

10 June 2015

Our Ref: AS121686

Crown Sydney Property
Attn: Daniel Prince
Level 3, Crown Towers
8 Whiteman Street
Southbank, Victoria, 3006

By email: Daniel.Prince@crownmelbourne.com.au

Dear Daniel

Re: Interim Audit Advice, Addendum to Remedial Action Plan, Crown Hotel Development (Part of ORWN Area), Barangaroo South

1 Introduction

1.1 General

As a NSW-EPA accredited Contaminated Sites Auditor, I am conducting a site contamination audit in relation to the Crown Sydney Hotel Resort Development within the southern portion of the site known as 'Barangaroo', at Millers Point, NSW, on behalf of Crown Sydney Property Pty Ltd (Crown). Barangaroo is a large site being developed in stages for a variety of uses, with different portions subject to separate audits. The portion of Barangaroo that is the subject of this audit has been designated as the Crown Sydney Hotel Resort Development ('the site') and is part of the 'Other Remediation Works (North)' area (ORWN). The site location is shown on Attachment 1 and the site and proposed development layout is shown on Attachment 2. The portion of Barangaroo which previously contained part of a manufactured coal gasworks and which has been declared by the NSW Environment Protection Authority (EPA) as a Remediation Site (No. 21122, 'the Declaration Area') is located to the east.

1.2 Background

1.2.1 Crown RAP and Site Audit Report

I prepared a Site Audit Report and accompanying Site Audit Statement dated 20 January 2015 (*the Crown SAR*) regarding the Remedial Action Plan (RAP) for the site. The RAP reviewed was prepared by AECOM Australia Pty Ltd (AECOM) and was Revision 9 (dated 13 January 2015). The key remediation objective considered by the RAP was to facilitate currently permissible and future intended land uses proposed as part of the future intended Crown Hotel development.

AECOM has provided me with Revision 10 of the RAP (dated 11 April 2015) together with the following letter:

- Re: "Amendments to Remedial Action Plan, Crown Hotel Development (Part of ORWN Area), Barangaroo South" by AECOM dated 4 May 2015.

The RAP was revised to reflect the current terminology used by the Environmental Impact Statement (EIS) that was being prepared in support of the proposed development applications. I reviewed Revision 10 of the RAP and the accompanying letter by AECOM (documented in a review letter dated 5 May 2015, included as Attachment 3 to this letter) and concluded that:

- The changes made were largely editorial, with no modification to the technical content, the remediation strategy or validation approach; and
- Site Audit Report and Site Audit Statement dated 20 January 2015 can be relied upon as being relevant to the revised RAP (Revision 10, 11 April 2015).

AECOM has since provided me with an Addendum to the RAP (dated 28 May 2015), the purpose of which is to facilitate development of the site for recreational open space land use (i.e. as a publicly accessible park, a 'park') which is consistent with land uses which are currently permissible under the approved Concept Plan (as modified). The purpose of this Interim Audit Advice (IAA) letter is to determine the suitability and appropriateness of the RAP Addendum in making the site suitable for the proposed land use (park).

1.2.2 Other Barangaroo RAPs and Site Audit Reports

RAPs for additional portions of Barangaroo surrounding the site have been reviewed by the Auditor on behalf of the Barangaroo Delivery Authority or Lend Lease (Millers Point) Pty Ltd (Lend Lease). The relevant SARs are as follows:

- 'Site Audit Report, Remedial Action Plan, Other Remedial Works (South), Barangaroo' and Site Audit Statement (SAS) GN 439B-1, dated 14 July 2011. Located to south of site, prepared for Lend Lease (*the ORWS SAR*).
- 'Site Audit Report, Remedial Action Plan, Declaration Area and Block 4, Barangaroo' with two SAS dated 31 July 2013; GN 447A for the Declaration Area relating to revocation of the EPA declaration (and removal of the Voluntary Management Proposal (VMP), and GN439B-3 for Block 4, including part of the Declaration Area, relating to development of Block 4. Adjoining the site to the east, prepared for Lend Lease (*the Declaration Site SAR*).

1.3 Scope of Work

This IAA letter is based on review of the document listed below as well as discussions with AECOM:

- Report 'Addendum to the Crown Hotel Development Remedial Action Plan, Crown Hotel Development (Part of ORWN Area), Barangaroo South' dated 28 May 2015, by AECOM ('the RAP Addendum').

This IAA letter relies on the findings of the Site Audit Statement and accompanying Site Audit Report prepared by the Auditor regarding the RAP for the Crown Sydney Hotel Resort Development (the Crown SAR), dated 20 January 2015. The key document reviewed in the Crown SAR was:

- Report 'Remedial Action Plan, Crown Hotel Development (Part of ORWN Area), Barangaroo South', Revision 9, 13 January 2015, AECOM (the Crown RAP) (later revised to Revision 10, 11 April 2015, with no material change, see Section 1.2.1, above)

Key documents considered in the Declaration Site SAR (GN439B-3 and GN 447A) and referred to herein are:

- Report 'VMP Remediation Extent, VMP Remediation Works Area, (Parts of Barangaroo and Hickson Road), Millers Point NSW', 23 July 2013, AECOM (the VMP Extent Report, AECOM 2013a)
- Report 'Remedial Action Plan, NSW EPA Declared Remediation Site 21122 and Block 4 (Stage 1b) Development Works, Barangaroo, Millers Point, NSW', 24 July 2013, AECOM (the VMP/ Block 4 RAP, AECOM 2013b)

This IAA letter discusses information specific to development of the site as a park. The Crown SAR should be referred to for detailed site characterisation information and discussion of issues relating to development of the site as a hotel.

2 Site Details

2.1 Location

The site details are as follows:

Street address:	Hickson Road (Sussex Street), Barangaroo, NSW 2000
Identifier:	Part Lot 5 and Part Lot 6 in DP 876514
Local Government:	City of Sydney
Owner:	Barangaroo Delivery Authority
Site Area:	Approximately 10,242 m ²

2.2 Zoning

The current zoning of the site was identified in the RAP as part zone B4 Mixed Use (eastern side) and part zone RE1 Public Recreation (western side). This is the zoning identified under State Environmental Planning Policy (Major Development) Barangaroo, dated 16 December 2010.

2.3 Adjacent Uses

The site is located within an area of mixed uses (Attachment 2):

- North: part of Barangaroo Central, concrete/ hardstand area, currently being used by Lend Lease for staging of surrounding construction works.
- South: part of the ORWN area outside the site which includes the footprint of the proposed Southern Cove, followed by the Harbour Heat Rejection (HHR) inlet area and the Barangaroo South Stage 1A development, which is under construction for commercial, residential and open space land uses.

- East: Barangaroo South Stage 1B (Block 4) development area (including part of the Declaration Area) then Hickson Road and residential and commercial buildings beyond.
- West: part of the ORWN area outside the site, to be developed as a public foreshore walkway, followed by Darling Harbour.

Attachment 2 shows the location of the former gasworks facilities to the east of the site, located within the Declaration Area. The former gasworks facilities have potential to have caused contamination at ORWN.

Darling Harbour is a nearby environmental receptor.

2.4 Site Condition

The site is flat, at an elevation a few metres above Darling Harbour water level. It is currently being used as a staging area for the adjacent Stage 1A (ORWS) construction site and for a water treatment plant.

2.5 Proposed Development

The development plans described in the RAP for the Crown Hotel Development comprised mixed uses including a hotel (incorporating high density residential with minimal access to soil), commercial/ retail, public open space and underground parking.

Development of the site as a park, as described in the RAP Addendum, is proposed to include:

- Areas of landscaping, comprising a combination of shallow root species and trees with deeper root systems;
- Areas of hardstand including roads, pedestrian ways and cycle paths, built on grade and with connection to other parts of Barangaroo; and
- Minor below ground services such as electricity, water and sewer constructed in association with amenities for the park. Anticipated to be at maximum depth of 1.5m below ground level (BGL), above the existing (saline) groundwater table.

The Human Health and Ecological Risk Assessment (HHERA) for ORWN (AECOM, dated 10 December 2014) derived criteria for a number of scenarios relevant to the Crown Hotel Development, which were considered in the Crown SAR. Scenarios relevant to the proposed park development described in the HHERA include:

- Scenario 3 – unpaved public domain/ open space;
- Scenario 4 – paved public domain/ open space; and
- Scenario 6 – short term ground-intrusive maintenance (with potential to contact groundwater).

3 Risk-Based Remediation Criteria

Site specific assessment criteria were originally developed to address a range of potential generic development scenarios for the Barangaroo site. These criteria were applied as remediation criteria in the RAPs for the ORWS area and for the VMP/ Block 4 area, to

determine the extent of remediation required. A detailed review of these criteria was undertaken by the Auditor and expert support team (EnRiskS) as documented in the ORWS SAR (GN439B-1) and were approved by the EPA (OEHL Letter dated 11 July 2011 to Lend Lease) subject to Conditions of Approval which incorporate the design, construction and operational assumptions made in their derivation.

As discussed in the Crown SAR, AECOM undertook an assessment of risks specific to the Crown Sydney Hotel Resort Development in the ORWN HHERA. The ORWN HHERA considered a range of generic and site specific land use scenarios. The generic scenarios were consistent with the previously reviewed and approved HHERAs, although some modifications were made to account for changes in the updated National Environmental Protection (Assessment of Site Contamination) Measure 1999 (NEPM (1999)[2013]). The objectives of the ORWN HHERA were to:

- Develop human health site specific target criteria (SSTC) for soil and groundwater for use in defining the remediation end-point for the site, where the remediation end-point is defined as that required to render the site suitable for use following redevelopment; and
- Assess the risk to ecological receptors that the site will represent based on the assumption that the remediation works described by the VMP/ Block 4 RAP (AECOM, 2013b) are undertaken.

Criteria were also derived for material to be used in the top 0.5m of unpaved recreation areas, known as "Suitable Fill".

3.1 SSTC (Risk to Human Health)

SSTC were derived in the ORWN HHERA for eight generic land use scenarios, three of which are relevant to the park development (Scenarios 3, 4 and 6, refer Section 2.5). SSTC were derived for contaminants of potential concern (COPC) identified in soil and groundwater.

The SSTC are specific to the proposed development and as such the application of the criteria derived and to be implemented within the RAP and RAP Addendum are tied to some fundamental assumptions of the proposed development. If these assumptions are not adhered to, then the objectives of the HHERA will not be met as there will be the potential for unacceptable risks to human health or the environment, and the SSTC are no longer valid. Key assumptions relevant to the proposed development include:

- At least 0.5 m of Suitable Fill is placed across the site (increased thickness in areas to be used for deeper rooting trees); and
- The depth of below ground services constructed within the site is not greater than 2 m below the finished development level.

Detailed review of all SSTCs derived for the relevant land use scenarios has not been conducted as part of this review since previously derived SSTC had already been approved for similar generic land use scenarios. The Auditor has considered in more detail the SSTC which increased from the previously approved generic SSTC. Several inputs were varied slightly to be consistent with the exposure assumptions adopted in the updated NEPM

(1999)[2013]. The resulting revised SSTC detailed in the Crown RAP and adopted in the RAP Addendum are considered appropriate for application to the park development.

No SSTC were derived for asbestos in the original HHERA and RAP documents. AECOM subsequently derived criteria in a separate Asbestos HHERA (16 October 2013) and documented the application of these criteria in the Crown RAP (reviewed in the Crown SAR). Asbestos criteria were derived for the Intrusive Maintenance Worker Scenario (Scenario 6) for application to paved and unpaved recreation areas, which are applicable to depths below 0.5m BGL (above which will be filled with "Suitable Fill") and above the groundwater table. The SSTC for bonded asbestos in soil under this scenario is 0.05 % w/w.

Suitable Fill is required to have "No Visible Asbestos" (which also meets the recreational open space criteria from the NEPM (1999)[2013] of 0.02% w/w). The Asbestos SSTC described in the Crown RAP and RAP Addendum are considered appropriate.

3.1.1 Remediation Goal

Based on the findings of the ORWN HHERA, the primary remediation goal for the protection of human health has been identified in the Crown RAP as removal/ remediation of separate phase gasworks waste and tar (SPGWT) to the extent practical.

The secondary remediation goal identified in the Crown RAP includes removal/ remediation of Confirmed Impacted Material (CIM) to the extent practical, where CIM is determined by comparison of soil and groundwater data with the relevant risk-based remediation criteria (SSTC) and is defined as:

- Unsaturated soil concentrations exceeding the soil SSTC (including for asbestos); and
- Unsaturated and saturated soil concentrations that are considered to be the source of groundwater concentrations exceeding the groundwater SSTC.

Saturated soil concentrations are not applicable in determining the remedial extent for the protection of human health (and therefore there are no saturated soil SSTC) because there is no complete exposure pathway with the maximum depth of services penetration of 2m (which is usually above the groundwater table). The Auditor considers this to be acceptable.

3.2 Risk to Environment

As discussed in the Crown SAR, the Declaration Site SAR found that if the VMP/Block 4 RAP (AECOM, 2013b) is implemented, residual gasworks related contamination remaining in situ down hydraulic gradient of the Declaration Area (including the site) would not represent an unacceptable risk to the environment. Only non-gasworks related contamination was therefore considered by AECOM in the ORWN HHERA from an ecological risk perspective. AECOM concluded that non-gasworks related contamination (namely copper, zinc, cobalt and cadmium) would not present an unacceptable risk to the environment and that the quality of groundwater in fill within the site will improve over time following the proposed remedial works in the Declaration Area and Block 4. It was therefore concluded that the risks to identified environmental receptors at the site are low and acceptable. As such, risk to the environment is not considered further in the RAP Addendum. This is considered appropriate.

3.3 Suitable Fill

Scenario 3, unpaved open space, assumes that 0.5m of 'Suitable Fill' will be placed over existing soils at the site, deeper in locations where deeper rooting trees may be planted. 'Suitable Fill' is defined as:

- Virgin excavated natural material (VENM); or
- Soil which contains contaminant concentrations below the Terrestrial Soil Criteria (TSC); and
- Soil which contains contaminant concentrations below the relevant SSTC; and
- Soil which is visually free of bonded Asbestos Containing Materials (ACM).

The TSC defined in the Crown RAP (and referenced in the RAP Addendum) are based on the protection of plant/soil health and are adopted from published sources (not derived). They are also protective of human health under a recreational land use scenario and are considered appropriate.

4 Extent of Remediation

A discussion of the results of soil and groundwater investigations at the site was presented in Sections 8 and 9 of the Crown SAR. Comparison of results to the risk-based remediation criteria was undertaken to determine the remediation extent required and was presented in Section 11 of the Crown SAR. The following sections present a brief summary of the soil and groundwater results, and consider the required extent of remediation with respect to the proposed park usage, as contemplated in the Crown RAP and RAP Addendum.

4.1 Soil

4.1.1 Chemical Contaminants

The soil analytical results indicate fill materials are impacted by heavy end TPH, PAH and some heavy metals. Contamination from gasworks wastes was present in underlying natural materials at depth, supporting the migration of contamination from the up gradient former gasworks on the natural ground surface, at the base of fill. Tar was absent from overlying fill material. Bedrock from the site has not been sampled extensively; however, visual observations have indicated limited contaminant impacts. Impacted soils are predominately located within the marine sediments from which there is a negligible contaminant flux.

Limited soil analytical data is available for the site, from a total of around 26 investigation locations. All contaminant concentrations reported were less than the SSTC, indicating no CIM that warrants remediation. AECOM has recommended in the RAP Addendum that additional delineation sampling of the soils in the unsaturated zone is required to ensure the sampling density is sufficient to properly characterise the unsaturated soil and delineate the final extent of CIM that warrants remediation. The Auditor agrees that further characterisation of unsaturated soil is required at the site for the proposed park development.

4.1.2 Asbestos

Fill from the site has not been well characterised for the potential for asbestos contamination. Notwithstanding the limited analytical data supporting the presence of asbestos at the site, AECOM considers that there is a significant potential for bonded ACM to be present within fill materials within the site based on the analysis performed and visual inspections during the Stage 1A basement excavation works in the adjacent ORWS Area which identified widespread bonded ACM.

This conclusion is further supported by additional information made available to AECOM since completion of the Crown RAP and documented in the RAP Addendum. Lend Lease identified a significant volume of bonded ACM during shallow excavation works required for a new sewerage pump out pit within the site. The pit was constructed for a New Amenities Area associated with the construction compound supporting the adjacent Stage 1A development works. Lend Lease estimated that the excavation measured approximately 3 x 3m and 2m deep. Lend Lease reported that between 20 and 30 bonded ACM fragments were observed in the small stockpile formed from this excavation and that the fragments measured in the order of 40 x 60mm x 6mm thick. The excavated material was added to stockpile SP225 which was classified as Special Waste (asbestos) for off-site disposal. Analysis of the fibre cement sheet fragments confirmed chrysotile, amosite and crocidolite asbestos to be present. Validation of the walls and base of the excavation was not undertaken. As such, it is likely that bonded ACM remains within the fill surrounding the excavation.

This area is shown on Attachment 2 and is identified as the initial remediation extent required to address ACM in soil. AECOM has recommended in the RAP Addendum that the additional delineation sampling of the soils in the unsaturated zone include gravimetric assessment of bonded ACM (per NEPM (1999)[2013], "asbestos quantification") to allow comparison with the SSTC for asbestos and to delineate the final extent of CIM that warrants remediation.

AECOM estimate that remediation will be required to a depth of approximately 2m below the final development level, and may be up to the depth of the unsaturated soil.

4.2 Groundwater

Groundwater was encountered at depths ranging from 1.8 to 2.9 mBGL. Dissolved phase concentrations of PAHs, heavy metals, benzene and ethylbenzene were reported in groundwater at the site. The most significant groundwater contamination was reported from wells screened deeper within the aquifer, specifically across the base of the fill and within the marine sediments immediately overlying bedrock.

SPGWT was identified at groundwater well location MW60 at a depth of 16 to 17.5mBGL within natural marine sediment. This occurred in association with groundwater detections of TPH C10-C36 and naphthalene that exceeded the SSTC. As discussed in the Crown RAP and Crown SAR, the reported exceedance of the groundwater SSTC and presence of SPGWT at MW60 is not considered representative of CIM that warrants remediation. AECOM state in the RAP Addendum that:

- *“MW60 was screened across the base of the fill and marine sediment interface (i.e. from 14 to 22 m bgl). ... there is considered to be negligible contaminant flux from the natural marine sediments into the overlying fill; and*
- *“Field observations from other investigation locations at the Site and adjacent to MW60 indicate that the presence of SPGWT is localised to the MW60 area indicating that the reported impact is relatively localised.*

“Based on the above information, the impacted groundwater at MW60 is not considered to pose a significant risk to future users of the Site and/or Darling Harbour”.

As noted in the Crown SAR, the Auditor considers that there is potential for further unidentified SPGWT, particularly in the east of the site near the Declaration Area boundary. This is not considered to present a risk to future recreational users of the site or Darling Harbour (assuming remediation described in the Block 4/ VMP RAP is undertaken).

5 Evaluation of Proposed Remediation

5.1 Remediation Strategy and Methodology Overview

The RAP Addendum adopted remediation criteria developed in the ORWN HHERA to determine CIM that requires remediation due to potential risks to human health. As discussed in Section 4, CIM has been identified in unsaturated soils that will require remediation to facilitate use of the site as a park.

AECOM has summarised the proposed remediation works as follows:

- Completion of additional delineation sampling works to adequately characterise the presence and extent of CIM requiring remediation within unsaturated soil (preparation of a Delineation Sampling, Analysis and Quality Plan (SAQP) is proposed);
- Based on the findings of the additional delineation sampling works, and in consultation with the NEW EPA Accredited Site Auditor, establishment of the extent of CIM that is considered to represent a risk to human health and requires remediation;
- Preparation of remediation documentation including Remedial Works Plan, Asbestos Management Plan and Validation SAQP;
- Site establishment and preparatory works;
- Selective excavation of CIM identified based on the outcomes of the additional delineation sampling works. Excavation works will be subject to visual and olfactory observation to confirm that the materials encountered are consistent with those anticipated based on previous investigations and additional delineation sampling works;
- Physical separation of recyclable and oversize material, including timber, rock, concrete, steel and brick, from other material;
- While not anticipated based on the available analytical data, treatment of excavated material (if required) to facilitate off-site disposal to licensed landfill;
- Off-site disposal of CIM to an EPA licensed landfill, subject to classification in accordance with the NSW EPA (2014) *Waste Classification Guidelines*;

- Validation of the resultant excavation to demonstrate compliance with the RAP Addendum;
- Backfilling of the remedial excavations using imported Suitable Fill validated in accordance with Section 15 of the RAP. Suitable Fill will be placed over the entire Site. Depending on the finished surface levels required for the park, the Suitable Fill will be either:
 - Used to backfill remedial excavations;
 - Placed on the existing surface of the site; or
 - Placed in excavations created such that the finished surface level of the 0.5 m thick layer of Suitable Fill corresponds with the required site finished surface levels.

Consistent with the Crown RAP, the RAP Addendum does not propose any active groundwater remediation or ongoing groundwater monitoring. This is considered appropriate.

5.2 Evaluation of Remedial Action Plan

The Auditor previously performed a detailed review of the RAP, documented in the Crown SAR. Review of information in the RAP Addendum that is unique to development of the site as a park has been performed by comparison with the checklist included in EPA (2011) 'Guidelines for Consultants Reporting on Contaminated Sites', as detailed in Table 5.1, below. The RAP Addendum was found to adequately address the required information for all items with the exception of identification of approvals required specific to the proposed development.

Table 5.1: Evaluation of Addendum to Remedial Action Plan		
Addendum RAP Element	Details	Auditor Comments
Remedial Goal s1.1	The key remediation objective of the RAP Addendum is to facilitate use of the site as a park. The key remediation objective of this Addendum is to facilitate use of the Site as a park. Specific objectives of the remediation works described by this Addendum are: • <i>"To ensure the remediated site is protective of human health in the context of recreational open space land use (i.e. a park);</i> • <i>To ensure the remediated site is protective of the environment (specifically groundwater and the adjacent Darling Harbour), to the extent practicable; and</i> • <i>Comply with applicable legislative and policy requirements including the appropriate requirements of the NSW EPA and NSW Department of Planning and Environment (DoPE)".</i>	The identified remedial objectives (remedial goal) are considered appropriate.

Table 5.1: Evaluation of Addendum to Remedial Action Plan

Addendum RAP Element	Details	Auditor Comments
Discussion of the extent of remediation required s4	CIM was defined based on screening of soil and groundwater results against the remediation criteria (Section 3 of this letter). CIM identified is discussed in Section 4 of this letter. An Initial Remediation Extent has been defined (refer Attachment 2), to an estimated depth of 2mBGL.	The initial extent of remediation is considered appropriate although additional delineation sampling is proposed to confirm.
Remedial Options s5	The RAP Addendum includes a section titled "Remedial Technology Assessment" which references the same section within the VMP/ Block 4 RAP.	Considered acceptable. Remedial options for similar issues have been adequately considered in previous RAPs.
Selected Preferred Option s6	The RAP presents the preferred remediation strategy (excavation and off-site disposal)	The remediation strategy is considered appropriate.
Rationale s5	The RAP presents the reasons for strategy selection in consideration of the Remedial Technology Assessment, in particular the following: • <i>"the limited opportunities for reuse of material within the development;</i> • <i>the maximum potential depth of excavations required (which will be limited to unsaturated soils only);</i> • <i>its applicability to the management of risks associated with bonded ACM contamination; and</i> • <i>its applicability to the management of a range of other potential CoPCs that may be identified in CIM as an outcome of the delineation sampling works".</i>	The rationale presented is considered appropriate.
Proposed Validation Criteria s3, 8.2	The proposed validation criteria are the remediation criteria (SSTC). Statistical soil validation is proposed including consideration of 95% Upper Confidence Limits	Considered appropriate. The statistical validation proposed is considered acceptable provided data sets are representative and appropriate statistic acceptance criteria from NEPM (1999)[2013] are applied.

Table 5.1: Evaluation of Addendum to Remedial Action Plan

Addendum RAP Element	Details	Auditor Comments
Proposed Validation Testing	A Delineation SAQP and Validation SAQP are proposed to be prepared and submitted to the Auditor for endorsement.	Considered appropriate.
s7.2, 7.4, 8	The RAP Addendum includes the following validation sampling: - Delineation sampling, preferably by test pits, to achieve an approximate 20m grid. Soil samples to be collected from 0.5 and 1.5mBGL and analysed for chemical COPC and asbestos (quantification in accordance with NEPM (1999)[2013]). - Following excavation, wall samples at 20m intervals and base samples on 20m grid, samples analysed biased to evidence of contamination. Samples to be analysed for chemical COPC and asbestos quantification. Inspection as visually free of SPGWT. - Sampling methods and data analysis are to be in accordance with Section 16 of the Crown RAP. - Classification of excavated material for off-site disposal in accordance with EPA (2014) Waste Classification Guidelines. - Validation of ORWN HHERA assumptions (adequate thickness of Suitable Fill and services at maximum depth of 2mBGL) will be achieved by review of Issued For Construction or As Constructed drawings. - Imported material is required to be VENM or ENM and/or otherwise validated in accordance with Section 7.4 of the RAP Addendum.	The approach to validation sampling is considered reasonable. The Auditor notes survey information and photographic evidence may also be required for validation of ORWN HHERA assumptions.
s7.3.3	Groundwater validation is not proposed since CIM has not been identified	Considered appropriate.
Interim Site Management Plan (before remediation)	None proposed.	Not required since the site is currently subject to construction management measures associated with the Stage 1A development, which appropriately consider the potential for contamination to be encountered.

Table 5.1: Evaluation of Addendum to Remedial Action Plan

Addendum RAP Element	Details	Auditor Comments
Site Management Plan (operation phase) including OH&S s7.1	The RAP Addendum refers to the Crown RAP for environmental management requirements, noting that the remediation strategy described in the RAP Addendum does not require bulk excavation (which is contemplated in the Crown RAP).	Considered appropriate.
Contingency Plan s9	The RAP Addendum refers to Section 20 of the Crown RAP for contingency measures potentially applicable to the proposed works. Site specific contingency measures are also identified as discussed below. If SPGWT is identified in the remediation excavation base, the vertical extent of excavation will be increased to a maximum depth of 4mBGL, at which point consideration will be given to preparation of a location specific risk assessment in consultation with the Auditor. Removal of the additional material will be validated through visual observations and documented via field notes and photographs. If ACM is identified in the remediation excavation base at concentrations above SSTC, the vertical extent of excavation will be increased to a maximum depth of 2mBGL. Material remaining below this depth will be managed by the Asbestos Management Plan to ensure that construction worker health and safety is appropriately protected. If treatment is required to facilitate offsite disposal this would be achieved via ex situ stabilisation/ solidification (as described in Appendix D of the Crown RAP). Off-site treatment prior to disposal is contemplated in the RAP Addendum.	Contingency measures are considered appropriate.
Remediation Schedule and Hours of Operation	Not discussed	Operational hours will be required to be in accordance with the development approval.
Licence and Approvals	Not discussed	It is assumed the requirements of the ORWN RAP will be applied. Any particular approvals relating to works in waterways will also need to be considered.
Contacts/ Community Relations	The RAP Addendum references Section 19 of the Crown RAP.	Considered acceptable.

Table 5.1: Evaluation of Addendum to Remedial Action Plan		
Addendum RAP Element	Details	Auditor Comments
Staged Progress Reporting s8.5	The RAP Addendum discusses a single validation report in accordance with the Crown RAP.	Considered acceptable.
Long term site management plan	Not discussed in RAP.	In the Auditor's opinion, a long term site management plan should not be required with respect to site suitability if the RAP/ RAP Addendum is implemented and validated successfully.

In the Auditor's opinion, the remediation and validation approach recommended by AECOM are appropriate.

6 Contamination Migration Potential

The potential for offsite migration of contamination from the site relates to the leaching potential of contaminants from soils and the movement of groundwater from the site to Darling Harbour. These factors have been discussed in the Crown SAR.

In the Auditor's opinion, completion of the remediation works as described in Section 5 will minimise the potential for future offsite migration of contamination from the site, provided the remedial works described by the VMP/ Block 4 RAP are also completed.

7 Assessment of Risk

Potential risks to human health and the environment have been addressed through the development of site specific remediation criteria and the design of the remediation works.

8 Conclusions and Recommendations

AECOM concluded in the RAP Addendum (28 May 2015):

"It is concluded that the preferred management strategy described by this RAP will, upon successful implementation as evidenced by the prescribed validation program, ensure that the Site is suitable for use as a Park".

Based on the information presented in the reports reviewed, the Auditor concludes that the site can be made suitable for the purposes of 'parks, recreational, open space' land use if the site is remediated, developed and managed in accordance with the following remedial action plans:

- Report 'Remedial Action Plan, Crown Hotel Development (Part of ORWN Area), Barangaroo South', Revision 10, 11 April 2015, by AECOM Australia Pty Ltd
- 'Addendum to the Crown Hotel Development Remedial Action Plan, Crown Hotel Development (Part of ORWN Area), Barangaroo South' dated 28 May 2015, by AECOM Australia Pty Ltd

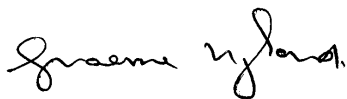
on the condition that the remediation works described by the VMP/ Block 4 RAP (AECOM, 24 July 2013) are undertaken.

* * *

Consistent with Department NSW EPA requirement for staged "signoff" of sites that are the subject of progressive assessment, remediation and validation, I advise that:

- This advice letter does not constitute a Site Audit Report or Site Audit Statement.
- At the completion of the remediation and validation I will provide a Site Audit Statement and supporting documentation.
- This interim advice will be documented in the Site Audit Report.

Yours faithfully
ENVIRON Australia Pty Ltd



Graeme Nyland
Accredited Auditor 9808

Enc:

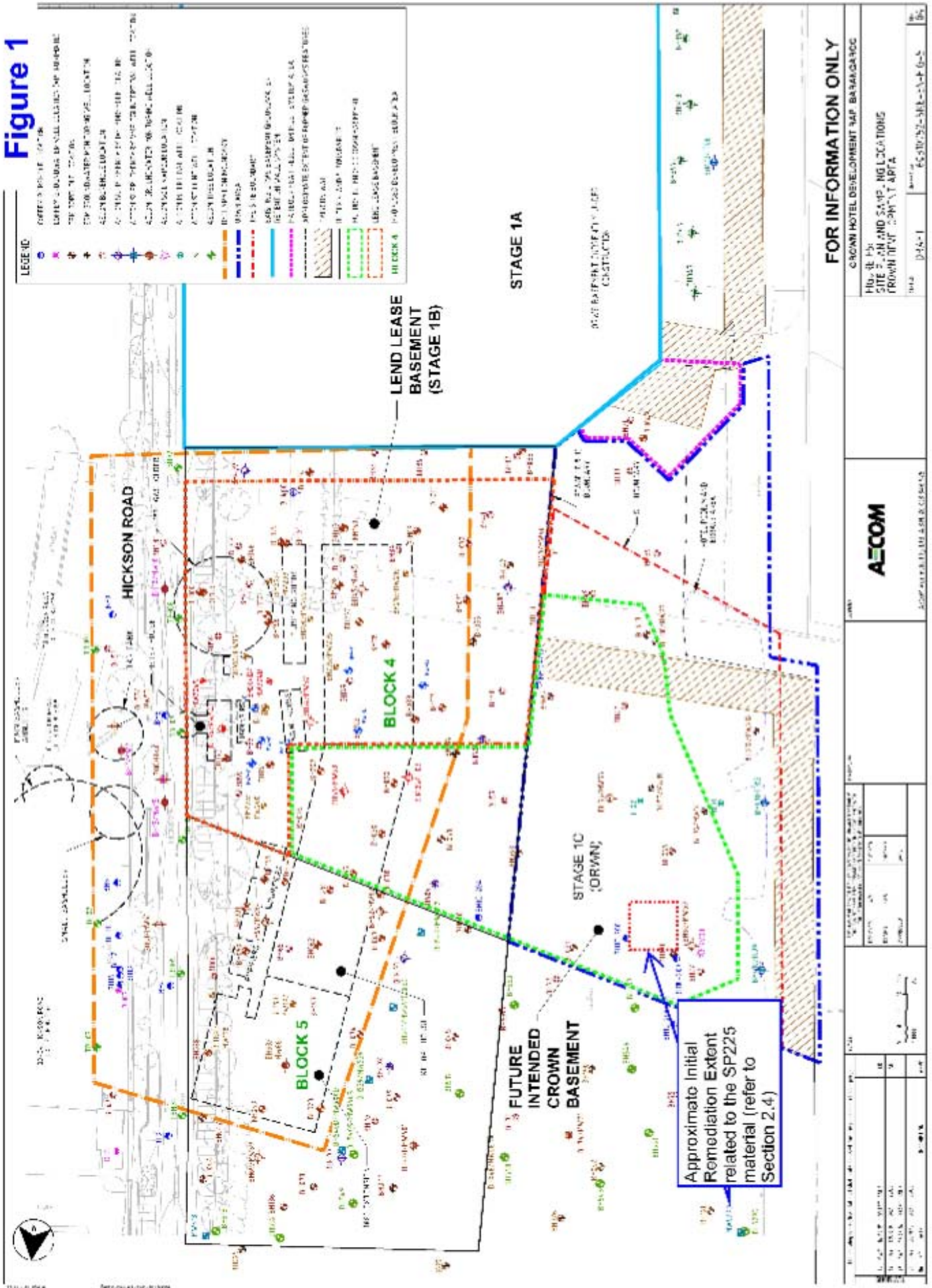
Attachment 1: Site Location

Attachment 2: Site and Development Layout

Attachment 3: ENVIRON Letter "Reliance on Site Audit Report/ Site Audit Statement – Amendments to Remedial Action Plan, Crown Hotel Development (Part of ORWN Area), Barangaroo South" dated 5 May 2015



Figure 1



Attachment 3: ENVIRON Letter "Reliance on Site Audit Report/ Site Audit Statement – Amendments to Remedial Action Plan, Crown Hotel Development (Part of ORWN Area), Barangaroo South" dated 5 May 2015

5 May 2015

Our Ref: AS121686

Crown Sydney Property
Attn: Daniel Prince
Level 3, Crown Towers
8 Whiteman Street
Southbank, Victoria, 3006

By email: Daniel.Prince@crownmelbourne.com.au

Dear Daniel

Re: Reliance on Site Audit Report/ Site Audit Statement – Amendments to Remedial Action Plan, Crown Hotel Development (Part of ORWN Area), Barangaroo South

1 Introduction

As a NSW-EPA accredited Contaminated Sites Auditor, I am conducting a contamination audit in relation to the Crown Sydney Hotel Resort Development within the southern portion of the site known as “Barangaroo”, at Millers Point, NSW, on behalf of Crown Sydney Property Pty Ltd (Crown). I prepared a Site Audit Report and accompanying Site Audit Statement dated 20 January 2015 regarding the Remediation Action Plan (RAP) for the site. The RAP reviewed was prepared by AECOM Australia Pty Ltd (AECOM) and was Revision 9 (dated 13 January 2015).

AECOM has provided me with Revision 10 of the RAP (dated 11 April 2015) together with the following letter:

- Re: “Amendments to Remedial Action Plan, Crown Hotel Development (Part of ORWN Area), Barangaroo South” by AECOM dated 4 May 2015.

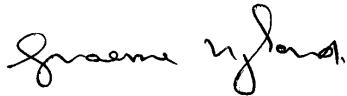
The RAP has been revised to reflect the current terminology used by the Environmental Impact Statement (EIS) that is being prepared in support of the proposed development applications. The key amendment is the revised description of the proposed staged planning approval process. The document has also been amended to clarify those land uses which are currently permissible under the approved Concept Plan (as modified) and those future intended land uses which are proposed as part of Modification 8 to the Concept Plan.

AECOM considers in their letter (4 May 2015) that *"...the amendments reflected in the Crown RAP - Rev 10 (AECOM, 11 April 2015):*

- *"relate predominantly to changes in terminology to align with the overarching planning documents (including the EIS);*
- *Do not modify the technical content of the Crown RAP - Rev 10 (AECOM, 11 April 2015); and*
- *Do not amend the recommended remediation strategy or approach to validation".*

Based on review of the revised RAP and AECOM's letter, I agree with AECOM's findings and consider the changes made to be largely editorial, with no modification to the technical content, the remediation strategy or validation approach. My Site Audit Report and Site Audit Statement dated 20 January 2015 can be relied upon as being relevant to the revised RAP (Revision 10, 11 April 2015).

Yours faithfully
ENVIRON Australia Pty Ltd



Graeme Nyland
Accredited Auditor 9808