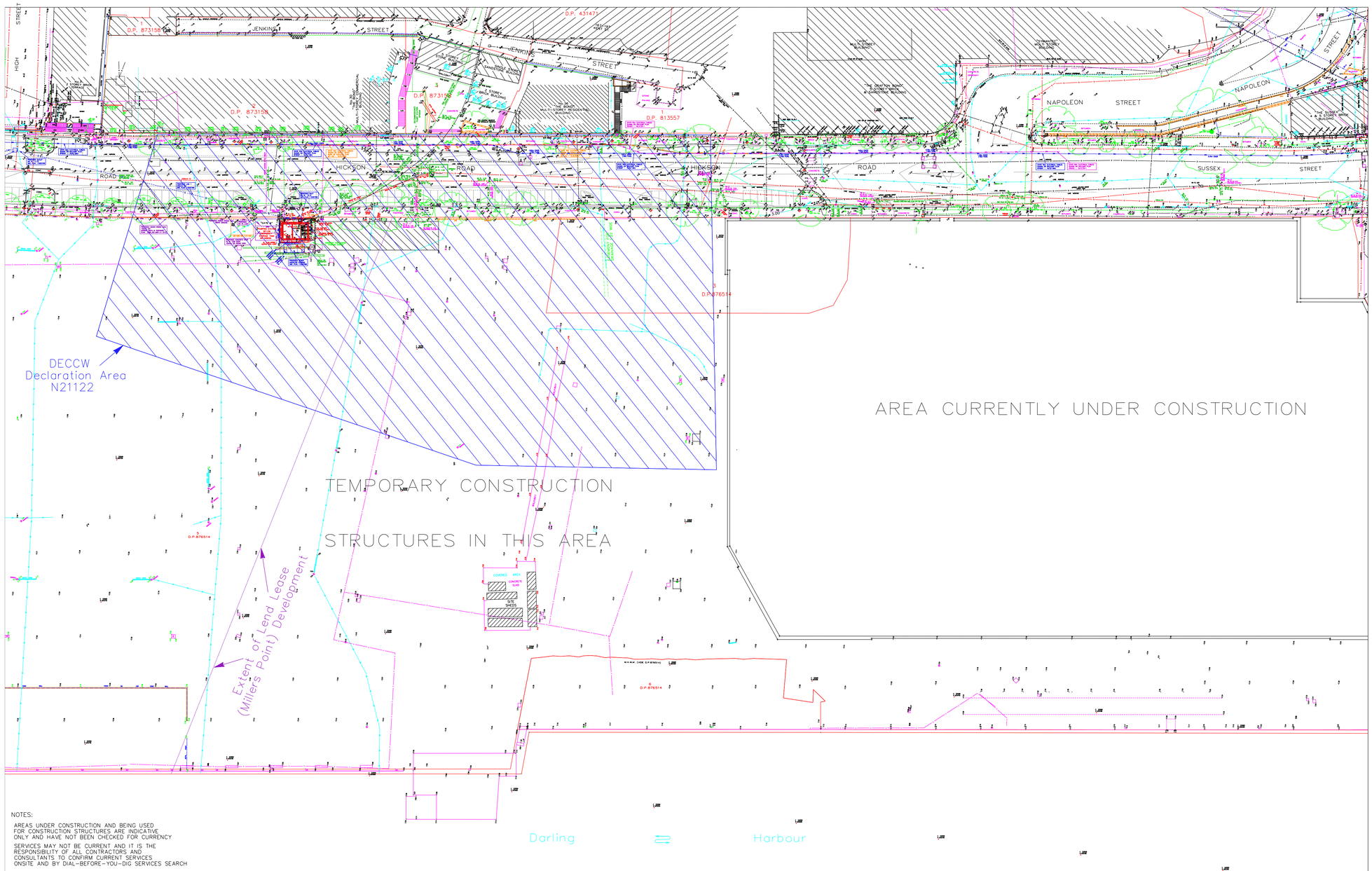
Scale 1:1000 @ A1 Scale 1:2000 @ A3

0 50M

Checked:
Milan Busina
19.05.2016
Approved:
Stephanie Smith
19.05.2016

Drawing: BB2_PA2_A001
Date: 19 May 2016 Revision: B
DEVELOPMENT APPLICATION

$FILES LLdesign pxv01 19/05/2016 11:17:51 AM



NOTES:

AREAS UNDER CONSTRUCTION AND BEING USED FOR CONSTRUCTION STRUCTURES ARE INDICATIVE ONLY AND HAVE NOT BEEN CHECKED FOR CURRENCY

SERVICES MAY NOT BE CURRENT AND IT IS THE RESPONSIBILITY OF ALL CONTRACTORS AND CONSULTANTS TO CONFIRM CURRENT SERVICES ONSITE AND BY DIAL-BEFORE-YOU-DIG SERVICES SEARCH

REV.	DATE	AMENDMENTS

NOTES:

COPYRIGHT ? RYGATE & COMPANY PTY. LIMITED 2014. NO PART OF THIS PLAN MAY BE REPRODUCED, COMMUNICATED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM WITHOUT THE WRITTEN PERMISSION OF THE COPYRIGHT OWNER EXCEPT AS PERMITTED BY THE COPYRIGHT ACT 1968. ANY PERMITTED DOWNLOADING, ELECTRONIC STORAGE, DISPLAY, PRINT, COPY, REPRODUCTION OR COMMUNICATION OF THIS SURVEY SHOULD CONTAIN NO ALTERATION OR ADDITION TO THE ORIGINAL SURVEY.

0 — REDUCTION RATIO 600 @ A1 — 60

THIS TITLE BLOCK AND NOTES FORM AN INTEGRAL PART OF THE PLAN AND MUST BE REPRODUCED IN ANY USE, DUPLICATION OR AMENDMENT.

DATUM : AUSTRALIAN HEIGHT DATUM

CONTOUR INTERVAL :

ORIGIN OF LEVELS : S.S.M. 46693 R.L. 2.454 A.H.D.

RYGATE SURVEYORS
SURVEYING SINCE 1893

Rygate & Company Pty Limited
P.W. Rygate & West
ABN 61 001 204 897

Suite 904 Level 9, 89 York St Sydney NSW 2000
p +61 2 9262 6800
f +61 2 9262 6843
e surveyors@rygate.com.au
w rygate.com.au

SUBDIVISION | STRATA PLANS | STRATUM SUBDIVISION | LEASE PLANS | TOPOGRAPHIC SURVEYS | GPS SURVEYS | 3D MODELLING | RACECOURSE DESIGN | PROJECT MANAGEMENT | SUN SHADOW DIAGRAMS

SURVEYOR	DRAWN	CHECKED	APPROVED
AC & SG	SK, GD & TM	TM	TM

CLIENT: LEND LEASE

LOCALITY: BARANGAROO

L.G.A.: CITY OF SYDNEY

PLAN
SHOWING DETAIL & LEVELS
HICKSON ROAD
BARANGAROO

REFERENCE No.	PLAN No.	DATE	SHEET No.
76691		16/12/14	1 OF 1 SHEETS

lendlease
ONE SYDNEY HARBOUR
BARANGAROO

PRINCIPAL ARCHITECT:
RPBW
RENZO PIANO BUILDING WORKSHOP
Via P.P. Rubens 29, 16158 Genova - Italy
Emanuela Baglietto | Nominated Architect NSW ARB 9512

EXECUTIVE ARCHITECT:
Lend Lease Design
ABN 97 000 098 162
30 The Bond, 30 Hickson Road, Millers Point, NSW, 2000
Stephanie Smith | Nominated Architect NSW ARB 6480

STAGE 1B BASEMENT SSD6960
SURVEY PLAN

Checked: *Milan Busina 19.05.2016*
Approved: *Stephanie Smith 19.05.2016*

Drawing: BB2_PA2_A002
Date: 19 May 2016 Revision: B
DEVELOPMENT APPLICATION

$FILES LLdesign pxv01 19/05/2016 11:19:53 AM

30 THE BOND

36 THE BOND

GRAFTON ROAD

HICKSON ROAD

TREES REMOVED DUE TO PROPOSED ROAD

TREES REMOVED DUE TO PROPOSED ROAD

BARTON STREET

WATERMAN'S QUAY

REFER TO PROJECT APPLICATION MP10_0023

BARANGAROO AVENUE

EXISTING SAND FILLED CAISSON SEA WALL TO BE DEMOLISHED TO ALLOW BASEMENT CONSTRUCTION WHERE REQUIRED (SUBSEQUENT TO CONSTRUCTION OF NEW BASEMENT PERIMETER RETENTION SYSTEM

CENTRAL BARANGAROO

BARANGAROO STAGE 1B

BARANGAROO STAGE 1A

LEGEND

- BARANGAROO SOUTH SITE BOUNDARY
- INTERIM KERB / ROAD LINES
- R4A PORTE CONCHERE ENTRY DOCUMENTED BY SEPARATE DA SUBMISSION
- POTENTIAL ADDITIONAL ROCK/SOIL EXCAVATION BEYOND SSD5897
- EXTENT OF HARD STAND DEMOLITION
- ROAD AND SERVICES CONNECTION ZONE
- SERVICES ZONE
- EXTENT OF BASEMENT

lendlease
ONE SYDNEY HARBOUR
BARANGAROO

PRINCIPAL ARCHITECT:
RPBW
RENZO PIANO BUILDING WORKSHOP
Via P.P. Rubens 29, 16158 Genova - Italy
Emanuela Baglietto | Nominated Architect
NSW ARB 9512

EXECUTIVE ARCHITECT:
Lend Lease Design
ABN 97 000 098 162
30 The Bond, 30 Hickson Road
Millers Point, NSW, 2000
Stephanie Smith | Nominated Architect
NSW ARB 6480

STAGE 1B BASEMENT SSD6960
DEMOLITION, EXCAVATION & SERVICES ZONE PLAN

Scale 1 : 500 @ A1 Scale 1:1000 @ A3

0 25M

Checked:
Milan Busina
19.05.2016
Approved:
Stephanie Smith
19.05.2016

Drawing: BB2 _PA2_A003
Date: 19 May 2016 Revision: B
DEVELOPMENT APPLICATION

LEGEND

- BARANGAROO SOUTH SITE BOUNDARY
- CONCRETE IN-SITU RETAINING WALL
- PERIMETER RETAINING WALL DOCUMENTATION COVERED UNDER SEPARATE SUBMISSION NO. SSD5897
- SHARED INFRASTRUCTURE & FACILITIES
- VOID

FITOUT OF ROOMS SUBJECT TO DESIGN DEVELOPMENT PRIOR TO ISSUE CC.

PARKING IS INDICATIVE & SUBJECT TO FUTURE BUILDING APPROVALS.

ALL STRUCTURE IS FOR APPROVAL. LAYOUT, INCLUDING GFA, IS INDICATIVE AND SUBJECT TO CHANGE.

lendlease
ONE SYDNEY HARBOUR
BARANGAROO

PRINCIPAL ARCHITECT:
RPBW
RENZO PIANO BUILDING WORKSHOP
Via P.P. Rubens 29, 16158 Genova - Italy
Emanuela Baglietto | Nominated Architect
NSW ARB 9512

EXECUTIVE ARCHITECT:
Lend Lease Design
ABN 97 000 098 162
30 The Bond, 30 Hickson Road
Millers Point, NSW, 2000
Stephanie Smith | Nominated Architect
NSW ARB 6480

STAGE 1B BASEMENT SSD6960
BASEMENT PLAN LEVEL B0

Scale 1 : 250 @ A1 Scale 1:500 @ A3

0 25M

Checked:
Milan Busina
19.05.2016
Approved:
Stephanie Smith
19.05.2016

Drawing: BB2 _PA2_A100
Date: 19 May 2016 Revision: B
DEVELOPMENT APPLICATION

LEGEND

- BARANGAROO SOUTH SITE BOUNDARY
- CONCRETE IN-SITU RETAINING WALL
- PERIMETER RETAINING WALL DOCUMENTATION COVERED UNDER SEPARATE SUBMISSION NO. SSD5897
- SHARED INFRASTRUCTURE & FACILITIES
- BASEMENT GFA

FITOUT OF ROOMS SUBJECT TO DESIGN DEVELOPMENT PRIOR TO ISSUE CC.

PARKING IS INDICATIVE & SUBJECT TO FUTURE BUILDING APPROVALS.

ALL STRUCTURE IS FOR APPROVAL. LAYOUT, INCLUDING GFA, IS INDICATIVE AND SUBJECT TO CHANGE.

lendlease
ONE SYDNEY HARBOUR
BARANGAROO

PRINCIPAL ARCHITECT:
RPBW
RENZO PIANO BUILDING WORKSHOP
Via P.P. Rubens 29, 16158 Genova - Italy
Emanuela Baglietto | Nominated Architect
NSW ARB 9512

EXECUTIVE ARCHITECT:
Lend Lease Design
ABN 97 000 098 162
30 The Bond, 30 Hickson Road
Millers Point, NSW, 2000
Stephanie Smith | Nominated Architect
NSW ARB 6480

STAGE 1B BASEMENT SSD6960
BASEMENT PLAN LEVEL B1

Scale 1 : 250 @ A1 Scale 1:500 @ A3

0 25M

Checked:
Milan Busina
19.05.2016
Approved:
Stephanie Smith
19.05.2016

Drawing: BB2 _PA2_A101
Date: 19 May 2016 Revision: B
DEVELOPMENT APPLICATION

LEGEND

- BARANGAROO SOUTH SITE BOUNDARY
- CONCRETE IN-SITU RETAINING WALL
- PERIMETER RETAINING WALL DOCUMENTATION COVERED UNDER SEPARATE SUBMISSION NO. SSD5897
- SHARED INFRASTRUCTURE & FACILITIES

FITOUT OF ROOMS SUBJECT TO DESIGN DEVELOPMENT PRIOR TO ISSUE CC.

PARKING IS INDICATIVE & SUBJECT TO FUTURE BUILDING APPROVALS.

ALL STRUCTURE IS FOR APPROVAL. LAYOUT, INCLUDING GFA, IS INDICATIVE AND SUBJECT TO CHANGE.

lendlease
ONE SYDNEY HARBOUR
BARANGAROO

PRINCIPAL ARCHITECT:
RPBW
RENZO PIANO BUILDING WORKSHOP
Via P.P. Rubens 29, 16158 Genova - Italy
Emanuela Baglietto | Nominated Architect
NSW ARB 9512

EXECUTIVE ARCHITECT:
Lend Lease Design
ABN 97 000 098 162
30 The Bond, 30 Hickson Road
Millers Point, NSW, 2000
Stephanie Smith | Nominated Architect
NSW ARB 6480

STAGE 1B BASEMENT SSD6960
BASEMENT PLAN LEVEL B2

Scale 1 : 250 @ A1 Scale 1:500 @ A3

0 25M

Checked:
Milan Busina
19.05.2016
Approved:
Stephanie Smith
19.05.2016

Drawing: BB2 _PA2_A102
Date: 19 May 2016 Revision: B
DEVELOPMENT APPLICATION

LEGEND

- BARANGAROO SOUTH SITE BOUNDARY
- CONCRETE IN-SITU RETAINING WALL
- PERIMETER RETAINING WALL DOCUMENTATION COVERED UNDER SEPARATE SUBMISSION NO. SSD5897
- SHARED INFRASTRUCTURE & FACILITIES

FITOUT OF ROOMS SUBJECT TO DESIGN DEVELOPMENT PRIOR TO ISSUE CC.

PARKING IS INDICATIVE & SUBJECT TO FUTURE BUILDING APPROVALS.

ALL STRUCTURE IS FOR APPROVAL. LAYOUT, INCLUDING GFA, IS INDICATIVE AND SUBJECT TO CHANGE.

lendlease
ONE SYDNEY HARBOUR
BARANGAROO

PRINCIPAL ARCHITECT:
RPBW
RENZO PIANO BUILDING WORKSHOP
Via P.P. Rubens 29, 16158 Genova - Italy
Emanuela Baglietto | Nominated Architect
NSW ARB 9512

EXECUTIVE ARCHITECT:
Lend Lease Design
ABN 97 000 098 162
30 The Bond, 30 Hickson Road
Millers Point, NSW, 2000
Stephanie Smith | Nominated Architect
NSW ARB 6480

STAGE 1B BASEMENT SSD6960
BASEMENT PLAN LEVEL B3

Scale 1 : 250 @ A1 Scale 1:500 @ A3

0 25M

Checked:
Milan Busina
19.05.2016
Approved:
Stephanie Smith
19.05.2016

Drawing: BB2 _PA2_A103
Date: 19 May 2016 Revision: B
DEVELOPMENT APPLICATION

LEGEND

- BARANGAROO SOUTH SITE BOUNDARY
- CONCRETE IN-SITU RETAINING WALL
- PERIMETER RETAINING WALL DOCUMENTATION COVERED UNDER SEPARATE SUBMISSION NO. SSD5897
- SHARED INFRASTRUCTURE & FACILITIES

FITOUT OF ROOMS SUBJECT TO DESIGN DEVELOPMENT PRIOR TO ISSUE CC.

PARKING IS INDICATIVE & SUBJECT TO FUTURE BUILDING APPROVALS.

ALL STRUCTURE IS FOR APPROVAL. LAYOUT, INCLUDING GFA, IS INDICATIVE AND SUBJECT TO CHANGE.

lendlease
ONE SYDNEY HARBOUR
BARANGAROO

PRINCIPAL ARCHITECT:
RPBW
RENZO PIANO BUILDING WORKSHOP
Via P.P. Rubens 29, 16158 Genova - Italy
Emanuela Baglietto | Nominated Architect
NSW ARB 9512

EXECUTIVE ARCHITECT:
Lend Lease Design
ABN 97 000 098 162
30 The Bond, 30 Hickson Road
Millers Point, NSW, 2000
Stephanie Smith | Nominated Architect
NSW ARB 6480

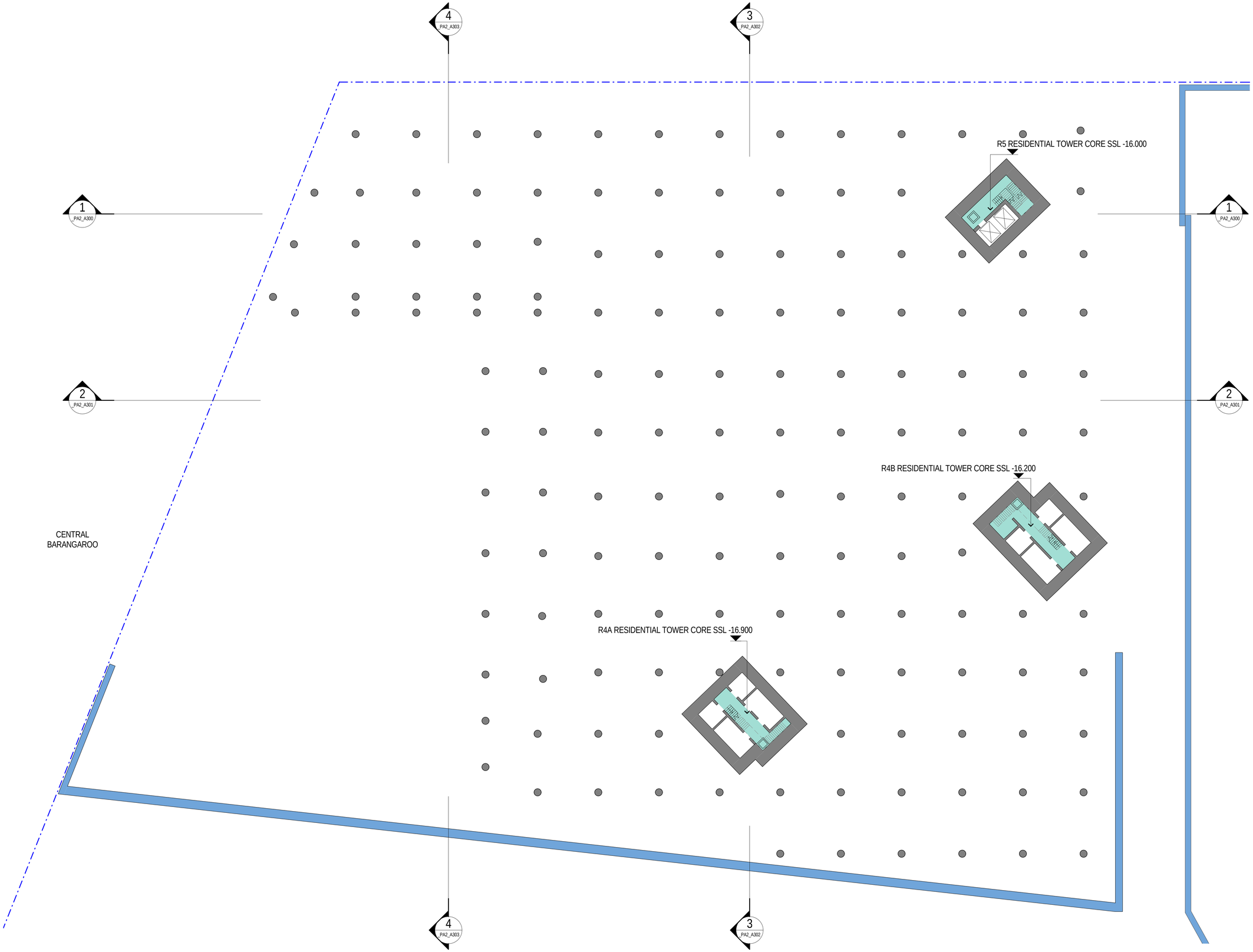
STAGE 1B BASEMENT SSD6960
BASEMENT PLAN LEVEL B4

Scale 1 : 250 @ A1 Scale 1:500 @ A3

0 25M

Checked:
Milan Busina 19.05.2016
Approved:
Stephanie Smith 19.05.2016

Drawing: BB2 _PA2_A104
Date: 19 May 2016 Revision: B
DEVELOPMENT APPLICATION



LEGEND

- BARANGAROO SOUTH SITE BOUNDARY
- CONCRETE IN-SITU RETAINING WALL
- PERIMETER RETAINING WALL DOCUMENTATION COVERED UNDER SEPARATE SUBMISSION NO. SSD5897
- SHARED INFRASTRUCTURE & FACILITIES

FITOUT OF ROOMS SUBJECT TO DESIGN DEVELOPMENT PRIOR TO ISSUE CC.

PARKING IS INDICATIVE & SUBJECT TO FUTURE BUILDING APPROVALS.

ALL STRUCTURE IS FOR APPROVAL. LAYOUT, INCLUDING GFA, IS INDICATIVE AND SUBJECT TO CHANGE.

lendlease
ONE SYDNEY HARBOUR
BARANGAROO

PRINCIPAL ARCHITECT:
RPBW
RENZO PIANO BUILDING WORKSHOP
Via P.P. Rubens 29, 16158 Genova - Italy
Emanuela Baglietto | Nominated Architect
NSW ARB 9512

EXECUTIVE ARCHITECT:
Lend Lease Design
ABN 97 000 098 162
30 The Bond, 30 Hickson Road
Millers Point, NSW, 2000
Stephanie Smith | Nominated Architect
NSW ARB 6480

STAGE 1B BASEMENT SSD6960
BASEMENT PLAN LEVEL B5

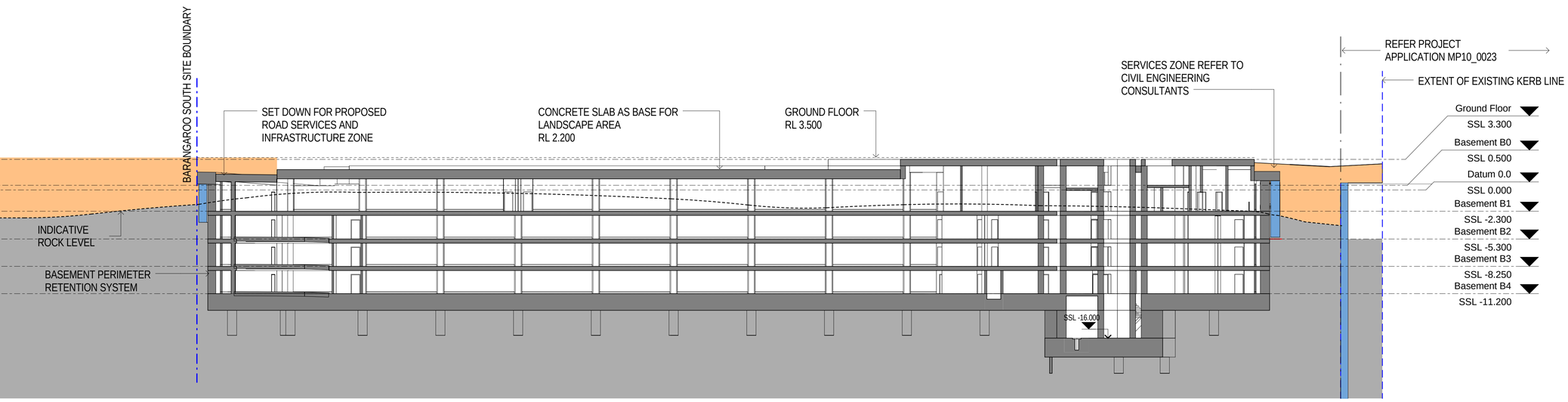
Scale 1 : 250 @ A1 Scale 1:500 @ A3

0 25M

Checked:
Milan Busina
19.05.2016
Approved:
Stephanie Smith
19.05.2016

Drawing: BB2 _PA2_A105
Date: 19 May 2016 Revision: B
DEVELOPMENT APPLICATION

KEY PLAN



lendlease
ONE SYDNEY HARBOUR
BARANGAROO

PRINCIPAL ARCHITECT:
RPBW
RENZO PIANO BUILDING WORKSHOP
Via P.P. Rubens 29, 16158 Genova - Italy
Emanuela Baglietto | Nominated Architect
NSW ARB 9512

EXECUTIVE ARCHITECT:
Lend Lease Design
ABN 97 000 098 162
30 The Bond, 30 Hickson Road
Millers Point, NSW, 2000
Stephanie Smith | Nominated Architect
NSW ARB 6480

STAGE 1B BASEMENT SSD6960
SECTION 01

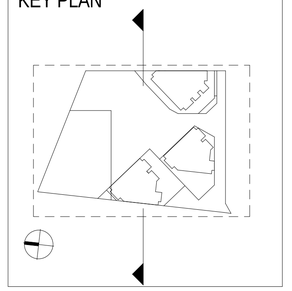
Scale 1 : 250 @ A1 Scale 1:500 @ A3

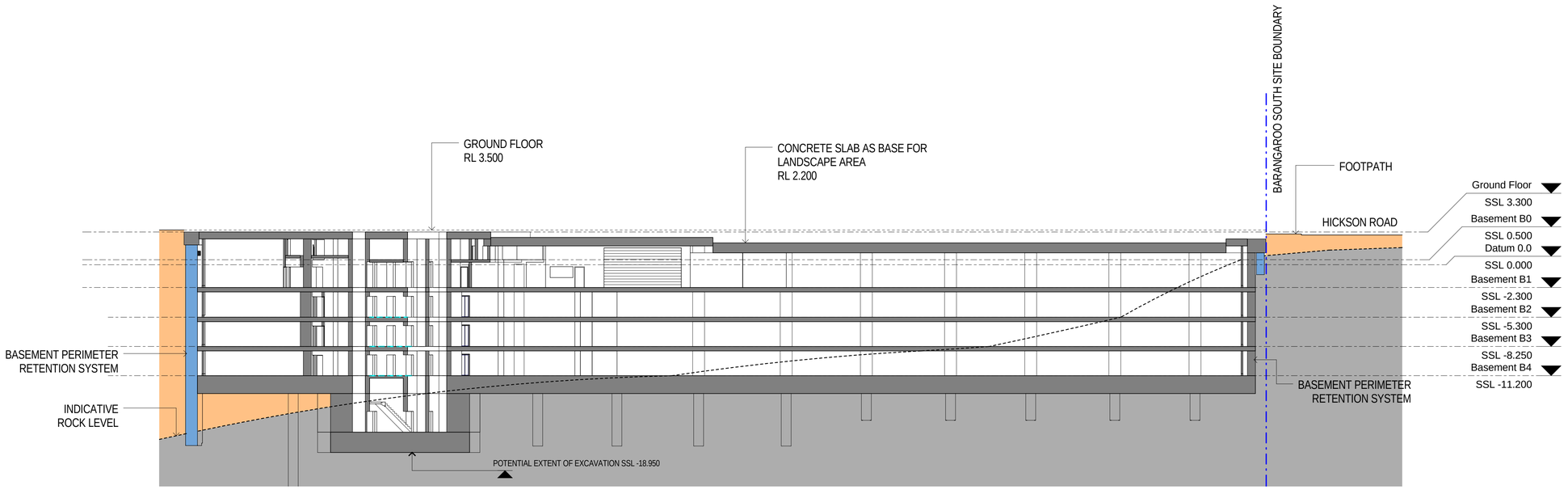
0 25M

Checked:
Milan Busina
19.05.2016
Approved:
Stephanie Smith
19.05.2016

Drawing: BB2 _PA2_A300
Date: 19 May 2016 Revision: B
DEVELOPMENT APPLICATION

KEY PLAN





lendlease
ONE SYDNEY HARBOUR
BARANGAROO

PRINCIPAL ARCHITECT:
RPBW
RENZO PIANO BUILDING WORKSHOP
Via P.P. Rubens 29, 16158 Genova - Italy
Emanuela Baglietto | Nominated Architect
NSW ARB 9512

EXECUTIVE ARCHITECT:
Lend Lease Design
ABN 97 000 098 162
30 The Bond, 30 Hickson Road
Millers Point, NSW, 2000
Stephanie Smith | Nominated Architect
NSW ARB 6480

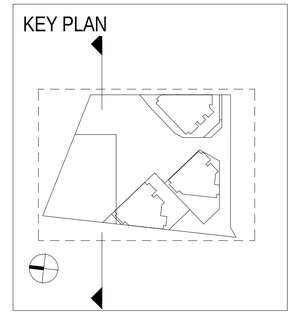
STAGE 1B BASEMENT SSD6960
SECTION 03

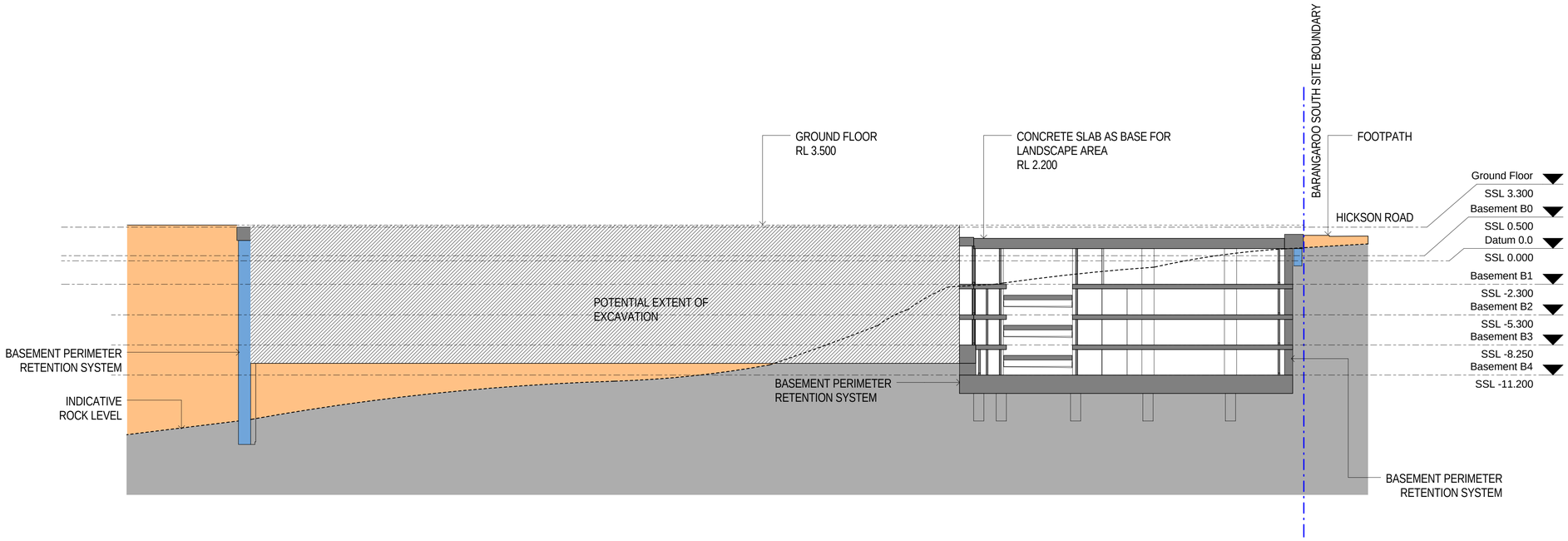
Scale 1 : 250 @ A1 Scale 1:500 @ A3

0 25M

Checked:
Milan Busina
19.05.2016
Approved:
Stephanie Smith
19.05.2016

Drawing: BB2 _PA2_A302
Date: 19 May 2016 Revision: B
DEVELOPMENT APPLICATION





lendlease
ONE SYDNEY HARBOUR
BARANGAROO

PRINCIPAL ARCHITECT:
RPBW
RENZO PIANO BUILDING WORKSHOP
Via P.P. Rubens 29, 16158 Genova - Italy
Emanuela Baglietto | Nominated Architect
NSW ARB 9512

EXECUTIVE ARCHITECT:
Lend Lease Design
ABN 97 000 098 162
30 The Bond, 30 Hickson Road
Millers Point, NSW, 2000
Stephanie Smith | Nominated Architect
NSW ARB 6480

STAGE 1B BASEMENT SSD6960
SECTION 04

Scale 1 : 250 @ A1 Scale 1:500 @ A3
0 25M

Checked:
Milan Busina
19.05.2016
Approved:
Stephanie Smith
19.05.2016

Drawing: BB2 _PA2_A303
Date: 19 May 2016 Revision: B
DEVELOPMENT APPLICATION

HICKSON ROAD

BARTON STREET

WATERMAN'S QUAY

BARANGAROO AVENUE

BASEMENT EXIT

LIFT LOBBY

LIFT SHAFT

CAR PARK AIR SUPPLY

LIFT LOBBY

LIFT SHAFT

FIRE BOOSTER VALVES

BASEMENT EXIT

FIRE CONTROL ROOM

CAR PARK AIR SUPPLY

RS

CAR PARK ROLLER SHUTTER

BASEMENT EXIT 2

BASEMENT EXIT 1

DIESEL GENERATOR

LOADING DOCK AIR EXHAUST

CAR PARK AIR EXHAUST

LIFT LOBBY

LIFT SHAFT

SUBSTATION 10 EXIT 2

SUBSTATION 10 EXIT 1

KEY PLAN

LEGEND

BARANGAROO SOUTH SITE BOUNDARY

INTERIM KERB / ROAD LINES

R4A PORTE CONCHERE ENTRY DOCUMENTED BY SEPARATE DA SUBMISSION

TEMPORARY BUILDING ELEMENTS

ROAD LAYOUT INDICATIVE ONLY

lendlease

ONE SYDNEY HARBOUR

BARANGAROO

PRINCIPAL ARCHITECT:

RPBW

RENZO PIANO BUILDING WORKSHOP
Via P.P. Rubens 29, 16158 Genova - Italy

Emanuela Baglietto | Nominated Architect
NSW ARB 9512

EXECUTIVE ARCHITECT:

Lend Lease Design
ABN 97 000 098 162
30 The Bond, 30 Hickson Road
Millers Point, NSW, 2000

Stephanie Smith | Nominated Architect
NSW ARB 6480

STAGE 1B BASEMENT SSD6960
BUILDING ELEMENTS - GROUND FLOOR

Scale 1 : 250 @ A1

Scale 1:500 @ A3

0 25M

Checked:
Milan Busina
19.05.2016

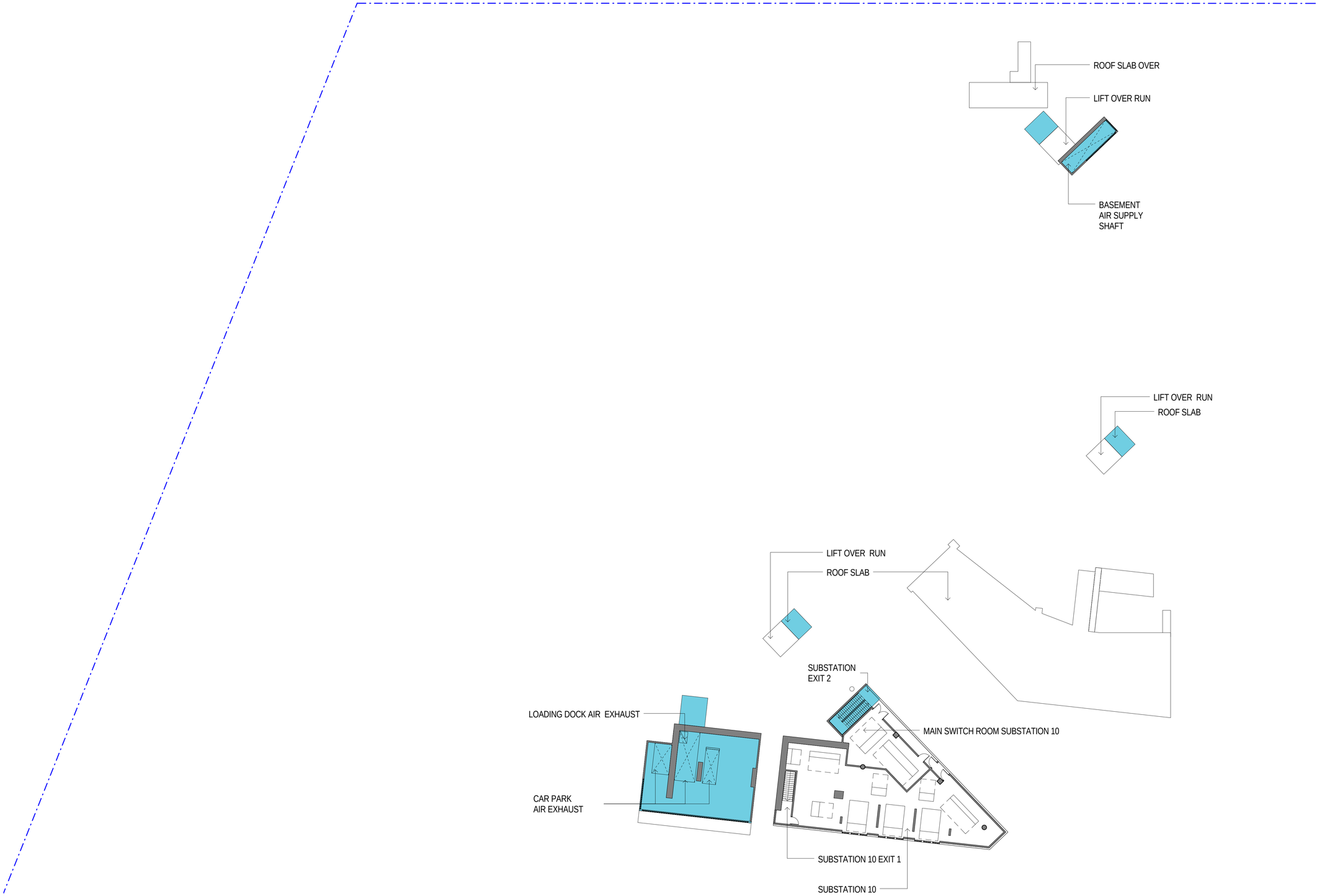
Approved:
Stephanie Smith
19.05.2016

Drawing: BB2 _PA2_A400

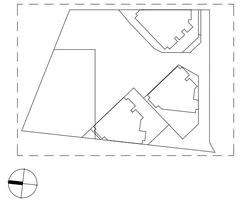
Date: 19 May 2016

Revision: B

DEVELOPMENT APPLICATION



KEY PLAN



BARANGAROO SOUTH
SITE BOUNDARY

TEMPORARY BUILDING
ELEMENTS

lendlease
ONE SYDNEY HARBOUR
BARANGAROO

PRINCIPAL ARCHITECT:
RPBW
RENZO PIANO BUILDING WORKSHOP
Via P.P. Rubens 29, 16158 Genova - Italy
Emanuela Baglietto | Nominated Architect
NSW ARB 9512

EXECUTIVE ARCHITECT:
Lend Lease Design
ABN 97 000 098 162
30 The Bond, 30 Hickson Road
Millers Point, NSW, 2000
Stephanie Smith | Nominated Architect
NSW ARB 6480

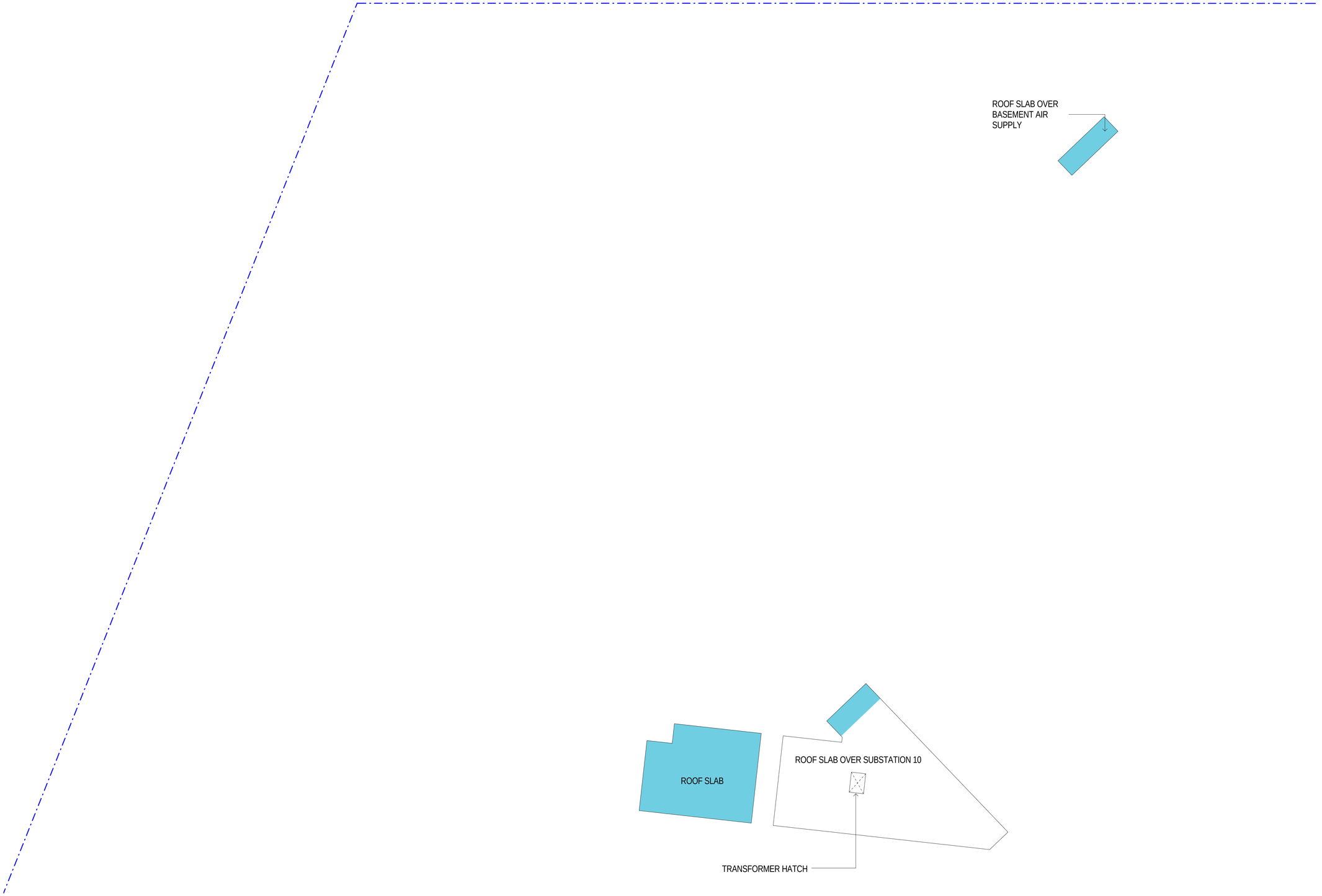
STAGE 1B BASEMENT SSD6960
BUILDING ELEMENTS - PODIUM P1

Scale 1 : 250 @ A1 Scale 1:500 @ A3

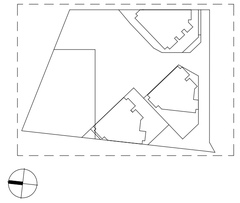
0 25M

Checked:
Milan Busina
19.05.2016
Approved:
Stephanie Smith
19.05.2016

Drawing: BB2 _PA2_A401
Date: 19 May 2016 Revision: B
DEVELOPMENT APPLICATION



KEY PLAN



BARANGAROO SOUTH
SITE BOUNDARY

TEMPORARY BUILDING
ELEMENTS

lendlease
ONE SYDNEY HARBOUR
BARANGAROO

PRINCIPAL ARCHITECT:
RPBW
RENZO PIANO BUILDING WORKSHOP
Via P.P. Rubens 29, 16158 Genova - Italy
Emanuela Baglietto | Nominated Architect
NSW ARB 9512

EXECUTIVE ARCHITECT:
Lend Lease Design
ABN 97 000 098 162
30 The Bond, 30 Hickson Road
Millers Point, NSW, 2000
Stephanie Smith | Nominated Architect
NSW ARB 6480

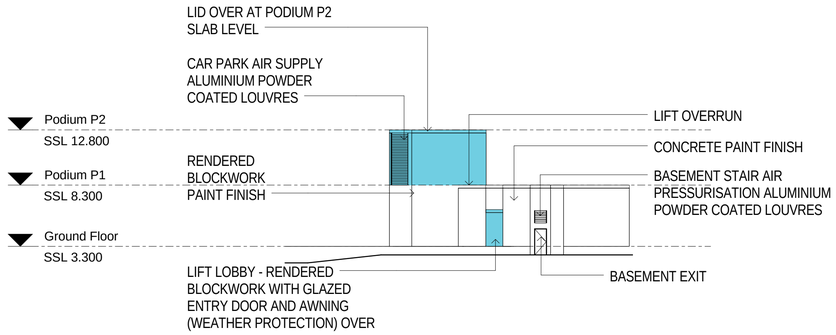
STAGE 1B BASEMENT SSD6960
BUILDING ELEMENTS - PODIUM P2

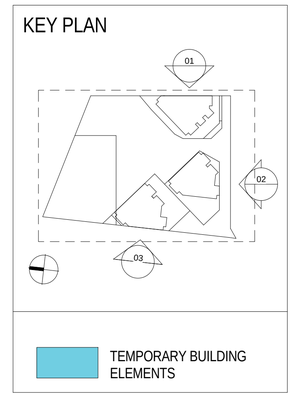
Scale 1 : 250 @ A1 Scale 1:500 @ A3

0 25M

Checked:
Milan Busina
19.05.2016
Approved:
Stephanie Smith
19.05.2016

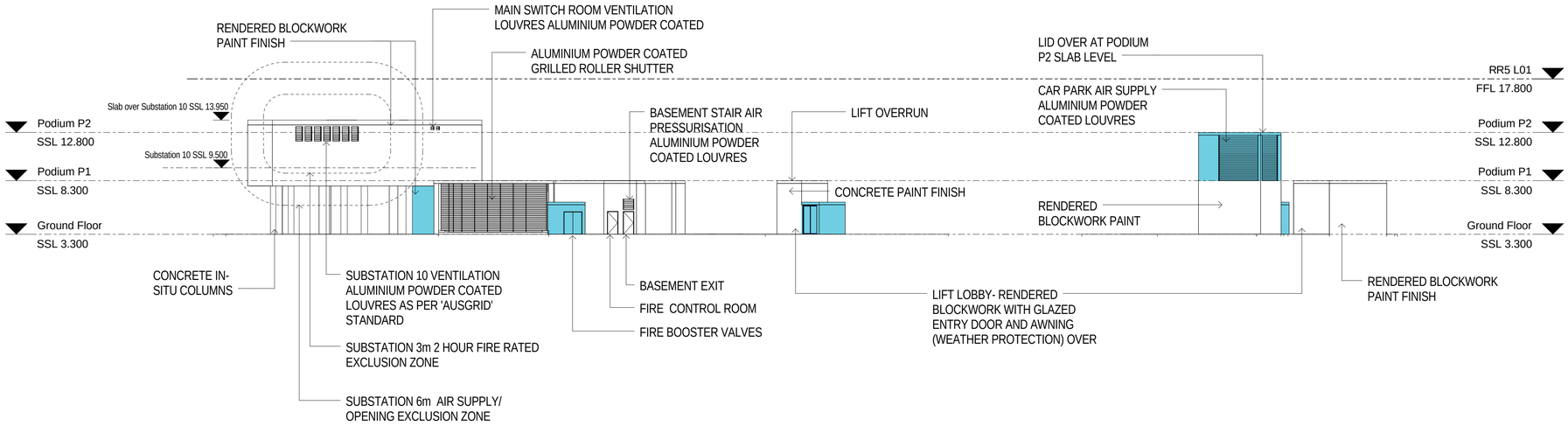
Drawing: BB2 _PA2_A402
Date: 19 May 2016 Revision: B
DEVELOPMENT APPLICATION





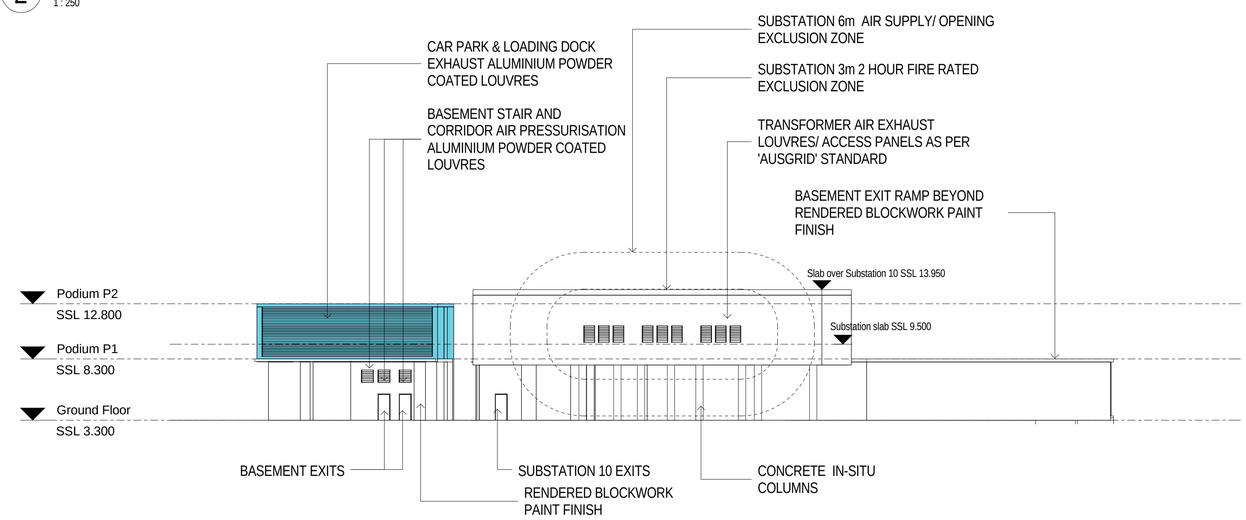
1 HICKSON ROAD ELEVATION

1 : 250



2 WATERMAN'S QUAY ELEVATION

1 : 250



3 BARANGAROO AVENUE ELEVATION

1 : 250

lendlease
ONE SYDNEY HARBOUR
BARANGAROO

PRINCIPAL ARCHITECT:
RPBW
RENZO PIANO BUILDING WORKSHOP
Via P.P. Rubens 29, 16158 Genova - Italy
Emanuela Baglietto | Nominated Architect
NSW ARB 9512

EXECUTIVE ARCHITECT:
Lend Lease Design
ABN 97 000 098 162
30 The Bond, 30 Hickson Road
Millers Point, NSW, 2000
Stephanie Smith | Nominated Architect
NSW ARB 6480

STAGE 1B BASEMENT SSD6960
BUILDING ELEMENTS - ELEVATIONS

Scale 1 : 250 @ A1 Scale 1:500 @ A3

0 25M

Checked:
Milan Busina
19.05.2016
Approved:
Stephanie Smith
19.05.2016

Drawing: BB2 _PA2_A501
Date: 19 May 2016 Revision: B
DEVELOPMENT APPLICATION

Attachment 5: Table T1 - Applicable ORWN Services Zone Soil Analytical Results

Location	AECOM_BH01	AECOM_BH01	AECOM_BH01	AECOM_BH01	AECOM_BH01	AECOM_BH01	AECOM_BH33	AECOM_BH33	AECOM_BH36	AECOM_BH36	AECOM_BH36
Sample Field ID	BH01_0.3-0.4	BH01_1.0-1.2	BH01_2.0-2.2	BH01_4.0-4.1	QC01	QC02	BH33_0.75-0.85	BH33_5.0-5.2	BH36_1.0-1.2	BH36_2.5-2.9	BH36_4.0-4.4
Sample Depth (m)	0.3-0.4	1-1.2	2-2.2	4-4.1	1-1.2	1-1.2	0.75-0.85	5-5.2	1-1.2	2.5-2.9	4-4.4
Matrix	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill
Sample Type	Normal	Normal	Normal	Normal	Field_D	Interlab_D	Normal	Normal	Normal	Normal	Normal
Area	ORWN Services	ORWN Services	ORWN Services	ORWN Services	ORWN Services	ORWN Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services
Sample Date	12/02/2009	12/02/2009	12/02/2009	12/02/2009	12/02/2009	12/02/2009	2/12/2010	2/12/2010	3/03/2010	3/03/2010	3/03/2010

Chem_Group	ChemName	output unit	EQL	ASC NEPM (NEPC, 2013) EIL	ASC NEPM (NEPC 2013) HILD D										
Metals	Arsenic	mg/kg	4	**160**	3000	<5	<5	<5	<5	<5	<1	<5	6	<5	-	<5
	Barium	mg/kg	10			20	40	70	40	30	15	-	-	10	-	30
	Beryllium	mg/kg	1			1	<1	<1	<1	<1	<1	-	-	<1	-	<1
	Cadmium	mg/kg	0.5		900	<1	<1	<1	<1	<1	<0.1	<1	<1	<1	-	<1
	Chromium	mg/kg	1			2	7	18	10	6	6	8	10	8	-	7
	Chromium (hexavalent)	mg/kg	0.5		3600	-	-	-	-	-	-	-	-	-	-	-
	Cobalt	mg/kg	2		4000	12	3	5	6	2	1	-	-	<2	-	<2
	Copper	mg/kg	1		240,000	331	17	44	92	11	6	264	12	<5	-	<5
	Iron	mg/kg	50			-	-	-	-	-	-	-	-	-	-	-
	Lead	mg/kg	1	**1800**	1500	6	19	30	16	14	11	6	36	17	-	9
	Manganese	mg/kg	5		60,000	725	152	329	355	105	78	-	-	43	-	73
	Mercury	mg/kg	0.1		730	<0.1	-	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	-	<0.1
	Nickel	mg/kg	1		6000	6	4	8	5	2	2	10	12	<2	-	2
	Vanadium	mg/kg	5			106	16	32	51	16	11	-	-	12	-	12
	Zinc	mg/kg	1		400,000	46	38	2070	42	26	16	50	77	14	-	17
PAHs	2-chloronaphthalene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	<0.5
	2-methylnaphthalene	mg/kg	0.5			-	-	-	-	-	-	-	-	<0.5	-	<0.5
	3-methylcholanthrene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	<0.5
	Acenaphthene	mg/kg	0.1			-	-	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5
	Acenaphthylene	mg/kg	0.1			-	-	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5
	Acetophenone	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	<0.5
	Anthracene	mg/kg	0.1			-	-	-	1.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5
	Benz(a)anthracene	mg/kg	0.1			-	-	-	1.9	<0.5	<0.5	-	<0.5	<0.5	-	<0.5
	Benzo(a) pyrene	mg/kg	0.05			-	-	-	1.2	<0.5	<0.5	-	<0.5	<0.5	-	<0.5
	Benzo(b)&(k)fluoranthene	mg/kg	0.2			-	-	-	-	-	<1	-	-	-	-	<1
	Benzo(b)fluoranthene	mg/kg	0.5			-	-	-	1.2	<0.5	-	-	<0.5	<0.5	-	-
	Benzo(g,h,i)perylene	mg/kg	0.1			-	-	-	0.6	<0.5	<0.5	-	<0.5	<0.5	-	<0.5
	Benzo(k)fluoranthene	mg/kg	0.5			-	-	-	0.7	<0.5	-	-	<0.5	<0.5	-	-
	Chrysene	mg/kg	0.1			-	-	-	1.4	<0.5	<0.5	-	<0.5	<0.5	-	<0.5
	Dibenz(a,h)anthracene	mg/kg	0.1			-	-	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5
	Fluoranthene	mg/kg	0.1			-	-	-	4.9	<0.5	<0.5	-	<0.5	<0.5	-	<0.5
	Fluorene	mg/kg	0.1			-	-	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1			-	-	-	0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5
	Naphthalene	mg/kg	0.1	**370**	1900*	-	-	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5
	CPAH (ESDAT)	mg/kg			40	-	-	-	7.5	<4	<3	-	<4	<4	-	<3
	PAHs (Sum of total)	mg/kg	0.5		4000	-	-	-	-	-	0	-	-	<0.5	-	-
	Phenanthrene	mg/kg	0.1			-	-	-	5.3	<0.5	<0.5	-	<0.5	<0.5	-	<0.5
	Pyrene	mg/kg	0.1			-	-	-	4.4	<0.5	<0.5	-	<0.5	<0.5	-	<0.5
Phenols	2,4-dimethylphenol	mg/kg	0.01			-	-	-	-	-	-	-	<0.5	<0.5	-	<0.5
	2-methylphenol	mg/kg	0.01			-	-	-	-	-	-	-	<0.5	<0.5	-	<0.5
	2-nitrophenol	mg/kg	0.01			-	-	-	-	-	-	-	<0.5	<0.5	-	<0.5
	3-&4-methylphenol	mg/kg	0.5			-	-	-	-	-	-	-	<1	<1	-	<0.5
	3-Methylphenol	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-
	4-chloro-3-methylphenol	mg/kg	0.01			-	-	-	-	-	-	-	<0.5	<0.5	-	<0.5
	4-methylphenol	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-
	4-nitrophenol	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-
	Phenol	mg/kg	0.01			-	-	-	-	-	-	-	<0.5	<0.5	-	<0.5
	Phenolics Total	mg/kg				-	-	-	-	-	-	-	-	-	-	-
TPH	TPH C6 - C9	mg/kg	2		5100*	-	-	-	<10	<10	<10	<10	<10	<10	-	<10
	TPH C10 - C14	mg/kg	50		3800*	-	-	-	<50	<50	<50	<50	<50	<50	-	<50
	TPH C15-C28	mg/kg	100		5300*	-	-	-	<100	<100	<100	<100	<100	<100	-	<100
	TPH C29-C36	mg/kg	100		7400*	-	-	-	<100	<100	<100	<100	<100	<100	-	<100
Asbestos	Asbestos fibres	-	0.1			-	-	-	-	-	-	-	-	-	-	-
	weight of sample	g	0.01			-	-	-	-	-	-	-	-	-	-	-
BTEX	Total Xylene (ESDAT)	mg/kg	0.15			-	-	-	<1	<1	<1.5 - 0	<1	<1	<1	-	<1
	Benzene	mg/kg	0.2		120*	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2
	Ethylbenzene	mg/kg	0.2		5300*	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5
	Toluene	mg/kg	0.2		18000*	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5
	Xylene (m & p)	mg/kg	0.2		15000*	-	-	-	<0.5	<0.5	<1	<0.5	<0.5	<0.5	-	<0.5
	Xylene (o)	mg/kg	0.2			-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5

NOTES: EIL - Ecological Investigation Level
HIL - Health Investigation Level
* CRC Care (2011) Health Screening Level - Direct Contact

Location	AECOM_BH36	AECOM_BH37	AECOM_BH37	AECOM_BH37	AECOM_BH38	AECOM_BH38	AECOM_BH39	AECOM_BH39	AECOM_BH39	AECOM_BH39	AECOM_BH40
Sample Field ID	BH36-0.07-0.1	BH37_0.06-0.1	BH37_2.5-2.7	BH37_5.5-5.7	BH38_0.15-0.25	BH38_2.5-2.7	BH39_0.15-0.25	BH39-2.5-2.7	BH39-20.5-20.7	BH39-4.0-4.2	BH40_1.0-1.2
Sample Depth (m)	0.7-0.1	0.06-0.1	2.5-2.7	5.5-5.7	0.15-0.25	2.5-2.7	0.15-0.25	2.5-2.7	20.5-20.7	4-4.2	1-1.2
Matrix	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Area	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	ORWN Services	ORWN Services	ORWN Services	ORWN Services	ORWN Services	ORWN Services	ORWN Services
Sample Date	19/02/2010	17/02/2010	17/02/2010	18/02/2010	18/02/2010	19/02/2010	18/02/2010	23/02/2010	24/02/2010	24/02/2010	18/02/2010

Chem_Group	ChemName	output unit	EQL	ASC NEPM (NEPC, 2013) EIL	ASC NEPM (NEPC 2013) HILD D										
Metals	Arsenic	mg/kg	4	**160**	3000	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	Barium	mg/kg	10			20	20	<10	30	30	30	20	110	10	110	20
	Beryllium	mg/kg	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Cadmium	mg/kg	0.5		900	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chromium	mg/kg	1			2	2	5	8	4	6	2	8	4	10	9
	Chromium (hexavalent)	mg/kg	0.5		3600	-	-	-	<0.5	-	-	-	-	-	-	-
	Cobalt	mg/kg	2		4000	12	12	<2	3	13	<2	13	3	<2	3	3
	Copper	mg/kg	1		240,000	256	225	23	<5	231	15	247	<5	<5	<5	<5
	Iron	mg/kg	50			-	-	-	8730	-	-	-	-	-	-	-
	Lead	mg/kg	1	**1800**	1500	6	6	9	20	11	31	6	6	<5	7	10
	Manganese	mg/kg	5		60,000	753	768	9	125	864	185	819	156	<5	206	181
	Mercury	mg/kg	0.1		730	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Nickel	mg/kg	1		6000	7	7	<2	5	7	3	7	3	<2	3	4
	Vanadium	mg/kg	5			119	125	8	15	128	14	139	10	<5	11	13
	Zinc	mg/kg	1		400,000	51	47	11	28	50	57	52	18	<5	16	20
PAHs	2-chloronaphthalene	mg/kg	0.5			-	-	-	-	-	-	-	-	<0.5	-	-
	2-methylnaphthalene	mg/kg	0.5			-	-	-	-	-	-	-	-	<0.5	-	-
	3-methylcholanthrene	mg/kg	0.5			-	-	-	-	-	-	-	-	<0.5	-	-
	Acenaphthene	mg/kg	0.1			-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-
	Acenaphthylene	mg/kg	0.1			-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-
	Acetophenone	mg/kg	0.5			-	-	-	-	-	-	-	-	<0.5	-	-
	Anthracene	mg/kg	0.1			-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-
	Benz(a)anthracene	mg/kg	0.1			-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-
	Benzo(a) pyrene	mg/kg	0.05			-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-
	Benzo(b)&(k)fluoranthene	mg/kg	0.2			-	-	-	-	-	-	-	-	<1	-	-
	Benzo(b)fluoranthene	mg/kg	0.5			-	-	-	<0.5	-	-	-	-	-	<0.5	-
	Benzo(g,h,i)perylene	mg/kg	0.1			-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-
	Benzo(k)fluoranthene	mg/kg	0.5			-	-	-	<0.5	-	-	-	-	-	<0.5	-
	Chrysene	mg/kg	0.1			-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-
	Dibenz(a,h)anthracene	mg/kg	0.1			-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-
	Fluoranthene	mg/kg	0.1			-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-
	Fluorene	mg/kg	0.1			-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1			-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-
	Naphthalene	mg/kg	0.1	**370**	1900*	-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-
	CPAH (ESDAT)	mg/kg			40	-	-	-	<4	-	-	-	-	<3	<4	-
	PAHs (Sum of total)	mg/kg	0.5		4000	-	-	-	-	-	-	-	-	-	-	-
	Phenanthrene	mg/kg	0.1			-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-
	Pyrene	mg/kg	0.1			-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-
Phenols	2,4-dimethylphenol	mg/kg	0.01			-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-
	2-methylphenol	mg/kg	0.01			-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-
	2-nitrophenol	mg/kg	0.01			-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-
	3-&4-methylphenol	mg/kg	0.5			-	-	-	<1	-	-	-	-	<0.5	<1	-
	3-Methylphenol	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-
	4-chloro-3-methylphenol	mg/kg	0.01			-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-
	4-methylphenol	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-
	4-nitrophenol	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-
	Phenol	mg/kg	0.01			-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-
	Phenolics Total	mg/kg				-	-	-	-	-	-	-	-	-	-	-
TPH	TPH C6 - C9	mg/kg	2		5100*	-	-	-	<10	-	-	-	-	<10	<10	-
	TPH C10 - C14	mg/kg	50		3800*	-	-	-	<50	-	-	-	-	<50	<50	-
	TPH C15-C28	mg/kg	100		5300*	-	-	-	<100	-	-	-	-	<100	<100	-
	TPH C29-C36	mg/kg	100		7400*	-	-	-	<100	-	-	-	-	<100	<100	-
Asbestos	Asbestos fibres	-	0.1			-	-	-	-	-	0	-	-	-	-	-
	weight of sample	g	0.01			-	-	-	-	-	20.2	-	-	-	-	-
BTEX	Total Xylene (ESDAT)	mg/kg	0.15			-	-	-	<1	-	-	-	-	<1	<1	-
	Benzene	mg/kg	0.2		120*	-	-	-	<0.2	-	-	-	-	<0.2	<0.2	-
	Ethylbenzene	mg/kg	0.2		5300*	-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-
	Toluene	mg/kg	0.2		18000*	-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-
	Xylene (m & p)	mg/kg	0.2		15000*	-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-
	Xylene (o)	mg/kg	0.2			-	-	-	<0.5	-	-	-	-	<0.5	<0.5	-

NOTES: EIL - Ecological Investigation Level
HIL - Health Investigation Level
* CRC Care (2011) Health Screening Level - Direct Contact

Location	AECOM_BH41	AECOM_BH41	AECOM_BH41	AECOM_BH46	AECOM_BH46	AECOM_BH46	BH017	BH017	BH017	BH049	BH049
Sample Field ID	BH41_0.07-0.1	BH41_1.0-1.4	BH41_4.0-4.4	BH46-1.0-1.2	BH46-4.0-4.2	QC56	BH017 0.5-0.6	BH017 1.5-1.95	BH017 3.0-3.45	BH049_0.3-0.5	BH049_3.0-3.45
Sample Depth (m)	0.07-0.1	1-1.4	4-4.4	1-1.2	4-4.2	1-1.2	0.5-0.6	1.5-1.95	3-3.45	0.3-0.5	3-3.45
Matrix	Fill	Fill	Fill	Fill	Fill		Fill	Fill	Fill	Fill	Fill
Sample Type	Normal	Normal	Normal	Normal	Normal	Field_D	Normal	Normal	Normal	Normal	Normal
Area	Block 4 Services	Block 4 Services	Block 4 Services	ORWN Services	ORWN Services	ORWN Services	ORWN Services	ORWN Services	ORWN Services	ORWN Services	ORWN Services
Sample Date	19/02/2010	4/03/2010	4/03/2010	23/02/2010	23/02/2010	23/02/2010	8/05/2006	8/05/2006	8/05/2006	25/05/2006	25/05/2006

Chem_Group	ChemName	output unit	EQL	ASC NEPM (NEPC, 2013) EIL	ASC NEPM (NEPC 2013) HILD D										
Metals	Arsenic	mg/kg	4	**160**	3000	<5	7	<5	<5	<5	<5	<5	<5	<5	<5
	Barium	mg/kg	10			20	510	20	270	50	300	-	-	-	-	-
	Beryllium	mg/kg	1			<1	1	<1	<1	<1	<1	-	-	-	-	-
	Cadmium	mg/kg	0.5		900	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chromium	mg/kg	1			2	11	7	20	8	11	5	35	19	3	3
	Chromium (hexavalent)	mg/kg	0.5		3600	-	<0.5	-	-	-	-	-	-	-	-	-
	Cobalt	mg/kg	2		4000	13	13	4	5	5	5	-	-	-	-	-
	Copper	mg/kg	1		240,000	356	11	<5	7	8	5	150	49	32	262	<5
	Iron	mg/kg	50			-	38,400	-	-	-	-	-	-	-	-	-
	Lead	mg/kg	1	**1800**	1500	7	17	8	11	6	12	30	21	18	6	8
	Manganese	mg/kg	5		60,000	852	682	215	285	130	352	-	-	-	-	-
	Mercury	mg/kg	0.1		730	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Nickel	mg/kg	1		6000	11	21	5	6	6	6	6	6	5	6	2
	Vanadium	mg/kg	5			127	22	10	13	11	14	-	-	-	-	-
	Zinc	mg/kg	1		400,000	54	94	34	29	24	34	71	56	40	54	10
PAHs	2-chloronaphthalene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-
	2-methylnaphthalene	mg/kg	0.5			-	<0.5	<0.5	-	-	-	-	-	-	-	-
	3-methylcholanthrene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-
	Acenaphthene	mg/kg	0.1			-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-
	Acenaphthylene	mg/kg	0.1			-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-
	Acetophenone	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-
	Anthracene	mg/kg	0.1			-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-
	Benz(a)anthracene	mg/kg	0.1			-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-
	Benzo(a) pyrene	mg/kg	0.05			-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-
	Benzo(b)&(k)fluoranthene	mg/kg	0.2			-	-	-	-	-	-	-	-	-	-	-
	Benzo(b)fluoranthene	mg/kg	0.5			-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.1			-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-
	Benzo(k)fluoranthene	mg/kg	0.5			-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-
	Chrysene	mg/kg	0.1			-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.1			-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-
	Fluoranthene	mg/kg	0.1			-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-
	Fluorene	mg/kg	0.1			-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1			-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-
	Naphthalene	mg/kg	0.1	**370**	1900*	-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-
	CPAH (ESDAT)	mg/kg			40	-	<4	<4	<4	-	<4	-	-	-	-	-
	PAHs (Sum of total)	mg/kg	0.5		4000	-	<0.5	<0.5	-	-	-	-	-	-	-	-
	Phenanthrene	mg/kg	0.1			-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-
	Pyrene	mg/kg	0.1			-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-
Phenols	2,4-dimethylphenol	mg/kg	0.01			-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-
	2-methylphenol	mg/kg	0.01			-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-
	2-nitrophenol	mg/kg	0.01			-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-
	3-&4-methylphenol	mg/kg	0.5			-	<1	<1	<1	-	<1	-	-	-	-	-
	3-Methylphenol	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-
	4-chloro-3-methylphenol	mg/kg	0.01			-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-
	4-methylphenol	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-
	4-nitrophenol	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-
	Phenol	mg/kg	0.01			-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-
	Phenolics Total	mg/kg				-	-	-	-	-	-	-	-	-	-	-
TPH	TPH C6 - C9	mg/kg	2		5100*	-	<10	<10	<10	-	<10	-	-	-	<2	-
	TPH C10 - C14	mg/kg	50		3800*	-	<50	<50	<50	-	<50	-	-	-	<50	-
	TPH C15-C28	mg/kg	100		5300*	-	<100	<100	<100	-	<100	-	-	-	<100	-
	TPH C29-C36	mg/kg	100		7400*	-	<100	<100	<100	-	<100	-	-	-	<100	-
Asbestos	Asbestos fibres	-	0.1			-	-	-	-	-	-	-	-	-	-	-
	weight of sample	g	0.01			-	-	-	-	-	-	-	-	-	-	-
BTEX	Total Xylene (ESDAT)	mg/kg	0.15			-	<1	<1	<1	-	<1	-	-	-	<0.4	-
	Benzene	mg/kg	0.2		120*	-	<0.2	<0.2	<0.2	-	<0.2	-	-	-	<0.2	-
	Ethylbenzene	mg/kg	0.2		5300*	-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	<0.2	-
	Toluene	mg/kg	0.2		18000*	-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	<0.2	-
	Xylene (m & p)	mg/kg	0.2		15000*	-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	<0.2	-
	Xylene (o)	mg/kg	0.2			-	<0.5	<0.5	<0.5	-	<0.5	-	-	-	<0.2	-

NOTES: EIL - Ecological Investigation Level
HIL - Health Investigation Level
* CRC Care (2011) Health Screening Level - Direct Contact

Location	BH109	BH109	BH113	BH113	BH114	BH114	BH116	BH116	BH116	BH116	BH143
Sample Field ID	BH109 0.3_0.5	BH109 3.0_3.45	BH113 1.5_1.95	BH113 3.0_3.45	BH114 0.3_0.5	BH114 3.0_3.45	BH116 1.5_1.95	BH116 1.5_1.95	BH116 3.0_3.45	BH116 3.0_3.45	BH143 1.5_1.95
Sample Depth (m)	0.3-0.5	3-3.45	1.5-1.95	3-3.45	0.3-0.5	3-3.45	1.5-1.95	1.5-1.95	3-3.45	3-3.45	1.5-1.95
Matrix	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Area	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	ORWN Services	ORWN Services	ORWN Services	ORWN Services	ORWN Services
Sample Date	27/06/2006	27/06/2006	27/06/2006	27/06/2006	28/06/2006	28/06/2006	27/06/2006	28/06/2006	27/06/2006	28/06/2006	10/07/2006

Chem_Group	ChemName	output unit	EQL	ASC NEPM (NEPC, 2013) EIL	ASC NEPM (NEPC 2013) HILD D										
Metals	Arsenic	mg/kg	4	**160**	3000	<5	<5	<5	5	<5	6	-	<5	-	<5	<5
	Barium	mg/kg	10			-	-	-	-	-	-	-	-	-	-	-
	Beryllium	mg/kg	1			-	-	-	-	-	-	-	-	-	-	-
	Cadmium	mg/kg	0.5		900	<1	<1	<1	<1	<1	<1	-	<1	-	<1	<1
	Chromium	mg/kg	1			3	41	10	33	4	37	-	9	-	31	8
	Chromium (hexavalent)	mg/kg	0.5		3600	-	-	-	-	-	-	-	-	-	-	-
	Cobalt	mg/kg	2		4000	-	-	-	-	-	-	-	-	-	-	-
	Copper	mg/kg	1		240,000	225	20	<5	12	198	12	-	30	-	18	11
	Iron	mg/kg	50			-	-	-	-	-	-	-	-	-	-	-
	Lead	mg/kg	1	**1800**	1500	12	14	9	17	15	15	-	23	-	14	6
	Manganese	mg/kg	5		60,000	-	-	-	-	-	-	-	-	-	-	-
	Mercury	mg/kg	0.1		730	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	<0.1
	Nickel	mg/kg	1		6000	6	8	4	8	5	7	-	4	-	4	4
	Vanadium	mg/kg	5			-	-	-	-	-	-	-	-	-	-	-
	Zinc	mg/kg	1		400,000	53	34	21	52	54	47	-	38	-	28	18
PAHs	2-chloronaphthalene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-
	2-methylnaphthalene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-
	3-methylcholanthrene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-
	Acenaphthene	mg/kg	0.1			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-
	Acenaphthylene	mg/kg	0.1			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-
	Acetophenone	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-
	Anthracene	mg/kg	0.1			<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	-	<0.5	-	-
	Benz(a)anthracene	mg/kg	0.1			<0.5	<0.5	<0.5	0.9	1.2	<0.5	<0.5	-	0.6	-	-
	Benzo(a) pyrene	mg/kg	0.05			<0.5	<0.5	<0.5	0.7	1.7	<0.5	<0.5	-	<0.5	-	-
	Benzo(b)&(k)fluoranthene	mg/kg	0.2			-	-	-	-	-	-	-	-	-	-	-
	Benzo(b)fluoranthene	mg/kg	0.5			<0.5	<0.5	<0.5	0.8	2	<0.5	0.7	-	0.7	-	-
	Benzo(g,h,i)perylene	mg/kg	0.1			<0.5	<0.5	<0.5	<0.5	1.3	<0.5	<0.5	-	<0.5	-	-
	Benzo(k)fluoranthene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	0.9	<0.5	<0.5	-	<0.5	-	-
	Chrysene	mg/kg	0.1			<0.5	<0.5	<0.5	0.8	1.2	<0.5	<0.5	-	<0.5	-	-
	Dibenz(a,h)anthracene	mg/kg	0.1			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-
	Fluoranthene	mg/kg	0.1			<0.5	<0.5	<0.5	1.8	2.3	<0.5	0.9	-	1.3	-	-
	Fluorene	mg/kg	0.1			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1			<0.5	<0.5	<0.5	<0.5	0.9	<0.5	<0.5	-	<0.5	-	-
	Naphthalene	mg/kg	0.1	**370**	1900*	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-
	CPAH (ESDAT)	mg/kg			40	<4	<4	<4	3.2	9.2	<4	0.7	-	1.3	-	-
	PAHs (Sum of total)	mg/kg	0.5		4000	-	-	-	-	-	-	-	-	-	-	-
	Phenanthrene	mg/kg	0.1			<0.5	<0.5	<0.5	1.8	1	<0.5	<0.5	-	1	-	-
	Pyrene	mg/kg	0.1			<0.5	<0.5	<0.5	1.8	2.5	<0.5	0.9	-	1.1	-	-
Phenols	2,4-dimethylphenol	mg/kg	0.01			-	-	-	-	-	-	<0.5	-	-	-	-
	2-methylphenol	mg/kg	0.01			-	-	-	-	-	-	<0.5	-	-	-	-
	2-nitrophenol	mg/kg	0.01			-	-	-	-	-	-	<0.5	-	-	-	-
	3-&4-methylphenol	mg/kg	0.5			-	-	-	-	-	-	<1	-	-	-	-
	3-Methylphenol	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-
	4-chloro-3-methylphenol	mg/kg	0.01			-	-	-	-	-	-	<0.5	-	-	-	-
	4-methylphenol	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-
	4-nitrophenol	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-
	Phenol	mg/kg	0.01			-	-	-	-	-	-	<0.5	-	-	-	-
	Phenolics Total	mg/kg				-	-	-	-	-	-	-	-	-	-	-
TPH	TPH C6 - C9	mg/kg	2		5100*	<2	<2	<2	<2	<2	<2	-	<2	-	-	-
	TPH C10 - C14	mg/kg	50		3800*	<50	<50	<50	70	<50	60	-	<50	-	-	-
	TPH C15-C28	mg/kg	100		5300*	<100	<100	<100	540	130	620	-	350	-	-	-
	TPH C29-C36	mg/kg	100		7400*	<100	130	<100	470	210	360	-	410	-	-	-
Asbestos	Asbestos fibres	-	0.1			-	-	-	-	-	-	-	-	-	-	-
	weight of sample	g	0.01			-	-	-	-	-	-	-	-	-	-	-
BTEX	Total Xylene (ESDAT)	mg/kg	0.15			<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	-	<0.4	-	-	-
	Benzene	mg/kg	0.2		120*	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	-	-
	Ethylbenzene	mg/kg	0.2		5300*	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	-	-
	Toluene	mg/kg	0.2		18000*	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	-	-
	Xylene (m & p)	mg/kg	0.2		15000*	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	-	-
	Xylene (o)	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	-	-

NOTES: EIL - Ecological Investigation Level
HIL - Health Investigation Level
* CRC Care (2011) Health Screening Level - Direct Contact

Location	BH143	BH159	BH159	BH408	BH409	BH409	TBH01	TBH01	TBH01
Sample Field ID	BH143 3.0_3.45	BH159_0.25-0.35	D1408-8	BH408_2.0-2.4	BH409_3.7-4.0	BH409_5.0-5.3	DUP 01	TBH01_0.43-0.5	TRIP01
Sample Depth (m)	3-3.45		0.25-0.35	2-2.4	3.7-4	5-5.3	0.43-0.5	0.43-0.5	0.43-0.5
Matrix	Fill	Fill	Fill	Fill	Fill	Natural Sand		Fill	
Sample Type	Normal	Normal	Interlab_D	Normal	Normal	Normal	Field_D	Normal	Interlab_D
Area	ORWN Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services	Block 4 Services
Sample Date	10/07/2006	14/08/2006	14/08/2006	14/02/2011	14/02/2011	14/02/2011	5/02/2011	5/02/2011	5/02/2011

Chem_Group	ChemName	output unit	EQL	ASC NEPM (NEPC, 2013) EIL	ASC NEPM (NEPC 2013) HILD D									
Metals	Arsenic	mg/kg	4	**160**	3000	<5	-	-	<5	<5	22	<5	<5	2.4
	Barium	mg/kg	10			-	-	-	-	-	-	-	-	-
	Beryllium	mg/kg	1			-	-	-	-	-	-	-	-	-
	Cadmium	mg/kg	0.5		900	<1	-	-	<1	<1	<1	<1	<1	<0.5
	Chromium	mg/kg	1			10	-	-	8	15	7	16	12	10
	Chromium (hexavalent)	mg/kg	0.5		3600	-	-	-	-	-	-	-	-	-
	Cobalt	mg/kg	2		4000	-	-	-	-	-	-	-	-	-
	Copper	mg/kg	1		240,000	6	-	-	36	<5	<5	12	11	31
	Iron	mg/kg	50			-	-	-	-	-	-	-	-	-
	Lead	mg/kg	1	**1800**	1500	14	-	-	10	6	<5	71	103	120
	Manganese	mg/kg	5		60,000	-	-	-	-	-	-	-	-	-
	Mercury	mg/kg	0.1		730	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	0.2	<0.1
	Nickel	mg/kg	1		6000	8	-	-	8	<2	3	4	4	<5
	Vanadium	mg/kg	5			-	-	-	-	-	-	-	-	-
	Zinc	mg/kg	1		400,000	43	-	-	30	8	7	24	30	25
PAHs	2-chloronaphthalene	mg/kg	0.5			-	-	-	-	-	-	-	-	-
	2-methylnaphthalene	mg/kg	0.5			-	-	-	-	-	-	-	-	-
	3-methylcholanthrene	mg/kg	0.5			-	-	-	-	-	-	-	-	-
	Acenaphthene	mg/kg	0.1			<0.5	<0.5	<0.5	<0.5	<0.5	5.6	<0.5	<0.5	<0.5
	Acenaphthylene	mg/kg	0.1			<0.5	<0.5	<0.5	2.2	<0.5	2.8	<0.5	<0.5	<0.5
	Acetophenone	mg/kg	0.5			-	-	-	-	-	-	-	-	-
	Anthracene	mg/kg	0.1			<0.5	<0.5	<0.5	3.5	<0.5	1.9	<0.5	0.5	<0.5
	Benz(a)anthracene	mg/kg	0.1			<0.5	<0.5	<0.5	6.2	<0.5	0.6	<0.5	1.9	0.8
	Benzo(a) pyrene	mg/kg	0.05			<0.5	<0.5	<0.5	6.3	<0.5	<0.5	<0.5	1.7	1
	Benzo(b)&(k)fluoranthene	mg/kg	0.2			-	-	<1	-	-	-	-	-	1.7
	Benzo(b)fluoranthene	mg/kg	0.5			<0.5	<0.5	-	7.1	<0.5	<0.5	<0.5	1.8	-
	Benzo(g,h,i)perylene	mg/kg	0.1			<0.5	<0.5	<0.5	4.5	<0.5	<0.5	<0.5	0.6	0.7
	Benzo(k)fluoranthene	mg/kg	0.5			<0.5	<0.5	-	3.1	<0.5	<0.5	<0.5	0.7	-
	Chrysene	mg/kg	0.1			<0.5	<0.5	<0.5	5.2	<0.5	<0.5	<0.5	1.4	0.7
	Dibenz(a,h)anthracene	mg/kg	0.1			<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5
	Fluoranthene	mg/kg	0.1			<0.5	<0.5	<0.5	12.6	<0.5	1.2	0.7	3.1	1.3
	Fluorene	mg/kg	0.1			<0.5	<0.5	<0.5	<0.5	<0.5	2.2	<0.5	<0.5	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1			<0.5	<0.5	<0.5	3.6	<0.5	<0.5	<0.5	0.6	0.6
	Naphthalene	mg/kg	0.1	**370**	1900*	<0.5	<0.5	<0.5	<0.5	<0.5	33.8	<0.5	<0.5	<0.5
	CPAH (ESDAT)	mg/kg			40	<4	<4	<3	36.7	<4	0.6	<4	8.7	3.8
	PAHs (Sum of total)	mg/kg	0.5		4000	-	-	0	-	-	-	-	-	7.9
	Phenanthrene	mg/kg	0.1			<0.5	<0.5	<0.5	6.6	<0.5	6.8	<0.5	1.2	<0.5
	Pyrene	mg/kg	0.1			<0.5	<0.5	<0.5	12.9	<0.5	1.8	0.7	3	1.1
Phenols	2,4-dimethylphenol	mg/kg	0.01			-	-	-	0.03	<0.01	-	-	-	-
	2-methylphenol	mg/kg	0.01			-	-	-	0.02	<0.01	-	-	-	-
	2-nitrophenol	mg/kg	0.01			-	-	-	<0.01	<0.01	-	-	-	-
	3-&4-methylphenol	mg/kg	0.5			-	-	-	-	-	-	-	-	-
	3-Methylphenol	mg/kg	0.01			-	-	-	0.02	<0.01	-	-	-	-
	4-chloro-3-methylphenol	mg/kg	0.01			-	-	-	<0.01	<0.01	-	-	-	-
	4-methylphenol	mg/kg	0.01			-	-	-	0.02	<0.01	-	-	-	-
	4-nitrophenol	mg/kg	0.01			-	-	-	<0.01	<0.01	-	-	-	-
	Phenol	mg/kg	0.01			-	-	-	<0.01	0.01	-	-	-	-
	Phenolics Total	mg/kg				-	-	-	-	-	-	-	-	-
TPH	TPH C6 - C9	mg/kg	2		5100*	<2	<2	<10	<10	<10	12	<10	<10	<10
	TPH C10 - C14	mg/kg	50		3800*	<50	<50	<50	<50	<50	150	<50	<50	<50
	TPH C15-C28	mg/kg	100		5300*	<100	270	<100	190	<100	180	<100	<100	<100
	TPH C29-C36	mg/kg	100		7400*	<100	960	280	260	<100	<100	<100	<100	<100
Asbestos	Asbestos fibres	-	0.1			-	-	-	-	-	-	-	-	-
	weight of sample	g	0.01			-	-	-	-	-	-	-	-	-
BTEX	Total Xylene (ESDAT)	mg/kg	0.15			<0.4	0.3	<1.5 - 0	<1	<1	2.9	<1	<1	<0.15
	Benzene	mg/kg	0.2		120*	<0.2	<0.2	<0.2	<0.2	<0.2	1.8	<0.2	<0.2	<0.5
	Ethylbenzene	mg/kg	0.2		5300*	<0.2	<0.2	<0.5	<0.5	<0.5	3.5	<0.5	<0.5	<0.5
	Toluene	mg/kg	0.2		18000*	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Xylene (m & p)	mg/kg	0.2		15000*	<0.2	0.3	<1	<0.5	<0.5	1.1	<0.5	<0.5	<1
	Xylene (o)	mg/kg	0.2			<0.2	<0.2	<0.5	<0.5	<0.5	1.8	<0.5	<0.5	<0.5

NOTES: EIL - Ecological Investigation Level
HIL - Health Investigation Level
* CRC Care (2011) Health Screening Level - Direct Contact

Location	
Sample Field ID	
Sample Depth (m)	
Matrix	
Sample Type	
Area	
Sample Date	

Chem_Group	ChemName	output unit	EQL	ASC NEPM (NEPC, 2013) EIL	ASC NEPM (NEPC 2013) HILD D	Statistical Summary										
						Number of Results	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Average Concentration	Median Concentration	Standard Deviation	Number of Guideline Exceedances	Number of Guideline Exceedances
Metals	Arsenic	mg/kg	4	**160**	3000	48	6	<1	2.4	22	22	3.2	2.5	3	0	0
	Barium	mg/kg	10			25	24	<10	10	510	510	73	30	118	0	0
	Beryllium	mg/kg	1			25	2	<1	1	1	1	0.54	0.5	0.14	0	0
	Cadmium	mg/kg	0.5		900	48	0	<0.1	ND	<1	ND	0.49	0.5	0.074	0	0
	Chromium	mg/kg	1			48	48	2	2	41	41	11	8	9.6	0	0
	Chromium (hexavalent)	mg/kg	0.5		3600	2	0	<0.5	ND	<0.5	ND		0.25		0	0
	Cobalt	mg/kg	2		4000	25	20	1	1	13	13	5.6	4	4.7	0	0
	Copper	mg/kg	1		240,000	48	36	<5	5	356	356	69	12	104	0	0
	Iron	mg/kg	50			2	2	8730	8730	38400	38400		23565		0	0
	Lead	mg/kg	1	**1800**	1500	48	46	<5	6	120	120	18	11.5	23	0	0
	Manganese	mg/kg	5		60,000	25	24	<5	9	864	864	338	206	298	0	0
	Mercury	mg/kg	0.1		730	47	1	<0.05	0.2	0.2	0.2	0.053	0.05	0.022	0	0
	Nickel	mg/kg	1		6000	48	43	<2	2	21	21	5.4	5	3.5	0	0
	Vanadium	mg/kg	5			25	24	<5	8	139	139	42	14	48	0	0
	Zinc	mg/kg	1		400,000	48	47	<5	7	2070	2070	78	34	294	0	0
PAHs	2-chloronaphthalene	mg/kg	0.5			2	0	<0.5	ND	<0.5	ND		0.25		0	0
	2-methylnaphthalene	mg/kg	0.5			5	0	<0.5	ND	<0.5	ND	0.25	0.25	0	0	0
	3-methylcholanthrene	mg/kg	0.5			2	0	<0.5	ND	<0.5	ND		0.25		0	0
	Acenaphthene	mg/kg	0.1			30	1	<0.5	5.6	5.6	5.6	0.43	0.25	0.98	0	0
	Acenaphthylene	mg/kg	0.1			30	2	<0.5	2.2	2.8	2.8	0.4	0.25	0.58	0	0
	Acetophenone	mg/kg	0.5			2	0	<0.5	ND	<0.5	ND		0.25		0	0
	Anthracene	mg/kg	0.1			30	5	<0.5	0.5	3.5	3.5	0.48	0.25	0.68	0	0
	Benz(a)anthracene	mg/kg	0.1			30	8	<0.5	0.6	6.2	6.2	0.65	0.25	1.1	0	0
	Benzo(a) pyrene	mg/kg	0.05			30	6	<0.5	0.7	6.3	6.3	0.62	0.25	1.2	0	0
	Benzo(b)&(k)fluoranthene	mg/kg	0.2			5	1	<1	1.7	1.7	1.7	0.74	0.5	0.54	0	0
	Benzo(b)fluoranthene	mg/kg	0.5			25	7	<0.5	0.7	7.1	7.1	0.75	0.25	1.4	0	0
	Benzo(g,h,i)perylene	mg/kg	0.1			30	5	<0.5	0.6	4.5	4.5	0.47	0.25	0.79	0	0
	Benzo(k)fluoranthene	mg/kg	0.5			25	4	<0.5	0.7	3.1	3.1	0.43	0.25	0.58	0	0
	Chrysene	mg/kg	0.1			30	6	<0.5	0.7	5.2	5.2	0.56	0.25	0.94	0	0
	Dibenz(a,h)anthracene	mg/kg	0.1			30	1	<0.5	0.7	0.7	0.7	0.27	0.25	0.082	0	0
	Fluoranthene	mg/kg	0.1			30	10	<0.5	0.7	12.6	12.6	1.2	0.25	2.4	0	0
	Fluorene	mg/kg	0.1			30	1	<0.5	2.2	2.2	2.2	0.32	0.25	0.36	0	0
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1			30	5	<0.5	0.5	3.6	3.6	0.42	0.25	0.62	0	0
	Naphthalene	mg/kg	0.1	**370**	1900*	30	1	<0.5	33.8	33.8	33.8	1.4	0.25	6.1	0	0
	CPAH (ESDAT)	mg/kg			40	30	9	0.6	0.6	36.7	36.7	3.7	2	6.6	0	0
	PAHs (Sum of total)	mg/kg	0.5		4000	6	3	0	7.9	7.9	7.9	1.4	0.25	3.2	0	0
	Phenanthrene	mg/kg	0.1			30	7	<0.5	1	6.8	6.8	0.98	0.25	1.8	0	0
	Pyrene	mg/kg	0.1			30	10	<0.5	0.7	12.9	12.9	1.2	0.25	2.4	0	0
Phenols	2,4-dimethylphenol	mg/kg	0.01			13	1	<0.01	0.03	<0.5	0.03	0.21	0.25	0.087	0	0
	2-methylphenol	mg/kg	0.01			13	1	<0.01	0.02	<0.5	0.02	0.21	0.25	0.089	0	0
	2-nitrophenol	mg/kg	0.01			13	0	<0.01	ND	<0.5	ND	0.21	0.25	0.092	0	0
	3-&4-methylphenol	mg/kg	0.5			11	0	<0.5	ND	<1	ND	0.45	0.5	0.1	0	0
	3-Methylphenol	mg/kg	0.01			2	1	<0.01	0.02	0.02	0.02		0.0125		0	0
	4-chloro-3-methylphenol	mg/kg	0.01			13	0	<0.01	ND	<0.5	ND	0.21	0.25	0.092	0	0
	4-methylphenol	mg/kg	0.01			2	1	<0.01	0.02	0.02	0.02		0.0125		0	0
	4-nitrophenol	mg/kg	0.01			2	0	<0.01	ND	<0.01	ND		0.005		0	0
	Phenol	mg/kg	0.01			13	1	<0.01	0.01	<0.5	0.01	0.21	0.25	0.091	0	0
	Phenolics Total	mg/kg				0	0	99999	ND	0	ND				0	0
TPH	TPH C6 - C9	mg/kg	2		5100*	31	1	<2	12	12	12	3.9	5	2.4	0	0
	TPH C10 - C14	mg/kg	50		3800*	31	3	<50	60	150	150	32	25	24	0	0
	TPH C15-C28	mg/kg	100		5300*	31	7	<100	130	620	620	112	50	144	0	0
	TPH C29-C36	mg/kg	100		7400*	31	8	<100	130	960	960	136	50	194	0	0
Asbestos	Asbestos fibres	-	0.1			1	1	0	ND	0	ND		0		0	0
	weight of sample	g	0.01			1	1	20.2	20.2	20.2	20.2		20.2		0	0
BTEX	Total Xylene (ESDAT)	mg/kg	0.15			31	4	<0.15	0.3	2.9	2.9	0.46	0.5	0.48	0	0
	Benzene	mg/kg	0.2		120*	31	1	<0.2	1.8	1.8	1.8	0.16	0.1	0.31	0	0
	Ethylbenzene	mg/kg	0.2		5300*	31	1	<0.2	3.5	3.5	3.5	0.31	0.25	0.6	0	0
	Toluene	mg/kg	0.2		18000*	31	0	<0.2	ND	<0.5	ND	0.2	0.25	0.071	0	0
	Xylene (m & p)	mg/kg	0.2		15000*	31	2	<0.2	0.3	1.1	1.1	0.26	0.25	0.19	0	0
	Xylene (o)	mg/kg	0.2			31	1	<0.2	1.8	1.8	1.8	0.25	0.25	0.3	0	0

NOTES: EIL - Ecological Investigation Level
HIL - Health Investigation Level
* CRC Care (2011) Health Screening Level - Direct Contact

Attachment 6: Table T2 - Applicable ORWN Interim Public Domain Soil Analytical Results

Location	AECOM_BH46	AECOM_BH46	AECOM_BH47	AECOM_BH56	AECOM_BH73	BH021	BH054	BH063	BH143
Sample Field ID	BH46-1.0-1.2	QC56	BH47-1.0-1.2	BH56_2.5-2.7	BH73_2.5-2.7	BH021 1.5-1.95	BH054-1.5-1.6	BH063-1.5-1.65	BH143 1.5_1.95
Sample Depth (m)	1-1.2	1-1.2	1-1.2	2.5-2.7	2.5-2.7	1.5-1.95	1.5-1.6	1.5-1.65	1.5-1.95
Matrix	Fill		Fill	Fill	Fill	Fill	Fill	Fill	Fill
Sample Type	Normal	Field_D	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Area									
Sample Date	23/02/2010	23/02/2010	22/02/2010	4/03/2010	2/03/2010	9/05/2006	29/05/2006	1/06/2006	10/07/2006

Chem_Grou	ChemName	output unit	EQL	ASC NEPM (NEPC, 2013) EIL	ASC NEPM (NEPC, 2013) HIL D								
Metals	Arsenic	mg/kg	5	**160**	3000	<5	<5	<5	<5	<5	<5	<5	<5
	Barium	mg/kg	10			270	300	120	80	20	-	-	-
	Beryllium	mg/kg	1			<1	<1	<1	<1	<1	-	-	-
	Cadmium	mg/kg	1		900	<1	<1	<1	<1	<1	<1	<1	<1
	Chromium	mg/kg	2			20	11	8	11	8	22	8	8
	Chromium (hexavalent)	mg/kg	0.5		3600	-	-	-	-	-	-	-	-
	Cobalt	mg/kg	2		4000	5	5	3	3	<2	-	-	-
	Copper	mg/kg	5		240,000	7	5	19	25	<5	24	6	6	11
	Iron	mg/kg	50			-	-	-	-	-	-	-	-
	Lead	mg/kg	5	**1800**	1500	11	12	164	290	26	70	24	46	6
	Manganese	mg/kg	5		60,000	285	352	137	214	28	-	-	-	-
	Mercury	mg/kg	0.1		730	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1
	Nickel	mg/kg	2		6000	6	6	4	5	2	21	4	3	4
	Vanadium	mg/kg	5			13	14	21	13	8	-	-	-	-
	Zinc	mg/kg	5		400,000	29	34	177	118	18	65	20	30	18
PAHs	2-chloronaphthalene	mg/kg	0.5			-	-	-	-	-	-	-	-	-
	2-methylnaphthalene	mg/kg	0.5			-	-	-	-	-	-	-	-	-
	3-methylcholanthrene	mg/kg	0.5			-	-	-	-	-	-	-	-	-
	Acenaphthene	mg/kg	0.5			<0.5	<0.5	-	<0.5	-	-	-	1.1	-
	Acenaphthylene	mg/kg	0.5			<0.5	<0.5	-	<0.5	-	-	-	1.1	-
	Acetophenone	mg/kg	0.5			-	-	-	-	-	-	-	-	-
	Anthracene	mg/kg	0.5			<0.5	<0.5	-	<0.5	-	-	-	3.2	-
	Benz(a)anthracene	mg/kg	0.5			<0.5	<0.5	-	0.5	-	-	-	8.1	-
	Benzo(a) pyrene	mg/kg	0.5			<0.5	<0.5	-	<0.5	-	-	-	8.8	-
	Benzo(b)&(k)fluoranthene	mg/kg	1			-	-	-	-	-	-	-	-	-
	Benzo(b)fluoranthene	mg/kg	0.5			<0.5	<0.5	-	0.6	-	-	-	10.4	-
	Benzo(g,h,i)perylene	mg/kg	0.5			<0.5	<0.5	-	<0.5	-	-	-	6.3	-
	Benzo(k)fluoranthene	mg/kg	0.5			<0.5	<0.5	-	<0.5	-	-	-	3.6	-
	Chrysene	mg/kg	0.5			<0.5	<0.5	-	<0.5	-	-	-	7.8	-
	Dibenz(a,h)anthracene	mg/kg	0.5			<0.5	<0.5	-	<0.5	-	-	-	1.1	-
	Fluoranthene	mg/kg	0.5			<0.5	<0.5	-	0.9	-	-	-	18.3	-
	Fluorene	mg/kg	0.5			<0.5	<0.5	-	<0.5	-	-	-	1.6	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5			<0.5	<0.5	-	<0.5	-	-	-	4.8	-
	Naphthalene	mg/kg	0.5	**370**	1900*	<0.5	<0.5	-	<0.5	-	-	-	0.7	-
	CPAH (ESDAT)	mg/kg			40	<4	<4	-	1.1	-	-	-	50.9	-
	PAHs (Sum of total)	mg/kg			4000	-	-	-	-	-	-	-	-	-
	Phenanthrene	mg/kg	0.5			<0.5	<0.5	-	0.6	-	-	-	9.1	-
	Pyrene	mg/kg	0.5			<0.5	<0.5	-	1	-	-	-	18.9	-
Phenols	2,4-dimethylphenol	mg/kg	0.5			<0.5	<0.5	-	<0.5	-	-	-	-	-
	2-methylphenol	mg/kg	0.5			<0.5	<0.5	-	<0.5	-	-	-	-	-
	2-nitrophenol	mg/kg	0.5			<0.5	<0.5	-	<0.5	-	-	-	-	-
	3-&4-methylphenol	mg/kg	0.5			<1	<1	-	<1	-	-	-	-	-
	4-chloro-3-methylphenol	mg/kg	0.5			<0.5	<0.5	-	<0.5	-	-	-	-	-
	Phenol	mg/kg	0.5			<0.5	<0.5	-	<0.5	-	-	-	-	-
	Phenolics Total	mg/kg				-	-	-	-	-	-	-	-	-
TPH	TPH C6 - C9	mg/kg	2		5100*	<10	<10	-	<10	-	-	<2	<2	-
	TPH C10 - C14	mg/kg	50		3800*	<50	<50	-	<50	-	-	<50	<50	-
	TPH C15-C28	mg/kg	100		5300*	<100	<100	-	<100	-	-	<100	420	-
	TPH C29-C36	mg/kg	100		7400*	<100	<100	-	<100	-	-	<100	400	-
Asbestos	Asbestos fibres	-	0.1			-	-	0	-	-	-	-	-	-
	weight of sample	g	0.01			-	-	49.9	-	-	-	-	-	-
BTEX	Total Xylene (ESDAT)	mg/kg				<1	<1	-	<1	-	-	<0.4	<0.4	-
	Benzene	mg/kg	0.2		120*	<0.2	<0.2	-	<0.2	-	-	<0.2	<0.2	-
	Ethylbenzene	mg/kg	0.2		5300*	<0.5	<0.5	-	<0.5	-	-	<0.2	<0.2	-
	Toluene	mg/kg	0.2		18000*	<0.5	<0.5	-	<0.5	-	-	<0.2	<0.2	-
	Xylene (m & p)	mg/kg	0.2		15000*	<0.5	<0.5	-	<0.5	-	-	<0.2	<0.2	-
	Xylene (o)	mg/kg	0.2			<0.5	<0.5	-	<0.5	-	-	<0.2	<0.2	-

NOTES: EIL - Ecological Investigation Level
HIL - Health Investigation Level
* CRC Care (2011) Health Screening Level - Direct Contact

Location	
Sample Field ID	
Sample Depth (m)	
Matrix	
Sample Type	
Area	
Sample Date	

Chem_Grou	ChemName	output unit	EQL	ASC NEPM (NEPC, 2013) EIL	ASC NEPM (NEPC, 2013) HIL D	Statistical Summary										
						Number of Results	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Average Concentration	Median Concentration	Standard Deviation	Number of Guideline Exceedances	Number of Guideline Exceedances
Metals	Arsenic	mg/kg	5	**160**	3000	9	0	<5	ND	<5	ND	2.5	2.5	0	0	0
	Barium	mg/kg	10			5	5	20	20	300	300	158	120	122	0	0
	Beryllium	mg/kg	1			5	0	<1	ND	<1	ND	0.5	0.5	0	0	0
	Cadmium	mg/kg	1		900	9	0	<1	ND	<1	ND	0.5	0.5	0	0	0
	Chromium	mg/kg	2			9	9	8	8	22	22	12	8	5.5	0	0
	Chromium (hexavalent)	mg/kg	0.5		3600	0	0	99999	ND	0	ND				0	0
	Cobalt	mg/kg	2		4000	5	4	<2	3	5	5	3.4	3	1.7	0	0
	Copper	mg/kg	5		240,000	9	8	<5	5	25	25	12	7	8.6	0	0
	Iron	mg/kg	50			0	0	99999	ND	0	ND				0	0
	Lead	mg/kg	5	**1800**	1500	9	9	6	6	290	290	72	26	95	0	0
	Manganese	mg/kg	5		60,000	5	5	28	28	352	352	203	214	127	0	0
	Mercury	mg/kg	0.1		730	9	1	<0.1	0.1	0.1	0.1	0.056	0.05	0.017	0	0
	Nickel	mg/kg	2		6000	9	9	2	2	21	21	6.1	4	5.7	0	0
	Vanadium	mg/kg	5			5	5	8	8	21	21	14	13	4.7	0	0
	Zinc	mg/kg	5		400,000	9	9	18	18	177	177	57	30	55	0	0
PAHs	2-chloronaphthalene	mg/kg	0.5			0	0	99999	ND	0	ND				0	0
	2-methylnaphthalene	mg/kg	0.5			0	0	99999	ND	0	ND				0	0
	3-methylcholanthrene	mg/kg	0.5			0	0	99999	ND	0	ND				0	0
	Acenaphthene	mg/kg	0.5			4	1	<0.5	1.1	1.1	1.1	0.46	0.25	0.43	0	0
	Acenaphthylene	mg/kg	0.5			4	1	<0.5	1.1	1.1	1.1	0.46	0.25	0.43	0	0
	Acetophenone	mg/kg	0.5			0	0	99999	ND	0	ND				0	0
	Anthracene	mg/kg	0.5			4	1	<0.5	3.2	3.2	3.2	0.99	0.25	1.5	0	0
	Benz(a)anthracene	mg/kg	0.5			4	2	<0.5	0.5	8.1	8.1	2.3	0.375	3.9	0	0
	Benzo(a) pyrene	mg/kg	0.5			4	1	<0.5	8.8	8.8	8.8	2.4	0.25	4.3	0	0
	Benzo(b)&(k)fluoranthene	mg/kg	1			0	0	99999	ND	0	ND				0	0
	Benzo(b)fluoranthene	mg/kg	0.5			4	2	<0.5	0.6	10.4	10.4	2.9	0.425	5	0	0
	Benzo(g,h,i)perylene	mg/kg	0.5			4	1	<0.5	6.3	6.3	6.3	1.8	0.25	3	0	0
	Benzo(k)fluoranthene	mg/kg	0.5			4	1	<0.5	3.6	3.6	3.6	1.1	0.25	1.7	0	0
	Chrysene	mg/kg	0.5			4	1	<0.5	7.8	7.8	7.8	2.1	0.25	3.8	0	0
	Dibenz(a,h)anthracene	mg/kg	0.5			4	1	<0.5	1.1	1.1	1.1	0.46	0.25	0.43	0	0
	Fluoranthene	mg/kg	0.5			4	2	<0.5	0.9	18.3	18.3	4.9	0.575	8.9	0	0
	Fluorene	mg/kg	0.5			4	1	<0.5	1.6	1.6	1.6	0.59	0.25	0.68	0	0
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5			4	1	<0.5	4.8	4.8	4.8	1.4	0.25	2.3	0	0
	Naphthalene	mg/kg	0.5	**370**	1900*	4	1	<0.5	0.7	0.7	0.7	0.36	0.25	0.23	0	0
	CPAH (ESDAT)	mg/kg			40	4	2	1.1	1.1	50.9	50.9	14	2	25	1	1
	PAHs (Sum of total)	mg/kg			4000	0	0	99999	ND	0	ND				0	0
	Phenanthrene	mg/kg	0.5			4	2	<0.5	0.6	9.1	9.1	2.6	0.425	4.4	0	0
	Pyrene	mg/kg	0.5			4	2	<0.5	1	18.9	18.9	5.1	0.625	9.2	0	0
Phenols	2,4-dimethylphenol	mg/kg	0.5			3	0	<0.5	ND	<0.5	ND	0.25	0.25	0	0	0
	2-methylphenol	mg/kg	0.5			3	0	<0.5	ND	<0.5	ND	0.25	0.25	0	0	0
	2-nitrophenol	mg/kg	0.5			3	0	<0.5	ND	<0.5	ND	0.25	0.25	0	0	0
	3-&4-methylphenol	mg/kg	0.5			3	0	<1	ND	<1	ND	0.5	0.5	0	0	0
	4-chloro-3-methylphenol	mg/kg	0.5			3	0	<0.5	ND	<0.5	ND	0.25	0.25	0	0	0
	Phenol	mg/kg	0.5			3	0	<0.5	ND	<0.5	ND	0.25	0.25	0	0	0
	Phenolics Total	mg/kg				0	0	99999	ND	0	ND				0	0
TPH	TPH C6 - C9	mg/kg	2		5100*	5	0	<2	ND	<10	ND	3.4	5	2.2	0	0
	TPH C10 - C14	mg/kg	50		3800*	5	0	<50	ND	<50	ND	25	25	0	0	0
	TPH C15-C28	mg/kg	100		5300*	5	1	<100	420	420	420	124	50	165	0	0
	TPH C29-C36	mg/kg	100		7400*	5	1	<100	400	400	400	120	50	157	0	0
Asbestos	Asbestos fibres	-	0.1			1	1	0	ND	0	ND		0		0	0
	weight of sample	g	0.01			1	1	49.9	49.9	49.9	49.9		49.9		0	0
BTEX	Total Xylene (ESDAT)	mg/kg				5	0	<0.4	ND	<1	ND	0.38	0.5	0.16	0	0
	Benzene	mg/kg	0.2		120*	5	0	<0.2	ND	<0.2	ND	0.1	0.1	0	0	0
	Ethylbenzene	mg/kg	0.2		5300*	5	0	<0.2	ND	<0.5	ND	0.19	0.25	0.082	0	0
	Toluene	mg/kg	0.2		18000*	5	0	<0.2	ND	<0.5	ND	0.19	0.25	0.082	0	0
	Xylene (m & p)	mg/kg	0.2		15000*	5	0	<0.2	ND	<0.5	ND	0.19	0.25	0.082	0	0
	Xylene (o)	mg/kg	0.2			5	0	<0.2	ND	<0.5	ND	0.19	0.25	0.082	0	0

NOTES: EIL - Ecological Investigation Level
HIL - Health Investigation Level
* CRC Care (2011) Health Screening Level - Direct Contact