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Re: Proposed Little Bay Development – Review of Site Contamination
Ref: MER-04-16399/LTR/v1 final

Introduction

ADE Consulting Group Pty Ltd (ADE) was engaged by Meriton Group (Meriton) to undertake a review of the Site Audit Reports (SAR) prepared for the area known as 'Little Bay Cove' (see figure 1) in relation to their proposed development. The Site has been issued with two Site Audit Statements by NSW EPA Accredited Site Auditor Graeme Nyland in 2012 and 2014, following remediation works undertaken between 2011 and 2014.

ADE understands that Meriton propose to develop the site for various uses ranging from medium to high density residential properties (town houses and apartments), public open space and retail. There will also be various roads throughout the Site.

As such ADE has been engaged to review the SARs previously prepared for the Site and provide comment on the suitability of the Site for the proposed Meriton development, based on the assumptions made within the SARs, any updated guidance, and the proposed layout (provided in Appendix I – Proposed Masterplan).

ADE has been provided with the following reports:

- Environ Australia Pty Ltd (Environ) 'Site Audit Report, Stage 1 & 2, Little Bay Cove Development, Anzac Parade, Little Bay', September 2012 (Environ 2012)
- Environ Australia Pty Ltd (Environ) 'Site Audit Report, Stage 3 & 4, Little Bay Cove Development, Anzac Parade, Little Bay', May 2014 (Environ 2014)

The above-mentioned SARs reference various other environmental reports prepared for the site, including the Site Validation reports, however as part of this letter, ADE has not reviewed other reports and has relied on summaries provided in Environ (2012) and Environ (2014).

Background

The Site, known as Little Bay Cove is shown in Figure 1, below. The areas subject to the SARs (Environ 2012 and Environ 2014) are also shown in the figure.

The site was previously owned by the University of New South Wales (UNSW) and included the former UNSW Solarch (solar research) compound, playing fields, open space and biological services compound. The north eastern section was subject to land filling in the 1960s-1970s. The area previously referred to as Stage 3 in the central portion of the Site is not included in the proposed Meriton development.

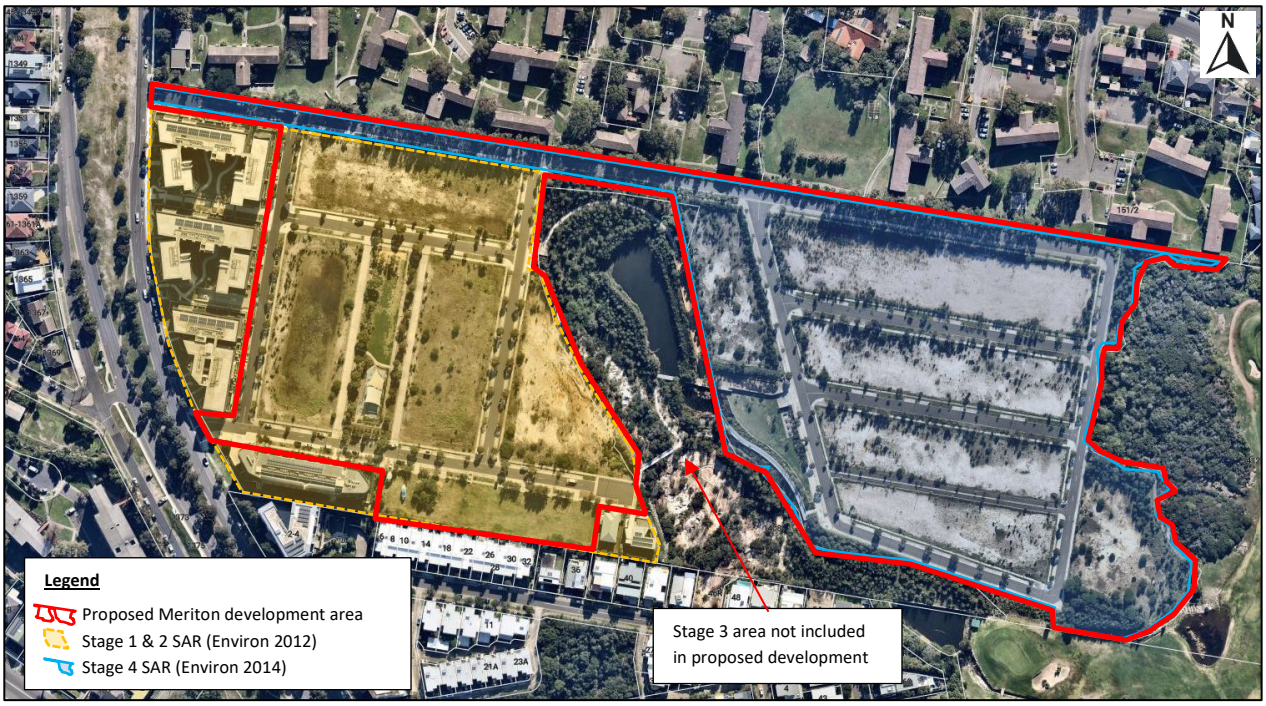

Figure 1: Proposed Development Site - Little Bay Cove (adapted from *Nearmap*, accessed 10.07.2019).

Stage 1 & 2 Area

Remediation of the Stage 1 & 2 area centred around the excavation of fill material from the former Solarch compound, while remediation was not considered necessary for the former playing fields. A summary of remediation works is as follows:

Western Playing Fields:

- Following removal of grass and topsoil from the playing fields area, a number of site walkovers identified 'occasional fragments' of asbestos containing material (ACM), which were removed from Site. A total of 7 fragments were found, with 4 other fragments encountered during targeted test pitting.
- Environ (2012) states:
    - *'There is a potential for some fragments of ACM to remain in the former western playing fields area. Given the relatively low number of detections over this large area, it is however considered that the amount is trivial. The potential for exposure of future residents to any residual asbestos fragments is considered to be negligible as VENM has been placed over most the area. Many of the areas that are not covered with VENM are to be used for basement excavations'*

- *'Although there is a potential for the stripped topsoil to contain fragments of ACM, the risk is considered to be sufficiently low such that further validation is not required. The material should be inspected during placement to further reduce this low risk'*

Former Solarch Compound:

- Fill containing building rubble, demolition waste, ACM was excavated to the depth of natural sand/bedrock sandstone
- Fill was either removed offsite or transferred to the Stage 3 & 4 area for further remediation. Validation of the excavation base and fill retained on the southern boundary was undertaken.
- VENM was imported to the site to facilitate design levels.

Stage 4 Area

The Stage 4 site remediation works included the demolition of the biological services building, validation, excavation of fill material and validation of excavations, offsite disposal of unsuitable fill, re-use of remediated and validated fill and monitoring of groundwater and landfill gas.

The remediation of fill material involved sieving out bulk material, followed by laying material onto 20 m x 20 m x 300 mm remediation beds (approx. 120 m^3), where ACM was handpicked to meet the remediation criteria of initially 0.01 % w/w, then 'no visible asbestos'. Following placement of the remediated fill, approximately 1 m of VENM/ENM was placed over the fill. All other contaminants of concern were also analysed, and were assessed to be acceptable based on statistical interpretation.

Although landfill gas assessment prior to remediation identified elevated concentrations of methane, it was concluded that landfill gas monitoring following remediation was not required. This was due to the fill material being excavated to bedrock/natural soil, offsite disposal of waste material, and putrescible waste not being identified in residual fill material. Furthermore, three groundwater wells were measured for landfill gas concentrations following remediation works, where methane was not detected. As such it was the conclusion of the consultant and the site auditor that the likelihood of landfill gas being present post remediation was low.

The SARs were prepared under the assumption of 'residential with access to soil' land use.

Updated Guidance

ADE notes that the remediation works and the Site Audit Report for the Stage 1 and 2 sites was undertaken in 2011-2012, before the amended National Environmental Protection (Assessment of Site Contamination) Measure 1999 (2013 Amendment) (NEPC 2013). The 2013 NEPM adopts the gravimetric approach for assessment of asbestos in soils, as outlined in the Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites (WA DOH 2009). ADE considers that although the Stage 1 and 2 area was not assessed for asbestos in soils as per NEPM 2013, due to the minimal amount of fill material within the western playing fields, and the fill from the Solarch compound area being removed and transferred to Stage 3 and 4, and the minor amount of asbestos fragments that were observed during remediation works, it is likely that the soils within this Site would meet the criteria for residential land use, and the previous conclusions to the suitability of the site for residential (with access to soils) are valid.

The Stage 3 and 4 areas, fill was remediated to reach the levels as per the WA DoH (as adopted by NEPM 2013), therefore ADE considers this area has been sufficiently assessed for asbestos in soils and suitability for residential land use (access to soils).

Emerging Contaminants – Per- and Poly-fluoroalkyl substances (PFAS)

ADE notes that since the completion of remediation works at the Little Bay Cove site, per- and poly-fluoroalkyl substances have emerged as a contaminant of concern within the contaminated land industry. PFAS are a group of man-made chemicals that have been used since the 1950s in a wide range of commercial/industrial applications including most notably fire fighting foams, non-stick cookware, garment and carpet surface protection treatments and metal plating.

The site history as per the SARs (Environ 2012 and Environ 2014) is summarised in Table 1 below.

Table 1: Site history (as taken from Environ (2012)

Date (approx.)	Activities
1881 – 1940	Hospital uses, however no buildings present on site. Paddocks and cultivated areas.
1940 – 1959	Sand mining
1959 – 1960	Land subdivided and granted to UNSW
1960 – 1979	Some landfilling on site and in adjacent areas (northeast of the Site) Fenced paddock areas in the east of the Site Areas offsite to the north were used as a resident's tip in 1969 Golf tee and green facilities constructed to the east An application to fill the western portion of the site with putrescible garbage refused by the Department of Health in 1970. Council subsequently offered to fill the area with non-putrescible materials (council clean up items). The site declared 'Unhealthy Building Land' by notice dated 8th July 1977 due to former use as a putrescible garbage landfill
1979 – 1992	The UNSW developed sporting field facilities in 1979. Caretakers cottage and office/amenities constructed in 1987 UNSW Biological Services Compound (BSC) and access road approved in 1984 and present in the 1986 aerial photograph. Excavation of fill material occurred. ADE understands the BSC to have been used for the breeding and accommodation of experimental animals used by UNSW.
1992 – 2007	The sports field were redesigned, and a synthetic hockey pitch installed in 1992 The Solarch building constructed in 1992/1993
2007 – 2011	Solarch building demolished in 2007 Demolition of hockey field and caretaker's cottage/amenities building in 2011/2012.

Based on the activities undertaken at the Site, ADE considers the risk of PFAS contamination to be low, however due to the presence of landfill material it cannot be discounted. The site is noted to have a 1 m VENM layer imported across the site, therefore based on the low risk of PFAS contamination, the risk to site receptors is negligible. Furthermore, as the former landfill areas have been excavated and remediated, with a large volume of material sent offsite, any potential PFAS impacts to groundwater are expected to have been longstanding, and no additional source of contamination is present. As such it is unlikely any remediation works are required. ADE notes that there are 5 registered groundwater bores within a 500 m radius, and none within the Site. Of the 5 registered bores, 3 are listed as being for household use, 1 for irrigation or agriculture and 1 unknown. As the area has reticulated water, it is expected that there will be no use of groundwater within the proposed residential sites, therefore ADE considers no further investigation of groundwater for PFAS is required.

ADE recommends that fill material to be excavated from former landfill areas for offsite disposal be assessed for PFAS. Due to the low risk, a reduced sampling density for PFAS may be able to be adopted.

Current Site Layout

A review of aerial photography between the period of the remediation works (2011-12) to date indicates that the majority of the site remains vacant, however a few lots on the western and south western boundary of the Stage 1 and 2 SAR area have been developed.

During the development of these lots, it appears Lot A of the proposed Meriton development site (refer to Appendix I – Proposed Masterplan) was used as a construction compound, with various site demountable buildings and containers present. A large stockpile was also present in the north eastern corner of this lot throughout 2017, presumed to have been excavated from the development lots to the east.

A playground area has been constructed in the proposed Lot B, present from approximately June 2014.

The proposed Park adjacent Lot C appears to have been underwater at various stages during and since the remediation works. It is unclear what the purpose of this dam area was.

ADE undertook a site walkover on the 12th of July 2019, to undertake a visual assessment of the site, and identify any major changes in comparison to the conditions described in the SARs. The following observations were made, site photographs are presented in Appendix II – Site Walkover Photographs:

- The site was vacant, however the roads were in use, with some cars parked in the parking bays on the roadside;
- The proposed Lot A was also vacant, with no remnants of the former construction site compound present;
- The surface of the unsealed areas was observed as crushed sandstone. Vegetation was present throughout with no signs of stress;
- The proposed park adjacent to the proposed Lot B was observed to be at a lower level than the adjacent Lots, with water still remaining in parts of this Lot.
- The proposed Lot C (townhouses) was grass cover. A small stockpile was also present, however the composition was not able to be determined due to overgrown grasses/vegetation. It was noted that some sandstone boulders were present at the edges of this stockpile.

The site walkover undertaken by ADE in conjunction with the review of aerial photography indicates that no major changes to the site have occurred since the completion of construction works, with the exception of the development of some Lots (not included in the Meriton proposal).

Proposed Development

ADE understands that the proposed development will include seven multi-storey residential buildings (as shown in Appendix I – Proposed Masterplan). Each building will also include underground car parking of at least 1 level. As such the remediated fill material beneath the imported VENM within Stage 3 and 4 will be disturbed. Although the fill has been remediated to a level acceptable for use within residential sites, there is still the possibility that asbestos materials may be encountered during excavation works.

ADE considers that appropriate management of excavation works via implementation of an asbestos management plan is sufficient to manage the asbestos risk during excavation works. Any spoil requiring offsite disposal will require classification as per the NSW EPA Waste Classification Guidelines, and any spoil containing asbestos will be classified as Special Waste.

Furthermore, ADE notes that a layer of VENM approximately 1 m thick was imported across the site. Areas that are not proposed to be excavated will remain with the surface VENM material, and as such are not at risk of having asbestos exposed on the surface.

Conclusion

Based on a review of the previous SARs, aerial photography of the Site in the time since the remediation works, and a site walkover, ADE believes the site can be considered suitable for the proposed Meriton development. ADE considers that appropriate management and classification of spoil during excavation works, including PFAS assessment, is sufficient to manage the low risk posed by residual contaminants present in fill material.

If you have any questions regarding the above, please do not hesitate to contact the undersigned.

Prepared by

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Project Manager

Reviewed by

Santo Ragusa
Principal Scientist

References

Environ Australia Pty Ltd, 'Site Audit Report (2012) Stage 1 & 2, Little Bay Cove Development, Anzac Parade, Little Bay', September 2012 (Environ 2012)

Environ Australia Pty Ltd, 'Site Audit Report (2014) Stage 3 & 4, Little Bay Cove Development, Anzac Parade, Little Bay', May 2014 (Environ 2014)

National Environment Protection Council (2013) 'National Environment Protection (Assessment of Site Contamination) Measure, 1999, 2013 Amendment' (NEPC 2013);

NSW Environment Protection Authority (2014) 'Waste Classification Guidelines, Part 1: Classifying Waste, (NSW EPA, 2014);

Western Australian Department of Health (2009) 'Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia' (WA DoH 2009)

Limitations

This letter summary has been prepared for use by the client who has commissioned the works in accordance with the project brief only and has been based on information provided by the client. The advice herein relates only to this project and all results, and conclusions made should be reviewed by a competent and experienced person with experience in environmental investigations, before being used for any other purpose. ADE Consulting Group Pty Ltd (ADE) accepts no liability for use or interpretation by any person or body outside the consent authority. This report should not be reproduced or amended in any way without prior approval by the client or ADE and should not be relied upon by any other party, who should make their own independent enquiries.

This report does not provide a complete assessment of the environmental status of the Site and it is limited to the scope defined herein. Should information become available regarding conditions at the Site including previously unknown sources of contamination, ADE reserves the right to review the report in the context of the additional information.

ADE's professional opinions are based upon its professional judgement, experience, training and results from analytical data. In some cases, further testing and analysis may be required, thus producing different results and/or opinions. ADE has limited investigation to the scope agreed upon with its client.

ADE has used a degree of care and skill ordinarily exercised in similar investigations by reputable member of the Environmental Industry within Australia. No other warranty, expressed or implied, is made or intended.

Appendix I – Proposed Masterplan

Proposed Masterplan

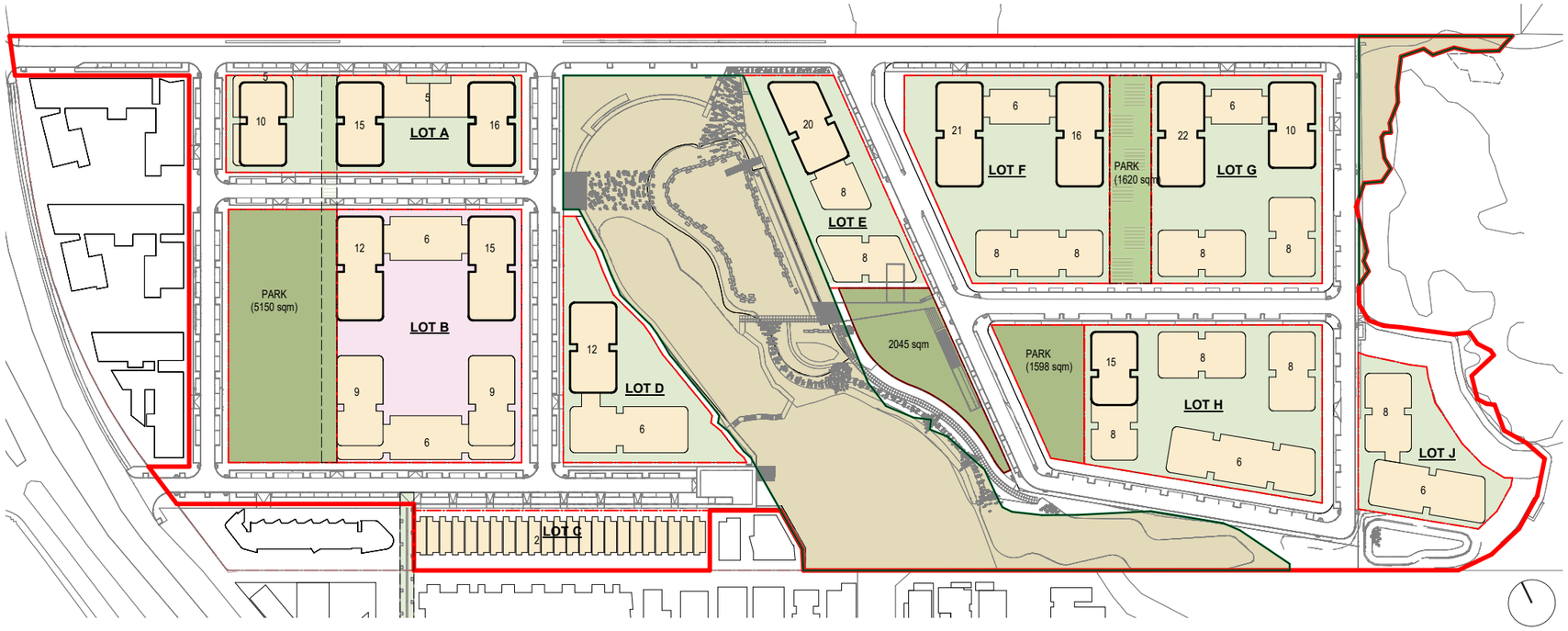
6.1 Site Layout Plan

The proposal height of proposed buildings varies from 22 storeys to two storeys across the site to create a sense of transition into the low density development surrounding the subject site.

The tallest parts of the proposal are in the north west corner, which minimises overshadowing to sensitive areas and the surrounding development.

The open space forms a spine through the precinct, bringing sunlight deep into the development and allowing residents and retail in the local area to spill out into the public realm. This will form the basis of a high amenity, enjoyable new precinct that has a strong sense of local connection to place and one another.

The podium will allow for communal open spaces to form below the tower, providing shared facilities for residents of the building. The configuration around the podium will maximise solar access with towers to the east and west of the envelope, while also providing shelter from wind tunnel effects,with the two storeys above podium to the north and south of the communal open space.



Key

- Site boundary
- Retail podium
- Residential
- Townhouse
- Open Space
- Pedestrian Through Link
- Proposed Beach Walk

Land Dedication Breakdown

LAND BREAKDOWN	AREA
TOTAL SITE AREA	123,203m²
Community title	25,060m²
Net Site Area	98,143m²
Open Space	35,670m²
Road/Infrastructure	38,391m²

Key Statistics

TOTAL	AREA
Retail GFA	5,900m2
Residential GFA	190,386m2
Total GFA	196,286m2
Residential NSA	156,741m2
FSR	2:1
Dwellings	1,909

Unit Mix

1 Bed	560	30%
2 Bed	906	50%
3 bed	420	28.8%
Town House	23	1.2%
Total	1909	

Assumptions

- Residential GBA-GFA Efficiency = 80%
- Residential GFA-NSA Efficiency = 82%
- Average Unit Size = 100m²

* Includes Community Title open space

Appendix II – Site Walkover Photographs

Photograph 1: Proposed Lot A (former construction compound area) – facing west. Dated 12.07.2019.

Photograph 2: Proposed park area. Evidence of former dam use – facing south. Dated 12.07.2019.

Photograph 3: Proposed eastern Lot – sandstone material throughout surface – facing east. Dated 12.07.2019.

Photograph 4: Proposed southern lots (lot C) – facing west. Overgrown stockpile present at far end. Dated 12.07.2019.