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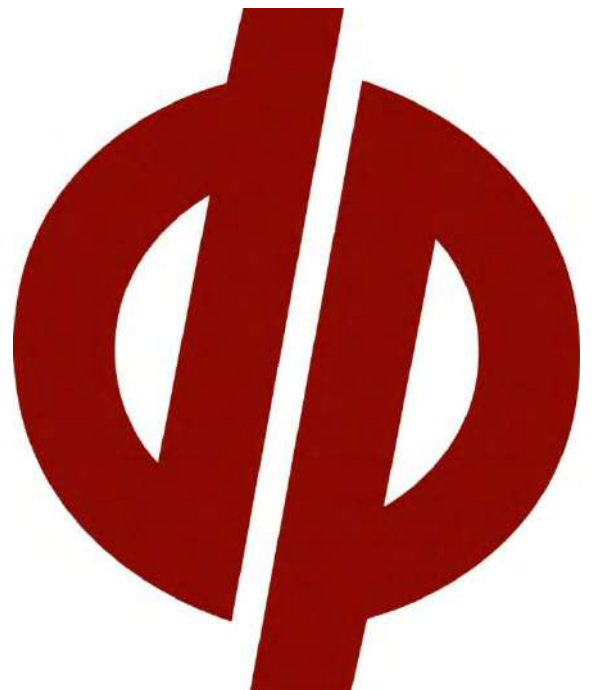
Report on Non Statutory Site Audit

Lot 97 in DP 270427
Little Bay Beach, Little Bay NSW

Prepared for
Randwick City Council

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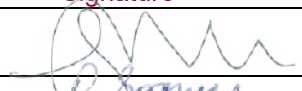
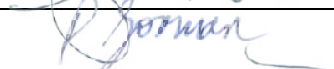
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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

	Signature	Date
Author		30 November 2021
Reviewer		30 November 2021



Douglas Partners Pty Ltd
 ABN 75 053 980 117
www.douglaspartners.com.au
 96 Hermitage Road
 West Ryde NSW 2114
 PO Box 472
 West Ryde NSW 1685
 Phone (02) 9809 0666

GLOSSARY OF TERMS - LIST OF ABBREVIATIONS

General

ACM	asbestos cement materials or asbestos containing materials
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
AGST	above-ground storage tank
AF	asbestos Fines
BRU	Beneficial Re-Use
CEMP	Construction Environmental Management Plan
CLM Act	Contaminated Land Management Act
COCOD	Chain of Custody Documentation
DA	development application
DEC	Department of Environment and Conservation
DECC	Department of Environment and Climate Change
DECCW	Department of Environment, Climate Change and Water
DSI	Detailed site investigation
DLWC	Department of Land and Water Conservation
DIPNR	Department of Planning and Natural Resources
DNR	Department of Natural Resources
DP	deposited plan
DUAP	Department of Urban Affairs and Planning
DQI	data quality indicators
DQO	data quality objectives
DWE	Department of Energy and Water
EMP	environmental management plan
EPA	Environment Protection Authority NSW
ESA	environmental site assessment
FA	fibrous asbestos
HDPE	high-density polyethylene
HIL	human health investigation level
HMTV	hardness modified trigger value
HHRA	Human Health Risk Assessment
GIL	groundwater investigation level
GSW	General Solid Waste
LTEMP	Long Term Environmental Management Plan
MNA	monitored natural attenuation
MSDS	Material Safety Data Sheet
NATA	National Association of Testing Authorities
NEPM	National Environment Protection Measure
NER	National Engineers Register
NSW	New South Wales
OEH	Office of Environment and Heritage
PCEMP	Post Construction Environmental Management Plan
PESA	preliminary environmental site assessment
PID	photo-ionisation detector
PSI	preliminary site investigation
PQL	practical quantitation limit

PSH	phase-separated hydrocarbons
QA	quality assurance
QC	quality control
RAP	remediation (remedial) action plan
RL	relative level
RPD	relative percentage difference
SAC	site assessment criteria
SAQP	sampling and analysis quality plan
SAP	sampling and analysis plan
SAS	site audit statement
SAR	site audit report
SIL	site investigation level
S(E)MP	site (environmental) management plan
SOP	standard operating procedure
SRN	sample receipt notification
SSC	sensitive site criteria
TCLP	Toxicity Characteristic Leaching Procedure
TBT	tri-butyl tin
UCL	upper confidence limit
UPSS	underground petroleum storage system
UST	underground storage tank
VMS	vapour mitigation system

Analytes - Inorganic

As	arsenic
Be	beryllium
B	boron
Cd	cadmium
Co	cobalt
Cr	chromium
Cu	copper
Fe	iron
Hg	mercury
Mn	manganese
Mo	molybdenum
Ni	nickel
Pb	lead
Sb	Antimony
Se	Selenium
Sn	Tin
V	Vanadium
Zn	zinc
CN	Cyanide

Analytes - Organic

B(a)P	benzo(a)pyrene
BTEX	benzene, toluene, ethylbenzene, xylene
OCP	organochlorine pesticides
OPP	organophosphorus pesticides
DDT	dichloro-diphenyl-trichloroethane
DDE	dichloro- diphenyl-dichloroethylene
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyls
SVOC	semivolatile organic compounds
TPH	total petroleum hydrocarbons
VHC	volatile halogenated compounds
VOC	volatile organic compounds

Measures

µg/L	micrograms per litre
km	kilometer
L	litre
m	metre
m ²	square metre
m ³	cubic metres
mg/kg	milligrams per kilogram
mg/L	milligrams per litre
mm	millimeter

Note: All acronyms listed above may not have been used in the report

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Report on Non Statutory Site Audit

Lot 97 in DP 270427

Little Bay Beach, Little Bay

1. Introduction

The subject of this Non-Statutory Site Audit Report (NS-SAR) is the site at Lot 97 in DP270427 at Little Bay Beach, Little Bay NSW. The site comprises the beach area and associated rock platforms and is generally within the area of tidal influence.

The audit was commissioned by Mr Stephen Leung of Randwick City Council (RCC), the client, following a proposal for the work, dated 08 June 2021. Mr Evan Buntoro is now the client's representative.

The purpose of this NS-SAR is to determine, following investigations by the assessment consultant, whether the land is suitable for any specified use or range of uses as defined in the *Contaminated Land Management Guidelines for the NSW Site Auditor Scheme* (3rd Edition), NSW EPA, 2017 and associated guidelines made or endorsed by NSW EPA (the auditor guidelines). The site audit is restricted to asbestos and asbestos containing materials at the request of the client.

The NS-SAR is based largely on the results of a contamination investigation undertaken by Trinitas Group (Trinitas) as documented in their report entitled '*Detailed Site Investigation of Potential Asbestos Contamination at Little Bay Beach, Little Bay NSW*,' Rev 6 dated 17 September 2021 (the DSI) and prior versions of the same report which were subject to audit commentary.

In addition, the audit included independent review of a human health risk assessment (HHRA) report prepared by JBS&G Australia Pty Ltd, entitled *Randwick City Council Updated Human Health Risk Assessment for Asbestos Little Bay Beach 4R Coast Hospital Road, Little Bay NSW* dated 24 September ref 59811-138906 (Revision 0).

Complete copies of the DSI and HHRA are provided in Appendix A and Appendix B respectively. Audit review comments in the form of Interim Advice Letters (IAL) and related email correspondence are included in Appendix C.

This NS-SAR has been prepared by Michael Nash who is accredited as an auditor with the NSW EPA (Auditor No. 9822) under the Contaminated Land Management Act, 1997. The auditor is also a NER registered engineer (No. 1168905) in both the Civil and Environmental Divisions of Engineers Australia and is a Certified Environmental Practitioner - Site Contamination (CEnvP-SC40065).

1.1 Involvement of Consultants and Auditor

Trinitas and JBS&G were engaged by RCC to carry out a DSI of the site and subsequently a HHRA based on the data from the DSI. The investigation works were carried out in late April 2021 following on from a series of 'emu pick' events to remove visible asbestos from the beach and rock shelves and platforms at the site (Lot 97 in DP270427).

Site investigation works by Trinitas were undertaken prior to audit commission. Emu picking works, air monitoring and corresponding reporting have continued on a biweekly basis from August 2020 to present.

A previous statutory audit has been carried out on the subject site as follows:

- Environmental Resources Management Australia (ERM, 2006). *Lot 33, Prince Henry at Little Bay, Summary Site Audit Report, PS53 - Lot 33*, dated 20 July 2006, prepared by Paul Steinwede.

In addition, a statutory audit has been carried out on the adjacent site as follows:

- EarthTech Engineering Pty Ltd (ETE, 2008). *Lot 79, Prince Henry at Little Bay, Summary Site Audit Report, PS45 - Lot 79*, dated 29 February 2008, prepared by Paul Steinwede.

It should be noted that the Lot nomenclature has changed since these audits were completed and it is understood from RCC that the former Lot 33 now essentially comprises Lot 97 (the subject site of this NS-SAR) and that Lot 79 now comprises Lot 98 (the area immediately landward of the beach).

The site audit reports ERM (2006) and ETE (2008) contain considerable detail regarding the site history of the land adjacent to the subject site, as well as details of site investigations and site remediation on the Lots adjacent to Little Bay Beach. ERM (2006) contains an unexpected finds protocol for the subject site, whereas ETE (2008) contains an Environmental Management Plan (EMP) for the future management of remediation in Lot 79 (now Lot 98). Further details of the EMP are provided in Section 2.4.

Current Lot boundaries for Lot 97 and Lot 98 are shown on Figures 1 and 2 below.

The auditor undertook one site inspection on 6 July 2021 accompanied by the auditor's assistant and Messrs Stephen Leung and Evan Buntoro of RCC.

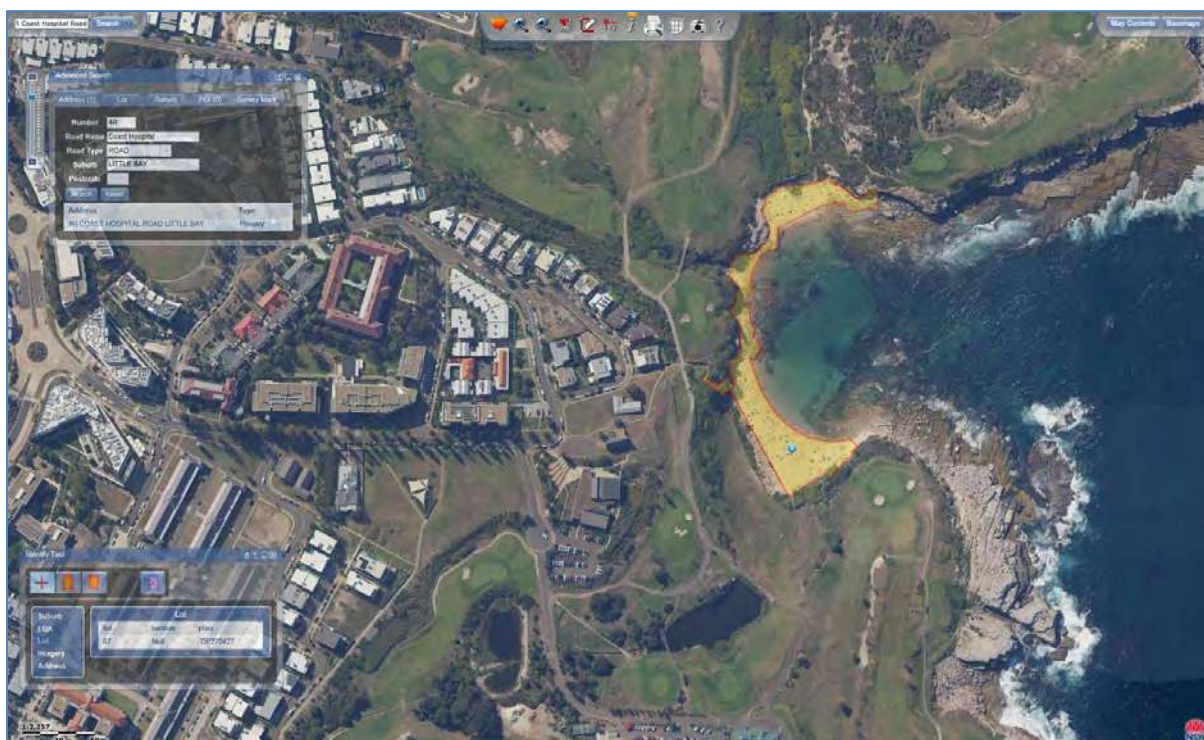


Figure 1 - Boundary of Lot 97 in DP270427



Figure 2 - Boundary of Lot 98 in DP270427

1.2 Scope of the Site Audit Report

This site audit was carried out principally using the criteria established and/or endorsed by the NSW EPA in auditor guidelines as referenced below and otherwise on their website <http://www.epa.nsw.gov.au/clm/index.htm>).

- NSW EPA (2017). *Contaminated Land Management Guidelines for the NSW Site Auditor Scheme* (3rd edition).

In addition, the auditor has referenced, where appropriate, other guidance documents made or approved by the NSW EPA under Section 105 of the Contaminated Land Management Act, 1997, including, inter alia:

- NEPC (2013) *National Environment Protection (Assessment of Site Contamination) Measure 1999*, as amended May 2013.
- NSW DECC (2014). *Waste Classification Guidelines, on Waste Classification Guidelines Part 1 Classifying Waste and Part 2 Immobilisation of Waste*.
- NSW EPA (1995). *Sampling Design Guidelines*.
- NSW EPA (2015). *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997*.
- NSW EPA (2020). *Consultants reporting on contaminated land Contaminated Land Guidelines (updated May 2020)*.
- Department of Health WA (2021) *Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia*.

In completing the audit process the auditor has reviewed the consultants' reports against checklists of requirements for reporting which have been adapted from the above guidelines. The scope of works by the consultants and therefore by the auditor was limited to the assessment of asbestos contamination at the site.

Other information referred to by the auditor is listed above and in Section 1.4 and in the References at Section 12.

The auditor notes that there is no known conflict of interest in regard to him undertaking a non-statutory audit (under the CLMA) for this site (Lot 97) and that he has no pecuniary interest in doing so. No members of the auditor's expert support team were used during the course of this audit¹.

¹ Support team members were not used during the course of this audit, including for risk assessment evaluation noting that the HHRA dealt only with asbestos and that chemicals and chemical combinations did not comprise part of the audit. The auditor notes that exposure risk is via the physical properties of asbestos fibres and that it is only airborne fibres which present a potential hazard and that when the asbestos is bound in a cement matrix (as is the case here), it is not readily released to the air, particularly when soils are regularly wetted.

1.3 Limitations

The auditor has prepared this NS-SAR and accompanying NS-SAS for the purposes specified in the above sections and as defined by Regulation and by the NSW EPA. The project scope of works undertaken by the auditor was developed specifically for the purpose of meeting the objectives outlined above. The objectives and scope of works adopted by the contamination assessment consultant are understood to have been developed based on similar objectives.

The auditing work and reporting undertaken has been carried out to a standard of care and diligence normally expected of professional engineers and scientists practicing in the areas of contaminated land assessment and management in NSW.

The degree of confidence in the findings and conclusions of the SAR and related SAS is governed by the typical limitations and constraints inherent in such audits. The audit is based entirely on the investigations undertaken by the contamination assessment consultants as well as on the reported relevance and quality of the information and data obtained during the investigations.

Where there are shortcomings or limitations regarding the data obtained from the site (investigations) or uncertainties in respect to the conclusions drawn from these data, such issues are identified in the SAR.

The audit, as undertaken, reflects the condition of the site at the time of investigations, which noting the nature of the beach environment may change due to a combination of physiographic factors and is based on the results of the investigations under audit. In this regard it is noted that the consultant (Trinitas) has indicated that the investigation results are time limited due to the tidal nature of the environment and the auditor notes that the nature and extent of contamination on the beach (asbestos) is likely to change with each tidal cycle as well as incident rainfall and runoff.

No liability can therefore be accepted for failure to identify site conditions or related environmental issues which may arise from ongoing site uses, or which could not have reasonably been determined or envisioned based on the scope of investigation works undertaken. In this regard it is noted that site conditions are determined by the consultant during the investigations, by means of investigative, interpretative and statistical methods using data obtained during sampling, and it is noted that conditions between sampling locations, and over time, may not be reflective of those actually sampled or analysed.

Accordingly, no liability is accepted by the auditor for unidentified contamination or subsurface features, or structures subsequently found to be present on the site where the investigations have been undertaken in substantial compliance with the guidelines made or endorsed by NSW EPA.

The data used to support the conclusions reached in this NS-SAR have been obtained by other consultants and have been audited with a reasonable level of scrutiny, care and diligence by the auditor. No liability can be accepted for unreported omissions, alterations or errors in the data collected and presented by the other consultants. Accordingly, the data and information presented by others are taken and interpreted in good faith by the auditor.

This NS-SAR should not be used for purposes other than those indicated in the previous sections of this report. The report and attached SAS (No. DPNS/19) should not be reproduced without the permission of Douglas Partners Pty Ltd (DP).

If additional copies of the report are required for any reason, then the SAR should be reproduced in its entirety including the SAS to which this report is attached.

This site audit does not address the geotechnical or engineering suitability of the site, or any materials thereon, including issues related to contaminants or conditions not related to asbestos. Accordingly, if required, it is suggested that suitable specialist advice is obtained in relation to geotechnical or engineering issues. Similarly, the audit does not specifically address the suitability of any materials for re-use on, or for application to, land which falls beyond the boundary of the site, although such matters are addressed in relation to the classification and destination of any materials as wastes (although at the time of reporting no excavations of any kind are known to have occurred other than site testing). In addition, the audit does not address hazardous building materials in existing structures, as no known structures are evident on Lot 97.

1.4 Associated Reports and Other Materials Referenced

Revisions 3-6 of the Trinitas DSI report were reviewed as part of the audit and comments were provided in IAL1, IAL3, IAL4, IAL5 and IAL6 issued between 2 July and 10 September 2021. Similarly, Revision A of the JBS&G HHRA was reviewed in IAL2 dated 9 July 2021. Revisions 1 and 2 of the DSI report were not provided for review.

Following the commencement of the audit earlier versions of the DSI and HHRA have been superseded by the reports referenced above. The auditor also consulted materials which predated audit commission, and which were made available for the purposes of tendering, including a briefing paper by Trinitas and an interim HHRA by JBS&G, again both documents were subsequently superseded by later DSI and HHRA reports as referenced above.

Other relevant additional information including correspondence between the auditor, client and consultants is included at Appendix C and comprised IALs as noted above as well as various supplementary emails which have been kept on record by the auditor.

A series of asbestos inspection and clearance documents and air monitoring reports by Trinitas dating from August 2020 which relate to asbestos removal from the beach area have also been examined. Some of these are relevant to the site investigation period (late April 2021) and are appended to the DSI at Appendix A.

2. Site Details

2.1 Site Description

A summary of site details is provided in Table 1 below.

No proposed development is contemplated, and the beach area will remain recreational in nature as public open space.

Table 1: Summary of Site Information

Site Owner:	Randwick City Council
Site Location:	4R Coast Hospital Road
Total Site Area:	The total site area is approximately 1 hectare
Title Identification:	Lot 97 in DP270427
Zoning:	Recreational
Recent Land Use:	Beach
Proposed End Land Use:	Beach
Adjacent Land Use:	Golf course, amenities and public beach access

Auditor's Opinion

The auditor concurs with the site description and locational information provided by the consultant which appears to coincide with the actual site (and proposed land use) under audit. The auditor notes that in previous versions of the DSI, Trinitas did not accurately define the site, and the site boundaries did not agree with the cadastral lot boundaries. In addition, the descriptions of the site in the DSI were not confined to the Lot in question but strayed into the adjacent site (Lot 98) occupied by a golf course and related amenities. In the final version of the DSI, Trinitas have clarified that the site boundary corresponds to the cadastral boundary of Lot 97 in DP270427. The auditor notes however that the condition of the adjacent land (Lot 98) may be relevant to the conditions observed on the beach itself as the consultant identifies the adjacent Lot as a likely source of (asbestos) contamination.

2.2 Topography, Geology, Soils, Drainage and Meteorology

The beach slopes gently into the Pacific Ocean and is flanked by low sandstone cliffs and what are apparently fill slopes on the landward side. Rock platforms and shelves interrupt the beach dividing it into three small sections (Northern, Middle (Western) and Southern Beach). The site (Lot 97) appears to be entirely tidal as evidenced by a wave cut notch in the sandstone cliffs (formed from Hawkesbury Sandstone). Strand lines of shell and other debris at the head of the beach are present and probably extend beyond the landward boundary of Lot 97.

Various anthropogenic materials were observed by the consultants, and by the auditor on the beach, including tile, ceramics, coal, plastics, brick, concrete as well as fibrous cement materials generally small fragments of fibre cement sheeting including both flat and corrugated pieces which were assumed to contain asbestos, i.e., asbestos containing materials (ACM).

Three small creeks debouche onto the beach via incised gullies (Crown Gullies 1-3), with one gully draining onto each beach (Crown Gully 1 the northern gully drains onto the northern beach, and so on). The creeks drain the hinterland immediately behind the beach, which comprises the Little Bay residential area, the golf course, and related amenities. Land to the west of the beach is known to be partially filled and has been remediated (including a containment cell) according to the relevant site audit (then Lot 79) as described in ETE (2008).

Following a request by the auditor some rainfall and tidal data was provided by the consultant in an attempt to determine the likelihood of contaminant migration within the beach and from the adjacent hinterland occasioned by erosional and mass transport mechanisms. Limited information was provided.

Auditor's Opinion

The consultant's description of site physiography was broadly satisfactory and extended to an appreciation of the overall condition of the adjacent site (Lot 98). Requests to correlate asbestos (ACM) occurrence on the beach with rainfall patterns and predominant onshore currents and tidal movements were not followed up by Trinitas (see Section 2.4), although the auditor considers these would have provided a useful insight into the impact of meteorological conditions on the frequency of ACM movement / deposition on the beach.

2.3 Site History

Trinitas provided a 'limited' site history review which focussed almost entirely on the history of the adjacent site (Lot 98). Focus on the bordering land appears to have occurred based on the reasonable assumption by the consultant that the adjacent land is the likely source of asbestos on the beach area. In this regard Trinitas noted that parts of the adjacent land had been historically filled with demolition debris from the former Prince Henry Hospital. Trinitas also noted that there were gaps in the history of the adjacent land, in particular in relation to the nature and extent of filling.

Gaps in the site history in relation to Lot 98 were listed in Section 3.6 of the DSI as follows, although the auditor notes that many of these actually relate to the site walkover performed by Trinitas, viz:

- *The Site walkover indicated that there were potential fill materials in immediate surroundings including exposed soils at the golf course, stockpiles adjacent to Crown Gully 1, dumped waste along the Heritage Wall, dumped waste inside of Crown Gully 2. However, the details of fill materials (if present), such as origin or extent, were not known (some stockpiles could be traceable to the ongoing landscaping activities from the golf course).*
- *The Site walkover indicated the presence of visible ACM fragments throughout the Site. The origin of these fragments was not known.*
- *The Site walkover also identified several ACM fragments under boulders in all of the three rock areas. It was not known if there was further potential asbestos contamination across the underwater sands and rock areas.*
- *Both Crown Gully 1 and Crown Gully 3 were not accessible and were out of the scope of this work. However, ACM fragments were confirmed in the lower section of Crown Gully 2.*
- *Both soil erosion and bush clearance were observed at the upstream of Crown Gully 3 and Crown Gully 1. The sources of accumulative ACM fragments adjacent to the outlets were not known.*
- *Stormwater runoff and soil erosion cut through the beds of Crown Gully 1 and Crown Gully 2, by over 1 m deep at some visible sections. The conditions and extents of contamination in these gullies were not clear.*
- *The review of limited aerial photo Imagery indicated that the residential dwelling around the Site has been continuously developed for decades. It was not clear whether the residential development and bush clearance (i.e., north-western cleared paddocks at the upstream of Crown Gully 2, Middle Beach; upgradient of Crown Gully 1) resulted from the failure of former environmental management plans as listed in the previous Site Auditor Statement Letter.*

- *It was not clear that to what extent, the potential contamination sources (from the Open Water, Crown Gully 1, Crown Gully 2 and Crown Gully 3, up to the Golf Course) led to asbestos fragments disturbance in soils capped by layers of plastic mesh and imported clay soils.*
- *It was not clear to what extent, the ACM fragments being washed back and forth from the Bay, originated from dumped materials during redevelopment works.*

The eventual discovery of two previous site audit reports for the subject site and the adjacent site (see Section 1.1) provided further information, particularly on the history, remediation and redevelopment of Lot 98.

Focus on the history of the adjacent land by Trinitas appears to have been in part due to the fact that the actual boundary of the subject site (Lot 97) was not well understood (at least initially) leading the consultant to concentrate their historical focus on the off-site areas (Lot 98). Accordingly, the history of the beach area itself (the site) is not well documented, although this is understandable as limited historical information appears to be available regarding Lot 97. Moreover, it is also considered likely that no development or significant works have occurred on the beach apart from the construction of a wave deflection barrier at the head of the southern beach. Other remnant structures observed by the consultants, and by the auditor, are believed to be located wholly within Lot 98 which is outside the scope of the DSI and the audit, except inasmuch as the adjacent hinterland is the likely source of contamination on the subject site.

Examination of the previous site audit reports (Section 1.1), dated 2006 and 2008 has revealed that extensive remediation took place prior to the redevelopment of the Prince Henry Hospital site, including the entombment of approximately 7,785 cubic metres of asbestos contaminated waste (soils) which was placed into a cell adjacent to the 17th fairway. The asbestos contaminated soils were mostly sourced from the southern side of the site (the so called 'developable area' which now contains the Little Bay development, and / or from the 'undevelopable area' which now contains the golf course and various other amenities).

The material placed into the entombment cell reportedly complied with the NEPM Health Based Investigation Levels (HILs) for "Parks, recreational open space and playing fields and "inert" waste criteria as defined in the NSW EPA's "Environmental Guidelines; Assessment, Classification & Management of Liquid & Non-liquid Waste (1999). The auditor notes this guideline has since be superseded by NSW DECC (2014). *Waste Classification Guidelines, on Waste Classification Guidelines Part 1 Classifying Waste and Part 2 Immobilisation of Waste*. The contours of the entombment cell were blended with the existing undulating landform so that it is undistinguishable from the surrounding land. Approximately 500 mm of clean fill was placed over the contaminated fill and 100 mm of topsoil was placed on top of the clean fill. Turf was then laid over the top of the topsoil.

Trinitas report that an interview with Mr. Greg Bond (a local resident) revealed that there was no former report of asbestos contamination at Little Bay Beach and that he also indicated that he has around 50 years of knowledge of the site and that *"the legacy dumped tip is located on the northern hilltop adjacent to Crown Gully 1 and Northern Beach"*. Mr Bond made no reported mention of the remediation works which were completed in 2007 and which were reported in ETE (2008).

However, there is reasonably firm evidence in the previous audits and prior investigations that some asbestos was present on the beach in the early 2000s, although testing by EMS as reported in ERM (2006), did not appear to confirm this view.

Trinitas obtained a Section 10.7 Planning Certificate (under the Environmental Planning and Assessment Act, 1997) for the subject site being Lot 97 in DP270427 which indicated that RCC '*... HAS received a copy of a site audit statement, within the meaning of the Contaminated Land Management Act 1997, for this land...*'. The site audit statement (and report) referenced is in fact ERM (2006) which relates to Lot 33 (now Lot 97).

Trinitas did not however, obtain a corresponding S10.7 Certificate for the adjacent land (Lot 98) although the corresponding site audit statement and report ETE (2008) were obtained. However, as noted above these were not apparently reviewed by Trinitas despite the adjacent land being earmarked as the likely source of asbestos on Lot 97.

Auditor's Opinion

In general, the site history presented by Trinitas relates to Lot 98 rather than Lot 97, which is reasonable under the circumstances because Trinitas has identified Lot 98 as the likely source of asbestos. The history of the adjacent land was however, sufficient to reasonably suggest that the asbestos found on the beach and rock platforms was originally derived from the adjacent hinterland rather than from the beach itself and that this has occurred by means of a variety of mass movement processes which have transported the asbestos onto the beach and thence moved it around on the beach by current and wave action, which in turn may have buried the material in sand and then re-exposed it by continued tidal action. Notwithstanding, Trinitas have not provided corroborative evidence that the hinterland areas are unequivocally the source of asbestos, although this seems most likely based on the available, but still circumstantial evidence. Further study would be required in this regard, most notably to determine whether there is a higher incidence of asbestos (ACM) on the beach following heavy rainfall, which may occasion increased erosion, release, and transport of ACM from the hinterland via the gullies and onto the beach area. Tidal, current and wind action may also require examination.

2.4 Conceptual Site Model

A Conceptual Site Model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM provides the framework for identifying how the site became contaminated and how potential receptors may be exposed to contamination either in the present or the future i.e., it enables an assessment of the potential source - pathway - receptor linkages (complete pathways).

Trinitas developed a preliminary conceptual site model (CSM) for the site based on their review of desktop (historical) information which was largely based on the adjacent site (Lot 98) and on their appreciation of the physiographic conditions on the site and the likelihood that conditions on the beach would change quite rapidly because of tidal effects. Subsequently, following comments from the auditor Trinitas developed a slightly more detailed CSM which further identified not only the main likely sources of asbestos, but also the erosional mechanisms and transport vectors which would affect the distribution (degree and extent) of asbestos on the site.

Trinitas identified the potential sources, pathways and receptors of (asbestos) contamination and nominated filled areas in the hinterland to the west of the beach in Lot 98 as the likely sources and the three Crown Gullies (creeks) as the main transport routes, which are most likely to be active during heavy rainfall, and consequential erosion of filled areas which may release asbestos, and possibly other contaminants onto the beach.

Trinitas provided a summary of potential areas of environmental concern (AECs) and contaminants of Potential Concern (COPCs) in the form of Table 8 of the DSI (Appendix A herein), although it is noted that the DSI and this audit concern only asbestos contamination. Table 9 of the DSI provides a list of potential sources, pathways, and receptors of contamination (asbestos), although as noted below not all possible sources of asbestos were considered. Notwithstanding, from the site history and from observations on the beach of slag/coal like material near the discharge point of Gully 2, the auditor notes that other contaminants may be present in Lot 97. In this regard the auditor further notes from the site history that contaminants other than asbestos were present on the adjacent land and were remediated (including containment) along with asbestos.

From the frequency of asbestos on the beach over time, as shown in the trend line graph of ACM in Section 3.5 of the DSI (and from the various Asbestos Clearance Inspection and Clearance Certification Reports conducted since August 2020 - (see <https://www.randwick.nsw.gov.au/planning-and-building/council-works-and-upgrades/major-projects/little-bay-beach-asbestos-management>) there appears to be a constant replenishment of asbestos onto the beach from an unconfirmed source, likely to be from the hinterland (Lot 98), although this has not been empirically demonstrated in the auditor's opinion. Moreover, it is noted that the beach presents asbestos at / or near the surface at virtually all times, except perhaps immediately following each clearance event by Trinitas. However, redistribution of asbestos by tidal events may expose asbestos which was previously buried in the sand or was present below the water line, or conversely cover it with sand, or move it around on the rock shelves during each tidal cycle. Accordingly, the auditor notes that the lateral and vertical distribution of asbestos on Lot 97 is never likely to be static and is subject to constant change. Progressive removal of asbestos as reported in the Asbestos Clearance Inspection and Clearance Certification Reports by Trinitas, whilst removing a considerable amount of ACM over time (reportedly over 2000 pieces since August 2020) has not seemingly reduced the reported occurrence, particularly noting that at the time of the DSI in April 2021 asbestos clearance had been ongoing for 8 months and has subsequently continued a regular basis.

Trinitas noted that remediation works had occurred in the adjacent land and relied on the anecdotal information provided by Mr. Greg Bond, but did not provide a detailed review of the EMP for the adjacent site (which is included in the SAR for Lot 98 (formerly Lot 79)). The SAR (ETE 2008) and EMP (2008) provide considerable detail regarding the remediation of Lot 98 including a comprehensive site history as well as details of asbestos containment. The latter, in particular, was not interrogated by Trinitas, and it noted in this context that the relevant sections of the DSI are headed 'Limited Site History Review' and 'Preliminary Conceptual Site Model and Risk Assessment' respectively. The auditor further notes that the preliminary CSM should have been developed for the SAQP (which was not prepared in any detail and then modified after the completion of the DSI. Neither of these steps were undertaken by Trinitas.

The EMP (2008) by EMS (an Appendix of EME, 2008) reported that:

'...Approximately 7660 cubic metres of waste was placed into the entombment cell. Most of this waste was sandy soils containing asbestos. An additional 3,500 bags of asbestos waste from Building 59, Lot 53 and 7,700 bags of asbestos waste from Building 60, Lot 57 were placed into the containment cell. The average weight of the bags was approximately 20 kilograms resulting in an additional 125 cubic metres (224 tonnes) of asbestos contaminated waste being placed in the cell. The bagged asbestos was removed by ATS and given to Nace (the contractor) to place into the containment cell...'

and

‘...The sandy nature of the waste (the contaminated soil including asbestos) means that they have relatively high permeability ensuring that the likelihood of perched water within the cell will be negligible. It is expected that there will be some infiltration to the cell however it should be noted that even with some infiltration there is minimal probability that there will be any migration of asbestos fibres in the groundwater because of the density of the sandy soils...’.

Although Trinitas did not specifically reference the EMP (2008) or the corresponding site audit report for the adjacent site i.e., ETE (2008), they considered, most likely correctly, that the asbestos on the beach has been sourced from the Lot 98 area including from diffuse and point sources (see Table 3 and Appendix E of the DSI, Appendix A herein), including *inter alia* legacy tips, dumped waste, gullies, stockpiles, filled areas, etc. However, Trinitas have provided limited empirical (corroborative) evidence to back up this statement. However, there can logically be only a few plausible or even possible sources of the asbestos on the beach particularly noting that the ACM in question is clearly anthropogenic. Probable or possible sources of ACM on the beach areas shown in Table 2 and Drawing 1.

Auditor’s Opinion

The CSM developed by Trinitas is considered to be generally plausible and sufficient to identify the likely sources and transport mechanisms which have resulted in contamination of the beach (Lot 97) by ACM. The auditor considers that it is reasonable to assume that the original source of ACM is not from Lot 97.

The auditor notes that the CSM did not consider all possible sources of asbestos in Lot 97, nor did it provide unequivocal evidence that Lot 98 is the source of asbestos. The auditor has therefore prepared Table 2 which examines a range of possible sources of asbestos in Lot 97 and the likelihood that these have contributed to the observed contamination.

From Table 2 it is reasonable to conclude that the most likely source of asbestos on Lot 97 is indeed from Lot 98, although the mechanisms of exposure, release, transport, migration and deposition have not been fully explored by Trinitas, although the fundamentals have been identified.

In this regard Trinitas provided a graphic showing the frequency of asbestos (ACM) pieces recovered from the beach during successive emu pick exercises from August 2020 to March 2021 (which is ongoing) and indicated that there was no trend showing a reduction in frequency despite regular (biweekly) inspection and removal (viz *‘...visual inspections and emu-picking from 3 August 2020 to 2 June 2021 indicated that there was no obvious decreasing trend of visible ACM fragments throughout the three beaches...’*).

These findings suggest an ongoing supply of asbestos, and perhaps that periodic peaks in occurrence relate to periods of heavy rainfall, although again this relationship was not further pursued, despite a request to do so. Notwithstanding, circumstantial evidence, which is quite compelling, shows the greatest accumulation of asbestos near the Crown Gully outfalls and the observations tend to corroborate the hypothesis. However, this theory presupposes that asbestos (ACM pieces) in the southern beach area (which showed the highest incidence during testing by Trinitas in late April 2021, see Section 4) is not subject to tidal movement and redistribution - as it clearly is - and which will inevitably redistribute asbestos into other areas of the beach during each tidal cycle. Similarly, the DSI does not discuss in any detail, the effect that local currents, wave amplitude etc. would have on the redistribution of asbestos, other than stating that some asbestos is moved up and down the beach by wave action. Such a study would assist in developing a remediation and/or management programme for Lot 97 (and for the adjacent foreshore and hinterland area of Lot 98 if required).

Accordingly, some form of tracing study may be warranted to confirm the source or more particularly the amount of asbestos which is reaching the beach from Lot 98. The first step would, however, be to determine whether there is an increase in the occurrence of ACM on the beach, derived from the gullies/hinterland, following heavy rainfall events. The ACM Fragments Trend Line (Aug 2020-March 2021) in the DSI tends to suggest that this may well be the case, although the raw data supporting the graphic would need to be provided and / or compared with local rainfall patterns. This was requested by the auditor but was not supplied by Trinitas.

The CSM by Trinitas was provided in tabular / descriptive form rather than graphical form despite a request by the auditor to provide a schematic section, which would better inform the CSM. Accordingly, the auditor has developed a schematic section (Drawing 1) based on findings of the DSI, the site inspection and the contents of the prior audit reports (Section 1.1). However, given that the likely source of ACM contamination originates from outside the site and the nature and extent of any potential contamination on the site is relatively straightforward (and is likely to constantly change due to tidal action), a descriptive CSM was considered sufficient in this case.

Table 2: Possible Sources of ACM on Little Bay Beach

Source #	Possible ACM Source / Origin	Likelihood	Comments / Observations
1	ACM sourced from uncontrolled fill and demolition waste located in / on the beach's hinterland (Lot 98) which may or may not have been capped and or from gullies incised in fill materials	Possible to probable	Any breach in remedial capping or other sources in the immediate hinterland and foreshore should be evident if present or since repaired. Also, a record of maintenance should have been maintained under the EMP for Lot 79 (now Lot 98) as outlined in previous audit dated Feb 2008. [Note: Trinitas reported soil disturbance observed during inspection of the adjacent land]
2	ACM sourced from contained fill in the hinterland e.g., from the cell beneath the 17 th fairway (Lot 98) or similar	Possible	Any breach in capping should be evident if one has occurred. If since repaired, assuming the EMP has been implemented, and depending on frequency of inspections and need for rectification under the EMP, then a record of maintenance should have been maintained under the EMP for Lot 79 (now Lot 98). [Note: Trinitas reported soil disturbance observed during inspection of the adjacent land]
3	ACM sourced from below the low water mark	Probable	Any ACM below the low water mark must originally have been sourced from one or more of the above sources unless ACM has drifted into Little Bay by wave action or currents originating from another nearby onshore, or offshore source.
4	ACM from fill slope failure along beach foreshore and side slope (Lot 98)	Possible to probable	This mechanism could have contributed historically to ACM on the beach, but there is no evidence of catastrophic failure of fill slopes. Some occasional erosion may have occurred but not to the extent it would have supplied the amount of asbestos thus far removed. Trinitas has indicated that fill slopes extend down towards the beach onto the foreshore. It is however noted that significant remediation measures were installed prior to 2008 which are not known to have failed. No reports to the contrary resulting from the implementation of the EMP have been sighted and none are known to be available.
5	ACM from an unknown source on the beach (Lot 97 or former Lot 33)	Very unlikely	No known structures on the beach in Lot 97 (or former Lot 33). No structures reported by previous Audit dated July 2006
6	ACM from sources beyond the hinterland (Lot 98), or at sea	Highly unlikely	Distance, gradient and absence of other transport mechanisms would seem to rule out this mechanism as a possible source, other from via on shore currents (could include offshore dumping of asbestos contamination although there is no evidence of this)
7	Fly tipping/dumping of ACM on the beach/offshore (or in Lot 98)	Unlikely to highly unlikely	No record, evidence or report of this taking place has been sighted or made available
8	Asbestos from natural sources)	Highly unlikely to extremely unlikely	This is not reasonably feasible noting that the asbestos is ACM and is therefore anthropogenic

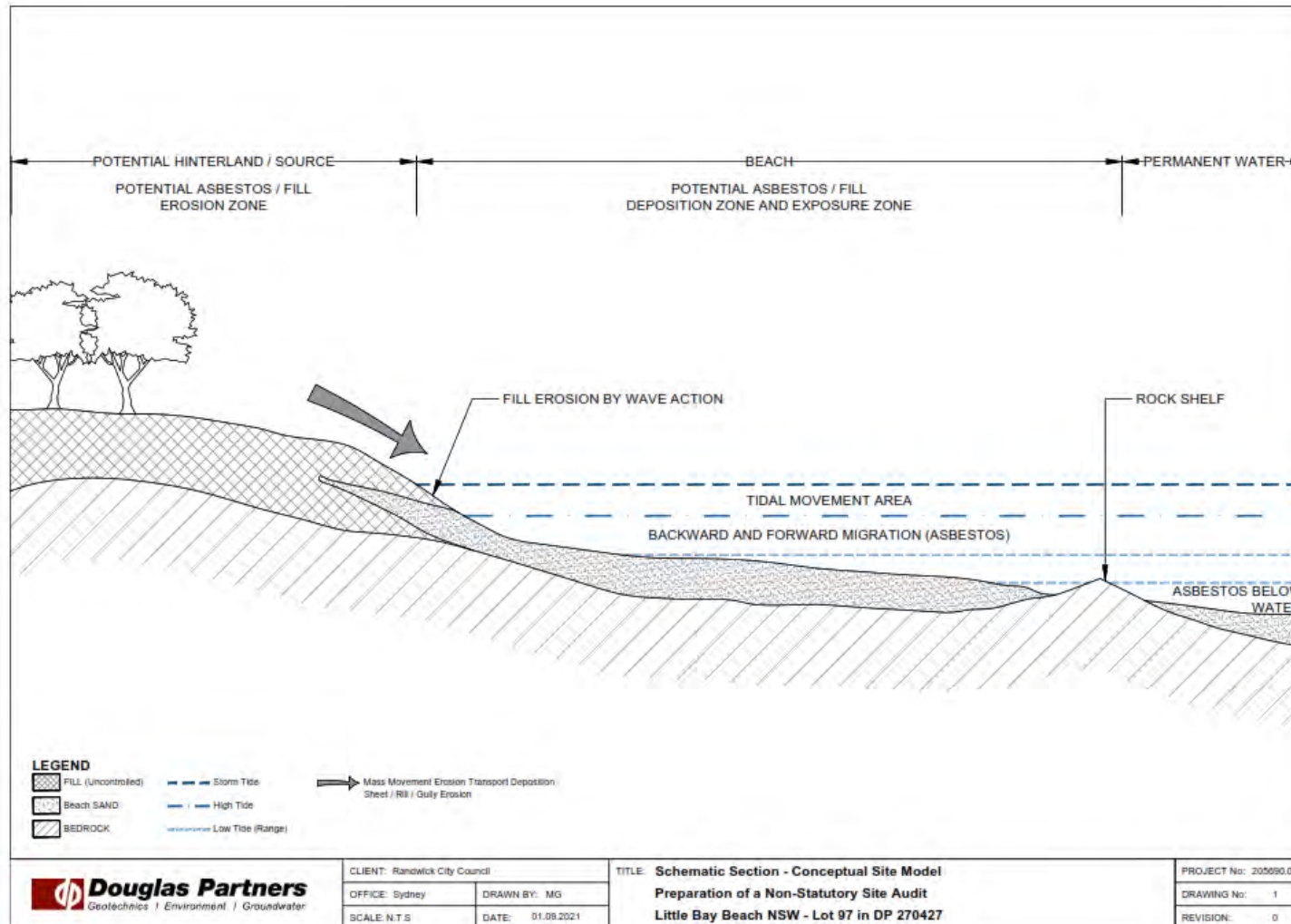
Possible ACM transport mechanisms have also been summarized in the following table.

Table 3: Possible Mechanisms of ACM Particle Movement in Lot 97

Movement / Motion of ACM	Action / Mechanism	Outcome	Issues
ACM released and transported from source site (potentially in Lot 98)	Sheet, rill and gully erosion	Transfer of ACM from source to sink	Source and release mechanism of ACM to be confirmed
ACM arrives at beach mostly during turbulent flow in gullies	Gully flow debouches and ACM settles out on beach	ACM arrives on the beach	Relationship of ACM frequency to heavy rainfall events to be confirmed
ACM to move back and forth up and down the beach from landward boundary of Lot 97 or strand line down to the water	Tidal movement	ACM pieces are comminuted ²	Any release of fibres is likely to be rapidly neutralised by attrition with sand grains and other particles
ACM moves laterally along the beach	Tidal movement and current	ACM migrates laterally along the beach from 3 Gully outlets	Distribution of ACM unlikely to be the same or similar beyond each tidal cycle
ACM deposited in sand or on rock shelves	Deposition/settlement	ACM may be buried and re-exposed or temporarily stranded on rock shelves	ACM is at the surface or at shallow depth but may be buried in sand at depths of >10cms
ACM pieces become smooth and rounded by continue movement	Tidal movement and granular attrition [Note: ACM is flat or planar in shape and has relatively low density and a hardness of 3-6 on Moh's Scale. Sand and rock by comparison have a higher density and hardness]	ACM pieces will gradually attenuate (wear away) being considerably softer and more fragile than the sand and rock on the beach	Any release of fibres is likely to be rapidly neutralised by attrition with harder sand grains and rock materials
ACM particle breakage	Wave action and with impact on rock shelves, boulders etc	ACM pieces break due to impact and reduce in size	Any release of fibres is likely to be rapidly neutralised by attrition occasioned by sand movement

² Comminution is defined as the reduction of solid materials from one average particle size to a smaller average particle size, by crushing, grinding, cutting, vibrating, or other processes. In geology, it occurs naturally during faulting in the upper part of the Earth's crust.

Drawing 1: Schematic Section of Little Bay



3. Site Investigation Methods

Other than a short list of dot points in the brief to RCC (Preliminary Technical Brief for Potential Asbestos Contamination at Little Bay Beach, Little Bay NSW, dated August 2020) Trinitas did not provide a detailed sampling and analysis plan (SAQP) before undertaking sampling for the DSI. Accordingly, the auditor had no opportunity to comment on the sampling programme reported in the DSI, noting that the field work for the DSI was completed in April 2021 whereas the site audit was commissioned only in June 2021.

Trinitas reported that their investigations comprised:

- Visual inspection and assessment.
- Periodic grid walkovers and asbestos identification and collection (by emu-picking which was not part of the DSI).
- Air quality monitoring which was not part of the DSI except for monitoring during the investigation period).
- Soil sampling undertaken as part of the DSI.

Visual inspections and emu picking exercises were reportedly carried out twice weekly by Trinitas from August 2020 and involved 5 m x 5 m intersecting grid walkovers and the collection / removal of observable pieces of ACM from the site surface.

Trinitas reported that over 2000 individual pieces of ACM were collected during this period, with this (total) number steadily increasing since then (see above). Trinitas advised that if suspected ACM was observed and / or identified during the inspection, it was marked as a suspected ACM sample and then removed. Trinitas further advised that all ACM fragments sighted during these inspections were picked up and that initially fragments were tested to confirm that the material was indeed asbestos.

No records of asbestos disposal were provided in the DSI or elsewhere, although Trinitas has advised verbally that the material is stored pending disposal. Moreover, Trinitas did not respond to the corresponding question posed in IAL6 (Appendix C). Accordingly, the auditor is unable to confirm whether appropriate disposal of asbestos removed from the site during emu picking activities has taken place since August 2020

The auditor notes that background air monitoring was conducted during the inspections and also during the investigation period. Air monitoring was conducted according to the National Occupational Health and Safety Commission (NOHSC) Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Dust' [NOHSC: 3003 (2005)].

Trinitas reported that airborne levels of fibres were not recorded at levels equal to or exceeding 0.01 f/m during the inspections or investigations

Other than the reports undertaken as part of the DSI the auditor has not reviewed these reports in detail as part of this audit but notes that these reports comprise additional information and that both the Air Monitoring Reports and the corresponding Asbestos Clearance Inspection and Clearance Certification Reports are published on the RCC website as referenced above.

The first three components of the investigations as noted above, were undertaken prior to completion of the DSI and before audit commission and thus do not strictly form part of the DSI. It is understood that such inspections, collection of ACM and air monitoring is ongoing, and that relevant information was incorporated into the HHRA up to the issue date (see Section 9).

Site investigations comprised 44 mostly shallow test pits (TP01-TP37 and TP37A-TP43) using a mechanical tracked excavator and hand tools with soil samples obtained from surface or near surface and a range of depths. Maximum excavation depth was reported at 2.5 m with the majority of test locations being <1.0 m depth. Noting the site location, and as would be expected, water ingress into the test pits prevented deeper excavation in most places. Sampling on rock shelves was undertaken by hand picking. Test locations are shown at Appendix B-D of the DSI, and test pit logs are shown in Appendix F of the DSI which is included in its entirety herein at Appendix A.

Trinitas indicated that test locations were deployed using a combination of systematic grid-based sampling methods and stratified sampling around hotspots as well as from the site history and site observations. Additional targeted sampling was undertaken within hotspot areas.

Sampling locations appear, however, to focus on the potential 'hotspot areas' located near the outlets of Crown Gullies 1-3. Notwithstanding, a reasonable grid was undertaken across the entire site area and the overall sampling density was in excess of the minimum requirements for a site area of approximately one hectare, ~21 locations, as defined in Table A of the *Sampling Design Guidelines*.

It is noted that no details of sampler PPE are included in the DSI report, other than Trinitas noting that:

'...a clean pair of disposable nitrile gloves were worn when collecting each sample...'

Some test locations appear to be marginally outside the site boundaries i.e., to the landward side of Lot 97. Test pitting and sampling for the DSI was conducted between 26 and 30 of April 2021 and locations recorded using a GPS or measured to fixed landscape features.

Trinitas collected soil samples from the near surface and at various depth intervals, including a 10 L sample collected from each location (obviously excluding rock shelf sampling), which was then weighed and sieved through a 7 mm sieve. Any ACM fragments captured on the sieve were placed into a zip-lock plastic bag and weighed in relation to the 10 L sample. A separate 500 mL soil sample was collected and placed into a zip-lock plastic bag for laboratory analysis (asbestos).

Trinitas noted that each sample was dispatched to a NATA-accredited laboratory (Eurofins Environment Testing (NATA Accreditation No. 1261) and analysed for asbestos identification and quantitation in soil in accordance with the ASC NEPM (2013) guideline and WA Department of Health (2009) Guidelines. Asbestos identification methodology adopted by Eurofins is noted on their laboratory certificates which are included in the DSI at Appendix J (see Appendix A herein).

Trinitas noted that sampling for asbestos was undertaken in accordance with the procedure outlined in the WA Department of Health (2009) Guidelines and that each sample included:

- A 10 L soil sample collected from each sample location, which were weighed.
- the 10 L sample was sieved through a 7 mm sieve.
- ACM fragments captured on the sieve were placed into a zip-lock plastic bag and weighed in relation to the 10 L sample.

- A separate 500 mL soil sample were collected and placed into a zip-lock plastic bag for NEPM asbestos analysis.
- ACM fragments observed on the surface of a test pit were also collected and placed into a zip-lock plastic bag for asbestos analysis.
- A clean pair of disposable nitrile gloves were worn when collecting each sample.
- Sample locations were recorded with a hand-held GPS or measured relative to site features.

Samples were collected in batches corresponding to the sampling dates and submitted to Eurofins a NATA registered laboratory under chain of custody documentation (COC). Sample receipt notification by Eurofins noted that:

- A detailed list of analytes logged into the Trinitas LIMS (the auditor notes that only asbestos was analysed).
- All samples were received as described on the COC.
- The COC has been completed correctly.
- No attempt to chill samples was evident (note the auditor considers that chilling is unnecessary for asbestos).
- Appropriately preserved sample containers have been used (the auditor notes that sample preservation is not required for asbestos).
- All samples were received in good condition.
- Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times (again the auditor considers that holding times are not relevant to asbestos).
- Appropriate sample containers have been used.
- Sample containers for volatile analysis received with zero headspace (the auditor notes that this observation by the laboratory is otiose as no volatile analysis was requested).
- Split sample were not sent to requested external laboratory (again the auditor considers this to be unnecessary for asbestos).
- Samples were not subcontracted.
- Custody seals not used (note the auditor considers that these are probably unnecessary in this instance).

In addition, Eurofins noted that their analytical methodology adopted was as follows:

Table 4: Laboratory Methods Adopted by Eurofins

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 - 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.

Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10 mm sieve followed by a 2 mm sieve. All fibrous matter greater than 10mm, greater than 2 mm as well as the material passing through the 2 mm sieve are retained and analysed for the presence of asbestos. If the sub 2 mm fraction is greater than approximately 30 to 60g then a subsampling routine based on ISO 3082:2009(E) is employed. NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be subsampled for trace analysis, in accordance with AS 4964-2004.
Bonded asbestos containing material (ACM)	The material is first examined, and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 4964 - 2004. NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length, or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl / asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g., 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). NOTE: NATA News March 2014, p.7, states in relation to AS 4964: 'This is a qualitative method with a nominal reporting limit of 0.01 % 'and that currently in Australia 'there is no validated method available for the quantification of asbestos'. This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.

Eurofins provided summary details of each sample received, including the client (Trinitas) and laboratory sample numbers for individual samples (indicating that each sample was identified), date sampled and received, sample description and certificates of testing containing analytical results, examples of which can be found in Appendix H of the DSI (Appendix A herein).

Trinitas provided a data summary at Table 6 of the DSI (Appendix A herein) entitled 'Sampling Plan and Site Investigation Summary for Areas of Environmental Concern' summarising the samples which yielded a positive asbestos find, the contamination depth and the estimated volume of contaminated material in cubic metres $\pm 25\%$. The latter calculation being based on the assumed affected area multiplied by the maximum depth recorded with positive asbestos.

The auditor notes that such a calculation is probably meaningless as there is no real basis for determining the size of the affected hotspot area, or for that matter the depth. The auditor further notes that such parameters will in any case change with each tidal cycle even if they were initially representative of the entire beach, or even a subsection of the beach, which is doubtful as each sampling point represents the conditions at that location only and as noted above these are likely to change continually.

Trinitas also provided a quite useful analytical data summary in Appendix I of the DSI (Appendix A herein) which records the sample number / identity, sample depth, GPS location, sample description, presence of asbestos / ACM in each sample according to laboratory analysis and / or observations and type of asbestos detected (principally chrysotile, but with some crocidolite and amosite).

Auditor's Opinion

Investigations within Lot 97 were hampered by both tidal conditions and water level within the sand and thus the representativeness of any investigation would at best be short lived and would provide only a temporary snapshot of site conditions and characteristics at any one time. In particular the auditor notes that the vertical and horizontal distribution of asbestos in the site is likely to be modified during each tidal cycle, more so when higher or more vigorous tidal conditions prevail, and as onshore current direction changes with wind direction and other variables.

Notwithstanding, sufficient sampling locations were obtained to meet the minimum sampling density set out in published guidelines and as far as possible were sufficient to characterise conditions on the site both vertically and laterally within the likely zone of tidal disturbance in the beach soils (sand) and rock platforms. Some test pit logs e.g., TP03, TP04, TP05 logged 'Fill' material and recorded '*...fill with glasses (sic), tiles, brick, plastic, metal, concrete and coal. Boulder and brown silty sand were observed from 1 m...*'. The auditor notes that these test pits and others which logged similar materials are likely to be beyond the site boundary of Lot 97 and are probably located within Lot 98 and more than likely represent fill slope materials, or gully fill materials, immediately to the landward side of the Lot 97 boundary. Whereas TP09, TP21 and TP22 show natural sand with building rubble (possibly washed-out from topographically higher fill) above fill materials. This superposition seems to be in contravention of the logging conventions set out in AS 1726: 2017 Geotechnical Site Investigations. The AS advises on logging and stratigraphical procedures and defines fill as '*...a volume of material which has been placed by anthropogenic processes ...*'. Whereas 'in situ' is defined as '*...in the place and situation in which it exists naturally...*'.

Accordingly, natural material is unlikely to be superimposed above fill on Lot 97 under normal circumstances. However, in this instance, whilst it is considered unlikely that material was dumped directly on to the beach (Lot 97), it is quite feasible that historically fill was placed (applied to land) on Lot 98 and the material has subsequently (perhaps progressively) moved down gradient by various mass movement / transport mechanisms onto the landward fringe of the beach. Such possibilities were not discussed in the CSM or reflected in the narrative regarding the test pit logging results.

Moreover, if any materials have been 'buried' on the beach (Lot 97) as implied in the DSI then evidence needs to be provided to verify this situation. In this regard it seems quite plausible that geo-mechanical mechanisms may have caused material to accumulate at the toe of the fill slope and then become covered by sand movement and depositional drift (wind, waves, or gravity). Such anthropogenic material could be classifiable as either fill or as anthropogenic (or Anthropocene) deposits, but as noted above are unlikely to be located on Lot 97 except temporarily as they would soon be subject to tidal movement, redistribution and redeposition.

4. Field Work Results

Trinitas provided a data summary which is provided in Appendix I of the DSI (Appendix A herein).

As noted above, the summary provided brief descriptions of the sample number and depth, location, description, percentage amount of ACM (w/w) in the 10L sample, percentage amount of AF/FA (w/w), amount of asbestos in sample in grams (NEPM), visually observed asbestos in sample, ACM in 10L soil sample, depth of asbestos observed, and type of asbestos encountered. Trinitas report that from the 44 test pits (apparently 45 from the logs) a total of 67 samples were submitted for analysis to Eurofins as recorded in Appendix J of the DSI.

As outlined above Trinitas noted that for the most part sampled soils generally comprised well graded beach sands with shell fragments and some sandstone boulders (probably cobbles) and occasional anthropogenic fragments of glass, tile, brick etc, plus ACM. The latter was generally reported to be smooth surfaced, but in some cases was logged as appearing ('looked or seemed') weathered.

Test pit logs are provided in Appendix H of the DSI (Appendix A herein). Test pits mostly encountered beach sand with some boulders. The sand was described in some test pit logs as comprising silty sand or loam, although the auditor notes that the latter (loam³) is highly unlikely in a beach environment. Whereas, from observation (and noting that the sand is largely derived from Hawkesbury Sandstone) the sand appeared medium to coarse grained, although finer particles would inevitably be present in the form of silt and clay fractions. No sieve analysis of the sand was, however, undertaken by Trinitas to confirm the particle size distribution according to AS 1289.3.6.1-2009 (*Methods of Testing Soils for Engineering Purposes, Method 3.6.1: Soil classification tests - Determination of the particle size distribution of a soil*).

As noted above the anthropogenic deposits found in TP03, TP04 and TP05 which were logged as fill to at least 1.0 m depth and included glass (a bottle), tile, brick, plastic, metal, concrete and coal (possibly ash), are considered likely to be outside the curtilage of the Lot 97 site and within Lot 98. The auditor considers that these may be representative of deposits which have accumulated at the base of the coastal fringe due to mass movement from the back shore rather than deliberate dumping, and which may since have been overtopped by blown sand or sand deposited by wave action at the head of the beach in the upper reaches of the intertidal or littoral zone

³ Loam (in geology and soil science) is soil composed mostly of sand (particle size > 63 micrometres (0.0025 in)), silt (particle size > 2 micrometres (7.9×10⁻⁵ in)), and a smaller amount of clay (particle size < 2 micrometres (7.9×10⁻⁵ in)). By weight, its mineral composition is about 40–40–20% concentration of sand–silt–clay, respectively.

[Note: the intertidal zone can be further divided into three zones: high tide, middle tide, and low tide. The high tide zone is only submerged at high tide. The middle tide zone is submerged and exposed for equal amounts of time. Maximum tide levels at Little Bay Beach are reported at around 2.1 m which appears to coincide with a distinct notch at the base of the low cliffs above the rock shelves, and it is likely that the entire beach is covered during normal high tides of 1.7 m. The littoral zone or nearshore is the part of a sea / ocean that is close to the shore.

In coastal environments, the littoral zone extends from the high-water mark, which is rarely inundated, to shoreline areas that are permanently submerged. Littoral sediment is defined using descriptions of particle sizes - mainly gravel (16-4 mm), coarse sand (4-1 mm), medium sand (1-0.25 mm), fine sand (0.25-0.063 mm) and mud (less than 0.063 mm) and various admixtures of these (and coarser) grades - muddy sand, sandy mud and mixed sediment (boulders, cobbles, gravel, sand etc].

Other test pits e.g., TP08 show fill logged under sand which is considered unlikely and the anthropogenic inclusions within the sand column in this instance are considered likely to be the result of natural churn occasioned by wave action whereby such materials upon arrival on the beach are continually redeposited, potentially at shallow depths by wave action and natural sedimentation processes. Such deposits may well qualify as belonging to the Anthropocene.

[Note: the Anthropocene is defined as the current geological age, and follows on from the Holocene, and is viewed as the period during which human activity has been the dominant influence on climate and the environment, to the extent that geological deposits can be characterised by human influence and often by human artefacts. The Anthropocene was officially recognised by the geological community in 2019 with a proposed start date of 1950 or thereabouts, although some authors attribute a date coincident with the start of the industrial revolution. The Anthropocene Period brought a close to the Holocene (also a division of the Quaternary Period (2.6 million years ago to present day)).

The data summary at Appendix I in the DSI, indicates that of the 67 samples analysed, 15 contained asbestos, 4 of which exceeded the adopted site assessment criterion (HSL) of 0.02% w/w. No samples reportedly contained FA/AF above the HSL of 0.01% w/w whilst 15 locations were reported with observable asbestos. Analysis reported that the asbestos mainly comprised chrysotile, with crocidolite noted in 5 locations and amosite in one location.

Trinitas observed that all fibrous cement sheeting fragments on the beach surface were highly polished, whilst the fibrous cement sheeting fragments under (or on) rock or under water are in a fair or slightly weathered condition. The auditor notes that it is not evident how sampling was undertaken under water as no details were provided, it is further noted that any such material at the tidal fringe is likely to be mobilised up and down the beach during each tidal cycle, the degree of which will depend on tidal conditions and vary over time.

Trinitas did not determine if the overall condition at the site or if the overall sampling results exceeded the adopted HSL of 0.02% w/w. This exercise was performed by JBS&G in the HHRA (see Section 9).

A good photographic record of the sampling locations and nature of the deposits, including dimensions of some the ACM fragments is provided in Appendix G of the DSI (Appendix A herein) and in the Asbestos Clearance Inspection and Clearance Certificate reports as referenced above.

Auditor's Opinion

Sampling density within Lot 97 (even on the basis that some locations appear to be outside the subject site boundary) is sufficient to characterise the site, although it is noted that any site characterisation of a site within a beach environment is inevitably transitory.

Test pits were limited in depth in most cases, but again excavation depth was largely constrained by the waterlogged conditions, even at the head of the beach. Logging of soils was generally acceptable, although the auditor considers that the law of superposition was not necessarily followed. Similarly, the description of fill underlying natural soils appears to contravene the provisions of AS1496:2017.

Overall, however the field investigation for the DSI appears to be broadly satisfactory in terms of providing a snapshot of site conditions in late April 2021, although it is acknowledged by both the consultant and the auditor that conditions will change over time and probably within each tidal cycle, inasmuch as any fragment or multiple fragments of ACM which is / are within the beach environment either at the surface or at shallow depth in sand, or on the rock shelves, is likely to move even within one tidal cycle.

Accordingly, the investigation performed during late April 2021 is assumed to represent the 'average' condition of the beach, which could of course change significantly (in terms of the amount of asbestos in the system at any one time) due to weather (rainfall intensity) and / or tidal fluctuations which may bring asbestos up from beneath the permanent water level.

The auditor notes that in earlier drafts of the DSI there was some discursive commentary regarding the presence of friable asbestos in samples and or in observed or collected materials. Later versions of the DSI indicate that the asbestos was all non-friable ACM. Moreover, sample testing undertaken by Eurofins did not identify any FA/AF.

The DOH WA *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - Summary Update* (now 2021) state that:

'...Asbestos cement products are the most common form of asbestos site contamination.... The three separate categories of asbestos contaminants are defined in the Guidelines.... Asbestos-Containing Material (ACM) is often referred to as bonded or non-friable material. The Guideline definition of Fibrous Asbestos (FA) includes friable material, such as loose insulation or any material that can be crumbled or broken by hand pressure. Friable asbestos may include material that has become degraded into a friable condition. For example, some products such as textile materials, asbestos insulation board, etc. are likely to degrade following use, removal, handling or weathering. Both ACM and FA can often be detected visually. The final category is Asbestos Fines (AF), which includes any material less than 7mm x 7mm, including AF resulting from degraded, broken, damaged or weathered ACM or FA...'

Accordingly, the auditor considers that certain of the fragmentary materials observed by Trinitas may qualify as potentially friable due to the degree of weathering, and indeed Trinitas appeared to equivocate in this regard in various versions of their reports and correspondence. However, for the most part such materials, appear to lie within Lot 98 or if not are likely to be progressively smoothed or comminuted by wave action and sand movement (Table 3) unless they remain stationary. Such conditions are considered unlikely on the beach and rock platforms of Lot 97 but may well occur within the adjacent areas comprising Lot 98 and such fragments of ACM could progressively make their way into the beach environment, but would then in all likelihood revert to the condition recorded for the majority of ACM pieces within the beach per se.

It is further noted that the DOH WA have recently updated their guidelines (September 2021) but that the works undertaken to date precede this update.

5. Laboratory Testing and Results

Analytical results reported in the Eurofins laboratory indicate that a total of 97 samples were received from Trinitas, most of which were soils, although some comprised materials. For example, TP08_0.5FC01 sampled on 30 April 2021 comprised a sample of approximately 1g / 17 x13 x 2 mm of material which consisted of brown fibre cement in which chrysotile asbestos was detected, whilst the sample from TP08_0.5 also dated 30 April 2021 comprised approximately 717 g and consisted of brown fine-grained sandy soil, rocks and organic debris in which no asbestos was detected at the reporting limit of 0.001% w/w and no trace asbestos was detected.

A summary of the data by Trinitas is provided at Appendix I in the DSI (Appendix A herein) and a summary of each sample tested plus the results is provided in the Eurofins Certificates of Analysis at Appendix J of the DSI. Soil samples were analysed for asbestos only.

Trinitas reported that 44 test pit locations were sampled (apparently 45 from the logs), although only 38 are recorded in Table 6 of the DSI (Appendix A herein). The summary table at Appendix I of the DSI records 10 positive asbestos detections in soil and 15 where asbestos was observed during test pitting. Four of the 10 samples exceeded the adopted site assessment criterion (/HSL) of 0.02% w/w. Six samples indicated positive results from the Northern sand beach area, 7 from the Middle sand beach area and 4 from the Southern sand beach area. Accordingly, most asbestos positive samples were recorded at or near the so called 'hotspot areas' which coincide with the 3 nominated Crown Gullies. No samples reportedly contained FA/AF above the HSL of 0.01% w/w. Laboratory analysis by Eurofins reported that the asbestos mainly comprised chrysotile, with crocidolite noted in five locations and amosite in one location.

Trinitas reported that of 15 of the test pits reported positive asbestos contamination (detectable concentrations of asbestos), four of which exceeded the adopted HSL of 0.02% w/w (Table 3). The maximum being at TP41-1.0 m (1.125% w/w) which reportedly contained several ACM fragments. However, as previously noted Trinitas did not attempt to determine the overall, or average asbestos content of site soils

A set of laboratory reports from Eurofins is provided in Appendix J of the DSI (Appendix A herein). The reports identified which samples were submitted for testing according to the DOH WA guidelines and or for the absence / presence of asbestos and identified whether the sample comprised soil or building material. The laboratory indicated a reporting limit of the testing employed of 0.001% w/w. The laboratory provided the measured weights of all samples submitted and a description, including the contents of bulk samples and the nature and dimensions of materials samples. The descriptions included in the laboratory reports provides information not necessarily recorded by Trinitas in the field.

Eurofins identified the test method adopted was conducted in accordance with the Australian Standard AS 4964 - 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarized light microscopy (PLM) and dispersion staining (DS) techniques.

Auditor's Opinion

Investigations reportedly comprised a total of 44 testing locations although Table 6 of the DSI reports only 38. Whereas Appendix I of the DSI records 44 test pits, whereas the test pit logs at Appendix H of the DSI (Appendix A herein) show 45 logs (noting that TP37 and TP 37A are logged). The laboratory results indicated the presence of asbestos in 17 samples (25% of samples) whereas potential ACM was observed at 15 locations.

Not all locations where asbestos was observed tested positive by the laboratory and because collected ACM fragments were tested separately to soil in some cases and which are readily discernible in the Eurofins laboratory reports because of their relatively lower weight than the soil samples, for example sample TP19_1.0FC01 was described as 42g / 100 x 40 x 4 mm and consisted of grey fibre plaster cement material, whereas sample TP19_1.0 was recorded as comprising 754 g and consisted of brown coarse-grained sandy soil, glass and rocks.

It is also noted that some samples were replaced by others for analysis (i.e., TP24_0.3FC01 was not received, the analysis was cancelled and TP03_1.5 received as TP03_1.0 and was logged as per COC.

Notwithstanding the laboratory testing results are considered to be accurate and to reasonably represent the conditions experienced at the site during the testing period.

6. Site Assessment Criteria

Trinitas adopted criteria set out in NEPM, (2013) as the main basis for the HSL. Specifically, Trinitas noted that both the existing and future land use of the site is recreational and thus qualifies under that general land use category which coincides with HSL C which includes parks, public open spaces, playing fields etc. As the beach area is a public open space and recreational area HSL C is considered to apply.

Accordingly, the adopted HSL based on ACM is 0.02% w/w asbestos and for FA/AF the adopted HSL was 0.001% w/w asbestos which applies to all land uses.

In addition, the NSW EPA and DOH WA specify respectively that there should be no asbestos at the surface and that the accessible ground surface (nominally 10 cm depth) should be free of all visible ACM and FA. The auditor notes that this is a condition which this site is unlikely to comply with at any given time (although on occasions and depending on changing site conditions and the degree of turbation, asbestos may not be present at the surface at all times, but equally may be present at all times).

The adopted HSLs are shown in Table 5 below (as reproduced from Table 7 of Schedule B1 of NEPM (2013).

Table 5: Health Screening Levels for Asbestos Contamination in Soils

Form of asbestos	Health Screening Level (w/w)			
	Residential A ¹	Residential B ²	Recreational C ³	Commercial/Industrial D ⁴
Bonded ACM	0.01%	0.04%	0.02%	0.05%
FA and AF ⁵ (friable asbestos)	0.001%			
All forms of asbestos	No visible asbestos for surface soil			

1. Residential A with garden/accessible soil also includes children's day care centres, preschools and primary schools.
2. Residential B with minimal opportunities for soil access; includes dwellings with fully and permanently paved yard space such as high-rise buildings and apartments.
3. Recreational C includes public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and unpaved footpaths.
4. Commercial/industrial D includes premises such as shops, offices, factories and industrial sites.
5. The screening level of 0.001% w/w asbestos in soil for FA and AF (i.e. non-bonded/friable asbestos) only applies where the FA and AF are able to be quantified by gravimetric procedures (refer Section 4.10). This screening level is not applicable to free fibres.

Definitions are as follows:

- Bonded ACM:** Asbestos containing material which is in sound condition, bound in a matrix of cement or resin, and cannot pass a 7 mm x 7 mm sieve.
- FA:** Fibrous asbestos material including severely weathered cement sheet, insulation products and woven asbestos material. This material is typically unbonded or was previously bonded and is now significantly degraded and crumbling.
- AF:** Asbestos fines including free fibres, small fibre bundles and small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve.

In regard to the latter, it should be noted that whilst no FA / AF was reported by either Trinitas or the laboratory in the testing results, it is reasonably feasible that the attrition of ACM within the beach environment could, over time and depending on prevalent conditions, lead to small fragments of ACM being derived from larger ones which would otherwise be retained on the sieve. Notwithstanding the same conditions are likely to rapidly comminute fibres.

Auditor's Opinion

The adopted site assessment criteria are considered generally acceptable. Furthermore NEPM (2013), indicates that the land use scenario considered for the HSL C values includes public open space and recreational areas. Accordingly, Trinitas's adopted HSLs for the site are considered appropriate. In their HHRA JBS&G adopted the same criteria.

7. Proposed and Existing Land Use

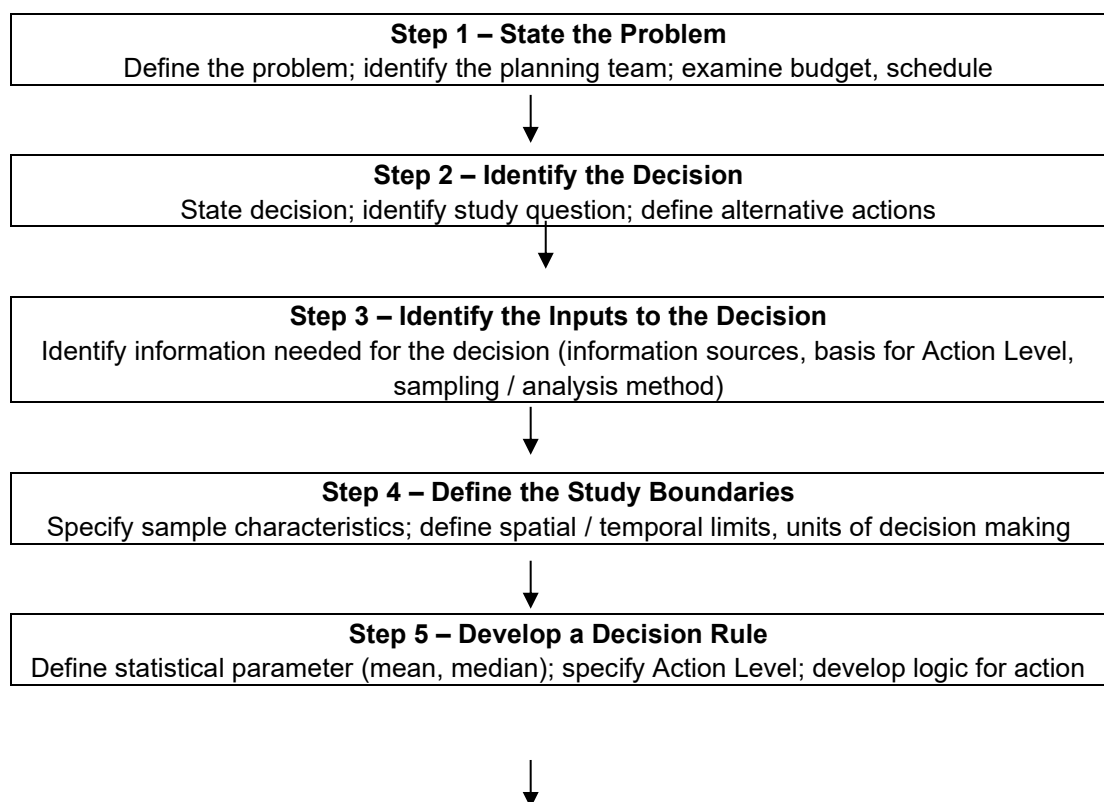
No development of Lot 97 is proposed to the auditor's knowledge, and it is reasonably assumed that the land use will remain as a recreational public beach.

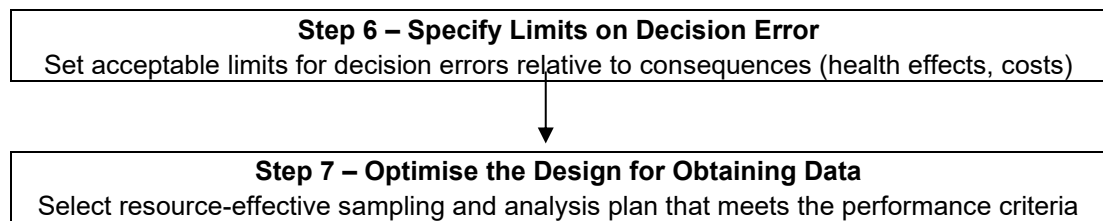
Auditor's Opinion

Adoption of the comparative criteria as noted in Section 6 is deemed appropriate.

8. Quality Assurance and Control

Trinitas generally set out their data quality objectives (DQOs) based on the seven-step planning approach outlined in the NEPM (2013), as shown below.





Trinitas reported limited field and no laboratory QA / QC, although the laboratory undertook standard procedures, noting that the sole contaminant / analyte comprised asbestos. No field duplicates were reportedly collected by the consultant. Trinitas made brief mention of data quality indicators (DQIs) and set these out in Table 4 of the DSI (Appendix A herein), but with little discussion of how these were achieved.

The laboratory analytical reports were prepared by Eurofins. No assessment of the findings of the laboratory QA / QC reporting was undertaken by Trinitas. Given the omission of such an assessment by the consultant the auditor has undertaken a brief assessment and key findings are presented below.

The laboratory provided details of the condition of the samples received, date of receipt, laboratory methods adopted the detection limits and date of analysis. No duplicates were submitted to the laboratory for analysis. Analysis of laboratory blanks, duplicates, spikes and spike recoveries are irrelevant for asbestos analysis.

The laboratory reports in respect to this project were appropriately endorsed with a NATA stamp / logo for each certificate / report issued. Method detection limits were generally appropriate for the analyte concerned and for the media tested and were suitable in respect of the adopted investigation levels (HSL) (and for waste classification where applicable).

RPDs between field duplicates was not possible and not relevant in terms of laboratory analysis.

The laboratory's analytical precision and accuracy are considered adequate for this type of investigation and sole analyte involved.

8.1 QA / QC Evaluation

The auditor has reviewed the DQOs / DQIs and limited QA / QC information provided by Trinitas over the course of the project and this is summarised below in Table 6.

Table 6: Summary of Data Quality Indicators
Part A

COMPLETENESS					
A measure of the amount of useable data (expressed as %) from a data collection activity					
Field considerations		Laboratory considerations		Comments	
- All critical locations sampled - All samples collected (from lateral grid and at depth) - SOPs appropriate and complied with - Experienced samplers - Documentation correct	✓	- All critical samples analysed according to sampling plan - All analytes (asbestos only) analysed according to investigation and requirements - Appropriate methods and PQLs - Sample documentation complete - Sample holding times complied with standards (not applicable in this instance)	✓	The required percentage completeness should be specified in the SAQP (no specific SAQP prepared by Trinitas). All required data must be obtained for critical samples and chemicals of concern (only asbestos) Incompleteness is influenced by: - field performance problems (access problems, difficulties on site, damage etc.) - laboratory performance problems (matrix interference, invalid holding times etc.) - matrix problems	N/A
	✓		✓		✓
	✓		✓		✓
	✓		✓		✓
	✓		✓		✓
			N/A		N/A
Comment:					
Soil media comprised mainly beach sand, or fragments of ACM picked from the surface rock shelf					

Part B

COMPARABILITY The confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event					
Field considerations		Laboratory considerations		Comments	
- Same SOPs used on each occasion - Experienced sampler - Climatic conditions (temperature, rainfall, wind, ...) - Same types of samples collected sand and ACM fragments	☒ ☒	- Sample analytical methods used - Sample PQLs (justify/quantify if different) - Same laboratory (justify/quantify if different) - Same units (justify/quantify if different)	☒ ☒	- Same approach to sampling (SOPs, holding times etc, - Note: holding times are not applicable for asbestos.) - Quantify influence from climatic or physical conditions - Samples collected, preserved, handled in same manner (no sample preservation required as asbestos was the only analyte)	☒ ☒
Comment: Climatic conditions were not reported by the consultant during sampling, although this is probably not relevant as the sampling was undertaken for asbestos only. One laboratory was used by the consultant for all analysis.					

Part C

REPRESENTATIVENESS						
The confidence (expressed qualitatively) that data are representative of each media present on the site						
Field considerations		Laboratory considerations		Comments		
• Appropriate media sampled according to CSM and sampling plan • All media identified in CSM and sampling plan were sampled	☒	• All samples analysed according to CSM and sampling plan	☒	• Samples were collected to reflect the characteristics of each media • Sample analyses reflected properties of field samples • Homogeneity of the samples (same materials sampled,) • Appropriate collection, handling, storage and preservation (Note: sample preservation not required other than containerization) • Detection of laboratory artefacts, e.g. contamination blanks	N/A	
	☒				☒	N/A
					☒	N/A
Comment: Despite the minor presence of construction and demolition material within sand materials the sand media is relative uniform across the site, although some filling may be present in sampled locations but these are probably marginally off-site.						

Part D

PRECISION					
A quantitative measure of the variability (or reproducibility) of data					
Field considerations		Laboratory considerations		Comments	
Adopted SOPs appropriate for the media / CSM	☑	Analysis of: - laboratory and inter-laboratory duplicates - field duplicates - laboratory-prepared volatile trip spikes	N/A	Measured by the coefficient of variance or standard deviation of the mean or by RPDs	N/A
			N/A	Field duplicates measure field and laboratory precision – asbestos only	N/A
			N/A	Laboratory duplicates measure analytical precision	N/A
				No major discrepancies given the possible impacts due to volatile organic compounds	N/A

Comment:

The consultant did not collect field duplicates. Field duplicates are not considered necessary for asbestos. The auditor considers that the laboratory data is generally suitable for the investigation

Part E

ACCURACY (BIAS)					
A quantitative measure of the closeness of reported data to the true value					
Field considerations		Laboratory considerations		Comments	
SOPs appropriate and complied with	☒	Analysis of: - field blanks - rinsate blanks - reagent blanks - method blanks - matrix spikes - matrix spike duplicates - surrogate spikes - reference materials - laboratory control samples - laboratory-prepared spikes	N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A	Bias introduced: - by chemicals during handling or transport from contaminated equipment - from contaminated reagents - during laboratory analysis - during laboratory preparation and analysis (may be high or low) - precision of preparation and analytical method - Comprehensive QA/QC	N/A N/A N/A N/A N/A N/A N/A
Comment: No field QA/QC sampling was undertaken by the consultant.					

Note: Key ☒ = complied
 ☐ = not complied
 ☒ ☐ = partially complied
 N/A Not applicable

DQIs were not fully explored by Trinitas, the auditor provides the following assessment based on the information which was presented in the DSI.

Table 7: Data Quality Indicators (Auditor's Assessment)

Data Quality Indicator	Method(s) of Achievement
Precision	Field staff followed standard operating procedures and reasonable decontamination and safety measure. RPD between original samples and replicates not measured as no duplicate samples obtained Satisfactory results for all other field and laboratory QC samples (not relevant).
Accuracy	Field staff followed standard operating procedures. Satisfactory results for all field and laboratory QC samples (not relevant).
Representativeness	Target media sampled. Sample numbers recovered and analysed are considered to be representative of the target media and complying with DQOs. Samples did not require extraction and were analysed within holding times (note holding times for asbestos are indefinite). Samples were analysed in accordance with the COC.
Completeness	Systematic and selected target locations sampled. Preparation of borehole logs, sample location plan and chain of custody records. Laboratory sample receipt information received confirming receipt of samples intact and appropriateness of the chain of custody. Samples analysed for contaminants of potential concern (COPC) identified in the Conceptual Site Model (CSM). Completion of chain of custody (COC) documentation. NATA accredited laboratory results certificates provided by the laboratory. Satisfactory frequency and results for field and laboratory quality control (QC) samples.
Comparability	Using appropriate techniques for sample recovery, storage and transportation, which were the same for the duration of the project. Experienced samplers used. Use of NATA registered laboratories, with test methods the same or similar between laboratories. Satisfactory results for field and laboratory QC samples.

Based on the above, it is considered that the DQIs have been complied with. As such, it is concluded that the field and laboratory test data obtained are reliable and useable for this assessment.

The overall accuracy, precision and repeatability of the assessment (investigations) results by the consultant and their analytical laboratory, are generally considered to be acceptable and suitable for the purposes of forming an opinion on the current condition of the site (at the time of the investigation) with regard to asbestos contamination.

Although there are departures from guidelines, particularly in respect to the collection of field QA / QC samples but given the nature of the investigation the auditor considers the omission of field QA / QC samples does not detract from the quality of the dataset as a whole. Moreover, the consultant generally provided adequate justification for their sampling design which focussed on areas of the site (beach) most likely to contain asbestos.

Auditor's Opinion

The consultant's reporting on data quality was generally absent as they did not carry out field QA / QC sampling, nor did they assess laboratory QA / QC. The consultant did not provide significant analysis of field and laboratory DQOs against the requirements of the 'Consultants Reporting on Contaminated Land - Contaminated Land Guidelines (NSW EPA, 2020). Therefore, the consultant's assessment of QA / QC is not compliant with the requirements of the NSW EPA endorsed guidelines.

However, given that the only contaminant of interest was asbestos and that the site comprises beach sands (on a tidal beach) and rock shelves, the auditor considers that the omission of field QA / QC sampling does not significantly impact on the suitability of the data or the ability of the consultant to characterise the site in terms of the current / proposed land use, although it is noted that Trinitas were equivocal in this regard. Similarly, the absence of QA / QC sampling and assessment is not believed to compromise the HHRA consultant's use of the data for the purposes of risk assessment.

The so-called PARCC principles are listed below together with the auditor's overall opinion regarding the data provided in the Trinitas DSI.

Precision:	A quantitative measure of the variability (or reproducibility) of data. Auditor view - The Trinitas data was considered sufficiently precise to provide a time limited characterisation of the site in terms of the degree and extent of asbestos in Lot 97. The data was suitable for the purposes of the HHRA.
Accuracy:	A quantitative measure of the closeness of reported data to the "true" value. Auditor view - The Trinitas data was considered sufficiently precise to provide a time limited characterisation of the site in terms of the degree and extent of asbestos in Lot 97.
Representativeness:	The confidence (expressed qualitatively) that data are representative of each media present on the site. Auditor view - The Trinitas data was considered sufficiently representative of the site condition.
Completeness:	A measure of the amount of useable data from a data collection activity. Auditor view - The Trinitas data was considered sufficiently complete.
Comparability:	The confidence (expressed qualitatively) that data can be considered equivalent for each sampling and analytical event. Auditor view - The Trinitas data was considered sufficiently comparable between sampling locations to be representative of the overall site condition.

9. Human Health Risk Assessment

The auditor refers to the following reports/documentation in relation to the HHRA:

- JBS&G (June 2021), *Interim Human Health Risk Assessment for Asbestos* Reference 59811-138906 (Revision A) draft;
- IAL2 (9 July 2021);
- JBS&G (July 2021), *Updated Human Health Risk Assessment for Asbestos* Reference 59811-138906 (Revision B);
- Email from the auditor dated 14 July 2021 stating that the auditor has reviewed the amended HHRA (dated 24 September 2021 ref 59811-138906 (Revision 0) and related feedback from JBS&G and considers that they have suitably addressed the issues raised in IAL2, and in general agrees with their conclusions and recommendations with respect to Lot 97 DP270427;
- Email from RCC (Evan Buntoro) dated 21 September 2021 stating JBS&G has been forwarded the latest DSI Report and advised that there are no changes based on the latest DSI Rev6; and
- JBS&G (September 2021), *Updated Human Health Risk Assessment for Asbestos* Reference 59811-138906 (Revision 0).

The auditor has completed a review of the HHRA against:

- The requirements specified in the *NSW EPA Guidelines for the NSW Site Audit Scheme (3rd Edition)* (NSW EPA 2017);
- *NSW EPA Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA, 2020);
- *enHealth Environmental Health Risk Assessment, Guidelines for Assessing Human Health Risks from Environmental Hazards* (enHealth 2012); and
- National Environment Protection Council (1999). *National Environment Protection (Assessment of Site Contamination) Measure*, as amended May 2013.

The final version of the HHRA is included at Appendix B herein.

Table 8 (below) provides a review of the sections of the HHRA in relation to the Human health risk assessment checklist (Appendix E - Guidelines for the NSW Site Auditor Scheme (NSW EPA, 2017).

The JBS&G human health risk assessment (HHRA) for asbestos was undertaken in 2020-1 to address the potential health risk posed by the occurrence of asbestos impact at Little Bay Beach accessed from 4R Coast Hospital Rd Little Bay NSW to determine whether the levels of asbestos as estimated on Little Bay Beach are present at a level that poses an unacceptable health risk to an ongoing recreational use of the site / sites in proximity and/or residents in proximity of the site. The assessment has been based on estimates of surface levels of asbestos as present on the Beach, and further considered levels of asbestos measured in sub-surface soils / sands on the Beach. The risk assessment has been restricted to the assessment of asbestos.

The auditor provides the following review of the HHRA Sections:

S 1 - Introduction and Background

The information provided in this section is considered to be generally appropriate and in accordance with NEPM requirements.

Section 1.11 Data Evaluation - includes a review of Trinitas data from the DSI and previous investigations (Asbestos Clearance Inspections and Clearance Certifications) and Section 1.11.11 provides a review of data reliability by JBS&G for the purposes of the HHRA.

JBS&G concluded:

- *All Trinitas assessments are noted to have been completed by Licensed Asbestos Assessors;*
- *Sampling methods, for the quantification of asbestos, have generally complied with the guidance provided in NEPC (2013) and WA DoH (2009)⁴ for the collection of samples to premise quantified estimates of the levels of asbestos in soils. It is acknowledged that these estimates have likely overestimated the level of asbestos present in near surface soils but an apparent bias to target horizons / depths where asbestos is most likely present;*
- *All analysis of samples have been undertaken by NATA accredited laboratories;*
- *It is noted that field assessments of quality assurance / quality control (QA / QC) were available to Trinitas but have not been undertaken. However, noting the assessed media and the contaminant the absence of these QA / QC checks is considered unlikely to substantially affect the reliability of the data; and*
- *On this basis - and with the extent of conservative assumptions adopted in the handling of Trinitas data, the data is considered sufficiently reliable to premise the risk assessment.*

Auditor's Opinion

The auditor considers that all risk assessments should contain an evaluation/statement that sampling data are reliable and suitable for use in the assessment. The auditor is satisfied that JBS&G have suitably assessed and undertaken this task, although Trinitas did not.

The auditor notes that no field or laboratory quality assurance / quality control (QA / QC) has been undertaken or reported by Trinitas (see Section 8) which has been noted by JBS&G. This has been considered acceptable due to the COC being asbestos only. The auditor agrees that the lack of QA / QC does not compromise the overall reliability of the data used in the HHRA.

S 2 Conceptual Site Model

Overall: The information presented in this section provides a good summary of the conceptual site model and identified impacts in the (asbestos) inhalation pathway.

⁴ This HHRA was undertaken prior to issue of the revised DoH WA (2018) then (2021).

JBS&G characterized the potential and complete exposure pathways as future human receptors on and in immediate proximity of the site including:

- Recreational users of the Beach and Golf Course adjoining.
- Landscapers / gardening personnel as more likely retained on the Golf Course adjoining, but also potentially engaged within the Beach (periodic clean-up / maintenance works).
- Potential future sub-surface maintenance / excavation workers.

The CSM does not specifically list the residents in proximity of the site however these are discussed in later sections of the CSM and in Section 6.1 - Exposure Assessment.

Exposure pathways listed include oral, dermal and inhalation pathways. Inhalation exposures will potentially occur by the release of fibres from impacted soils into human breathing zones.

The discussion of Preferential Pathways includes:

- Associated with sandy soil horizons and potential services present across the site area (i.e., stormwater outlet adjacent to the southern Beach, etc.).
- The steep slope of the potential asbestos soils / materials adjoining the boundary of the Beach.
- Gravity / overland run-off assisted processes can cause increased movement of ACM down the steep slope and onto the Beach.

Regarding complete source-pathway-receptor linkages JBS&G noted that; '*...Potentially complete source-pathway-receptor linkages are considered to be limited to potential inhalation exposures of fibres of on-site receptors, and recreational areas and residential properties in proximity of the site...*'. The auditor agrees with this conclusion.

The related calculations by JBS&G were used to estimate that bonded asbestos was present at an (asbestos) concentration of 24 mg/kg (0.0024% w/w) at the site surface. In correspondence (IAL2) the auditor questioned the basis of the calculations undertaken by JBS&G in order to estimate the concentration of bonded ACM encountered at the site. JBS&G responded by stating that in absence of this level of assessment in the Trinitas documentation, these calculations were required in the HHRA.

These were based on the following data:

- Fragments of ACM removed from the Beach area during Trinitas clearance work from August 2020; and
- Weight of fragments of ACM removed from the stormwater outlet area at the southern beach.

The auditor sought clarification from JBS&G regarding the targeted sampling of the locational and depth focus in areas where ACM was expected by Trinitas and increased conservatism of results than would otherwise be the case if genuine grid sampling had been deployed?

JBS&G provided the following response:

'...JBS&G agrees that '...data currently employed likely introduces a more conservative result than would otherwise be the case if genuine grid sampling had been deployed'. The conservatism as caused by the biasing of the Trinitas sample locations has been noted through the assessment. The estimated risk levels on this likely conservative data is noted to be well below the acceptable levels. Further grid-based sampling may be warranted where risk levels were approaching acceptable levels, and greater confidence was needed that the site did not pose an unacceptable health risk. Otherwise, it is most likely that additional grid-based sampling will simply result in lower levels of health risk being estimated....'

Auditor's Opinion

The auditor considers the logic applied to these asbestos calculations to be suitable based on the available data. The auditor notes that as asbestos is an 'isolated, physical contaminant that does not generally fit the normal distribution model', the notion of asbestos hotspots should perhaps be avoided, although this terminology is used in various guidelines, including DOH WA (2009, 2018 and now 2021) in relation to asbestos. NEPM (2013) notes that identifying hotspots may require several lines of evidence, for example, statistical analysis, spatial distribution of samples and site history.

The auditor also notes that the amended DSI has clarified that no friable asbestos or FA/AF has been encountered at the site, or by analysis, therefore the inhalation risk due to fibres is not relevant to the HHRA based on the Trinitas data.

The auditor also agrees that the conservatism introduced by the targeted sampling by Trinitas does not affect the overall reliability of data used in the HHRA.

S 3 Issue Identification

JBS&G have defined the issue in the relevant environmental context as follows:

'...The environmental hazards across the open space / parkland are restricted to the impacted Beach sands and associated near surface soils within the Beach which have been historically disturbed on the site, or otherwise impacted from off-site locations. The risk assessment takes into consideration the ongoing use of the site as per the current recreational setting. The major human stakeholders identified for the ongoing use of the Beach include recreational users, landscapers, Beach surface maintenance / cleaning and maintenance workers of above ground and sub-surface services in proximity. Potential exposures of further recreational and residential receptors in proximity of the site have also been identified...'

The data sources reviewed by JBS&G include Trinitas data from 2020-2021. The auditor notes previous data as described in the Site Audit Report (EMS 2006) has not been included in this discussion by JBS&G, however from the documentation, it is evident that such data (for asbestos) likely falls outside the curtilage of the current site.

As this data predates EMS (2006), and that it is unlikely that pre 2006 data is relevant to the current circumstances, in particular, because of the dynamic beach environment and the virtually certainty that asbestos in the top 100 mm of sand and on the rock-platforms is likely to have been redistributed through each tidal cycle. Accordingly, the auditor is satisfied that the relevant data has been included in the JBS&G review.

The HHRA is limited in scope to asbestos as directed by the client. Accordingly, no discussion of other potential contaminants has been provided in the HHRA, nor indeed in the DSI or this SAR for the same reason.

Auditor's Opinion

The auditor is satisfied that JBS&G have a suitable appreciation of this task.

S 4 Selection of Constituents of Potential Concern

The data provided in the DSI (restricted to asbestos) has been considered in the HHRA and correspondingly the report focuses only on the risk assessment of asbestos. JBS&G noted that based on the Trinitas data - asbestos has been identified as bonded asbestos only and occurs in the form of fibre cement sheet (and corrugated sheet) fragments.

Auditor's Opinion

The auditor is satisfied that JBS&G have suitably undertaken this task.

S 5 Toxicological Assessment

A summary of published data by NHMRC, NEPC, WHO, enHealth, NEHF, NICNAS, ATSDR, NTP and US EPA was undertaken by JBS&G (as shown in Table 5.1 of the HHRA, attached herein at Appendix B). The adopted value by JBS&G to assess potential toxicological effects of asbestos exposure was WHO recommended unit risk of 0.2 (f/ml)^{-1} .

In addition, JBS&G stated:

'...Asbestos is not toxic by oral or dermal exposure pathways. The unit risk to assess non-threshold effects, has been demonstrated as being suitably conservative to account for potential threshold effects of exposure to amphibole forms of asbestos...'

The auditor notes that the main type of asbestos found was chrysotile which is an amphibole mineral, as are amosite and crocidolite which were also present, based on the analyses by Eurofins.

The information provided in this section is considered to be generally appropriate and in accordance with NEPM requirements and the auditor considers the relevant toxicological data been considered and discussed for the purposes of the toxicological assessment.

Auditor's Opinion

The auditor is satisfied that JBS&G have suitably undertaken this task.

S 6 Exposure Assessment

JBS&G have specified the potential receptors of concern for further assessment are:

- *Recreational users of the Beach.*
- *Landscapers / Gardeners / Beach maintenance workers.*
- *Sub-surface maintenance / excavation workers.*
- *Residents adjoining / in proximity of the site.*

The level of asbestos present in site soils (predominantly sand) was based on levels of accessible asbestos as present in surface soils, and in deeper soils, that may be caused to be available at the site surface in the future.

Exposure factors for the various scenarios were presented by JBS&G in Tables 6.1-6.4. The equations provided in Section 6.4 are consistent, clearly defined and satisfy the requirements of as outlined below.

The auditor requested clarification for the extreme weather events (e.g., king tides and 1 in 100-year storm / flood events, sea level rise, increased public activities at the beach (spring / summer) and increased emissions during hot and dry conditions and increased dust / wind of summer months.

JBS&G clarified that they:

'... consider the conservatism in the sampling is sufficient to address the extreme weather events. They also confirmed that the risk assessment has been based on a chronic dose to asbestos. The exposure parameters adopted are considered sufficiently robust to be protective of increased incidence of beach activity during, as offset with inevitable decreased activity during cooler months / poor weather, and further noting that a substantial proportion of beach activity will not comprise the active agitation / disturbance of the site sands that may cause the release of asbestos fibres.

JBS&G also confirmed that the hot and dry conditions that may occur to cause a potential increase in asbestos fibre emissions are not considered applicable to an intertidal / seaside location such as Little Bay. It must be noted that the site is likely to more subject to inundation / higher moisture levels than the construction sites / development sites that have been adopted in the development of the dataset used to estimated potential asbestos fibre emissions. This additional factor, as adopted in the WA guidelines is only applicable for locations where no water ingress / proximity is likely...'

Auditor's Opinion

The auditor is satisfied that JBS&G have suitably undertaken this task and is satisfied with the responses to the issues raised by the auditor in IAL2.

S 7 Criteria for Assessment of Risk

JBS&G have specified the acceptable risk guidelines are available from a range of national and international environmental agencies including US EPA (1991), WHO (2004b) and NHMRC/ARMCANZ (2011).

Auditor's Opinion

The auditor is satisfied that JBS&G have suitably undertaken this task.

S 8 Assessment of Risk

The following assessment of risk was presented by JBS&G in relation to the exposure assessment:

- *Recreational User* 1.6×10^{-6}
- *Landscaper / Gardener / Beach Maintenance Worker* 1.6×10^{-6}
- *Sub-surface Maintenance Worker* 7.1×10^{-7}
- *Adjoining Resident* 1.5×10^{-6}

The sum of these risk estimates is 3.0×10^{-6} which remains well below the adopted risk criterion.

JBS&G concluded:

'...On this basis, subject to future works to cause the remediation / management of gross levels of buried asbestos at the south-eastern portion of the southern beach area, it is considered that the levels of asbestos as present on the Beach will not pose an unacceptable health risk to ongoing / potential future users of the site and / or potentially sensitive populations in proximity of the site...'

Auditor's Opinion

The auditor is satisfied that JBS&G has suitably undertaken this task; however, it is noted that visible asbestos is certainly present on the beach surface and no doubt is also present to depths of 100 mm or more in the sand as well as at the surface on rock shelves, albeit being moved around by tidal action from time to time. Accordingly, whilst the % w/w criteria (HSLs) outlined in Table 7 Schedule B1 of NEPM (2013) are met, visible asbestos is present at the surface which contravenes the latter category set out in Table 3 (Table 7 from Schedule B1 NEPM (2013)).

S 9 Sensitivity Analysis

A sensitivity analysis was undertaken with changes to the following variables undertaken to test the resilience of the risk assessment:

- Levels of asbestos as estimated by soil sampling programs completed on the site.
- Toxicological parameters.
- Anticipated and assessed current and future land-uses.
- Exposure parameters used to characterise future population behaviours on the site.

- Physical parameters.
- Equations and related relationships used to estimate levels of COPCs from reported levels in soils and groundwater to points of exposure.

JBS&G concluded that:

'... the risk estimates can be observed to be sufficiently robust, particularly where the conservatism of the approach adopted is considered...'

Auditor's Opinion

The auditor is satisfied that JBS&G have suitably completed this task.

S 10 and S11 Conclusions, Recommendations and Limitations

JBS&G have concluded:

'...The fate and transport assessment has estimated the potential worse case airborne concentration of asbestos fibres on the site. This has been found to be well below a level of 0.01 fibres per millilitre (f/ml) of air, as identified in Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997, 2015, NSW EPA as a potential trigger to warrant reporting under the Contaminated Lands Management Act 1997. Further recent respirable fibre monitoring undertaken by Trinitas during site assessment / remediation works has not identified airborne levels of fibres equal to or exceeding 0.01 f/ml. It is concluded on this basis that there is not a requirement to report asbestos impact to the NSW EPA...'

JBS&G made several recommendations, including (i) preparation of an Asbestos Register and Asbestos Management Plan, (ii) the initiation of a remediation / management response for localised high levels of asbestos (as measured at depth) at the south-eastern portion of the southern beach; and (iii) the appropriate training of nominated council staff to remove visible ACM when it is encountered during normal Beach maintenance activities. In general, these recommendations are supported by the auditor.

The auditor sought further clarification based on the findings of the HHRA as to whether JBS&G considered that the beach should be closed to the public until the recommended management (remedial) plans have been prepared / actioned.

JBS&G provided the following response:

'...JBS&G are of the opinion that most significant findings of the Trinitas works is that there are no occurrences of asbestos fines / free asbestos / friable asbestos on the site. Put simply, asbestos fibres are not caused to be released from bonded asbestos - and in absence of the release of asbestos fibres there is no health risk. Even by the assumption within the risk assessment that the asbestos on the Beach will spontaneously decompose and be available as free asbestos fibres - an unacceptable health risk cannot be estimated. The recommendations as provided by JBS&G relates only to the maintenance of an aesthetic condition of the Beach that would be expected by the community. They are in no way driven or guided by an unacceptable level of potential cancer risk...'

Auditor's Opinion

The auditor is not convinced that the recommended Asbestos Register is applicable to this site despite JBS&G's advice that it is a function of the Work Health and Safety Act 2011 and Work Health and Safety Regulation 2017, as in virtually all circumstances the beach is not a workplace.

Notwithstanding, the auditor has no objection to an Asbestos Register being prepared for workers who may visit the site, not least those involved with asbestos removal from time to time. In addition, it is also noted that the distribution of asbestos on the beach is unlikely to be either uniform or consistent over time and therefore the location of asbestos would be difficult to register spatially over any specified period.

The transient beach environment with tidal movements, coastal processes etc is likely to render any such register unworkable because the distribution of asbestos is unlikely to remain static even over short periods, also the ongoing remediation of the beach by emu-picking would also be expected to compromise any observations noted in the Asbestos Register. In any event the auditor notes such details would need to be included in the limitations of the Asbestos Register if one is prepared

Other than this detail, the auditor is satisfied that the conclusions, recommendations, and limitations presented by JBS&G and summarized in the executive summary are an appropriate reflection of their HHRA findings and that they have suitably completed this task.

The auditor has conducted a review of the HHRA with reference to the auditor's guidelines as provided in Table 8.

Table 8: Human health risk assessment checklist (Appendix E - Site Auditors Guideline 2017)

Hazard identification	Yes / No	Comments
Have all appropriate sources of information regarding chemicals of potential concern been identified and appraised?	Yes	The auditor notes that the 2006 SAR for the site has not been referenced as part of this HHRA, possibly because this document only become available well after the completion of the first 5 drafts of the DSI. Also given the elapsed time since the previous investigations (2006) the auditor considers the known sources of information regarding contaminants of concern (asbestos) including the Trinitas DSI and all bi-weekly clearance reports prepared by Trinitas since August 2020 were sufficient for the preparation of the HHRA.
Has justification been given for the selection of the chemicals of potential concern?	Yes	The risk assessment process is designed to determine a site-specific estimate of the risk posed by the level of asbestos present in soils on the Beach.

Hazard identification	Yes / No	Comments
Have all appropriate sources of information regarding chemicals of potential concern been identified and assessed? Has justification been given for the selection of the chemicals of potential concern?	No	This HHRA for Asbestos has targeted asbestos only in this assessment. The consideration of other substances and chemicals of concern was not part of the scope of works for this HHRA.
Toxicological Information		
Have the critical toxic effects been identified?	Yes	A summary of published data by NHMRC, NEPC, WHO, enHealth, NEHF, NICNAS, ATSDR, NTP and US EPA was undertaken by JBS&G in Table 5.1 of the HHRA (Appendix B herein).
Have the effects on each body system (for example renal, hepatic, cardiovascular and developmental) and the types of effects (for example genotoxic and carcinogenic) been summarised?	Yes	A study of the toxicology has been provided in Section 5.1 of the HHRA, however the effects on each body system of the impact of asbestos exposure has not been specifically outlined in the section. JBS&G have specified that the primary effects of asbestos are via the respiratory system (inhalation of two amphibole forms of asbestos) and asbestos is not toxic by oral or dermal exposure pathways
Has the dose–response relationship for chemicals of potential concern been discussed?	Yes	Section 5.5 and Table 5.1
Have all relevant toxicological data been considered and checked for accuracy?	Yes	Section 5.5 and Table 5.1
Has the adequacy of the available toxicological database been commented on?	Yes	Section 5.5 and Table 5.1
Have relevant primary toxicological resources been considered?	Yes	Section 5.5 and Table 5.1
Have different toxicity data from different resources been assessed and discussed?	Yes	Section 5.5 and Table 5.1
Have the selected toxicity data been adequately justified?	Yes	Section 5.5 and Table 5.1

Hazard identification	Yes / No	Comments
Exposure Assessment		
Have all potential receptors been identified?	Yes	the potential receptors of concern were listed as: • Recreational users of the Beach. • Landscapers / Gardeners / Beach maintenance workers. • Sub-surface maintenance / excavation workers; and • Residents adjoining / in proximity of the site.
Have the estimated or measured exposure concentrations for each exposure route and chemical of potential concern been quantified?	Yes (asbestos only)	Tables 6.1 - 6.4 of the HHRA.
Risk Characterisation		
Has the acceptable risk level been identified and justified?	Yes	The sum of these risk estimates is 3.0×10^{-6} which is well below the adopted risk criterion.
Have all potential receptors and pathways been considered?	Yes	
Has the relative significance of each exposure pathway, based on the risk analysis, been discussed?	Yes	
Has a sensitivity/uncertainty analysis been presented?	Yes	A sensitivity analysis undertaken of the risk assessment process has found that risk estimates are appropriately conservative and suitable for decision making as to the suitability of the site.
Equations		
Have all equations used in the risk assessment been presented in the report?	Yes	Section 6.4 of the HHRA provides the relevant equations.
Are all equations consistent?	Yes	
Have all parameters in each equation been clearly defined?	Yes	
Have the correct units been allocated to each parameter?	Yes	
Are all equations dimensionally correct?	Yes	
Have all unit conversion factors, where applicable, been included in the equations?	Yes	

Hazard identification	Yes / No	Comments
Has all pertinent information been provided to enable calculations to be checked through in a step-wise process?	Yes	
Data Evaluation		
Have the data collection objectives been stated and are they consistent with the requirements of the risk assessment?		Section 1.11 of the HHRA outlines the review of previous Trinitas investigations including a review of data reliability in Section 1.11.11
Have the laboratories that did the chemical analyses been noted, and do they have NATA accreditation (or equivalent) to perform each chemical analysis?		Yes - NATA accredited laboratories used for analysis as follows: Eurofins 791697, 791702, 791703, 791704, 791709, 791711.
Has laboratory quality assurance/quality control (QA/QC) been reported and analysed?		No - as asbestos is the only COC in this HHRA this is considered acceptable
Has field QA/QC been reported and analysed?		No - Trinitas did not undertake field QA/QC during this DSI.
Have statements of the accuracy of the laboratory data for each contaminant been made and have these been considered in the risk assessment?		Statements about the reliability have been made by JBS&G in Section 1.11.11 (discussed above) of the HHRA.
Assessment and Report Presentation		
Has information been presented coherently and in an appropriate sequence to enable efficient appraisal of the report?	Yes	
Have the objectives and scope been clearly stated?	Yes	
Has information from previous reports on the site been appropriately selected and incorporated into this report?	Yes	
Has the analysis been based on up-to-date literature?		
Have all assumptions and data been identified and justified?	Yes	
Have all tables and figures been referred to correctly in the text of the report?	Yes	
Has adequate data been presented to support the conclusions?	Yes	

Auditor's Opinion

The auditor conducted a review of the HHRA for Asbestos (September 2021) and earlier revisions were amended to incorporate auditor feedback and queries (IAL2) as noted in **Appendix C**. Whilst uncertainties are acknowledged in regard to the spatial and temporal distribution of asbestos on the subject site due to the tidal and wave effects on the ACM on the beach, the estimations of asbestos concentrations made by JBS&G are considered to represent a logical interpretation of the raw data provided by Trinitas. Clarifications regarding this raw data were sought by the auditor and were addressed by JBS&G.

The auditor considers based on the physico-chemical and toxicological properties of asbestos, (the identified contaminant of potential concern), and the exposure modelling as noted by JBS&G, the overall conclusion of the HHRA is acceptable.

10. Future Human Health Risks

The current and proposed land use comprises a beach used by the general public. Accordingly, the land-use is deemed to be recreational.

Sampling has revealed that the site is generally underlain by beach sands, possibly some Anthropocene deposits (fill slopes) in the foreshore areas (although these are unlikely to be within the subject site, i.e., Lot 97) and rock shelves comprising bedded sedimentary rocks (Hawkesbury Sandstone). Asbestos in the form of bonded ACM has been found within beach sands both at the surface and at shallow depth and to some extent entrained to depths of up to 2.5 m. No fibrous asbestos or FA/AF asbestos was reported by Trinitas (or Eurofins) and none was assumed by JBS&G in the HHRA.

Furthermore Section 3.2.4 of NEPC (2013) indicates that the land use scenario considered for the current and future land use is recreational open space, and therefore HSL C criteria apply.

Some minor building material debris (including ACM) was observed by the auditor on the beach surface and on the rock shelves, as well as in the approaches to the beach and in Crown Gully 2 which also contained significant amounts of brick and other demolition debris. Both of these latter areas are however wholly outside the subject site, i.e., beyond the western boundary of Lot 97.

As noted in Section 9 the HHRA concluded that:

'...subject to future works to cause the remediation / management of gross levels of buried asbestos at the south-eastern portion of the southern beach area, it is considered that the levels of asbestos as present on the Beach will not pose an unacceptable health risk to ongoing / potential future users of the site and/or potentially sensitive populations in proximity of the site...'

The HHRA also noted that the sum of the (various elements of the) risk estimates is 3.0×10^{-6} which is well below the adopted risk criterion.

The auditor however notes that surface asbestos (defined in DOH WA, 2021 documentation as being on or within 10 cm of the surface) is present across the beach surface, albeit perhaps concentrated in 'hotspot' areas centred on the three gullies, particularly the southern gully, and including on the rock shelves. Asbestos (ACM) may also be present beneath the sand surface and may at any time be redistributed to the surface or conversely covered by sand with each successive tidal cycle. Asbestos may also be present below the permanent water level (and as such has migrated off site beyond the seaward boundary of Lot 97) and may remain below water level where impacts are likely to be negligible.

Similarly asbestos in the form of ACM pieces on the rock shelves, and potentially below permanent water level, are likely to be redistributed by tidal movements. In addition, certain samples obtained by Trinitas, when subject to calculation of % w/w asbestos, exceeded the adopted HSL C of 0.02% w/w. However, it is noted that this exceedance is for the sample and not for the beach area (site) itself. The auditor further notes that the results for any one sample at any one time are most likely to be transitory for the reasons stated above and as such the horizontal and vertical distribution of asbestos will vary with time.

The HHRA provided the following concluding statements and recommendations:

- *An Asbestos Register and Asbestos Management Plan are required to be prepared for Little Bay Beach;*
- *The high levels of asbestos as measured at depth at the south-eastern portion of the southern beach do not pose a current health risk, as they are present in a bonded form and are buried at a sub-surface depth. However, the occurrence of ACM at a frequency approaching 10% within a recreational area is not consistent with community expectations for the Beach and poses a potential risk of being caused to be present at the surface of the Beach in the future. A remediation / management response is required for this localised area of impact; and*
- *The ongoing occurrence of ACM at the Beach surface is not consistent with the aesthetic requirements for a recreational area. Based on the consultant observations, small quantities of ACM are anticipated to continue to be present at the surface of the Beach. On the basis of the occurrence of asbestos as bonded forms only, and small quantities being present, it is considered most appropriate that the ongoing response to the asbestos impact be restricted to normal Council maintenance being requested to remove visible ACM at the same time that normal Beach maintenance activities are undertaken. Nominated Council staff should receive asbestos awareness training prior to commencing these works.*

The HHRA however, notes that management and remediation of Lot 97 are required to prevent asbestos accumulation, in particular to the extent that health risks may change over time.

In addition, although certain HSLs were exceeded (at the time of the DSI) the site specific HHRA has indicated that the risk to human health from asbestos is acceptable. Moreover, when queried (see IAL2 in Appendix C) if JBS&G could provide an opinion based on the findings of the HHRA as to whether the beach should be closed to the public until the recommended management (remedial) plans have been prepared / actioned JBS&G stated that:

'... JBS&G are of the opinion that most significant findings of the Trinitas works is that there are no occurrences of asbestos fines / free asbestos / friable asbestos on the site. Put simply, asbestos fibres are not caused to be released from bonded asbestos - and in absence of the release of asbestos fibres there is no health risk. Even by the assumption within the risk assessment that the asbestos on the Beach will spontaneously decompose and be available as free asbestos fibres— an unacceptable health risk cannot be estimated...'

JBS&G also noted that based on the findings of the HHRA the site does not require notification to EPA under Section 60 of the Contaminated Land Management Act, 1997, viz:

'...The fate and transport assessment has estimated the potential worse case airborne concentration of asbestos fibres on the site. This has been found to be well below a level of 0.01 f/ml as identified in Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997, 2015, NSW EPA as a potential trigger to warrant reporting under the Contaminated Lands Management Act 1997. Further recent respirable fibre monitoring undertaken by Trinitas during site assessment / remediation works has not identified airborne levels of fibres equal to or exceeding 0.01 f/ml. It is concluded on this basis that there is not a requirement to report asbestos impact to the NSW EPA...'

The auditor concurs with the evaluation of risk and with their opinion on notification.

Trinitas did not provide a definitive statement regarding site suitability or indeed the current human health risk but deferred to the HHRA. Notwithstanding, Trinitas provided a lengthy series of recommendations regarding the need for further work which included, interim 'make safe measures' on Lot 97 itself, offshore investigations for asbestos, a detailed investigation of the adjacent land, including the three Crown Gullies, the catchment area and the golf course area. Trinitas also recommended, further risk assessment, the preparation of an RAP and related validation report and a long-term EMP. In most cases these recommendations relate to land which is outside the boundary of Lot 97 and for the most part (with the exception of the seabed adjacent to the beach) fall within Lot 98.

Auditor's Opinion

As noted above the auditor agrees with the assessment of human health risk, and notes that both consultants have indicated the need for management and remediation. The auditor also notes that asbestos is present at the surface which fails one of the HSLs published in NEPC (2013) and DOH WA (2021). In addition, in certain locations the testing indicated that the HSL for ACM of 0.02% w/w was breached for individual samples although not on average for the data set as a whole.

Based on the findings of the DSI and HHRA the auditor agrees that the risk to human health from asbestos in the environment at Lot 97 is acceptable, i.e., under the circumstances observed during the investigations (DSI) and likely remains so, because of continued asbestos collection and removal. The auditor notes however, that the rate of asbestos accumulation is not known and that despite regular collection and removal of asbestos from the beach the amount reported during regular collection events has not apparently diminished since August 2020.

The auditor agrees with JBS&G that the site does not warrant notification, but notes that one of the HSLs set out in NEPM is not met because asbestos is present at or near the surface (probably at all times) and that in certain locations samples exceeded the adopted HSL of 0.02% w/w. The auditor concludes that whilst human health risk is almost certainly quite low as determined by the HHRA, a higher risk cannot be entirely ruled out. Moreover, as the HHRA points out '*...occurrence of ACM at a frequency approaching 10% within a recreational area is not consistent with community expectations for the Beach...*'.

Both the DSI and HHRA note that since August 2020 over 2000 pieces of ACM have been removed from the beach by emu picking and it is axiomatic that this asbestos would still be present in the beach environment if asbestos collection had not occurred, thus potentially increasing the risk.

JBS&G has restricted their recommendations to what can be directly achieved on Lot 97 which is largely related to regular removal of visible ACM as well as unspecified responses for localised areas of impact. The auditor concurs that management and remediation of asbestos on Lot 97 are necessary, either by a continuation of the current arrangements, or by similar arrangements as JBS&G has suggested. Any such continuing clean up should be formalised by means of an EMP which sets out the requirements, processes, methods, implementation, monitoring regime and responsibilities which should be reasonably legally enforceable. The EMP for Lot 97 should be prepared by a suitably qualified consultant. The continuing implementation of this initiative is expected to meet the requirements of the unexpected finds protocol set out in the previous (statutory) audit for the beach area (formerly known as Lot 33). No formal EMP is, however, currently available and accordingly the auditor has included an Interim EMP on the site audit statement. It is intended that the Interim EMP will be replaced as soon as possible (ideally within 6 months of the date of the SAS) and be replaced by formal plans as noted above and in Section 11.

Regarding the recommendations by Trinitas, the auditor acknowledges that further investigation of the source of asbestos needs to be undertaken as it seems reasonably likely that any effective management and remediation programme for Lot 97 will need to extend beyond the westerly boundary of the Lot.

Such an investigation is needed to determine the next steps in terms identifying and confirming the source of asbestos (which is apparently being continually supplied onto the beach) and thence to determine what preventative remediation measures are required, not only within Lot 97 but also on its boundary and in all probability beyond the Lot 97 boundary into Lot 98.

In this regard it is also recommended that the provisions of the EMP for Lot 98 (formerly Lot 79), as attached to the Statutory Site Audit for that site, are re-examined to confirm that maintenance of (existing) remediation works are being undertaken as necessary in the adjacent land (which is immediately inland of the beach area). In addition, it would be necessary at the same time to determine the history of both the implementation and effectiveness of the EMP for Lot 79 (now Lot 98) in terms of past inspections and maintenance activities since 2008, i.e., as specified in Section 7 of the EMP.

It is the auditor's view that the one of the first steps of this programme would be to confirm that Lot 98 is indeed the source of asbestos (as posited by Trinitas) and accordingly this would involve *inter alia* verifying that asbestos is being transported down the three Crown Gullies (or other gullies) during heavy rainfall events, most particularly when the depth, duration and intensity of rainfall is likely to erode, mobilise and transport asbestos from the creek banks (and elsewhere in the catchment) during turbulent creek flow.

Correlation of asbestos incidence on the beach with such rainfall events would help demonstrate this relationship (or otherwise) and could be combined with further investigations (not necessarily intrusive) to determine where asbestos is (or is likely) to be exposed within Lot 98 and to confirm whether it has been or is likely to be subjected to erosional mechanisms (which may include sheet, rill or gully erosion). The auditor has requested that the relationship between rainfall events and asbestos on the beach be examined as part of the DSI, but this was not fully pursued by Trinitas. It is however noted that Trinitas reported that they had observed several areas of erosion and disturbed ground during their inspections of the adjacent land, including on the hill slopes and in gullies.

Following on from these investigations, appropriate remedial measures can be devised in the form of an RAP and subsequently the success of their implementation confirmed via a site validation report (SVR). It is recommended that the above investigations and the ensuing development of an RAP, SVR and long term EMP (as required) are undertaken by a suitably qualified consultant with specialist knowledge of erosional geomechanics and stream hydraulics and who has practical experience in the design, installation and maintenance of the types of remedial measures which may be proposed. All such investigations, remediation measures and their implementation should be reviewed by an accredited auditor.

11. Conclusions

The site has been subject to a suitable sampling density and testing regime (in regard to asbestos) to characterise the contamination status of the site for the current and future land use as a beach (recreational open space). The investigations by Trinitas and JBS&G have found that the site remains suitable for continuing public access and land use as a beach and recreational open space area, subject to continued management and remediation.

The DSI and HHRA provide some recommendations on what works are necessary, but understandably these are not specific as such measures would need to be proscribed in the appropriate management and remediation plans.

Preparation of such plans was outside the scope of the DSI and HHRA and are also beyond the scope of this SAR. Notwithstanding, it is recommended that such plans and related investigations should proceed, with the first steps being to formalise the continuance of regular asbestos inspections, removal and clearance in the form of an EMP for Lot 97, and the second step would determine the source of asbestos in Lot 97 (believed to be from Lot 98) and what measures are required to prevent asbestos reaching the beach.

The purpose of the related works, as previously noted, will be to identify and remove asbestos (ACM pieces) from the site (Lot 97) including the beach area and rock shelves and any part of the foreshore included in Lot 97. The purpose of the EMP will be to ensure that asbestos is continually removed from the beach (and ultimately to prevent it from arriving at the beach, possibly by the erection of barriers) to prevent a build-up of ACM. This will be beneficial not only from an aesthetic perspective but will also minimise the risk of excessive accumulation of asbestos on the beach which may increase risks to human health.

The HHRA has concluded that the beach need not be closed under such circumstances and has opined that there are no grounds to report (notify) the site to the EPA under Section 60 of the Contaminated Land Management Act, 1997.

Accordingly, the auditor concludes that the site is suitable for use as recreational open space subject to the implementation of an Interim EMP, and as soon as possible thereafter the development of formal management and remediation measures along the lines set out above.

In this regard the auditor makes the following concluding observations.

- I. The investigation data in the DSI provided by Trinitas are satisfactory and sufficient to provide a 'snapshot' characterisation of the site (Lot 97) and to form an opinion on the condition of the land at the time of the investigations with respect to asbestos. The auditor notes that physiographic conditions experienced in Lot 97 will result in regular changes in the distribution and degree and extent of asbestos, potentially during each tidal cycle, making the exposure conditions and longer-term risk assessment difficult to accurately determine.
- II. The sampling and analysis data in the DSI are sufficient to support the human health risk assessment (HHRA), prepared by JBS&G.
- III. Other aspects of the DSI are less satisfactory when compared with the requirements of NSW EPA contaminated land guidance but have been addressed in this site audit report and in the relevant IALs (Appendix C) in the form of auditor commentary and opinion.
- IV. The conclusion of the HHRA is that the risk posed by asbestos on the site is acceptable (see extracts from the report above).
- V. The DSI provides a similar conclusion but defers to the HHRA (see extract below).
- VI. The testing results from the DSI fail to meet at least one of the published health screening levels (HSLs) as set out in Table 7 of NEPM (2013) Schedule B1 (*no visible asbestos for surface soil*).
- VII. In addition, concentrations of asbestos in certain samples obtained by Trinitas from the site exceeded the NEPM HSL of 0.02% w/w (bonded ACM) for recreational land use, although the average for the site was below the HSL.
- VIII. The HHRA has also indicated that the presence of asbestos is not consistent with aesthetic requirements for a recreational area and that asbestos (ACM) is anticipated to continue to be present at the surface of the beach. In this regard the DSI has indicated that asbestos frequency on the beach has not declined despite implementation of a regular emu picking programme since August 2020.

- IX. Neither the DSI or HHRA are unequivocal regarding site suitability for the current and future recreational land use, and there is no specific statement in either report which indicates that the site is suitable, indeed both reports provide recommendations for further works which *inter alia* include the preparation of management and remediation plans.
- X. The HHRA restricts itself to the remediation and management that may be achieved in Lot 97 whereas the DSI opines that further investigations, remediation and long-term management may *inter alia* extend to the gullies, catchment and golf course beyond the landward boundary of Lot 97 (into Lot 98).
- XI. Trinitas has identified the likely source of asbestos on the beach as being from Lot 98 where extensive remediation took place prior to 2008, including asbestos entombment. Trinitas have also observed erosion in parts of the adjacent land.
- XII. The adjacent Lot (Lot 98), previously Lot 79, is the subject of a statutory site audit dated February 2008 which includes a long-term environment management plan (EMP) dated January 2008. The EMP specifies inspections and maintenance of the remediation measures and provides mechanisms for their implementation. It is not known how effective these management measures have been as this issue was not pursued by the consultant (Trinitas).
- XIII. The same auditor also provided a statutory site audit for Lot 97 (then Lot 33) dated July 2006. Both audit reports are referenced in Section 1 of this SAR.
- XIV. Any future work related to remediation or management of asbestos on the beach (Lot 97), or any investigations, remediation or management related to the probable source of asbestos (assumed) to be in Lot 98 will need to examine the EMP (as above) and determine how effectively the EMP has been implemented since 2008.
- XV. In general, the auditor agrees with the investigation findings and conclusions of the DSI and HHRA in that remediation and management of the site is required.
- XVI. The auditor further concludes that whilst the consultants have not fully demonstrated that Lot 97 is currently suitable for continued recreational land use (with regard to asbestos), noting that conditions on the beach change continually, it is conceded that the risks from asbestos are, in all probability acceptable, and will remain so depending on the amount of asbestos which finds its way onto the beach and the corresponding amount of asbestos (ACM) which is collected and removed by regular inspection and clearance. Again, leading to the conclusion that continuing management and remediation of the site is required.
- XVII. To be effective in the longer term any management and remediation of asbestos will need to identify, confirm and address the source of the asbestos encountered on Lot 97. Initially this will involve confirming that asbestos is being transported down the three Crown Gullies (and from elsewhere in the catchment) during heavy rainfall events, most particularly when the depth, duration and intensity of rainfall is likely to cause erosion and transport of material from the creek banks) during turbulent flow. Correlation of incidence of asbestos on the beach with intense rainfall events may help demonstrate this relationship.
- XVIII. Any management and remediation measures will need to consider the areas on the site boundary at the outlets of the gullies which exit Lot 98 and debouch onto the beach. Such measures will need to ensure that they are effective and are not subject to tidal or erosional effects or other forms of damage. It is noted that Trinitas has provided recommendations regarding 'make safe measures' including barricades. It is further noted that the installation of such structures may restrict or prevent beach access.

- XIX. In the meantime, interim asbestos mitigation measures should be implemented in Lot 97, and accordingly the auditor has provided a brief Interim EMP which is attached to the SAS which accompanies this SAR.
- XX. The auditor notes that the disposal of asbestos collected by Trinitas has not been recorded, although Trinitas has advised verbally that the material is stored pending disposal but did not respond to the corresponding question posed in IAL6. Accordingly, the auditor is unable to confirm whether appropriate disposal of asbestos removed from the site during emu picking activities has taken place since August 2020.

The auditor notes that review of the recommended management and remediation plans is beyond the scope of the current audit but notes that such plans should be prepared by a suitably qualified and experienced consultant and should be reviewed by an accredited auditor.

Accordingly, the auditor considers that it is now appropriate to issue this (non-statutory) SAR and accompanying SAS (No. DPNS/19) which comprises a Section A2 SAS.

The SAS states that the site is suitable for recreational open space use (beach) with regard to asbestos (noting that other contaminants may also be present particularly if migration from the adjacent land is occurring), but this finding is subject to, and initially contingent upon, the adoption of an Interim EMP (as attached to the SAS). The Interim EMP has been issued pending formalisation of more detailed management and remediation measures, which must be put in place as soon as possible (ideally within 6 months of the date of this SAR and the attached SAS). The Interim EMP requires operational, and maintenance works (ongoing removal of visible ACM) and is therefore an active control system and as such constitutes an 'Active Plan'. It is envisaged that subsequent management and remediation plans will also fall into the 'Active' category (as defined on the SAS proforma). RCC have agreed to legally enforce, implement, manage and notify the EMP (via amendment to the S10.7 Notice for Lot 97).

The auditor notes that the non-statutory SAR and SAS should be kept together.

12. References

NEPC (2013) *National Environment Protection (Assessment of Site Contamination) Measure 1999*, as amended May 2013.

NSW EPA (2017). *Contaminated Land Management Guidelines for the NSW Site Auditor Scheme* (3rd edition).

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NSW EPA (1995). *Sampling Design Guidelines*.

NSW EPA (2015). *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997*.

NSW EPA (2020). *Consultants reporting on contaminated land Contaminated Land Guidelines (updated May 2020)*.

DOH WA (2021) *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (September 2021)*

Douglas Partners Pty Ltd

Appendix A

The DSI

Detailed Site Investigation (DSI) of Potential Asbestos Contamination at Little Bay Beach, Little Bay NSW

Prepared for:	Randwick City Council
Site	Little Bay Beach
Location	4R Coast Hospital Rd, Little Bay NSW
Field Work Date	26 th – 30 th April 2021
Report Date	17 th September 2021
Report Version	v6 final
Prepared by:	Jeffrey Yu
	Senior Environmental Consultant • Licensed Asbestos Assessor (001366) • PhD in Environmental Engineering • PhD in Medicinal Chemistry

TRINITAS GROUP

ABN 12 161 759 708

Level 3, 24 Hunter St, PARRAMATTA NSW 2150

Ph: 1800 4 TRINITAS

Email: admin@trinitasgroup.com.au

Web: www.trinitasgroup.com.au

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Abbreviations

ACM	Asbestos Containing Material
AF/FA	Asbestos Fines / Fibrous Asbestos
AEC	Area of Environmental Concern
AHD	Australian Height Datum
ANZECC	Australia and New Zealand Environment and Conservation Council
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure
BGS	Below Ground Surface
CoPC	Chemical of Potential Concern
AEC	Area of Environmental Concern
Council	Randwick City Council
ESL	Ecological Screening Level
Trinitas	Trinitas Group Pty Ltd
HIL	Health Investigation Level
HSL	Health Screening Level
NATA	National Association of Testing Authorities, Australia
NEPC	National Environment Protection Council
NSW DECC	Department of Environment and Climate Change of New South Wales
NSW EPA	Environment Protection Authority of new South Wales
NSW OEH	Office of Environment and Heritage of New South Wales
QA	Quality Assurance
QC	Quality Control
RPD	Relative Percentage Difference
SOP	Standard Operating Procedure
PSI	Preliminary Site Investigation
DSI	Detailed Site Investigation
RAP	Remedial Action Plan
EMP	Environmental Management Plan

Executive Summary

Based on the best available data sources, previous reports and site investigations, Trinitas concludes that:

Daily Background Asbestos Air Monitoring was undertaken throughout the duration of the site work completed as part of this Detailed Site Investigation (DSI). Air Monitoring reports including laboratory certificates from a NATA accredited laboratory (Eurofins) have been presented in *Appendix K - Air Monitoring, Clearance and Laboratory Analysis Results*. All background air monitoring results were below the detection limit of 0.01 fibres/mL of air, the lowest detectable limit for the method used. Therefore, results were also below the National Exposure Standard (NES) for asbestos which is 0.1 f/mL.

A visual clearance inspection was undertaken for all areas of the Site following completion of the DSI to ensure that no ACM fragments remained exposed on the soil surfaces after test pit excavation and backfilling. A clearance certificate was provided upon completion of the visual clearance inspection which is attached in *Appendix K - Air Monitoring, Clearance and Laboratory Analysis Results*.

Field observation and inspection indicated that:

Prior to DSI

- Prior to the commencement of the DSI works, approximately 2000 fragments were collected during bi-weekly emu picking and clearance inspections undertaken between August 2020 and April 2021 at Little Bay Beach. There was no conclusive or scientific evidence to demonstrate a decreasing trend in terms of ACM fragment quantity or numbers identified and removed from the site during the bi-weekly site inspections and emu-picking being completed by Trinitas Licensed Asbestos Assessors and Occupational Hygienists. These reports can be accessed via the Randwick City Council Website at <http://www.randwick.nsw.gov.au/planning-and-building/council-works-and-upgrades/major-projects/little-bay-beach-asbestos-management#reports>

During DSI

- ACM fragments were washed up and down the three beaches at Little Bay Beach consistently by tidal movements.
- ACM fragments identified and removed from Little Bay Beach during the one-week investigation period of the DSI had the physical characteristics (pattern, colour, shape and morphology) of asbestos sheeting fragments and corrugated super 6 sheeting fragments.
- Several ACM fragments were collected from areas adjacent to the outlet of Stormwater Pipe at Crown Gully 3 and then all the way to the rocky area in the bay, the whole sand and rock area at the Middle Beach; the areas adjacent to the creek from the Heritage Wall and Crown Gully 1 at the Northern Beach.
- Visual inspections were undertaken within the soil surfaces within Gully 2, and suspected ACM fragments within dumped building waste were observed. Due to lack of safe access, no samples were collected from Gully 2.
- Suspected ACM fragments were sighted and confirmed within all the Rock Areas and some Unknown Underwater Areas adjacent to the three beaches.
- It is the opinion of Trinitas Group that all fragments collected during the DSI were bonded in nature.

- To assess the potential sources of contamination at the Site, visual inspections were undertaken in areas adjacent to the boundary of the Site. Suspected ACM fragments were observed within the following areas;
 - o Stockpiles, Exposed Soils at Golf Course adjacent to the catchment, Crown Gully 1;
 - o Dumped waste adjacent to Heritage Wall at Northern Beach;
 - o Cleared land at the upstream of Crown Gully 3
 - o Sand Area under open water in the bay.

This DSI identified contamination as follows:

- 15 out of 45 Test Pits reported asbestos contamination (positive): sighted, confirmed in 10 L of soil, or confirmed in 500 mL of soil.
- 4 out of 45 Test Pits were confirmed with bonded asbestos contamination over HSL threshold 0.02% w/w.
- No friable asbestos (AF/FA) was identified within any of the 45 Test Pits. No asbestos was detected at the reporting limit of 0.001% w/w. No trace asbestos was detected.
- Three Hotspots included:
 - o Southern Beach (25% positive Test Pits) had the Hotspot with the area of 1200 m² (approximately 800 m³), up to 1 m.
 - o Middle Beach (78% positive Test Pits) had the Hotspot with the area of 1000 m² (approximately 750 m³), up to 0.5 m;
 - o Northern Beach (12% positive Test Pits) had the Hotspot with the area of 1600 m² (approximately 1000 m³), up to 1 m.

Due to the nature of site contamination by bonded asbestos fragments in soil and on sand surfaces, it is the opinion of Trinitas that asbestos contamination at the Site poses a potentially low health risk to site users. The final risk ratings are to be determined by the Site Human Health Risk Assessment report.

Trinitas recommended a series of approaches, measures, and strategies for the site and for the current and future Recreational C land use (Public open space) subject to change with the required consultation among the client, community, decision makers and stakeholders, including:

- Further Risk Assessment completed in consultation with relevant stakeholders,
- Additional site investigations,
- Remedial Action Plan and/or Environmental Management Plan

1. Introduction

In response to the urgent request for a site investigation at Little Bay Beach – Lot 97, DP270427 (“The Site”) on 3 August 2020 from Randwick City Council (“The Client”), Trinitas Group Pty Ltd (“Trinitas”) conducted a visual inspection within a suspected asbestos contaminated area on the Northern Beach, also known as the Northern Sand Area of Little Bay Beach (See Figure 1). Emu-picking of suspected asbestos fragments was undertaken in conjunction with RMA Group (“Class A Licensed Asbestos Removal Contractor”).

Trinitas noted that a local resident reported suspected shell-like ACM fragments within the Northern Beach of Little Bay Beach on 2 August 2020. Interviews conducted at the Site revealed that it is the opinion of local residents that the Asbestos contamination is a result of widespread dumping activities undertaken during the redevelopment of Prince Henry Hospital (Lot 98).

Following a site meeting with the Client on 3 August 2020, Trinitas Hygienists collected ten (10) suspected ACM fragments from the Northern Beach and Middle Beach. All 10 samples returned positive for asbestos. Immediate measures and actions were implemented by the Client to remove any visible ACM pieces at the Site on 4 August 2020. The removal of surface ACM was undertaken by RMA Group on 4 and 5 of August 2020. Subsequent site walkovers and inspections also identified additional ACM fragments which were collected from the Southern Beach all the way up to the edge of the Rock Area during low tide periods.

Subsequent make safe measures including background air monitoring and emu-picking were undertaken by Trinitas Licensed Asbestos Assessors and Occupational Hygienists daily until 7 August 2020. From 7 August 2020 onwards, bi-weekly emu-picking and surface clearance inspections have been undertaken by Trinitas Group within the three sections of the beach above the tidal line.

During the first week of inspections, Trinitas Hygienists collected approximately one hundred (100) ACM fragments across the Northern, Western and Southern section of the Site. By 21 August 2020, over two hundred (200) suspected visible ACM fragments (including over 1 Kg of Super 6 corrugated sheeting chunks, flat fibrous cement sheeting and shell-like ACM fragments) had been collected by Trinitas hygienists.

Trinitas proposed that further investigation and assessment of the Site may need be required to understand the nature of asbestos contamination, the location and quantity of contaminated soil and dumped waste, risk assessment, remedial action plan and/or environmental management plan. Subsequently Trinitas was engaged by the Client to undertake a Detailed Site Investigation (DSI) at the Site to assess and report the extent of Asbestos Contamination at the Site (defined as Lot 97, DP270427)

The objectives of the DSI were to:

- Identify Areas of Environmental Concern (“AECs”) in relation to the Asbestos contamination at the Site;
- Assess the potential for contamination to exist at the Site, as a result of historical and current Site activities;
- Assess the presence of contamination across the Site;

- Assess the suitability of the Site for the proposed land use (from a contamination viewpoint);
- Provide recommendation for further investigation of areas of environmental concern; and
- Provide recommendations for remediation and/or management, if required.

In order to meet the above objectives, Trinitas carried out the following scope of works:

- A review of Site topography and geology;
- A limited Site history review, including a review of aerial photography, a review of previous contamination / remediation reports pertaining to the subject site and adjacent golf course site and a review of records held by relevant regulatory authorities;
- A Site walkover;
- A sampling program, targeting the potential AECs across the Site;
- Laboratory analysis of the samples for Asbestos; and
- Preparation of this DSI Report.

2. Background

Little Bay Beach is a popular beach with golden sands, sandstone outcrops and platforms as shown in Figure 1.

The east-facing bay is extremely popular among the locals, surrounding residents and tourists. It's well protected from large coastal swells making it perfect for swimming, fishing and snorkelling. The rock ledges to the north and south are well-known, but sometimes dangerous, fishing spots. Access to the secluded beach is via a steep timber staircase. A café is located in the Prince Henry Centre towards the top of the beach near the chapel.

NSW Office of Environment and Heritage Beachwatch program advises as a general precaution to avoid swimming during and for 24-hours after heavy rain. Stormwater runoff from surrounding streets drains to the beach which may pollute the water (<https://www.randwick.nsw.gov.au/facilities-and-recreation/beaches-and-coast/beaches/little-bay-beach>).



Figure 1 Overview of Little Bay Beach (Northern Beach, Middle Beach, Southern Beach)

2.1 Site Location and Identification

General Site details are included below in Table 1, Figure 1, Appendix A ~ Appendix F.

Table 1 Site Details

Item	Description
Site Address:	4R Coast Hospital Road, Little Bay, NSW. The Site location is shown in Figure 1
Approximate Site Area:	Maximum accessible total area of ~11000 m² during the DSI period (low tide ~0.3 m to 0.5 m), the required investigation areas of environmental concern by the Client, as shown in Appendix A. The investigation areas accessible as practically as possible during the DSI period included: - Northern Sand Area (~3600 m²) - Middle Sand Area (~1200 m²) - Southern Sand Area (~5300 m²)

Item	Description
	Note: - Sand (~10000 m²) under open water in the bay was not part of the current scope of work; - All gullies, dumped waste/stockpiles, exposed soils in the surrounding areas were out of the scope of work. - The sand areas varied all the time under dynamic environment. - Under extreme conditions (i.e., high tide (1.8 m), gust, rough swell), the total non-water-impacted area of three beaches could be less than ~2000 m², as shown in Table 12. - Identification of the accurate positions of upper tidal line and lower tidal line were out of the scope of the DSI.
Site Identification Details:	As shown in Figure 1, the Site with three Sand Areas (Southern Beach, Middle Beach, Northern Beach), was located at Lot 97, DP 270427 (Previous Lot 33, DP 270427 in 2005) Note: Lot depicts a parcel of land created on a survey plan. The site boundaries extracted from NSW Land Parcel and Property generally have positional accuracy in the range from less than 5 m from true position in rural areas to less than 0.2 m from true position in urban areas, dependent on the survey control available (A certified survey plan to accurately define the site boundaries should be conducted by the Client, other land-owners and/or stakeholders, which was out of the scope of the DSI).
Current Land Use:	The Site is currently used as a public open space
Future Land Use:	The Site is going to be used as a public open space
Surrounding Land Uses:	- Residential properties to the West - Chapel, Prince Henry Centre and Golf Club Centre to the west and southwest - The Coast Golf Course surrounding from North to South, - New development or cleared land/paddocks, 300 m upstream of Crown Gully 2, was observed. - Open water to the east
Site Co-ordinates:	The approximate centre of the site was located at 338437.053 (E), 6238704.688 (N) (GDA94 MGA Zone 56)

Note:

- The domains in previous Douglas Partners' reports could refer to Domain 7 (Little Bay Beach & Foreshore), adjacent areas including Domain 4, 6, 3, 2 and 1, as these areas were included or adjacent to the Site in this report.
- Trinitas noticed that in the boundaries of this DSI there could be some "**grey areas**" with land, water and/or soil. Whether they were located at the Council area, Landcom, Developer(s), other land-owners, and/or the Crown Land were out of the scope of this DSI report.

2.2 Site Features and Visual Observations

From the Site layout shown in the pictures above and photos in Appendix G, site features identified during the Site walkover were described below:

For **Southern Beach** Sand Area (1000 ~ 5300 m²), Appendix B

- Soil erosion on the slope of the golf course was observed.
- Surface ACM fragments were observed and collected.

- ACM fragments were identified and confirmed across the whole beach sand area all the way up to the rock area under water during low tide (0.3 m).
- ACM fragments are constantly being pushed up and down the beach sand area with tidal movements

For **Middle Beach** Sand Area (0 ~ 1200 m²), Appendix C

- Fill material was observed throughout the Crown Gully 2 and a stockpile of old bricks and concrete were stacked on the outlet of the gully.
- ACM fragments were identified and confirmed in the gully surface and buried within demolition material (only halfway towards the overpass was accessible at the time of inspection).
- ACM fragments are constantly being pushed up and down the sand area with tidal movements
- Hundreds of ACM fragments (super 6 corrugated sheeting chunks, flat ACM sheeting) have been collected since 21 August 2020.
- Crown Gully 2 has limited access.
- Visible ACM fragments were identified under the rock platform immediately adjacent to the low tide water line.
- Fill materials such as building rubbles and solid waste (including plastic, tiles, rubber, tyre, bricks) were observed along the edge of the hill slope.

For **Northern Beach** Sand Area (500 ~ 3600 m²), as shown Appendix D:

- Crown Gully 1 (no access) runs from the northern golf course, where a historical retaining wall forms a barrier with stormwater outlet.
- The channel with boulders runs from the retaining wall towards the bay. Under beach sand and around the boulders, dumped waste materials were observed. Several ACM fragments were collected and observed from the channel.
- Stained water from the gully flows toward the bay.
- Fill materials such as building rubbles and solid waste (including plastic, tiles, rubber, tyre, bricks) were observed along the edge of the hill slope and stockpiles adjacent to the Northern Beach.
- The eastern section of Northern Beach under the cliff has sandstone platform and abundant boulders.
- Visible ACM fragments were identified under the rock platform immediately adjacent to the low tide water line.
- ACM fragments are being pushed up and down the sand area with tidal movements

Rock outcrops separate the Middle Beach and Southern Beach. However, there is no apparent physical boundary between the Northern Beach and Middle Beach. Abundant ACM fragments (super 6 corrugated sheeting chunks, flat ACM sheeting) were observed, during the bi-weekly visual inspections undertaken prior to the DSI, within these rocky areas.

While Underwater Sand Area (~10000 m²) in the bay was out of the scope of work, ACM fragments have been observed between or under rocks/boulders in the water during the lowest tide period (~0.2 m). During high tide period (~2 m), the whole Middle Beach, most of the Northern Beach and half of the Southern Beach are under water or impacted by strong tides.

During heavy rain events, three creeks from the gullies change dramatically in terms of soil disturbance, flow direction, flow rate and bed depths. Overall, the site is very dynamic.

2.3 Site Topography and Drainage

Reference to the Bondi 9130-2S topographic map (1:25000) (accessed through the Spatial Information Exchange <https://six.nsw.gov.au/etopo>) indicates that the Site is situated under the cliffs from the north to the south. The Site steeply slopes toward the bay. The approximate elevation of the timber entry to the beach is 20 m(AHD).

Surface water generated during heavy rainfall events and from upper Golf Course and surrounding Little Bay areas is anticipated to flow into the three gullies towards the bay.

2.4 Site Geology

A review of the Sydney 1:100 000 Geological Series Map (Sheet 9130) indicated that the Site is underlain by Hawkesbury Sandstone, comprising medium to coarse grained sandstone with minor shale and laminate lenses.

3. Limited Site History Review

With reference to high resolution Aerial Photographs (Nearmap) since October 2009, there is no evidence of major landscape change at Little Bay Beach, however the redevelopment of the adjacent Prince Henry Hospital area has been undertaken in several stages. A review of the historical satellite images dating from 1943 - 2006 available via the NSW Spatial Services was conducted. While the resolution of aerial photographs prior to 1998 is considered to be insufficient to conduct a detailed review of changes to finished levels and conditions of the gullies / drainage channels, it is noted that potentially large-scale levelling of the golf course was undertaken between 1965 and 1970. The use of introduced fill to level the golf course has also been mentioned several times within 'Remediation Strategy Report & Future Site Management Principles Prince Henry Redevelopment Site – Undevelopable Area' prepared by EMS (EMS 2005). There is high potential that the asbestos contamination present within the introduced fill (Lot 98) over the years may have migrated to the Site via natural phenomenon such as, wind, storm water and soil erosion, and is considered a major source of ACM contamination at the Site (Lot 97).

Table 2 List of representative site photos around Little Bay Beach

	
Image 1: Old Hospital Facility around Crown Gully (Source: The Coast https://www.coastgolf.com.au/cms/about-us/#history)	Image 2: Male Lazaret around Crown Gully 1 (Source: The Coast https://www.coastgolf.com.au/cms/about-us/#history)



Image 3: Aerial Photograph dated 1998 (Source: NSW Spatial Services)



Image 4: Aerial Photograph dated 2005 (Source: NSW Spatial Services)



Image 5: Aerial Photograph dated 1965 (Source: NSW Spatial Services)



Image 6: Aerial Photograph dated 1970 (Source: NSW Spatial Services)



Image 7: 1900s Section of the Prince Henry Hospital looking north across Little Bay (Source: Randwick City Council archives)	Image 8: 1900s Little Bay Looking South 2 (Source: Randwick City Council archives)

“Prince Henry Hospital (Image 1 in Table 2) commenced its working life as a quarantine facility at the end of the 19th Century and was originally quite a remote area of Sydney, toward the end of the tram line to La Perouse, on the beach side of the northern peninsula of Botany Bay. The original hospital at Little Bay was known as ‘The Coast Hospital’ of which the Golf Club later became known. The hospital had a golf course in differing layouts since about 1922 for staff recreation.

The old hospital laundry was designated to become the Licensed premises for the golf club. The building being a “u” shaped brick construction with the northern aspect in weatherboard. Initial renovations in 1969 filled in the “u” shape to create a function room. In 1997 the clubhouse was internally renovated.

With the closure of Prince Henry Hospital and subsequent development of the site, the course moved into the transitional ownership of Landcom and later was later declared to Crown Lands. The Club was granted a long-term lease (75 years) and began its next phase of renovation and upgrade work. Subsequent refurbishments of the Clubhouse have embraced Club heritage, while modernizing the facilities for Club members, local residents and visiting patrons who are always most welcome.

The course has continued to improve over the past decade with ongoing improvements to fairway drainage, cart paths and two new greens on the 13th and 9th holes. With the introduction of a bent green nursery in 2014, the Club will continue to replace greens as it become necessary. In early 2017 members unanimously agreed to undertake a \$1.4 million replacement of the Irrigation system. Stage 1 of holes 10-17 were completed in late 2017 and the final stage was completed in December 2019.” (The Coast <https://www.coastgolf.com.au/cms/about-us/#history> and A Coast Chronicle – The History of the Prince Henry Hospital by C.R. Boughton and edited by George Caiger and Photos by Bob Burgess)

As observed in image 3 and image 4 in Table 2, large scale redevelopment of the areas surrounding the Site (Lot 98) was undertaken between 1998 and 2005 which involved demolition of several buildings and clearing of land. A review of ‘Remediation Strategy Report & Future Site Management Principles Prince Henry Redevelopment Site – Undevelopable Area’ prepared by EMS (EMS 2005) was undertaken and it is noted that the drainage channels where introduced fill was exposed were remediated via surface removal of asbestos cement fragments followed by installing a ‘vegetative promoting geotextile mesh’ and a layer of topsoil in addition to diverting the flow of runoff to PVC pipework. It is the opinion of Trinitas that these remediation measures failed to prove adequate as the exposed introduced fill can be observed at the surface of the drainage channels specifically within ‘domain 3 – former Ambulance Corps Area’ and asbestos contamination within these fill layers from Lot 98 to the sand areas within the Site (Lot 97) via natural phenomenon.

3.1 Site Interviews

As part of the Site history review, an interview was held with the Client representative on 3 August 2020. The interview revealed no former report of asbestos contamination at Little Bay Beach.

A Trinitas Consultant met a local resident (Greg Bond) on the beach on 31st August 2020. Greg has around 50 years of knowledge of the Site. Greg indicated that “the legacy dumped tip is located on

the northern hilltop adjacent to Crown Gully 1 and Northern Beach”, but the demolition of buildings of Male Lazaret and Female Lazaret or other subsequent buildings around the Crown Gully 1 and Crown Gully 2 during a 100-year period could not be reflected. Trinitas believes that this may have been reference to the entombed containment cell within the northern portion of Lot 98 containing ~7800 m³ cube of asbestos waste. However, it is noted that the site audit report for lot 98 considers the design and integrity of the containment cell to be satisfactory.

3.2 NSW EPA Records

A review of the NSW Office of Environment and Heritage (OEH) Contaminated Land – Record of Notices listed by the NSW EPA under the Contaminated Land Management Act 1997 on July 13 2020 did not identify former or current notices to the Site within the LGA of Randwick City Council (<https://apps.epa.nsw.gov.au/prclmapp/searchregister.aspx>).

A review on 14 July 2021 of the ‘List of NSW Contaminated Sites Notified to the EPA’ listed by the NSW EPA under the Contaminated Land Management Act 1997 (<https://www.epa.nsw.gov.au/your-environment/contaminated-land/notified-and-regulated-contaminated-land/list-of-notified-sites>) did not identify any notified sites in the Little Bay Beach area.

With reference to the NSW Office of Environment and Heritage and the NSW Office of Environment and Heritage's Atlas of NSW Wildlife, any investigations of ecological constraints or endangered and vulnerable species have not been conducted at the Site (out of the scope of work). If in doubt, further consulting services should be pursued by the Client.

Other regulatory databases were not conducted as the preliminary inspection only focuses on the asbestos on sand surfaces of the Site as instructed by the Client.

3.3 Council Section 10.7 (2) and (5) Planning Certificate Search

Section 10.7(2)&(5) Certificate is attached. See Appendix L

A review of information provided under Section 10.7 (2) has indicated the following;

- The land **IS NOT** significantly contaminated land within the meaning of the Contaminated Land Management Act 1997.
- The land **IS NOT** subject to a management order within the meaning of the Contaminated Land Management Act 1997.
- The land **IS NOT** the subject of an approved voluntary management proposal within the meaning of the Contaminated Land Management Act 1997.
- The land **IS NOT** the subject to an ongoing maintenance order within the meaning of the Contaminated Land Management Act 1997.
- Council **HAS** received a copy of a site audit statement, within the meaning of the Contaminated Land Management Act 1997, for this land.

A review of information provided under Section 10.7 (5) has indicated the following;

- Council has no obligation to provide any advice in this planning certificate in response to a request made under s.10.7 (5) of the Act.
- Draft Local Environmental Plans that have yet to be placed on Community Consultation under the Environmental Planning and Assessment Act, 1979.

- Council **IS** in possession of a flood study that covers the catchment in which this property is located. The flood study is available for inspection at the Council if required.

3.4 Council Record Search Available under the GIPA Act 2010

Trinitas understands from review of development application records that the Council did not hold any records of potentially contaminated land at the site. Further confirmation with the Client is recommended. A review of the title deeds / lot subdivision history was undertaken via council records and a timeline of the changes in lot subdivision is presented below:

- Prior to 2005: Part of same parcel of land as golf course / Prince Henry Hospital – Lot 23, DP 270427
- 16/03/2005: Subdivided into Lot 33, DP 2740427
- 15.12.2009: Consolidated and changed from Lot 33, DP 2740427 to Lot 97, DP 2740427

3.5 Summary of Previous Investigations

3.5.1 Trinitas Preliminary Technical Brief

In the previous Preliminary Technical Brief for Potential Asbestos Contamination at Little Bay Beach, Little Bay NSW by Trinitas on 24 August 2020 (Trinitas Ref. No.: Technical Brief Little Bay Beach_Brief_20200818_JYDBJYDB), several potential sources of asbestos contamination were identified as shown in Table 3.

There is high uncertainty of asbestos impacted fill in the three gullies. No sampling was undertaken within the gully areas as they fall outside of the Site boundary. However, considering that they are potentially major sources of contamination at the Site, further investigation within these areas is recommended.

There is high uncertainty of asbestos impacted sand at underwater area in the bay because ACM fragments are being pushed up and down the sand areas with tidal movements.

The likelihood of non-point source of contamination in both Golf Club Course (including catchments, hill slopes, soil erosion, land clearance) and waste under sand in the three beaches could be medium to high, in Table 3 on the following page.

Table 3 Potential sources of contamination from surrounding land use and preliminary findings

Potential Sources	Likelihood	Preliminary Finding	Recommendation
Point Sources			
Crown Gully 1	High	No access	Investigation required
Crown Gully 2	High	Confirmed up to the overpass bridge from Middle Beach	Further Investigation required
Crown Gully 3	Low	No access	Investigation required
Non-point Sources			
Underwater Sand	High	NA	Investigation required
Golf Club Course Catchments and Stockpiles, Exposed Soils	Medium to High	Partially confirmed via visual observation at southern hill and the catchment areas between Crown Gully 1 and Crown Gully 2	Investigation required
Northern Beach - Waste transported via natural phenomenon	Medium to High	NA	Investigation required
Middle Beach - Waste transported via natural phenomenon	Medium	NA	Investigation required
Southern Beach - Waste transported via natural phenomenon	Medium	NA	Investigation required

3.5.2 Trinitas Site Inspections, Emu-picking, Clearance and Air Monitoring Reports

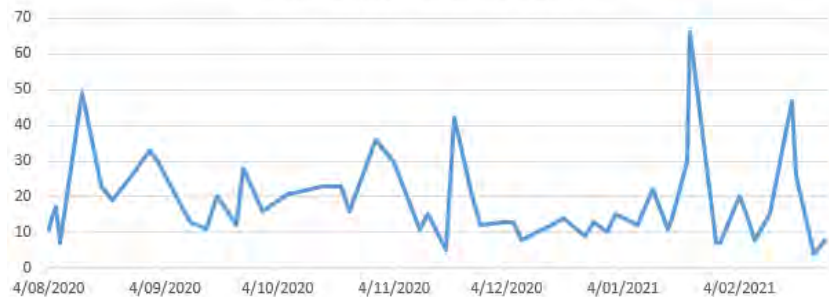
During bi-weekly site inspections and Emu-picking since 2 August 2020, Trinitas consultants have collected over **2000** ACM fragments from the three beach areas.

Background Air Monitoring was conducted during all emu picking and visual clearance inspections undertaken by Trinitas. No background air monitoring results identified airborne levels of fibres equal to or exceeding 0.01 f/ml.

Based on laboratory analytical results and visual inspections from August 2020 to June 2021, Trinitas summarised major findings as follows:

- ACM fragments were observed throughout the three beaches from the low tide line, shore boulders, and then up to the Coast Golf Course.
- Visual inspections and Emu-picking from 3 August 2020 to 2 June 2021 indicated that there was no obvious decreasing trend of visible ACM fragments throughout the three beaches. See chart below representing the number of fragments collected from the Site over a period of 7 months from August 2020 to March 2021;

ACM Fragments Trend Line - Little Bay Beach
Aug 2020 - March 2021



- Several bonded ACM fragments were observed at Southern Beach (Table 11)
- ACM fragments were observed in Crown Gully 2 (Table 17)
- Significant amount of ACM fragments (>1 Kg) was collected adjacent to the outlet of stormwater pipe at Crown Gully 3 and then all the way to the rocky area in the bay.
- ACM fragments were observed up to the Golf Course between Crown Gully 1 and Crown Gully 2, wherever soil is stockpiled, has been disturbed and/or eroded (land bush clearance, golf car drive path, stormwater runoff channels, fill slopes), asbestos fragments were scattered significantly below and above the plastic mesh material (Table 20)
- There are high uncertainties of ACM fragments on sand and/or under rocks within underwater area of the bay (out of the scope of work of this report), Table 14, Table 16, Table 19
- There are high uncertainties of ACM fragments on Coast Golf Course areas (out of the scope of work of this report (Table 20)

3.5.3 JBSG Interim Human Health Risk Assessment Report

Updated Human health risk assessment for asbestos, Little Bay Beach by JBSG (“**JBSG Report**”, Report Reference No.: 59811-138906 Revision B) on 11 July 2021 conservatively concluded that:

- “Levels of asbestos on the site have not been found to pose a potentially unacceptable health risk to current / future users of the site as consistent with a recreational land-use, recreational uses in proximity of the site, nor occupants of residential properties in proximity of the site”
- “The fate and transport assessment has estimated the potential worst case airborne concentration of asbestos fibres on the site. This has been found to be well below a level of 0.01 f/ml as identified in Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997, 2015, NSW EPA as a potential trigger to warrant reporting under the Contaminated Lands Management Act 1997”
- “Further recent respirable fibre monitoring undertaken by Trinitas during site assessment / remediation works has not identified airborne levels of fibres equal to or exceeding 0.01 f/ml. It is concluded on this basis that there is not a requirement to report asbestos impact to the NSW EPA”

3.5.4 Previous Site Auditor Statement and Preliminary Site Investigation Reports

A number of previous Site Investigation and Assessment reports were conducted on surrounding areas in/before 2005 and/or “undevelopable area”, “foreshore” area, or beach areas at Little Bay Beach. Woodward Clyde carried out a limited Preliminary Site investigation but most of this was confined to Lot 98 (surrounding areas of the Site).

Preliminary Site Investigations (PSI) reports undertaken by Douglas Partners were specifically concentrated on foreshore, immediate surroundings or rock areas adjacent to three beaches of the **Site** in this report, however these PSI reports were not made available by Douglas Partners for review during the DSI process.

Report titled: *Remediation strategy report & future site management principles, Prince Henry Redevelopment Site – Undevelopable Area* by Environmental Monitoring Services in December, 2005 (“**EMS Report**”, Reference No.: EMS 05 4328) summarised the key findings of previous reports adjacent to or/and related with, or on the Site in their DSI report.

“Douglas Partners have carried out a due diligence contamination assessment and two separate contamination assessments in the undevelopable area since March 2000. Details of these reports are as follows:

1. *Preliminary Site Contamination Assessment* prepared by Woodward Clyde, dated October 1999;
2. *Douglas Partners Draft Report on Contamination Assessment*, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site;
3. *Douglas Partners Report on Contamination Assessment*, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 – 2002; and
4. *Douglas Partners Draft Report on Supplementary Contamination Assessment*, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004.”

Key findings relevant to the Site in this report were summarised:

- “Domain 4 – The former Male Lazaret has heterogeneous fill to depths of 0.5 metres below ground level. Some profiles along the creek were however deeper than 1 metre. Fill material consisted of either gravelly sand with some ash and demolition rubble, or grey black silty sand with decaying organic material inclusions and trace glass fragments, ceramics, cutlery and plastic.” However, whether the Northern Beach Area in this DSI report was investigated or not is not clear.
- “Domain 7 – The Little Bay beach has medium to coarse grained sands with some building rubble inclusions. Two creeks intermittently flow over the beach into Little Bay. Sandstone outcropping is present on some locations of the beach.”
- “Fragments of asbestos cement are present on the surface of some of the areas of the undevelopable areas of the Site. These fragments appear to be widespread and were observed in all Domains including the southern foreshore of Little Bay beach.”
- “The top 500 mm of soil in the undevelopable area of the site has been shown to have low levels of asbestos contamination. A review of the asbestos data from the various investigations that have been carried out on the site shows that only one of the 58 targeted surface samples (<500 mm bgl) contained asbestos.

In an email (H04/6326(3) File NO: 04/2717) from Michael Staff, Director, Environmental Health Branch, to Mr Garry Bauer, Development Director, LANDCOM stated that “Should the remediation

approach and associated protocols outlined in your present documentation be followed as the Undevelopment Area site, the existing land use is not likely to pose any unacceptable risk to people's health from asbestos exposure". Those measures included, but not limited to, :

" ...

- There is a protocol for removal of any visible fragments of asbestos materials from surficial soils;
- There is a protocol for diverting drainage channels, fixing and managing erosion exposing underlying introduced fill materials (which may contain asbestos);
- The construction of two containment cells with the construction and maintenance of an effective barrier;
- There is an Unexpected finds protocol to be followed should asbestos materials be accidentally uncovered in the future;
- There is a long term Site Management Plan outlined that will govern the future use of the Undevelopable Area and prevent or control activities with the potential to disturb asbestos materials and place either visitors or maintenance personnel at risk. Ongoing inspection and maintenance of the barrier over fill material is stipulated. ..."

However, as shown in Appendix F, nil of the 34 boreholes conducted by Douglas Partners and/or EMS on Three Beach Sand Areas, the Site in this report, was confirmed with asbestos contamination, with reference to the previous investigation sampling map on Page 76, "ANNEX A Figures and Photographs, Figure 8 Borehole Location Plan (Survey Drawing Plan Supplied by: Connell Wagner (Ref: 051122 REV 18 int. DGN))" from Paul Steinwede, ERM, NSW Site Auditor Scheme Site Audit Statement, Reference No.: PS53-Lot 33_SAR1 on 20 July 2006.

All the emails, documents and reports from Douglas Partners Pty Ltd (DP) and Environmental Monitoring Services Pty Ltd (EMS) were not made available for reference at the time of this report. Emails between EMS, Randwick City Council and ERM were difficult to understand as photos and maps were not clearly described, how and what they had completed to implement these measures, who had implemented and will implement these measures.

While it is hard to review the PSIs conceptual site models, historical site records and implementation of these aforementioned strategies for management asbestos risk on the Site, ACM fragments have been exposed on the beach since 2005.

3.6 Gaps in the Site History – Little Bay Beach and Surrounding Land Use

There is very limited historical contamination information about the subject site (Lot 97), however, the following gaps have been identified within reports / investigations relating to Lot 98:

- The Site walkover indicated that there were potential fill materials in immediate surroundings including exposed soils at the golf course, stockpiles adjacent to Crown Gully 1, dumped waste along the Heritage Wall, dumped waste inside of Crown Gully 2. However the details of fill materials (if present), such as origin or extent, were not known (some stockpiles could be traceable to the ongoing landscaping activities from the golf course);
- The Site walkover indicated the presence of visible ACM fragments throughout the Site. The origin of these fragments was not known;
- The Site walkover also identified several ACM fragments under boulders in all of the three rock areas. It was not known if there was further potential asbestos contamination across the underwater sands and rock areas;
- Both Crown Gully 1 and Crown Gully 3 were not accessible and were out of the scope of this work. However, ACM fragments were confirmed in the lower section of Crown Gully 2.

- Both soil erosion and bush clearance were observed at the upstream of Crown Gully 3 and Crown Gully 1. The sources of accumulative ACM fragments adjacent to the outlets were not known.
- Stormwater runoff and soil erosion cut through the beds of Crown Gully 1 and Crown Gully 2, by over 1 m deep at some visible sections. The conditions and extents of contamination in these gullies were not clear.
- The review of limited aerial photo Imagery indicated that the residential dwelling around the Site has been continuously developed for decades. It was not clear whether the residential development and bush clearance (i.e., north-western cleared paddocks at the upstream of Crown Gully 2, Middle Beach; upgradient of Crown Gully 1) resulted from the failure of former environmental management plans as listed in the previous Site Auditor Statement Letter.
- It was not clear that to what extent, the potential contamination sources (from the Open Water, Crown Gully 1, Crown Gully 2 and Crown Gully 3, up to the Golf Course) led to asbestos fragments disturbance in soils capped by layers of plastic mesh and imported clay soils.
- It was not clear to what extent, the ACM fragments being washed back and forth from the Bay, originated from dumped materials during redevelopment works.

3.7 Integrity Assessment

Where available this limited site history assessment utilised formal sources of information issued by NSW EPA, and NSW Land & Property Information. These formal sources were supplemented by information provided by the client, landowner, and observations made by Trinitas professionals during site inspections.

4. Literature Review of Similar Asbestos Impacted Beaches in Australia

The dumping of material in the world's oceans has a long history. Historically, obsolete ammunition, organic refuse, chemicals and other waste have also been dumped off Australia (Sea Dumping in Australia: Historical and Contemporary Aspects, Geoff Plunkett, 2003). For example, Nightcliff Beach in NT and Esperance Beach in WA were impacted by asbestos. In NSW, it is not unusual that some coastal areas were historical dumped tips (i.e., Stockton beach in Newcastle; Terrigal Beach in Central Coast; Little Bay Beach, Yarra Bay Beach, Maroubra Beach in Sydney).

From April 2018 to July 2020 on Terrigal and Wamberal Beach, fragments of asbestos washing up and down on local shores continued to be a problem for Central Coast Council, which has urged members of the public to exercise caution if they notice any pieces of the mineral fibre. Even though the local council took approaches such as emu-picking on sand and bulldozer stockpiling of top sand, the asbestos impacted beach continues to be the hotspot in headlines due to the lack of a thorough understanding of the sources of asbestos impacted areas (<https://www.smh.com.au/national/nsw/the-beach-is-riddled-with-asbestos-erosion-unearths-toxic-legacy-at-wamberal-20200723-p55evt.html#:~:text=Asbestos%20has%20been%20discovered%20strewn,disgraced%20Labor%20p%20overbroker%20Eddie%20Obeid.>)

The Newcastle Herald revealed in January 2018 that an old council tip on land owned by Hunter Water and NSW Crown Lands [had been exposed by ongoing erosion and rubbish was washing into the sea](https://www.newcastleherald.com.au/story/5503885/deadly-find-on-popular-stockton-beach-angers-residents/). Angry residents questioned source of deadly asbestos littered along Stockton beach. In June 2018, Hunter Water began removing 8000 tonnes of waste from the tip site, near Corroba Oval, which took around three weeks and cost about \$1.9 million. Hunter Water secured the site by a geo-fabric cover, that was regularly inspected and maintained and stated that "There has been no further exposure of the landfill on our site since the initial incident" (<https://www.newcastleherald.com.au/story/5503885/deadly-find-on-popular-stockton-beach-angers-residents/>)

The City of Darwin Council in NT has been challenged by a long term cleaning up for the asbestos impacted Nightcliff Beach due to the unknown source or diffused asbestos contamination which was used for decades as a legacy dumping tip. "Eventually we have to get rid of it but it's going to be a long-term project and there's going to be a huge cost associated with it," Mr David Bridgman said. "Once you start mentioning asbestos people do start thinking about liability and responsibility, particularly if you're a government agency or a council." (<https://www.abc.net.au/news/2018-06-12/why-does-asbestos-pepper-darwin-beaches-what-being-done-about-it/9837262>)

As each beach has a specific set of site conditions, history and community perception, there is not a one-size-fits-all approach to managing asbestos related risks.

5. Data Quality Objectives

5.1 Data Quality Objectives

In order to determine the requirements for preliminary characterisation of the Site, Trinitas adopted the data quality objectives (DQOs) planning process as recommended in the National Environment Protection (Assessment of Site Contamination) Measure 2013 (ASC NEPM, 2013), Contaminated Land Guidelines Consultants Reporting on Contaminated Land (NSW EPA, 2020).

A review of all available soil and water data relevant to the Site was undertaken in order to develop a preliminary conceptual site model (CSM). A conceptual site model can take various forms, including text, tables, graphics, and flow diagrams, they can also take the form of site-specific plans and figures including cross-sections. Developing and refining a conceptual site model is an iterative process. The conceptual site model was refined throughout the site assessment process based on any available environmental or site historical or field information.

Details of the DQOs process was presented below.

5.1.1 State the Problem

The Site had historically been utilised for open space, recreational purpose. Previous contaminating activities or historical activities at the Site or adjacent areas could not be reviewed confidently.

Asbestos containing materials (ACM) from structures, landfill, and contaminated land may have been dumped, buried or used as fill in the immediate surrounding areas including Lot 98. Visual observations of ACM within gullies suggests that soil erosion of gullies are potential sources of contamination.

Although several measures were proposed and/or were implemented as indicated by previous investigation reports, management reports and site audit reports, suspected asbestos fragments were observed throughout the site. The sources and contents of potential contamination could not be confidently identified, therefore, the problem as it stood was that the site needs to be further investigated to characterise the potential for contamination at the site and assess the suitability of the site for the Recreational C setting (Public open space).

5.1.2 Identify the Decision

To assess whether the historical land use of the Site has led to potential contamination of soils, at concentrations that would preclude current and future Recreational C land use, the following decisions need to be addressed:

- Is soil contamination present on-site at concentrations exceeding adopted health screening levels for Recreational C land use setting?
- Are the sources of potential contamination from on-site and /or off-site migration?
- Is there sufficient soil information to allow a detailed remediation plan to be developed?
- Will the DSI provide a data set that is suitable to assess the risk posed by contamination (if present) to human health, ecological receptors (open water) and potential future liability of material that will remain at the Site?
- Do the findings provide a high degree of certainty of the source of identified contamination?

- Does the data set provide sufficient information to assess the potential for any off-site migration of contaminant?
- Will the DSI recommend further site investigation based on limited sampling?
- Does the DSI provide adequate preliminary characterisation to enable an assessment of remedial options, remedial cost estimates and or management of the contamination (if present)?

5.1.2.1 Identify Inputs into the Decision

The inputs required to make the decision include the following:

- Geological data;
- Visual observations of staining, odours and of building waste containing ACM;
- Comparing the concentrations of asbestos in/on soil to HSL-Recreational C to evaluate the potential for contamination adversely impacting on human health and ecological receptors; and
- The vertical and lateral distribution of contaminants in the subsurface.

5.1.2.2 Define the Boundaries of the Study

The Site is defined as Lot 97, DP270427.

The vertical investigation boundary was defined as up to 2.5 m below ground level, which was the maximum depth of the intrusive investigation without shoring for sand using 5 T excavation.

The temporal boundaries were determined on the basis of the timeline of one week for the current investigation. Importantly this report intentionally selected the time window with low tide of ~0.3 m, light wind and calm swell to cover all exposed soil/rock/sand areas as much as possible, because at ~2 m high tide, 80% of the investigation areas could be under water or impacted by tides, resulting in low possibility to delineate the contamination.

5.1.3 Develop a Decision Rule

The statistical parameters of interest and assessment criteria were presented in Section 6. These criteria were used as screening levels for Recreational C setting to determine whether additional assessment, remediation, and/or management could be required.

If the data were collected in an appropriate manner to establish completeness, comparability, representativeness, precision and accuracy, it was considered suitable for the purposes of this assessment;

If soil contamination were identified on-site at concentrations exceeding the HSL-Recreational C, then further assessment, remediation and/or management of the contamination may be required.

5.1.3.1 Optimise the design for obtaining data

This was achieved through the development of an appropriate sampling and analytical strategy which was reviewed and refined as necessary during the assessment evaluating field observations and analytical results. This included collection and analysis of soil and groundwater samples, and visual, observation for surface asbestos containing materials.

5.1.3.2 Aesthetic

The decision rule adopted for validation of aesthetic impact including removal of anthropogenic materials is as follows:

- Visual inspection including photographic record of the base and walls of the excavation in the identified burial pit areas must not identify areas containing anthropogenic materials to the extent practicable.
- Visual inspection including photographic record of the material to be backfilled must not identify areas containing anthropogenic materials to the extent practicable.

5.1.3.3 Specify Acceptable Limits of Decision Errors

Two primary decision error-types may occur due to uncertainties or limitations in the project data set:

- A sample/area may be deemed to pass the nominated criteria, when in fact it does not. This may occur if contamination is 'missed' due to limitations in the sampling plan, or if the project analytical data set is unreliable.
- A sample/area may be deemed to fail the nominated criteria, when in fact it does not. This may occur if the project analytical data set is unreliable, due to inappropriate sampling, sample handling, or analytical procedures.

The acceptable limit of error for sampling techniques and laboratory analysis was defined by the DQIs as follows:

5.1.3.4 Data Representativeness

It expresses the degree which sample data accurately and precisely represents a characteristic of a population or an environmental condition.

Representativeness was achieved by collecting samples in an appropriate pattern across the site, and by using an adequate number of sample locations to characterise the site. Consistent and repeatable sampling techniques and methods were utilised throughout the sampling.

5.1.3.5 Completeness

It is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study. If there is insufficient valid data, then additional data are required to be collected.

5.1.3.6 Comparability

A qualitative comparison of the confidence with which one data set can be compared to another. This is achieved through consistent sampling, analytical testing and reporting techniques. Until an alternative method to identify asbestos in bulk materials (including soil) is developed and validated, the use of the Australian Standard Method for the Qualitative Identification of asbestos in bulk samples (AS4964-2004).

5.1.3.7 Accuracy

Accuracy - measures the bias in a measurement system. Accuracy can be undermined by such factors as field contamination of samples, poor preservation of samples, poor sample preparation techniques and poor selection of analytical techniques by the analysing laboratory. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes, laboratory blanks and analyses against reference standards.

5.1.4 Optimise the Design for Obtaining Data

This was achieved through the development of an appropriate sampling and analytical strategy which was reviewed and refined as necessary during the assessment evaluating field observations and analytical results. This included collection and analysis of soil samples, and visual, observation for surface asbestos containing materials.

5.2 Data Quality Indicators

The DQOs, requirements and indicators for the assessment are presented in Table 4.

Table 4 Data Quality Objectives, Requirements and Indicators

Data Quality Objective	Requirement	Data Quality Indicator	Conclusion
Precision			
Standard operating procedures appropriate and complied with	The sampling methods comply with industry standards and guidelines	Meet Requirement	Acceptable
Accuracy			
Laboratory Control Samples	At least 1 per batch per analyte tested for	Result < Limit of reporting	Acceptable
Representativeness			
Sampling methodology - preservation	Appropriate for the sample type and analytes	Meet Requirement	Acceptable
Samples extracted and analysed within holding times	Specific to each analyte Meet Requirement	Meet Requirement	Acceptable
Comparability			
Sampling approach	Consistent for each sample	Meet Requirement	Acceptable
Analysis methodology Consistent methodology for each sample	Consistent methodology for each sample	Meet Requirement	Acceptable

6. Site Assessment Criteria

The Site assessment criteria adopted for this project are predominantly based on the following references:

- NEPC (2013) National Environment Protection (Assessment of Site Contamination Measure) Measure 1999 (2013 amendment); and
- WA DoH (2009) Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia.

The sections below discuss the adopted Site assessment criteria.

6.1 Asbestos in Soil Assessment Criteria

Trinitas has adopted the most recent Amended NEPM (2013) Tier 1 Guidelines over the criteria listed in NSW DEC (2006) as it is the most recent guidance available that has been approved by the NSW EPA under Section 105 of the Contaminated Land Management Act, 1997.

The WA DoH (2009) Guidelines and ASC NEPM 2013 provide the following definitions / groups for asbestos:

- ACM is defined as material, which is in sound condition, the asbestos is bound in a matrix, and cannot pass through a 7 mm x 7 mm sieve;
- Fibrous Asbestos (“**FA**”) encompasses friable asbestos material, such as severely weathered ACM, and asbestos in the form of loose fibrous materials such as insulation products. Friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure; and
- Asbestos Fines (“**AF**”) includes free fibres of asbestos, small fibre bundles and ACM fragments that can pass through a 7 mm x 7 mm sieve.

From a risk to human health perspective, FA and AF are considered to be equivalent to “friable” asbestos in Safe Work Australia (2011), which is defined therein as ‘material that is in a powder form or that can be crumbled, pulverised or reduced to a powder by hand pressure when dry, and contains asbestos’. Bonded asbestos ACM in sound condition represents a low human health risk. However, both FA and AF materials have a significantly higher potential to generate, or be associated with, free asbestos fibres and may represent a significant human health risk if disturbed and fibres are made airborne.

Non-friable asbestos may become friable as a result of work processes over time (for example, degradation due to chemical exposure) or due to other factors (for example, damage by fire).

The WA DoH (2009) Guidelines and ASC NEPM 2013 also provide Health Screening Levels (“HSLs”) for the assessment of asbestos concentrations in soil, for each of the three definitions / groups listed above. The HILs have been developed for various land use scenarios including low-density residential, high-density residential (with minimal access to soils), recreational and commercial / industrial.

Table 5 Health Screening Levels for Asbestos Contamination in Soil (NEPM 2013)

Form of asbestos	Health Screening Level (w/w)			
	Residential A ¹	Residential B ²	Recreational C ³	Commercial/Industrial D ⁴
Bonded ACM	0.01%	0.04%	0.02%	0.05%
FA and AF (friable asbestos)	0.001%			
All forms of asbestos	No visible asbestos for surface soil			

1. Recreational C with garden/accessible soil also includes children's day care centres, preschools and primary schools.
2. Residential B with minimal opportunities for soil access; includes dwellings with fully and permanently paved yard space such as high-rise buildings and apartments.
3. Recreational C includes public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and unpaved footpaths.
4. Commercial/industrial D includes premises such as shops, offices, factories and industrial sites.

The NEPM (2013) Schedule B (2) - Guideline on Site Characterisation provide the following management options in accordance with the WA Guidelines:

Asbestos buried deeper than 3 m is not usually regarded as contamination provided it is not likely to be disturbed.

The Guidelines provide that the percentage of soil asbestos is calculated using the following formula:

$$\% \text{ w/w asbestos in soil} = \frac{\% \text{ asbestos content} \times (\text{ACM}) \text{ kg}}{\text{Soil volume (L)} \times \text{soil density (kg/L)}}$$

In the example included in enHealth (2005) it was assumed that:

% asbestos content (within bonded ACM) = 15% and soil density (for sandy soil) = 1.65 kg/L.

The Site assessment criteria applicable for asbestos in soil adopted for this project are:

- ACM = 0.02% (weight of asbestos per weight of soil) since the Site is proposed for Recreational C purpose.
- FA and AF = 0.001% (weight of asbestos per weight of soil); and
- No visible asbestos on soil surface.

The adopted asbestos in soil assessment criteria were provided in Table 5

7. Methodology, Sampling and Analysis Plan

Trinitas Consultants employed the following methodologies for the assessment in relation to identification of suspected asbestos contamination from any potentially disturbed ACM on the site and immediate surrounding areas of environmental concern.

7.1 Visual Inspection & Assessment

Trinitas Consultants conducted the inspections, allowing inspection to be completed on a grid system walking across the surface at 90 degrees to each walk path within the grid. For each grid (5 m x 5 m) for areas of concern in the site, a walkover visual inspection was undertaken to identify suspected ACM in/on the surface to identify damaged and unstable ACM, fragments and debris as applicable.

The inspection process was listed below:

- Trinitas personnel walked across the surface. The inspection was carried out by means of a visual observation, during a slow traverse across the materials, with the consultant inspecting on a grid pattern at 90 degrees to each walk path. The surfaces were inspected to detect evidence of suspected asbestos containing materials (ACM). Colour, size and shape are used as indicators.

If suspected ACM was observed and/or identified during the inspection, it was marked as a suspected ACM sample. All ACM fragments sighted during investigation could be picked up and/or tested.

The remainder of the surface was inspected for any additional suspected ACM.

7.2 Identification of Materials to Contain Asbestos

Materials suspected to contain asbestos were collected and selected based on the likely pattern, morphology and appearance of the materials as well as our professional experience in the visual identification of such materials. The collected representative samples were sent to a NATA accredited laboratory for analysis in accordance with Australian Standard AS4964-2004 Method for the qualitative identification of asbestos in bulk samples.

7.3 Soil Sampling, Air Monitoring and Laboratory Analysis

7.3.1 Sampling Plan and Methodology

Sampling of the site was undertaken by Trinitas Consultants (Dr Jeffrey Yu, Asfar Riaz and Kieran Mackowski) from 26th to 30th of April 2021, as shown in Table 6 and Appendix B ~ Appendix D

Table 6 Sampling Plan and Site Investigation Summary for Areas of Environmental Concern

Zone	Area of Concern		Area /m ²	Minimum Sampling No.	Trinitas TP No.	Trinitas Positive TP No.	Contamination Depth /m BGL	Estimated Contamination Volume /m ³ (~ ±25%)
Northern Beach	Sand Area (from lowest tidal line 0.3 m)	Hotspot	~1600	-	20	TP07, 08, 10, 16, 19	0.0 - 1	1000
		Dumped Waste/Stockpile	~1000	-		-	0.0 - 2	1000
		Clean Sand Area	~1000			-	0.0 - 1	-
	Unknown_Underwater		~1000	-		-	>-0.5	-
Crown Gully 1 (Lot 98)			~1000	-		-	-	-
Golf Course Exposed Soil/Stockpile (Lot 98)			~1500	-		-	0.0 - >0.1	throughout
Middle Beach (Western Beach)	Hotspot (at lowest tide of 0.3 m)		1500	-	9	7 out of 9 TPs	0.0 - 0.5	750
	Unknown_Underwater including Rock Area		-	-	-	-	-	NA (ACM Observed)
Crown Gully 2 (Lot 98)			2500	-	-	-	>1	NA (ACM Observed)
Southern Breach	Sand Area (up to lowest tidal line, 0.3 m)	Hotspot	1200	-	9	TP36, 39, 41	0.1 - 1.7	800
		Clean Sand	4100	-	-	-	0.0 - 2.5	-
	Unknown_Underwater including Rock Area		2000	-		-	-	NA (ACM Observed)
Crown Gully 3 (Lot 98)				-	-	-	-	-
TOTAL			~11000	21 - 25	45	15	0 – 2.5	

Note 1. ACM fragments were sighted, detected or confirmed in 15 out of 45 test pits. Hotspot areas have visually broad ACM contamination.

Note 2. Both wet sands and fill with bricks and boulders resulted in inspection challenges.

Note 3. Building rubble, especially glass, tiles and ash were observed throughout the Site.

Note 4. The areas were estimated at low tide ~0.5 m. At high tide ~2 m, ~80% of sand areas were impacted by water or under water.

Note 5. The differentiation of ownership among land owners for land, soil and water was out of the scope of work.

The NSW EPA (1995) Sampling Design Guidelines and the WA Department of Health (2009) Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (adopted by ASC NEPM 2013) recommends that the minimum sampling points required for site characterisation based on detection of circular hot spots using systematic GRID sampling pattern should be around 22 (21 - 25) for area with ~11000 m².

Trinitas undertook a combination of systematic grid-based sampling method and stratified sampling for localised silty sand/fill, identified in each location around hotspots and from the site history and site observation. Additional targeted sampling was undertaken within hotspot areas.

According to the provided design drawings, a discrete sample was taken from each sampling location and analysed individually.

Therefore, to provide a contamination assessment of asbestos at the Site, Trinitas carried out double-density sampling from at least forty-four (44) locations across the potential areas of environmental concern with various depth up to 2.5 m at 25 cm increment. Note: If any suspect materials (identified by unusual staining, odour, discolouration or inclusions such as building rubble, asbestos sheets/pieces/pipes, ash material, etc.) or any potentially contaminated area(s) and filled area(s) in or between the sampling locations, were encountered during site investigation, further sampling was undertaken. Consultation through on-site meeting, email and or telephone with written records should be taken with key stakeholders as soon as practical after testing results indicated unexpected finds or excessive scale of heavy contamination.

The sampling was undertaken by a senior Trinitas environmental scientist, trained in sampling contaminated land. Trinitas allowed for:

- Collection of soil samples in an approximate grid pattern across the Site. The samples were collected using excavator, shovels, hand trowels, or other hand tools as appropriate.
- Sampling for asbestos was undertaken in accordance with the procedure outlined in the WA Department of Health (2009) Guidelines. Each sample included:
 - o A 10 L soil sample collected from each sample location, which were weighed;
 - o The 10 L sample was sieved through a 7 mm sieve;
 - o ACM fragments captured on the sieve were placed into a zip-lock plastic bag and weighed in relation to the 10 L sample; and
 - o A separate 500 mL soil sample were collected and placed into a zip-lock plastic bag for NEPM asbestos analysis.
 - o ACM fragment(s) observed on the surface of a test pit was also collected and placed into a zip-lock plastic bag for asbestos analysis.
- A clean pair of disposable nitrile gloves were worn when collecting each sample.
- The sample locations were recorded with a hand-held GPS or measured relative to Site features; or measured on the landscape footing marking piers.

Each sample was dispatched to a NATA-accredited laboratory and analysed for asbestos identification and quantitation in soil in accordance with the ASC NEPM (2013) guideline and WA Department of Health (2009) Guidelines.

7.3.2 Quality Assurance and Quality Control

Sampling was carried out in accordance with Trinitas Standard Operating Procedures (“SOPs”), which were based on current industry standards.

7.3.3 Laboratory Analysis

The soil samples collected were dispatched to the National Association of Testing Authorities (“NATA”) accredited laboratory. The samples were analysed for Asbestos (NEPM)

7.3.4 Air Monitoring

Daily Background Air Monitoring was undertaken at the Site throughout the duration of the DSI site work. Calibrated air monitoring pumps were installed at the boundary fences of the exclusion zone for the designated asbestos works area.

Filter samples were submitted to a NATA accredited laboratory for fibre count analysis. Results of air monitoring were compared against the trigger levels outlined in Table 7 below. All Air Monitoring Results were below 0.01 fibres/mL. Air Monitoring reports including laboratory certificates from a NATA accredited laboratory (Eurofins) have been presented in Appendix K - Air Monitoring, Clearance and Laboratory Analysis Results

Table 7 Air Monitoring Trigger Levels

Trigger Level	Fibre Concentration	Asbestos Management Action
(I)	< 0.01 fibres/mL	Continue works and maintain effective site controls.
(II)	≥0.01 but < 0.02 fibres/mL	Review site control measures and introduce more stringent controls. Notify Asbestos Assessor to advise on improved site controls.
(III)	≥0.02 fibres/mL	Stop work. Notify SafeWork NSW. Identify the cause of the elevated concentrations and update site protocols for approval by Asbestos Assessor prior to recommencing works.

8. Preliminary Conceptual Site Model and Risk Assessment

Based on the limited site history review, Site walkover undertaken as part of Trinitas Group's visual inspections, a preliminary CSM for asbestos in/on soil at the Site was prepared (all other Areas of concern are not addressed in this report as instructed by the Client). The preliminary CSM is discussed in the sections below.

8.1 Potential Areas and Contaminants of Environmental Concern

Based on preliminary findings, visual inspections and laboratory results, risk of asbestos contamination could not be underestimated, even though daily air monitoring data confirmed fibres in the air during the sampling periods did not exceed the adopted criteria. Table 5 summarises the preliminary assessment of potential areas of environmental concern.

Table 8 Potential Areas of Environmental Concern (AECs) and Contaminants of Potential Concern (COPCs)*

AEC	Potential Contaminating Activity	COPCs#	Risk of Contamination*
Norther Beach, Western Beach and Southern Beach	Contaminant on beach sand surfaces	Asbestos	Low to Medium
	Potential fill of unknown origin	Asbestos	Low to Medium
	Potential hazardous building materials on subsurface	Asbestos	Low to Medium

Notes:

*The risk of contamination provided was based on the qualitative risk of the contamination identified and does not represent the financial risk of the contamination.

*All gullies, catchments, underwater sand, golf course land were out of scope of work in this report.

*No AF/FA was identified within any samples collected from the Site.

8.2 Potential Sources, Pathways and Receptors of Contamination

NEPM Schedule A provides an overview of the site assessment process and the application of investigation and screening levels for human health and ecological risk assessment. While protection of human health often drives the first stages of assessment, protection of the environment (terrestrial and aquatic) should be a consideration for all site assessments. In assessing the overall risk to the environment from soil contamination the following site-specific aspects should be considered:

- the location of the contamination in relation to any on-site and off-site sensitive receptors, e.g. watercourses, estuaries, groundwater resources, sensitive ecological areas.
- the existing or proposed land use(s)
- the presentation of contaminants including areal extent, depth below finished ground level, the presence of barriers or containment that prevents or minimises the migration of contamination or exposure pathways

- the potential for contaminants to be transported from the site at levels of concern by erosive natural forces.

The potential sources, pathways and receptors of contamination are provided below in Table 9.

Table 9 Potential Sources, Pathways and Receptors of Contamination

Source	Pathway	Receptor	Comment
Migration and deposition due to natural phenomenon of waste materials including Asbestos under three beaches	Ingestion and dermal contact	Current and future Site users (residents, visitors, children, workers)	There is high potential for Site users to come into contact with subsurface contamination, therefore a complete pathway does potentially exist. But for asbestos contamination, this pathway usually not considered to pose risks.
	Inhalation of dust	Current and future Site users and surrounding Site users	There is potential for Site users and surrounding land users to be exposed to dust and vapours from the subsurface soil, therefore a complete pathway is considered likely
	Surface water runoff	Current and future Site users (residents, visitors, children, workers)	There is medium potential for stormwater runoff from the Site to be impacted from surface/subsurface soil contamination, which can then impact off-site surface water receptors through stormwater system flow or into the sea, therefore a complete pathway potentially exists.
Potentially hazardous building materials in water	Inhalation of mist after ACM fragments were flushed into water	Current and future Site users (residents, visitors, children, workers)	There is potential for Site users and to be exposed to mist from the Site, therefore a complete pathway potentially exists.
All adjacent Coast Golf Course land	Out of work scope	Out of work scope	A complete pathway potentially exists (out of work scope).
All open water areas	Out of work scope	Out of work scope	A complete pathway potentially exists (out of work scope).

Trinitas recommends an updated risk assessment for this Site.

9. Findings and Conclusions

Based on the best available data sources, previous reports and site investigations, Trinitas concluded that:

9.1 Air monitoring and Visual Surface Clearance Inspections

Daily Background Air Monitoring was undertaken at the Site throughout the duration of the DSI site work. Calibrated air monitoring pumps were installed at the boundary fences of the exclusion zone for the designated asbestos works area.

Filter samples were submitted to a NATA accredited laboratory for fibre count analysis. All Air Monitoring Results were below 0.01 fibres/mL. Air Monitoring reports including laboratory certificates from a NATA accredited laboratory (Eurofins) have been presented in Appendix K - Air Monitoring, Clearance and Laboratory Analysis Results.

A visual surface clearance inspection was undertaken for all areas of the Site following completion of the site work to ensure that no ACM fragments remained exposed on the soil surfaces after test pit excavation and backfilling. A clearance certificate was provided upon completion of the visual clearance inspection which is attached in Appendix K - Air Monitoring, Clearance and Laboratory Analysis Results.

9.2 Site inspection

Prior to DSI

- Prior to the commencement of the DSI works, approximately 2000 fragments were collected during bi-weekly emu picking and clearance inspections undertaken between August 2020 and April 2021 at Little Bay Beach. There was no conclusive or scientific evidence to demonstrate a decreasing trend in terms of ACM fragment quantity or numbers identified and removed from the site during the bi-weekly site inspections and emu-picking being completed by Trinitas Licensed Asbestos Assessors and Occupational Hygienists. These reports can be accessed via the Randwick City Council Website at <http://www.randwick.nsw.gov.au/planning-and-building/council-works-and-upgrades/major-projects/little-bay-beach-asbestos-management#reports>

During DSI

- ACM fragments were washed up and down the three beaches at Little Bay Beach consistently by tidal movements.
- ACM fragments identified and removed from Little Bay Beach during the one-week investigation period of the DSI had the physical characteristics (pattern, colour, shape and morphology) of asbestos sheeting fragments and corrugated super 6 sheeting fragments.
- Several ACM fragments were collected from areas adjacent to the outlet of Stormwater Pipe at Crown Gully 3 and then all the way to the rocky area in the bay, the whole sand and rock area at the Middle Beach; the areas adjacent to the creek from the Heritage Wall and Crown Gully 1 at the Northern Beach.
- Visual inspections were undertaken within the soil surfaces within Gully 2, and suspected ACM fragments within dumped building waste were observed. Due to lack of safe access, no samples were collected from Gully 2.

- Suspected ACM fragments were sighted and confirmed within all the Rock Areas and some Unknown Underwater Areas adjacent to the three beaches.
- It is the opinion of Trinitas Group that all fragments collected during the DSI were bonded in nature.
- To assess the potential sources of contamination at the Site, visual inspections were undertaken in areas adjacent to the boundary of the Site. Suspected ACM fragments were observed within the following areas;
 - o Stockpiles, Exposed Soils at Golf Course adjacent to the catchment, Crown Gully 1;
 - o Dumped waste adjacent to Heritage Wall at Northern Beach;
 - o Cleared land at the upstream of Crown Gully 3
 - o Sand Area under open water in the bay.

9.3 Asbestos in/on soil findings

This DSI identified contamination as follows:

- 15 out of 45 Test Pits reported asbestos contamination (positive): sighted, confirmed in 10 L of soil, or confirmed in 500 mL of soil.
- 4 out of 45 Test Pits were confirmed with bonded asbestos contamination over HSL threshold 0.02% w/w.
- No friable asbestos (AF/FA) was identified within any of the 45 Test Pits. No asbestos was detected at the reporting limit of 0.001% w/w. No trace asbestos was detected.
- Three Hotspots included:
 - o Southern Beach (25% positive Test Pits) had the Hotspot with the area of 1200 m² (approximately 800 m³), up to 1 m.
 - o Middle Beach (78% positive Test Pits) had the Hotspot with the area of 1000 m² (approximately 750 m³), up to 0.5 m;
 - o Northern Beach (12% positive Test Pits) had the Hotspot with the area of 1600 m² (approximately 1000 m³), up to 1 m.

Due to the nature of site contamination by bonded asbestos fragments in soil and on sand surfaces, it is the opinion of Trinitas that asbestos contamination at the Site poses a potentially low health risk to site users. The final risk ratings are to be determined by the Site Human Health Risk Assessment report.

10. Recommendations

Trinitas recommends a series of approaches, measures, and strategies including further risk assessment, additional site investigation, Remedial Action Plan and Environmental Management Plan to make the site suitable for the current and future public open space land use with the consultation among the client, community, decision makers and stakeholders.

As illustrated in Figure 2, Trinitas recommends the following measures and approaches to meet the guideline criteria based on limited visual inspections, laboratory results and limited site information:

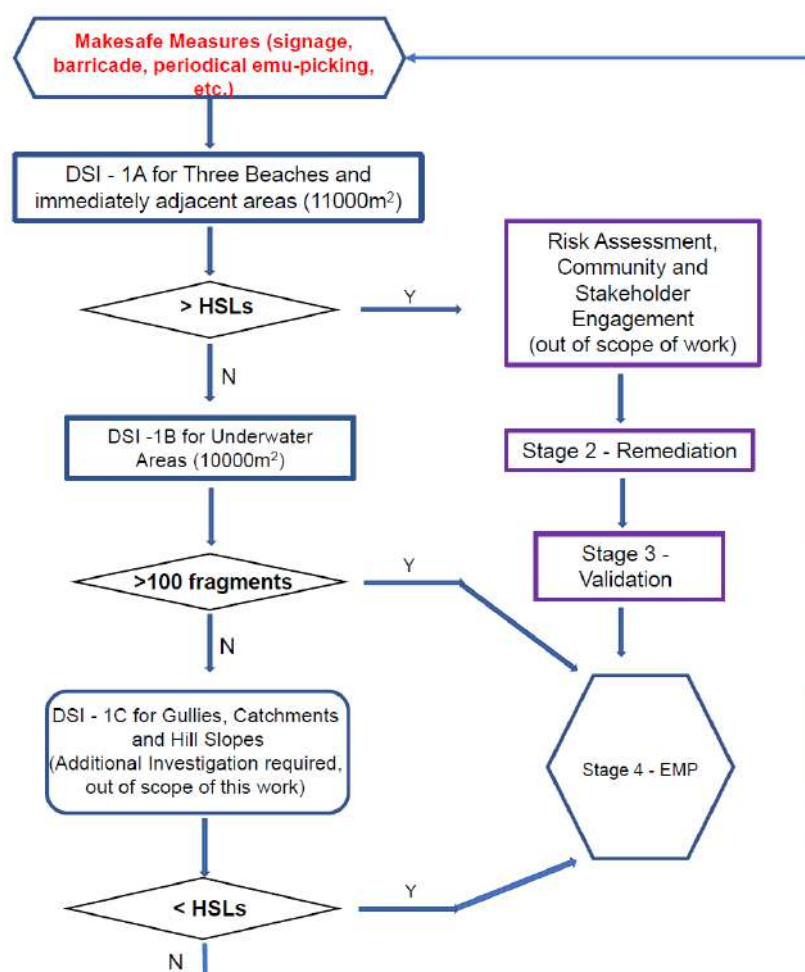


Figure 2 - Preliminary decision tree approach for assessing asbestos contamination at Little Bay Beach

10.1 Makesafe Measures

Makesafe Immediate Measures should be conducted in the short term as soon as reasonably practical, which includes, but not limited to:

- Air Monitoring and Emu-picking should be conducted at least twice per week (more frequently during warm seasons due to the high numbers of people visiting the beach) by a competent Licensed Asbestos Assessor or Competent Occupational Hygienist.
- Following storms and /or heavy rain, emu-picking should be conducted as soon as practical by a competent Licensed Asbestos Assessor or Competent Occupational Hygienist.
- Warning signage should be implemented as soon as possible around all the entries (wood stairs, footpaths from gullies to the beaches, Midden, Southern Rock Area, Northern Rock Area), the Northern Beach, the Western Beach and the Southern Beach, for example,

Warning/Danger:

*NO shell, NO pebble, NO glass, NO tile to be taken away from the beach
All suspected materials are Prohibited to be taken from Little Bay Beach*

- Barricades erected in place as soon as practicable in the following sections or hotspots:
 - 1) around the canal all the way from Old Concrete Pipe outlet adjacent to Crown Gully 3 all the way to the water in Southern Beach;
 - 2) around the canal all the way from Old Heritage Wall adjacent to Crown Gully 1 outlet all the way to the water in Southern Beach;
 - 3) all of the sand area at Middle Beach.
- Note that the erection of barricades should be part of a Safety Risk Assessment completed in consultation with key stakeholders including council Trinitas, Randwick City Council and Subject Matter Experts.
- The Client should prepare an information sheet outlining the potential risks of contact with asbestos material and distribute that information sheet to residents that live close to the Site.

10.1.1 Stage One 1B: Diving Investigation - Visual Inspection and Contamination Assessment of Underwater Sand in the Bay (if required)

If underwater visual inspection observes similar extent of contamination (for example, >100 ACM fragments on 10000 m² of sand surface), Stage Three: Long Term Environmental Management Plan (EMP) (if Required) should be conducted via consultation with the Client and stakeholders rather than Stage Two: Remedial Action Plan (RAP) with the consultation of stakeholders (the client, EPA, Safework, etc.)

10.1.2 Stage One 1C: Detailed Site Investigation and Contamination Assessment for Three Crown Gullies, Catchments and adjacent Golf Course Hill slopes (if required)

This investigation is out of the scope of this DSI, however further investigation into the source and extent of contamination will provide value to the investigation works

10.2 Human Health Risk Assessment

An updated Human Health risk assessment report should be completed upon receipt of final version of this DSI report.

All of these make safe measures and/or other measures recommended by Trinitas are subject to change according to the updated JBSG Risk Assessment Report and/or Site Auditor Statement.

10.3 Stage Two: Remedial Action Plan (RAP) (if required formally)

If Stage One 1B: Diving Investigation - Visual Inspection and Contamination Assessment of Underwater Sand in the Bay observe the similar contamination to the three beaches, Stage Three: Long Term Environmental Management Plan (EMP) should be conducted with the consultation of the Client and stakeholders rather than a RAP.

Depending on Trinitas's Site investigation and assessment report and other previous assessment reports, a Remedial Action Plan for the Site could be conducted.

The objectives of the RAP are to:

- Summarise the characteristics of the Site;
- Define the extent of remediation required;
- Identify potential remediation options and justify the selection of the preferred remediation option in comparison with unexpected failure of previous management plans/measures/strategies taken 15 years ago;
- Outline the methodology required to implement the preferred remediation option;
- Establish validation criteria in order to validate the Site to a level suitable for the proposed Recreational C land use;
- Outline regulatory environments applicable to the remediation works; and
- Outline requirements for the protection of human health and the environment during the remediation works.

The scope of work in the RAP will include the following:

- Background information on the project and Site;
- A summary of previous assessment reports and the detailed investigation works undertaken by Trinitas;
- Based on the findings of the site investigations and assessment reports, a Conceptual Site Model (CSM) for the Site will be prepared. The CSM includes:
 - summarises the Areas of Environmental Concern ("AEC's") and associated Contaminants of Concern ("CoC's") for the Site
 - Identify the potential sources, pathways and receptors of contamination
 - Consideration of different remediation options;
 - Identification and justification of the preferred remediation option (with the consultation with the Client and the regulator);
 - Procedures to be undertaken to carry out the preferred remediation option (including additional sampling if considered beneficial to the remediation phase of the project);
 - Procedures for Site validation, to confirm that remediation has been appropriately completed;
 - Site validation reporting requirements;
 - Environmental and Workplace Health & Safety ("WHS") management requirements;
 - Procedures for the management of unexpected finds (unexpected finds protocol); and
 - Communication and consultation requirements (including regulatory authority notification requirements).

- Identification of areas of the site that require remediation. This will be provided in the form of GPS locations and a clear site plan which highlights in red the remediation areas.
- The RAP will be undertaken in accordance with all Environmental Protection Authority requirements including but not limited to 'Guidelines for Consultants Reporting on Contaminated Sites'. The RAP will also consider NEPM and SafeWork NSW Codes of Practice relating to asbestos.
- Trinitas will provide one electronic (pdf) copy of a final version of the RAP to the Client.

10.4 Stage Three: Validation after Remediation (if required formally)

If required a validation investigation and report after remediation will be prepared. The validation report will clearly identify the areas of the site that are remediated and will be provided in the form of GPS locations and a clear site plan which highlights the remediated areas in red.

Note: Short Term and/or Long-Term Environmental Management Plan could be required.

Makesafe Immediate Measures could also be implanted by the Client according to the updated JBSG Risk Assessment Report and Site Auditor Statement.

10.5 Stage Four: Long Term Environmental Management Plan (EMP) (if required formally)

Long Term Environmental Management Plan for the Site (immediately surrounding areas both up to the top of three catchment areas and down to the underwater area should be managed by the land owner, but are out of the scope of work in this report) should be conducted (if required).

10.6 Recommendation Summary

Table 10 Recommendation Summary

Item	Timeframe	Organisation	Recommendation
1.	On-going	Randwick City Council	Air Monitoring and Emu-picking should be conducted at least twice per week (more frequently during warm seasons) by a competent Licensed Asbestos Assessor. Following storms and /or heavy rain, emu-picking should be conducted as soon as practical to remove surface fragments from the sand areas.
2.	Short Term	Randwick City Council	Issue report to independent auditor and Human Health Risk Assessor for their review
3.	Short Term	Randwick City Council	Obtain and issue HHRA report to independent auditor for their review
4.	Short Term	Randwick City Council	Obtain SAS and SAR for the DSI and HHRA from RA. This is an endorsement from the RA of the DSI and HHRA.
5.	Short Term	Randwick City Council	Issue Detailed Site Investigation report to relevant stakeholders for review and action including: • Landcom • Department of Planning Industry and Environment (DPIE) • Golfcourse tenants • EPA • Crown Land
6.	Short term	Randwick City Council	Warning signage should be implemented as soon as possible around all entries to the beach including (wood stairs, footpaths from gullies to the beaches, Midden, Southern Rock Area, Northern Rock Area), the Northern Beach, the Western Beach and the Southern Beach as reasonably practical

Item	Timeframe	Organisation	Recommendation
7.	Short term	Randwick City Council	Prepare an information sheet outlining the potential risks of contact with asbestos material, which includes the findings from the HHRA and distribute that information sheet to residents that live close to the Site.
8.	Medium Term	Randwick City Council / Landcom / Golf course / DPIE / Crown Land / EPA	Investigate a sediment control barrier to prevent fragments from entering the sand/bay area from the gullies and catchment areas.
9.	Medium Term	DPIE	Diving Investigation - Visual Inspection and Contamination Assessment of Surface and Underwater Sand in the Bay to identify the extent of asbestos contamination in the underwater bay area
10.	Medium Term	Landcom / Golf Course Tenants / DPIE / Crown Land / EPA	The owner of adjacent property should be responsible to undertake what ever due diligence (be it DSI, contamination assessment or other appropriate mitigation as they feel necessary) based on the findings of this report as a means to limit further ongoing ACM material from making its way onto RCC operated property. Areas include: • Three Crown Gullies, • Catchments and • Adjacent Golf Course Hill slopes
11.	Long Term	Randwick City Council	Remedial Action Plan (RAP) to be completed based on the findings of the additional site investigations, see item 7, 8, and 9.
12.	Long Term	Randwick City Council / Landcom / Golf Course Tenants / DPIE / Crown Land / EPA	Remediation of contaminated areas
13.	Long Term	Randwick City Council / Landcom / Golf Course Tenants / DPIE / Crown Land / EPA	Validation after Remediation of contaminated areas
14.	Long Term	Randwick City Council / Landcom / Golf Course Tenants / DPIE / Crown Land / EPA	Long Term Environmental Management Plan (LTEMP)

11. Assumptions

The following assumptions have been made when preparing this report

- The DSI period was one week with low tide at 0.3 m ~ 0.5 m.
- The investigation areas covered all beach sand areas accessible for excavation as practically as possible.
- ~80% investigation areas could be impacted by water or underwater under high tide or extreme conditions. Therefore, the estimated investigation areas were approximate due to dynamic environment at Little Bay Beach.
- Surveying of Lot boundaries or accurate positions were out of the scope of work.
- A DSI review undertaken by a Certified Environmental Practitioner was out of the scope of work.

12. Limitations

We have prepared this proposal for the purpose set out above. As we have prepared this proposal for that purpose, it is not appropriate for this proposal to be used for any other purpose, without our prior written consent. It is also not appropriate for this proposal to be released to any other party (either in whole or in part) without our prior written consent. In the event this proposal is used for a purpose for which it was not prepared, then neither Trinitas nor any member or employee of Trinitas, accept responsibility or liability for the use of this proposal for that purpose.

In addition, this proposal does not, and does not purport to, give legal advice as to your actual or potential asbestos or hazardous material liabilities, or draw conclusions as to whether any particular circumstances constitute a breach of relevant legislation. You will appreciate that this advice can only be given by qualified legal practitioners.

Finally, Trinitas does not make any other warranty, expressed or implied, as to the professional advice contained in this proposal.

13. References

- NSW Work Health and Safety Regulation (2017)
- How to Manage and Control Asbestos in the Workplace Code of Practice (2019)
- How to Safely Remove Asbestos Code of Practice (2019)
- Contaminated Land Management Act 1997
- National Environment Protection (Assessment of Site Contamination) Measure 1999
- enHEALTH Management of Asbestos in the Non-Occupational Environment (2005)
- Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, May 2009
- National Environment Protection (Assessment of Site Contamination) Measure. Schedule B (1) - Guideline on Investigation Levels for Soil and Groundwater (May 2013)
- National Environment Protection (Assessment of Site Contamination) Measure. Schedule B2 - Guideline on site characterisation.
- NSW Environment Protection Authority (EPA) Waste Classification Guidelines – Part 1: Classification of waste (November 2014)
- Office of Environment & Heritage - Guidelines for Consultants Reporting on Contaminated Sites (2011).
- The NSW EPA, Sampling Design Guidelines (1995)
- Australian Standard AS4964-2004 Method for the qualitative identification of asbestos in bulk samples.
- National Environment Protection Council (NEPC) (2013) National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1), Schedule B2: Guideline on Site Characterisation.
- Department of Environment and Conservation NSW (DEC) (2006) Contaminated Sites: Guidelines for the NSW Auditor Scheme (2nd Edition).
- US Environmental Protection Agency (USEPA) (2006) Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA/G-4, (Ref. EPA/240/B-06/001).
- Australian Standard AS 4482.1—2005, Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds.
- NSW EPA Contaminated Land Guidelines - Consultants Reporting on Contaminated Land (2020)
- Heads of EPA Australia and New Zealand (2020), PFAS National Environmental Management Plan Version 2.0.
- D00229667 Environmental Monitoring Services - Prince Henry Redvelopment Site - PHLB Undevelopable areas remediation strategy report EMS 211205.
- D03973784 Paul Steinwede ERM Prince Henry Hospital at Little Bay - Documentation Lot 33 Little Bay Beach Site ~ 1430 Anzac Parade Little Bay(3).
- Trinitas Clearance certificates and air monitoring reports, <https://www.randwick.nsw.gov.au/planning-and-building/council-works-and-upgrades/major-projects/little-bay-beach-asbestos-management>
- D04018270 Little Bay Beach Asbestos Interim Human Health Risk Assessment JBSG Australia Pty Ltd, 7-October-2020

Appendices

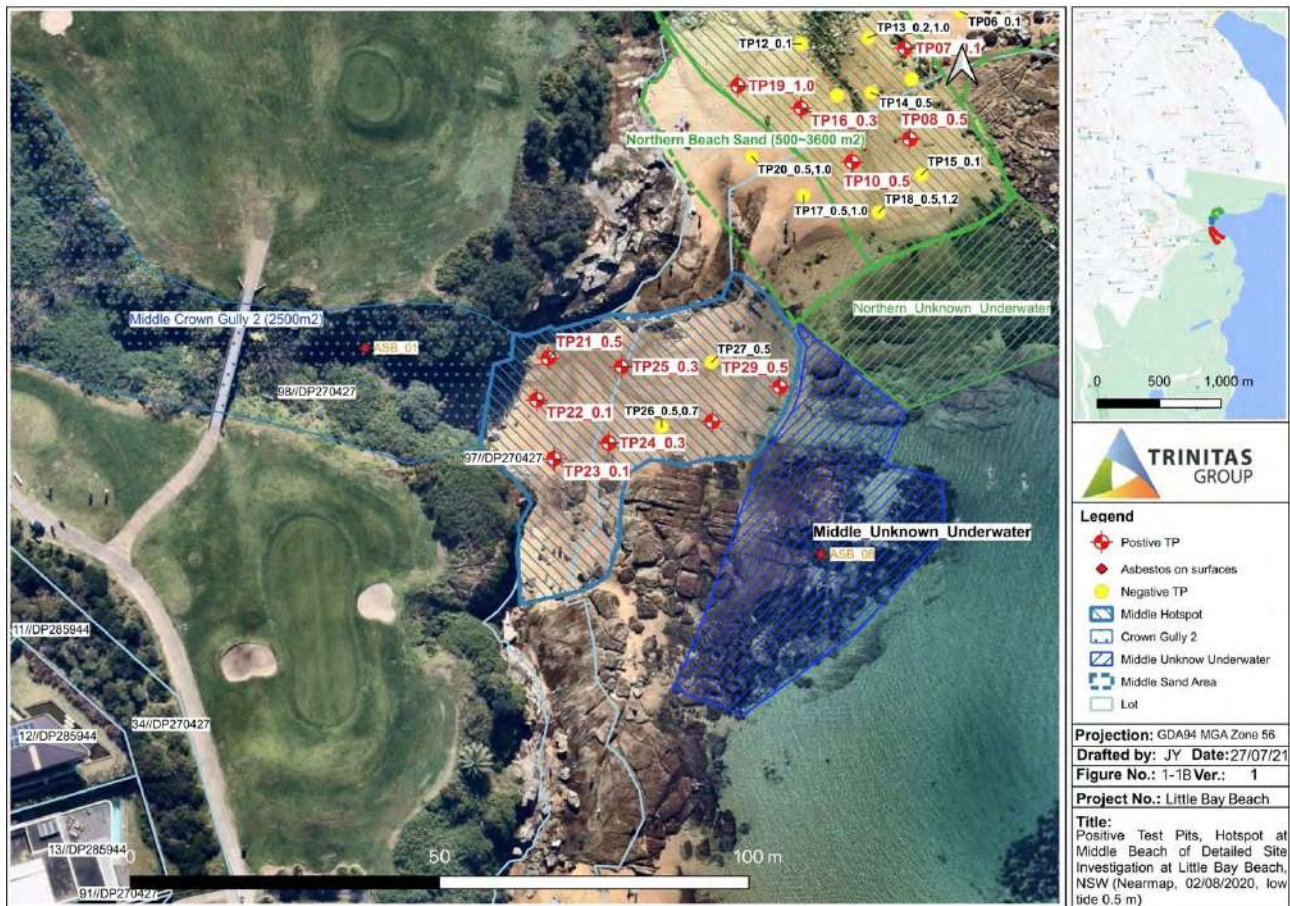
Appendix A Site Layout and Investigation Areas of Detailed Site Investigation at Little Bay Beach



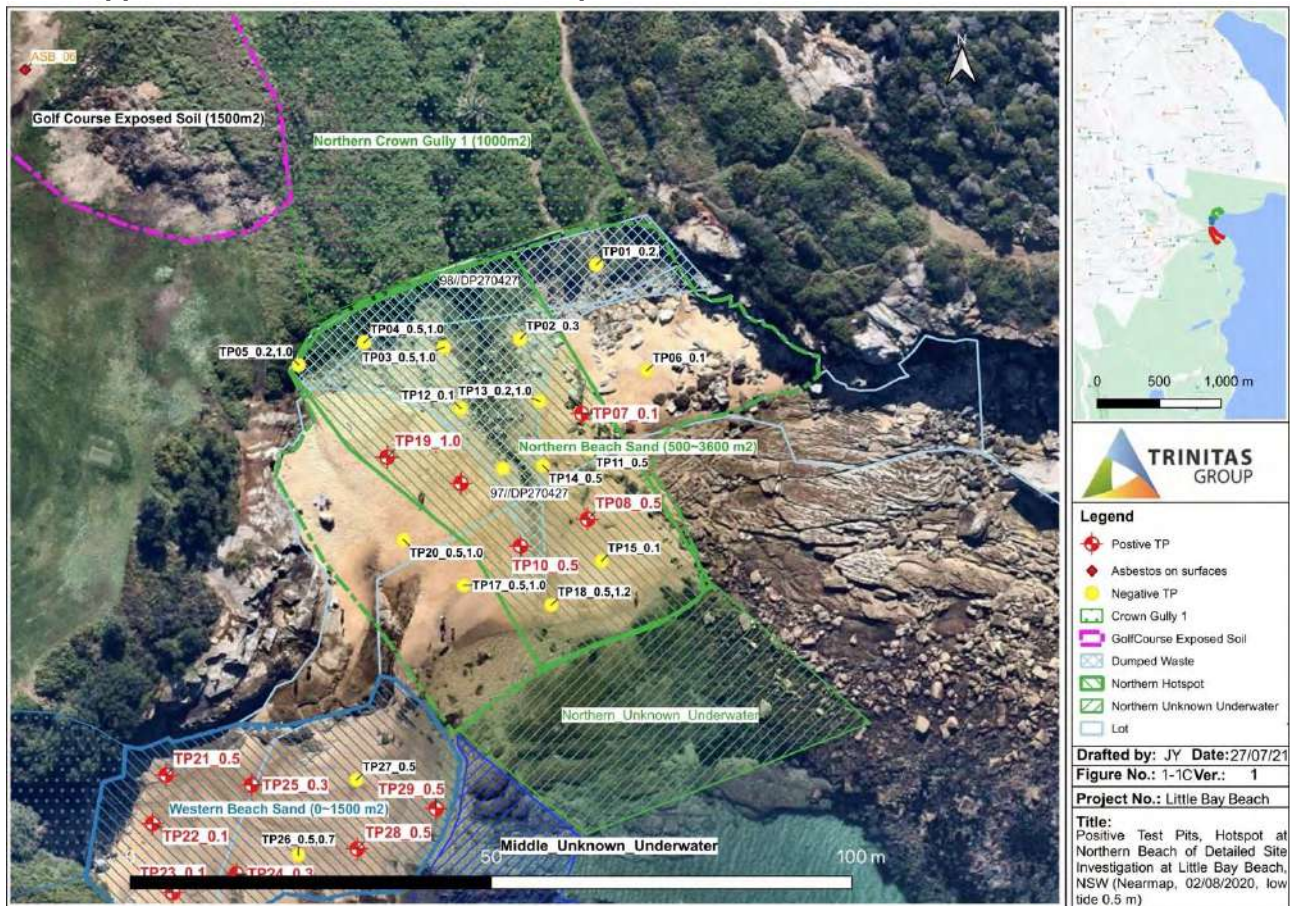
Appendix B Positive Test Pits, Hotspot, Rock Area, Unknown Underwater Area at Southern Beach



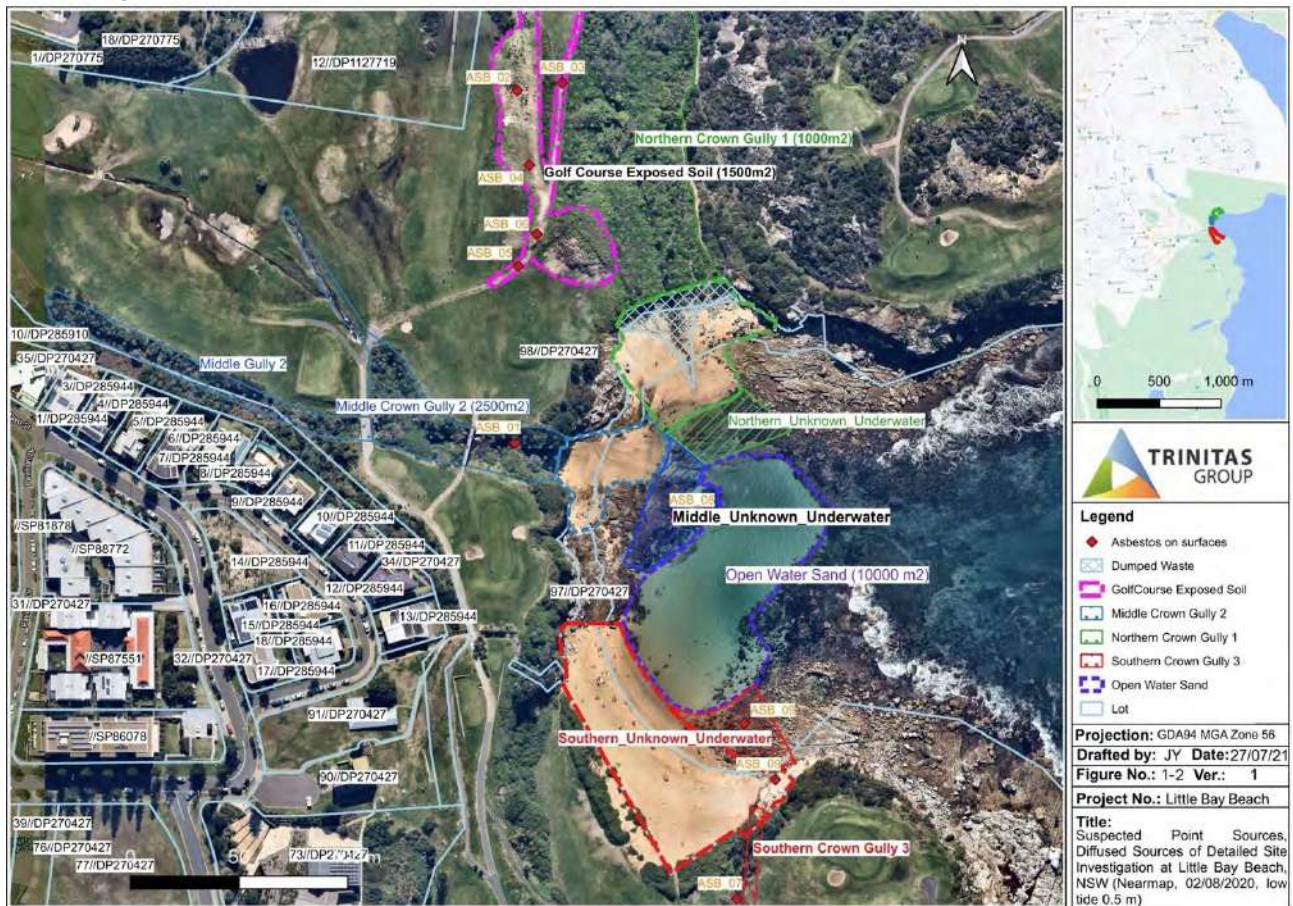
Appendix C Positive Test Pits, Hotspot, Rock Area, Unknown Underwater Area at Middle Beach



Appendix D Positive Test Pits, Hotspot, Unknown Underwater Area at Northern Beach



Appendix E Suspected Point Sources, Diffused Sources and Dumped Waste at Little Bay Beach



Appendix F Historical Site Plan, Historical Site Layouts and Previous Sampling Locations from ERM Site Audit Statement

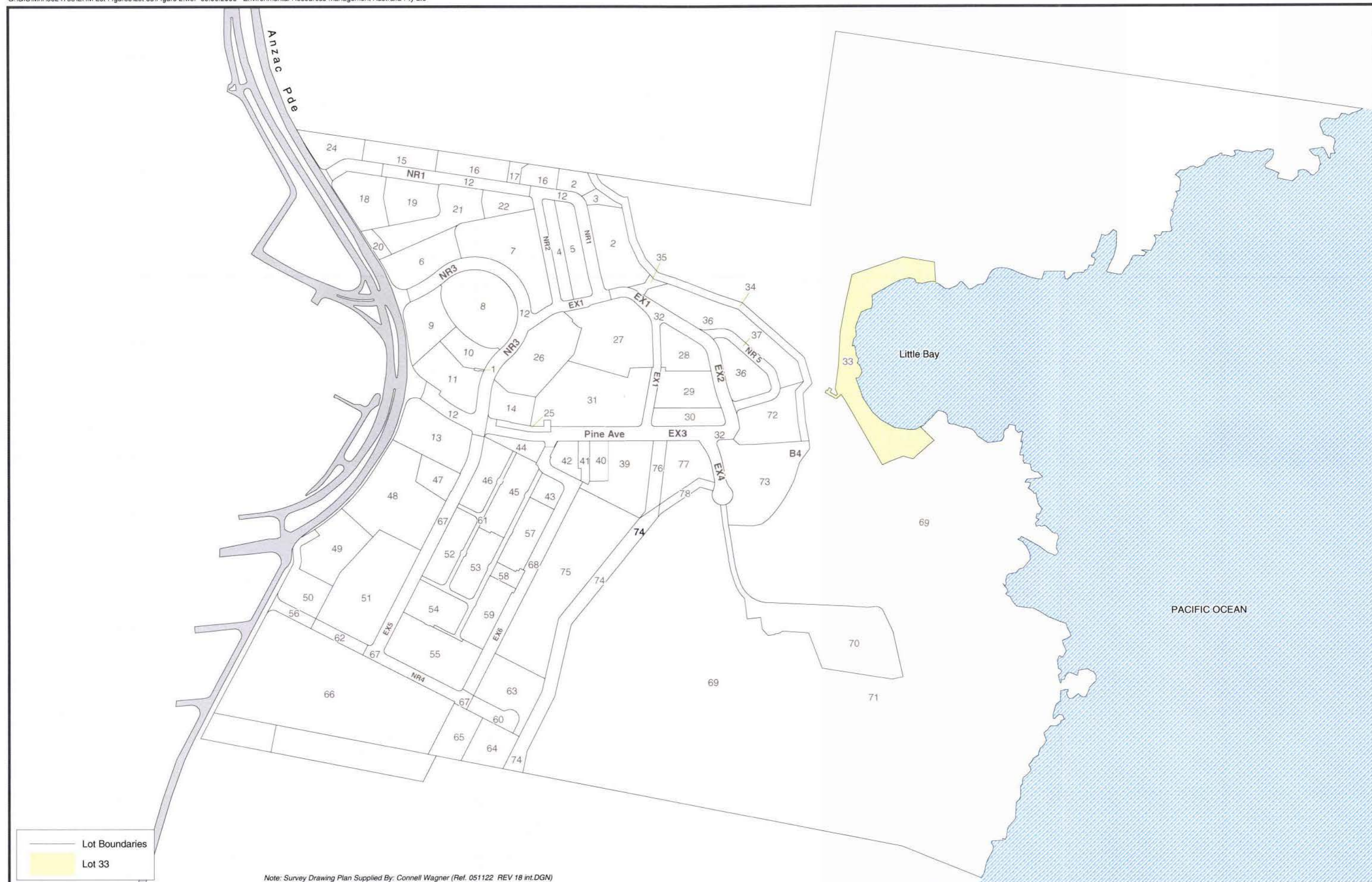
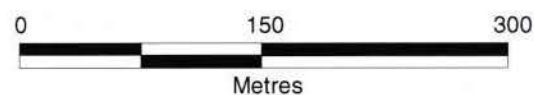


Figure 2 Location of Lot 33



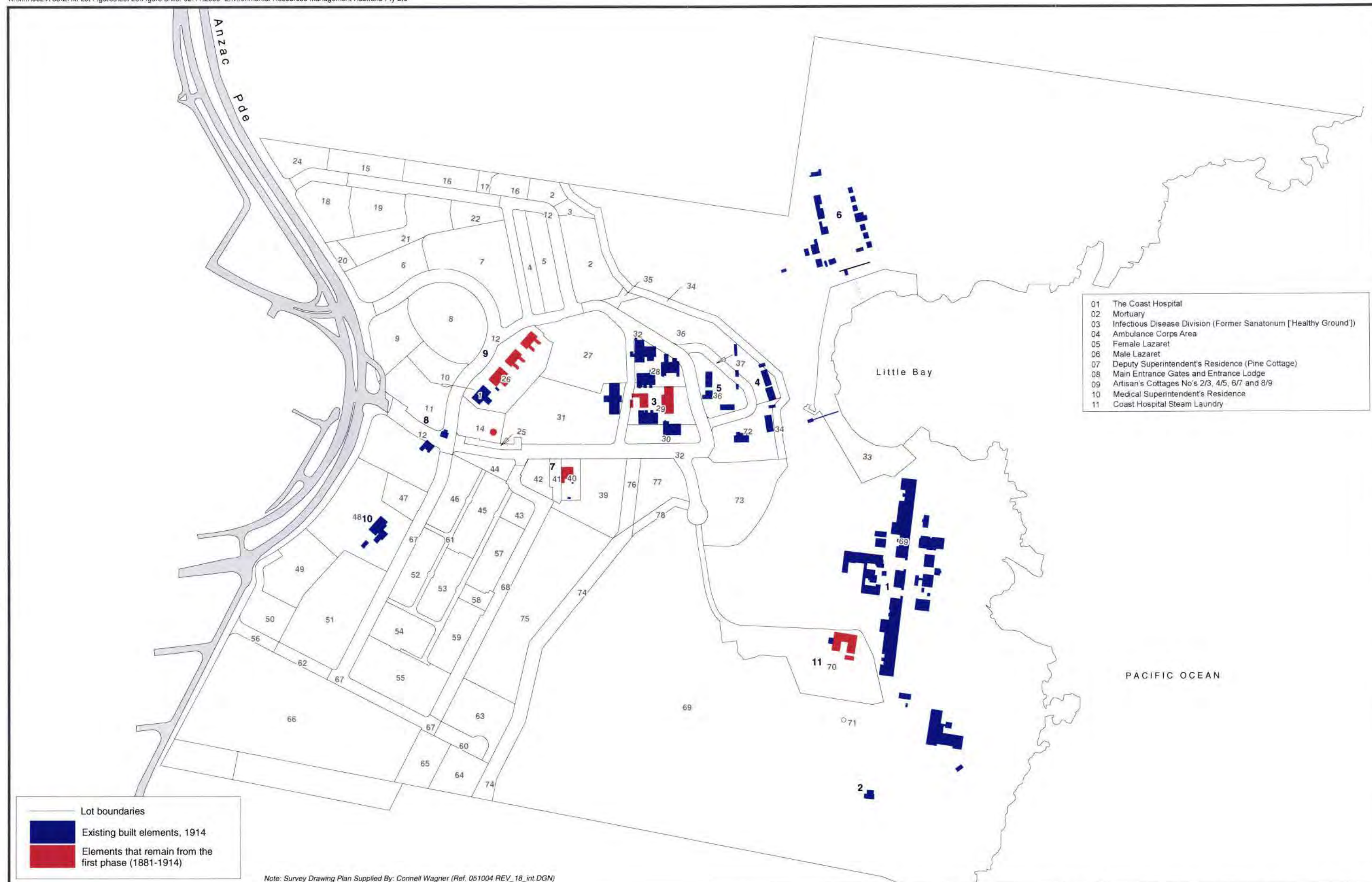


Figure 3

Schematic Plan indicating the approximate location of historical development (1881-1914), in comparison to Lot Areas

Landcom
Prince Henry Site, Little Bay

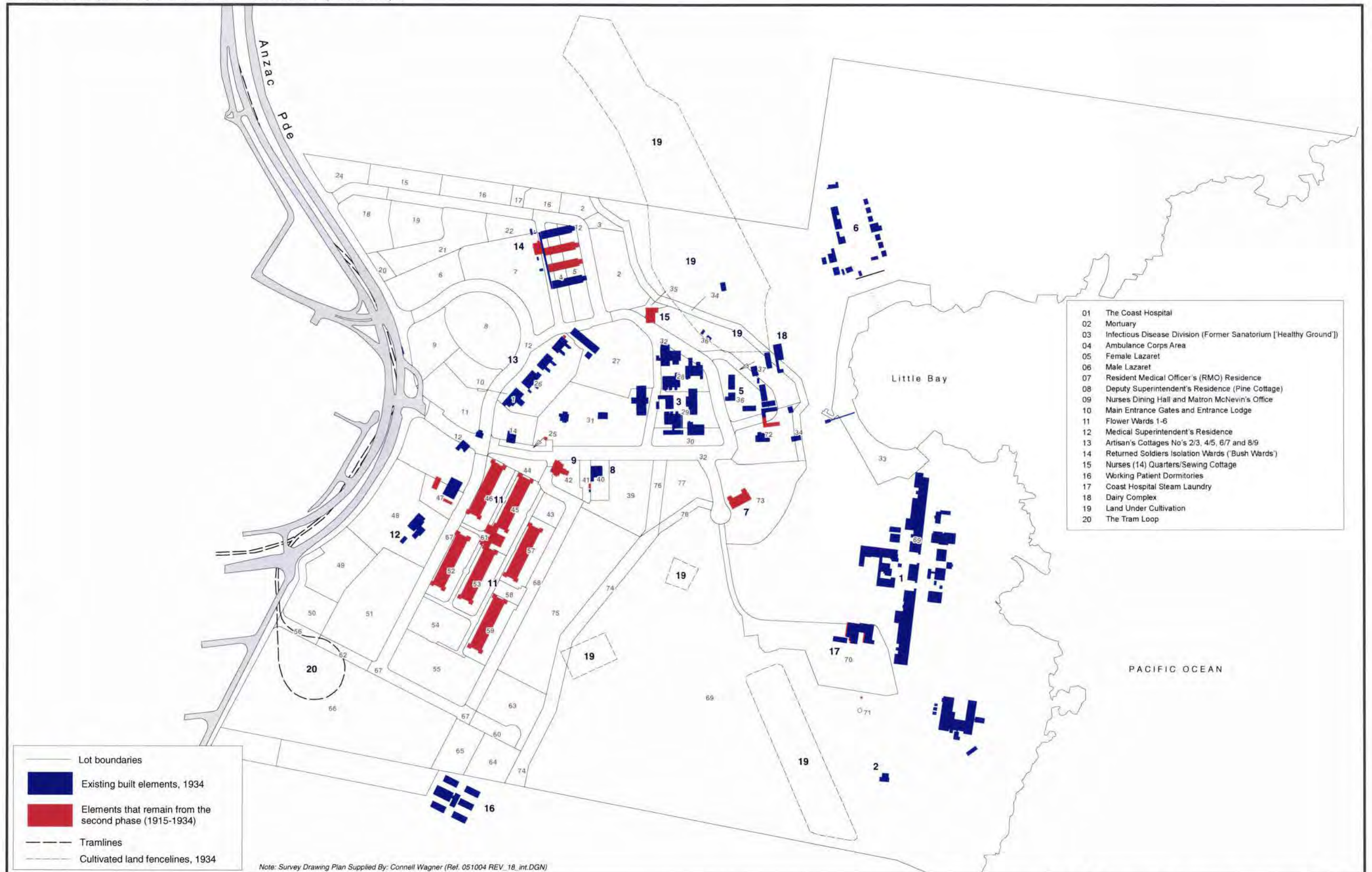


Figure 4

Schematic Plan indicating the approximate location of historical development (1915-1934), in comparison to Lot Areas

Landcom
Prince Henry Site, Little Bay

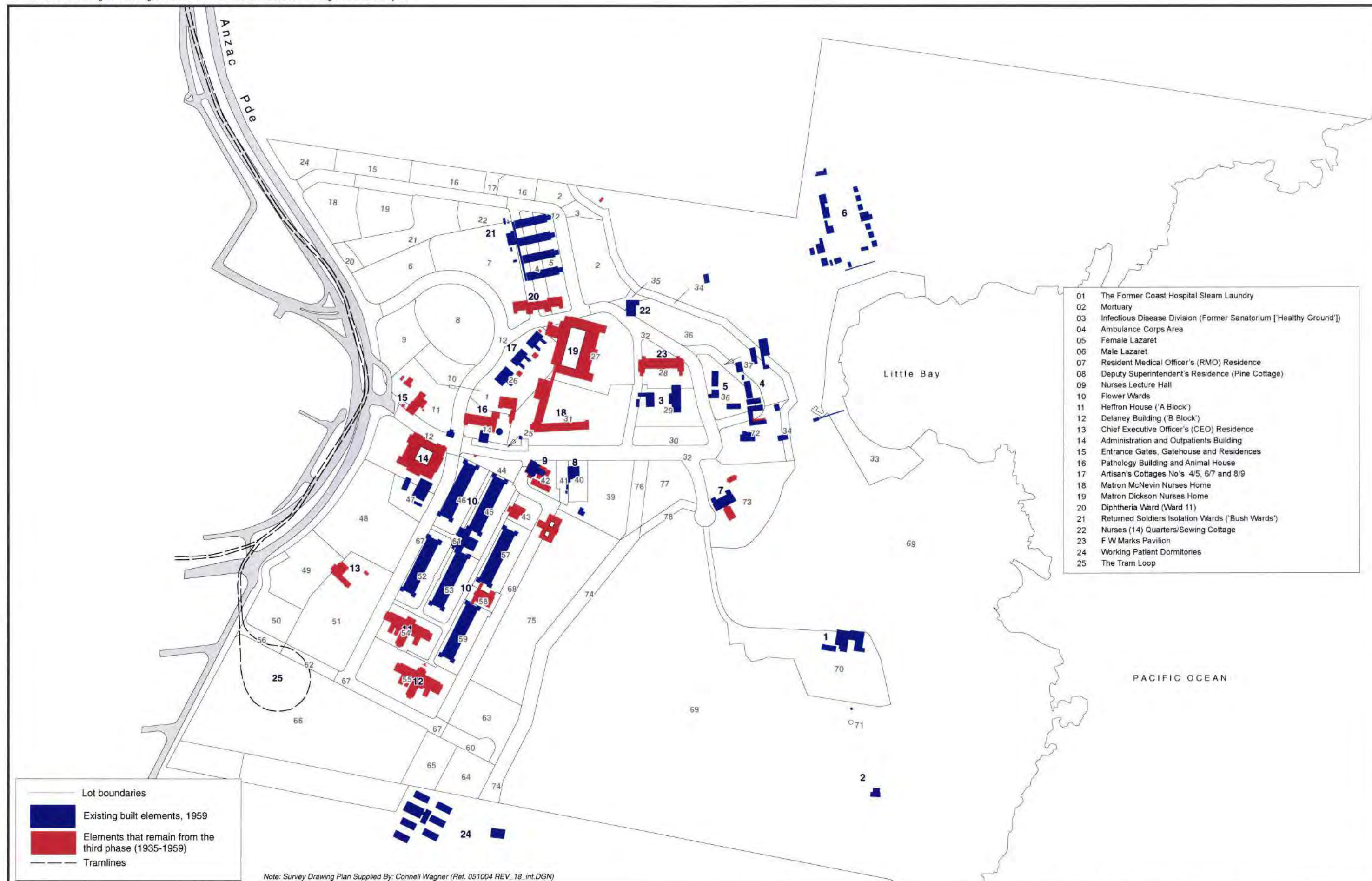


Figure 5

Schematic Plan indicating the approximate location of historical development (1935-1959), in comparison to Lot Areas

Landcom
Prince Henry Site, Little Bay

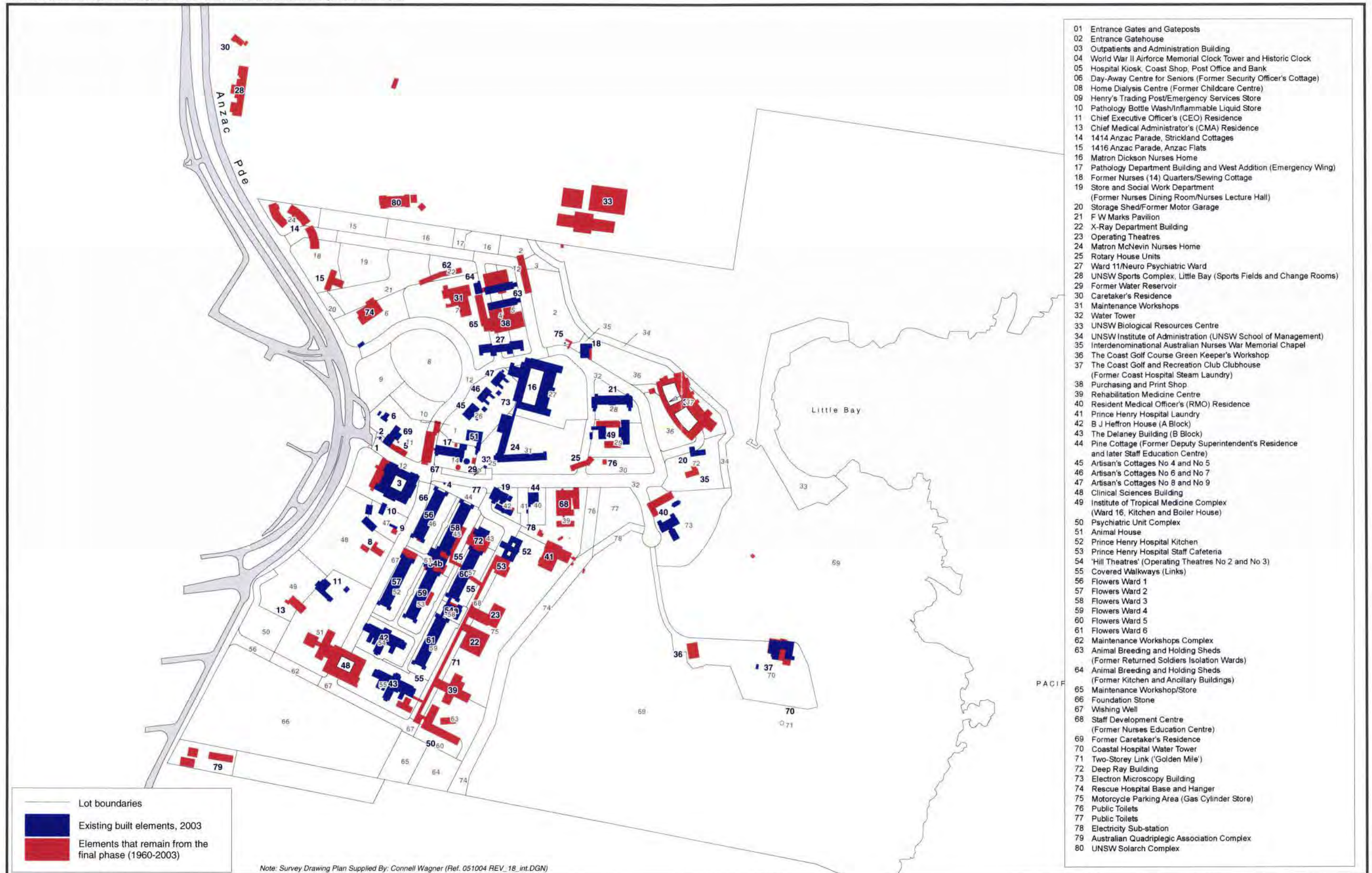


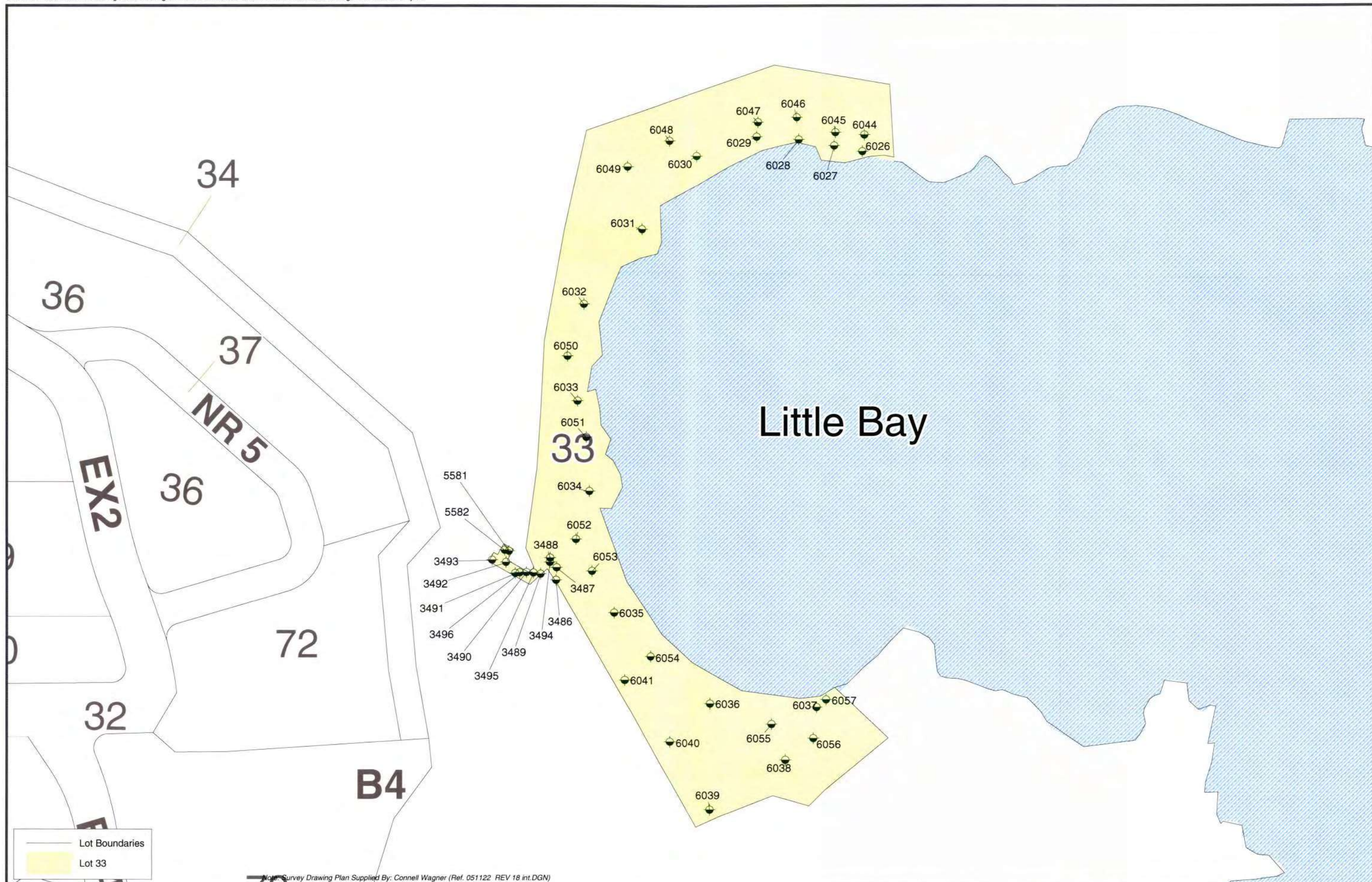
Figure 6

Schematic Plan indicating the approximate location of historical development (1960-2003), in comparison to Lot Areas

Landcom
Prince Henry Site, Little Bay



Note: Survey Drawing Plan Supplied By: Connell Wagner (Ref. 051004 REV. 18. int.DGN)



Note: Survey Drawing Plan Supplied By: Connell Wagner (Ref. 051122 REV 18 int.DGN)

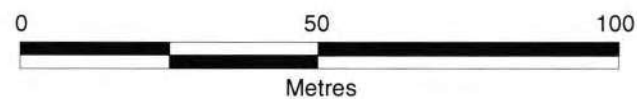


Figure 8

Borehole Location Plan

Landcom
Prince Henry Site, Little Bay

Appendix G Representative Photographic Records

Table 11 Photos – Thin Bonded ACM fragments

	
Thin ACM fragments, Southern Beach, collected during Make-safe Emu-picking and clearance before DSI	Thin ACM fragments, Southern Beach, collected during Make-safe Emu-picking and clearance before DSI

Table 12 Photos – Three beaches impacted by high tide and rough swell

	
Southern Beach impacted by high tide, rough swell (~1500 m² left)	Southern Beach impacted by high tide, rough swell (~1500 m² left)



Northern Beach impacted by high tide, rough swell (~500 m² left)



Middle Beach impacted by high tide, rough swell (0 m² left, all underwater)

Table 13 Photos - Southern Beach - Hotspot Area from Crown Gully 3 Outlet to Rock Area



Southern beach, TP41_0.5, Sand and rock with tiles, abundant glasses, fibro cement pieces



Southern beach, TP41_0.5FC01, FC sheeting fragments around 10cm×10cm



Southern beach, TP41_1.0, Sand and rock with glass, tiles and shell, ACM fragments.



Southern beach, TP41_1.0FC02, Sand and rock with glass, tiles and shell, ACM fragments.



Southern beach, TP36_0.5, sand, small suspected ACM fragment 1 cmx1 cm, sandstone boulders from 0.6 m.



Southern beach, TP39_0.1, Rock and sand with FC sheeting fragments 1.5 kg.



Southern beach, TP39_0.1FC02, two FC sheeting fragments



Southern beach, TP39_0.1FC01, several FC sheeting fragments (including one 6 cm×20 cm corrugated sheeting fragments)



Southern Beach – Hotspot Area, ACM fragments, high tide



Southern Beach –Hotspot, ACM fragments, low tide

Table 14 Photos - Southern Beach – Rock Area or Unknown Underwater Area

	
Southern Beach – Rock Area or Unknown Underwater Area, low tide	Southern Beach – Rock Area or Unknown Underwater Area, low tide

Table 15 Photos - Middle Beach (Western Beach) – Hotspot throughout the whole sand area

	
Middle beach, TP22_0.1, Fill with brick, building debris, FC fragments, tile, rocks.	Middle beach, TP22_0.1FC01, FC fragments



Middle beach, TP22_1.0, Fill with brick, glass, tile and concrete under top sand.



Middle beach, TP29_0.3, Fill with brick, glass, sand, shell, rocks, ACM fragments.



Middle beach, TP29_0.5FC01, FC fragments



Middle beach, soil erosion and disturbance

Table 16 Photos - Representative Photos of Asbestos observed in Rock Area or Unknown Underwater Areas at Middle Beach



Middle beach, ACM fragments under water, low tide

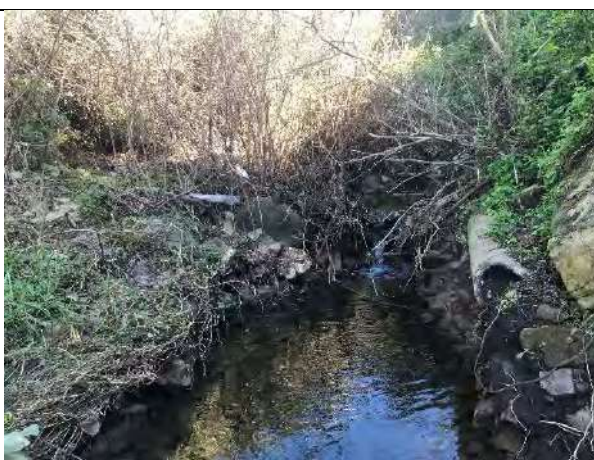


Middle beach, ACM fragments under water, low tide

Table 17 Photos - Representative Photos of Asbestos observed in Crown Gully 2, Middle Beach (Western Beach)



Crown Gully 2, landfill, ACM fragments



Crown Gully 2, eroded creek bed, ~1 m deep

Table 18 Photos - Northern Beach Sand Area - Hotspot Area

	
Northern beach, TP19_0.3, sand with gravel at 0.3 m	Northern beach, TP19_1.0FC01, ACM fragment
	
Northern beach, TP19_1.0, large sandstone boulders, building debris, bricks, ACM fragment	Northern beach, TP05_0.2, Fill with glasses, tiles, brick, plastic, metal, concrete and coal.



Northern beach, TP05_1.0, Fill with glasses, tiles, brick, plastic, metal, concrete and coal.



Northern beach, TP03_0.5, Fill with silty sand loam, boulders, bricks, plastic, glasses.



Northern beach, TP03_1.0, Fill with bricks, boulders, minor plastic. Dumped waste up to around 1.5 m.



Northern beach, TP10_0.5, sand, rocks, shell fragments, glass, soil, brick, sandstone layer at 0.3 m.

	
Northern beach, TP10_0.5FC01, ACM Fragment	Northern beach, TP08_0.5FC01, Sand with shells, boulders, tiles, glasses. Rock platform from 0.5 m.
	
Northern beach, TP09_0.5, Sand with boulders, sediment or stained soil around boulders.	Northern beach, TP09_1.5, Fill with abundant glasses, brick, tiles and plastic.

Table 19 Photos - Representative Photos of Asbestos Observed in Rock Area and Eroded Northern Beach



Northern Beach, Asbestos Observed in Rock Area



Northern Beach, Asbestos Observed in Rock Area



Northern Beach, eroded sand, up to 1 m deep, Gully 1



Northern Beach, ACM fragments on creek bed, Gully 1

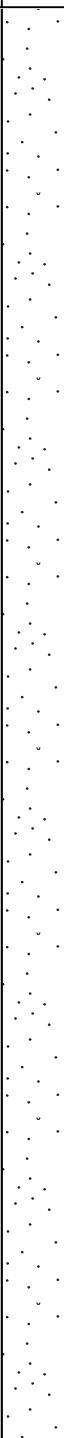
Table 20 Photos – Representative Photos of Asbestos Observed, Stockpiles, Exposed Soils on Golf Course, upgradient of Crown Gully 1, Northern Beach

	
Exposed Soils on Golf Course, adjacent to Gully 1	Suspected ACM fragments on Exposed Soils, Golf Course, adjacent to Gully 1
	
Northern Beach, land clearance, stockpile, adjacent to Crown Gully 1	Northern Beach, land clearance, stockpile, adjacent to Crown Gully 1

Appendix H Test Pit Log

PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 30/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Showel TOTAL DEPTH 0.2	COORDINATES 338516.737, 6238869.021 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION 3 m LOGGED BY Jeffrey YU CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP01_0.2	Y		SAND	Fill with bricks, tiles and glasses. Boulders obstacles. NO access for excavation.	Fill with bricks, tiles and glasses. Boulders obstacles. NO access for excavation.
					Termination Depth at: 0.2 m	

PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 30/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Excavator TOTAL DEPTH 0.3	COORDINATES 338506.134, 6238858.629 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION 3 m LOGGED BY Jeffrey YU CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP02_0.3	Y		SAND	Silty sand. Rock platform or boulders from 0.3 m.	Sand. Boulder or sandstone layer from 0.3 m.
					Termination Depth at: 0.3 m	

PROJECT NUMBER Little Bay	DRILLING DATE 29/04/2021	COORDINATES 338484.560, 6238858.154
PROJECT NAME Little Bay Beach	DRILLING COMPANY RMA	COORD SYS GDA94 MGA Zone 56
CLIENT RCC	DRILLER RMA	SURFACE ELEVATION 3 m
ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING METHOD Excavator	LOGGED BY Jeffrey YU
	TOTAL DEPTH 1.0	CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP03_0.5	Y		Fill	Fill with glasses, tiles, brick, plastic, boulders and shell.	Under weeds, Legacy tip or fill with glasses, tiles, brick, plastic, metal, concrete and coal.
0.5	TP03_1.0	Y		Fill	Fill with glasses, tiles, brick, plastic, boulders and shell. Boulder and brown silty sand were observed from 1 m.	Legacy tip or fill with glasses, tiles, brick, plastic, metal, concrete and coal. Boulders and brown silty sand observed from 1 m.
1					Termination Depth at: 1 m	

PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 29/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Excavator TOTAL DEPTH 1.0	COORDINATES 338484.560, 6238858.154 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION 3 m LOGGED BY Jeffrey YU CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP04_0.5	Y		Fill	Fill with glasses, tiles, brick, plastic, metal, concrete and coal.	Under weeds, Legacy tip or fill with glasses, tiles, brick, plastic, metal, concrete and coal.
				Fill		Legacy tip or fill with glasses, tiles, brick, plastic, metal, concrete and coal. Boulders and brown silty sand observed from 1 m.
0.5	TP04_1.0	Y			Fill with glasses, tiles, brick, plastic, metal, concrete and coal. Boulder and brown silty sand were observed from 1 m.	
1					Termination Depth at: 1 m	

PROJECT NUMBER Little Bay	DRILLING DATE 29/04/2021	COORDINATES 338475.434, 6238855.095
PROJECT NAME Little Bay Beach	DRILLING COMPANY RMA	COORD SYS GDA94 MGA Zone 56
CLIENT RCC	DRILLER RMA	SURFACE ELEVATION 3 m
ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING METHOD Excavator	LOGGED BY Jeffrey YU
	TOTAL DEPTH 1.0	CHECKED BY KM

COMMENTS						
Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP05_0.2	Y		Fill	Fill with glasses, tiles, brick, plastic, metal, concrete and coal.	Under weeds, Legacy tip or fill with glasses, tiles, brick, plastic, metal, concrete and coal.
0.5	TP05_1.0	Y		Fill	Fill with glasses, tiles, brick, plastic, metal, concrete and coal. Boulder and brown silty sand were observed from 1 m.	Legacy tip or fill with glasses, tiles, brick, plastic, metal, concrete and coal. Boulders and brown silty sand observed from 1 m.
1					Termination Depth at: 1 m	

PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 30/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Excavation TOTAL DEPTH 0.1	COORDINATES 338523.700, 6238854.251 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION 3 m LOGGED BY Jeffrey YU CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP06_0.1	Y		SAND	Sand. Boulders or outcrop from 0.1 m.	Boulders or outcrop from 0.1 m.
					Termination Depth at: 0.1 m	

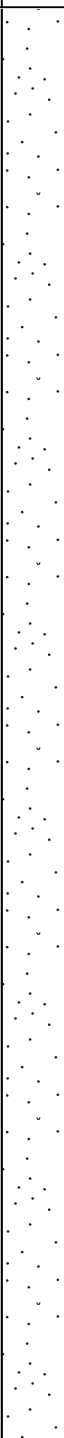
PROJECT NUMBER Little Bay	DRILLING DATE 30/04/2021	COORDINATES 338514.733, 6238848.290
PROJECT NAME Little Bay Beach	DRILLING COMPANY RMA	COORD SYS GDA94 MGA Zone 56
CLIENT RCC	DRILLER RMA	SURFACE ELEVATION 2 m
ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING METHOD Excavator	LOGGED BY Jeffrey YU
	TOTAL DEPTH 0.3	CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP07_0.3; TP07_0.1FC01	Y		SAND	Sand. ACM fragment observed. Rock platform or boulders from 0.3 m.	Sand. ACM fragment observed. Boulder or sandstone layer from 0.3 m.
					Termination Depth at: 0.3 m	

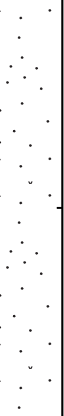
PROJECT NUMBER Little Bay	DRILLING DATE 30/04/2021	COORDINATES 338515.524, 6238833.626
PROJECT NAME Little Bay Beach	DRILLING COMPANY RMA	COORD SYS GDA94 MGA Zone 56
CLIENT RCC	DRILLER RMA	SURFACE ELEVATION 1 m
ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING METHOD Excavator	LOGGED BY Jeffrey YU
	TOTAL DEPTH 0.5	CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP08_0.5; TP08_FC01	Y		SAND with building rubble	Sand with shell, brick, glass. Water seepage from the creek.	Sand with shell, brick, glass, rock over 0.5 m. ACM fragment observed. Refusal due to water seepage. Boulder or sandstone layer from 0.5 m.
0.5					Termination Depth at: 0.5 m	

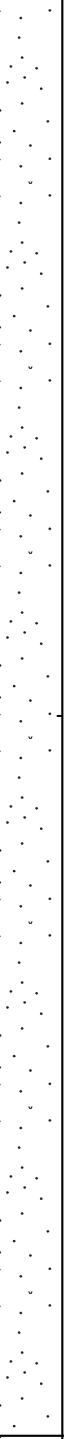
PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 30/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Excavator TOTAL DEPTH 1.7	COORDINATES 338503.813, 6238840.747 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION 2 m LOGGED BY Jeffrey YU CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
0.5	TP09_0.5	Y		SAND with building rubble	Sand with shell, brick, abundant glass, tiles, plastic. Rock and boulders from 0.5 m up to 1.7 m.	Sand with shell, brick, glass, rock over 1.5 m. Silty sand or loam from 1.5 m. Boulder or sandstone layer from 0.5 m up to 1.7 m.
1	TP09_1.5	Y		Silty Sand or Fill		
1.5						
					Termination Depth at: 1.7 m	

PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 29/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Excavator TOTAL DEPTH 0.5	COORDINATES 338506.240, 6238829.880 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION 1 m LOGGED BY Jeffrey YU CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP10_0.5; TP10_0.5FC01	Y		SAND with building rubble	Sand with shell, brick, glass, rock, and tiles. Boulder or rock platform from 0.3 m.	Sand with shell, brick, glass, rock, and tiles up to 0.5 m. ACM fragments observed. Sandstone platform or boulder from 0.3 m.
0.5					Termination Depth at: 0.5 m	

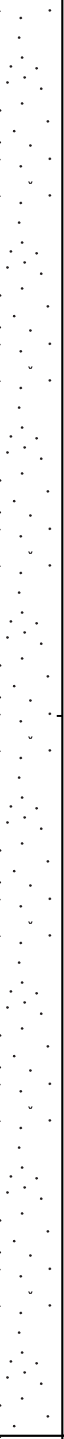
PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 29/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Excavator TOTAL DEPTH 0.5	COORDINATES 338484.560, 6238858.154 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION 2 m LOGGED BY Jeffrey YU CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP11_0.5	Y		SAND and Boulder	Sand with boulders. Sandstone platform from 0.5 m.	Sand with boulders. Sandstone platform from 0.5 m.
0.5					Termination Depth at: 0.5 m	

PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 29/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Excavation TOTAL DEPTH 0.1	COORDINATES 338497.983, 6238849.011 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION 3 m LOGGED BY Jeffrey YU CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP12_0.1	N		SAND and Boulder	Sand. Boulders or outcrop from 0.1 m.	Boulders or outcrop from 0.1 m.
					Termination Depth at: 0.1 m	

PROJECT NUMBER Little Bay	DRILLING DATE 29/04/2021	COORDINATES 338508.877, 6238850.031
PROJECT NAME Little Bay Beach	DRILLING COMPANY RMA	COORD SYS GDA94 MGA Zone 56
CLIENT RCC	DRILLER RMA	SURFACE ELEVATION 2 m
ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING METHOD Excavator	LOGGED BY Jeffrey YU
	TOTAL DEPTH 1	CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP13_0.2	Y		SAND with building rubble	Sand with shell, brick, glass, rock, plastic, and tiles up to 1 m.	Sand with shell, brick, glass, rock, plastic, and tiles up to 1 m. Sandstone platform or boulder from 1 m.
	TP13_1.0	N			Sand with shell, brick, glass, rock, plastic, and tiles up to 1 m. Sandstone layer from 1 m.	
0.5						
1					Termination Depth at: 1 m	

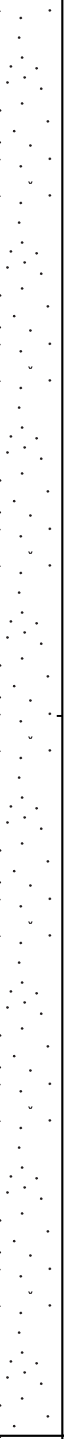
PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 29/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Excavator TOTAL DEPTH 0.5	COORDINATES 338509.352, 6238841.116 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION 1 m LOGGED BY Jeffrey YU CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP14_0.5	Y		SAND with building rubble	Sand with shell, brick, glass. Water seepage from the creek.	Sand with shell, brick, glass, rock over 0.5 m. Refusal due to water seepage.
0.5					Termination Depth at: 0.5 m	

PROJECT NUMBER Little Bay	DRILLING DATE 29/04/2021	COORDINATES 338517.348,6238827.819
PROJECT NAME Little Bay Beach	DRILLING COMPANY RMA	COORD SYS GDA94 MGA Zone 56
CLIENT RCC	DRILLER RMA	SURFACE ELEVATION 1 m
ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING METHOD Excavation	LOGGED BY Jeffrey YU
	TOTAL DEPTH 0.1	CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP15_0.1	N		SAND and Boulder	Sand with tiles and glasses.	Sand with tiles and glasses. Excavation had to be redirected to Middle Beach for investigation during low tide.
					Termination Depth at: 0.1 m	

PROJECT NUMBER Little Bay	DRILLING DATE 29/04/2021	COORDINATES 338498.011, 6238838.637
PROJECT NAME Little Bay Beach	DRILLING COMPANY RMA	COORD SYS GDA94 MGA Zone 56
CLIENT RCC	DRILLER RMA	SURFACE ELEVATION 1 m
ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING METHOD Excavator	LOGGED BY Jeffrey YU
	TOTAL DEPTH 1	CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP16_0.3; TP16_0.3FC01	Y		SAND with building rubble	Sand with shell, brick, glass, plastic and tiles. ACM fragment observed. Boulders from 0.3 m to over 1 m.	Sand with shell, brick, glass, rock, and tiles over 1 m. ACM fragments observed. Boulders from 0.3 m.
0.5	TP16_1.0	Y				
1					Termination Depth at: 1 m	

PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 28/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Excavator TOTAL DEPTH 1.0	COORDINATES 338498.333, 6238824.666 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION 2 m LOGGED BY Jeffrey YU CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP17_0.5	Y		SAND	SAND: well graded, brown with shell, brick, concrete, tiles and glasses up to 1 m.	Dry topsand to sand moist., with shells and building rubble.
0.5	TP17_1.0	Y			SAND: with shells and rocks, brick, concrete, tiles and glasses. Sandstone layer from 1 m. Water seepage.	Sand with shell, brick, concrete, tiles and glasses. Sandstone layer observed from 1 m.
1					Termination Depth at: 1.0 m	

PROJECT NUMBER Little Bay	DRILLING DATE 28/04/2021	COORDINATES 338510.488, 6238821.828
PROJECT NAME Little Bay Beach	DRILLING COMPANY RMA	COORD SYS GDA94 MGA Zone 56
CLIENT RCC	DRILLER RMA	SURFACE ELEVATION 1 m
ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING METHOD Excavator	LOGGED BY Jeffrey YU
	TOTAL DEPTH 1.2	CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP18_0.5	Y		SAND	SAND: well graded, brown with shell, brick, concrete, tiles and glasses up to 1.2 m.	Dry topsand to sand moist., with shells and building rubble. On the lower tidal line during low tide.
0.5	TP18_1.2	Y			SAND: with shells and rocks, brick, concrete, tiles and glasses. Sandstone layer from 1.2 m. Water seepage.	Sand with shell, brick, concrete, tiles and glasses. Sandstone layer observed from 1.2 m. Water seepage at around 0.5 m.
1						
					Termination Depth at: 1.2 m	

PROJECT NUMBER Little Bay	DRILLING DATE 28/04/2021	COORDINATES 338487.707, 6238842.207
PROJECT NAME Little Bay Beach	DRILLING COMPANY RMA	COORD SYS GDA94 MGA Zone 56
CLIENT RCC	DRILLER RMA	SURFACE ELEVATION 3 m
ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING METHOD Excavator	LOGGED BY Jeffrey YU
	TOTAL DEPTH 1.0	CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP19_0.3	Y		SAND	SAND: well graded, brown with shell and rocks over 1 m. Sandstone boulder gravels from 0.3 m.	Dry topsand to sand moist., with shells.
0.5	TP19_1.0	Y			SAND: with shells and rocks. ACM fragments observed. Seems weathered.	Sand with Boulder observed. ACM fragments. Looks weathered.
1					Termination Depth at: 1.0 m	

PROJECT NUMBER Little Bay	DRILLING DATE 28/04/2021	COORDINATES 338490.036, 6238830.853
PROJECT NAME Little Bay Beach	DRILLING COMPANY RMA	COORD SYS GDA94 MGA Zone 56
CLIENT RCC	DRILLER RMA	SURFACE ELEVATION 2 m
ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING METHOD Excavator	LOGGED BY Jeffrey YU
	TOTAL DEPTH 1.0	CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP20_0.5	Y		SAND	SAND: well graded, brown with shell.	Dry topsand to sand moist., with shells.
0.5	TP20_1.0	Y			SAND: with shells and rocks. Sandstone layer from 1 m.	Sand with shell. Sandstone layer observed from 1 m.
1					Termination Depth at: 1.0 m	

PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 29/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Excavation TOTAL DEPTH 0.5	COORDINATES 338456.934, 6238798.334 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION 2 m LOGGED BY Jeffrey YU CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP21_0.5; TP21_0.5FC01	Y		SAND	Sand with tiles and glasses.	Sand with tiles and glasses.
				Fill	Fill with several bricks, glasses. ACM fragment observed. Sandstone formation from 0.5 m.	Fill with several bricks, glasses. ACM fragment observed. Sandstone formation from 0.5 m.
0.5					Termination Depth at: 0.5 m	

PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 29/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Excavation TOTAL DEPTH 1	COORDINATES 338455.440, 6238790.802 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION 2 m LOGGED BY Jeffrey YU CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP22_0.1; TP22_0.1FC01	Y		SAND	Sand with tiles and glasses.	Sand with tiles and glasses. ACM fragment observed.
0.5	TP22_1.0	Y		Fill	Fill with several bricks, glasses, tiles, concrete. Stained sand observed.	Fill with several bricks, tiles, concrete, glasses. Stained sand from 0.2 m.
1					Termination Depth at: 1 m	

PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 29/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Excavation TOTAL DEPTH 0.1	COORDINATES 338457.680, 6238781.403 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION 2 m LOGGED BY Jeffrey YU CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP23_0.1; TP23_0.1FC01	Y		SAND	Sand with bricks, tiles and glasses. Sandstone from 0.1 m.	Sand with bricks, tiles and glasses. ACM fragment observed. Sandstone from 0.1 m.
					Termination Depth at: 0.1 m	

PROJECT NUMBER Little Bay
PROJECT NAME Little Bay Beach
CLIENT RCC
ADDRESS 4R Coast Hospital Rd, Little Bay
NSW 2036

DRILLING DATE 29/04/2021
DRILLING COMPANY RMA
DRILLER RMA
DRILLING METHOD Excavation
TOTAL DEPTH 0.3

COORDINATES 338466.893, 6238784.391
COORD SYS GDA94 MGA Zone 56
SURFACE ELEVATION 2 m
LOGGED BY Jeffrey YU
CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP24_0.3; TP24_0.3FC01	Y		SAND	Sand with bricks, tiles and glasses.	Sand with bricks, tiles and glasses. ACM fragment observed in the following day.
					Termination Depth at: 0.3 m	

PROJECT NUMBER Little Bay	DRILLING DATE 29/04/2021	COORDINATES 338468.816, 6238796.992
PROJECT NAME Little Bay Beach	DRILLING COMPANY RMA	COORD SYS GDA94 MGA Zone 56
CLIENT RCC	DRILLER RMA	SURFACE ELEVATION 1 m
ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING METHOD Excavation	LOGGED BY Jeffrey YU
	TOTAL DEPTH 0.3	CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP25_0.3; TP25_0.3FC01	Y		SAND	Sand with bricks, glasses, tiles.	Sand with bricks, tiles and glasses. ACM fragment observed. Sandstone formation from 0.3 m.
					Termination Depth at: 0.3 m	

PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 29/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Excavation TOTAL DEPTH 0.7	COORDINATES 338474.809, 6238789.684 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION 0 m LOGGED BY Jeffrey YU CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP26_0.5	Y		SAND	Sand with bricks, glasses, tiles.	Sand with bricks, tiles and glasses. Sandstone formation from 0.7 m.
0.5	TP26_0.7	N				
					Termination Depth at: 0.7 m	

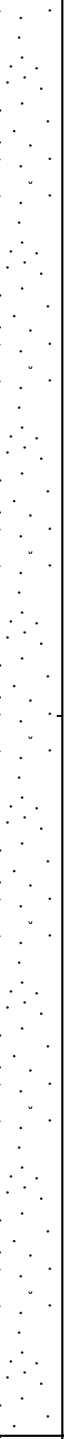
PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 29/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Excavation TOTAL DEPTH 0.5	COORDINATES 338483.214, 6238796.335 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION 1 m LOGGED BY Jeffrey YU CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP27_0.5	Y		SAND	Sand with bricks, glasses, tiles.	Sand with bricks, tiles and glasses. Sandstone formation from 0.5 m.
0.5					Termination Depth at: 0.5 m	

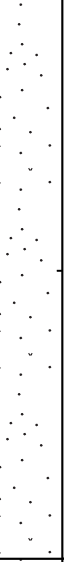
PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 29/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Excavation TOTAL DEPTH 0.5	COORDINATES 338483.653, 6238787.930 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION 0 m LOGGED BY Jeffrey YU CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP28_0.5; TP28_0.5FC01	Y		SAND	Sand with bricks, tiles and glasses.	Sand with bricks, tiles and glasses. ACM fragment observed.
0.5					Termination Depth at: 0.5 m	

PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 29/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Excavation TOTAL DEPTH 0.5	COORDINATES 338494.529, 6238793.541 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION 0 m LOGGED BY Jeffrey YU CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP29_0.3	Y		SAND	Sand with bricks, tiles and glasses.	Sand with bricks, tiles and glasses.
	TP29_0.5; TP29_0.5FC01	Y		SAND		Sand with rocks, tiles and glasses. ACM fragment observed.
0.5					Termination Depth at: 0.5 m	

PROJECT NUMBER Little Bay	DRILLING DATE 27/04/2021	COORDINATES 338461.108, 6238702.353
PROJECT NAME Little Bay Beach	DRILLING COMPANY RMA	COORD SYS GDA94 MGA Zone 56
CLIENT RCC	DRILLER RMA	SURFACE ELEVATION 3 m
ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING METHOD Excavator	LOGGED BY Jeffrey YU
	TOTAL DEPTH 2.2	CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
0.5	TP30_1.0	Y		SAND	SAND: well graded, brown with shell over 2 m.	Dry topsand to sand moist., with shells. Over 2 m.
1						
1.5						
2	TP30_2.2	Y		SAND	SAND: brown silty sand with shells.	Brown silty sand layer observed. Refusal due to sand wall collapsed.
					Termination Depth at: 2.2 m	

PROJECT NUMBER Little Bay	DRILLING DATE 28/04/2021	COORDINATES 338463.018, 6238677.383
PROJECT NAME Little Bay Beach	DRILLING COMPANY RMA	COORD SYS GDA94 MGA Zone 56
CLIENT RCC	DRILLER RMA	SURFACE ELEVATION 3 m
ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING METHOD Excavator	LOGGED BY Jeffrey YU
	TOTAL DEPTH 2.0	CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
0.5	TP31_0.5	Y		SAND	SAND: well graded, brown with shell over 2 m.	Dry topsand to sand moist., with shells. Over 2 m. Refusal due to sand wall collapsed.
1	TP31_2.0	Y		SAND		
1.5						
2					Termination Depth at: 2.0 m	

PROJECT NUMBER Little Bay	DRILLING DATE 28/04/2021	COORDINATES 338474.344, 6238657.051
PROJECT NAME Little Bay Beach	DRILLING COMPANY RMA	COORD SYS GDA94 MGA Zone 56
CLIENT RCC	DRILLER RMA	SURFACE ELEVATION 3 m
ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING METHOD Excavator	LOGGED BY Jeffrey YU
	TOTAL DEPTH 2.5	CHECKED BY KM

COMMENTS

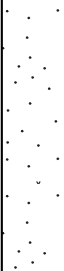
Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
0.5	TP32_1.0	Y		SAND	SAND: well graded, brown with shell	Dry topsand to sand moist., with shells. Over 2.5 m. Refusal due to sand wall collapsed.
1	TP32_2.5	Y		SAND	SAND: well graded, brown with shell over 2.5 m.	
1.5						
2						
2.5					Termination Depth at: 2.5 m	

PROJECT NUMBER Little Bay	DRILLING DATE 28/04/2021	COORDINATES 338487.443, 6238639.449
PROJECT NAME Little Bay Beach	DRILLING COMPANY RMA	COORD SYS GDA94 MGA Zone 56
CLIENT RCC	DRILLER RMA	SURFACE ELEVATION 3 m
ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING METHOD Excavator	LOGGED BY Jeffrey YU
	TOTAL DEPTH 2.5	CHECKED BY KM

COMMENTS						
Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
0.5	TP33_1.0	Y		SAND	SAND: well graded, brown with shell	Dry topsand to sand moist., with shells. Over 2.5 m. Refusal due to sand wall collapsed.
1	TP33_2.2	Y		SAND	SAND: well graded, brown with shell over 2.5 m.	
1.5						
2						
2.5					Termination Depth at: 2.5 m	

PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 28/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Excavator TOTAL DEPTH 2.6	COORDINATES 338501.361, 6238617.617 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION 2 m LOGGED BY Jeffrey YU CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
0.5	TP34_0.5	Y		SAND	SAND: well graded, brown with shell	Dry topsand to sand moist., with shells.
1						
1.5						
2						
2.5	TP34_2.5	Y		Silty Clay with abundant shell deposit	Black silty clay from 2.5 m.	After 2.5 m, Black silty clay or sandy clay with abundant shell deposit.
					Termination Depth at: 2.6 m	

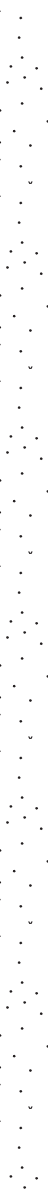
PROJECT NUMBER Little Bay	DRILLING DATE 27/04/2021	COORDINATES 338517.899, 6238621.489
PROJECT NAME Little Bay Beach	DRILLING COMPANY RMA	COORD SYS GDA94 MGA Zone 56
CLIENT RCC	DRILLER RMA	SURFACE ELEVATION 2 m
ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING METHOD Excavator	LOGGED BY Jeffrey YU
	TOTAL DEPTH 2.5	CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP35_0.25	Y		SAND	SAND: well graded, brown, minor shell, tiles and glasses up to 1.5 m.	Dry topsand to sand moist., with minor glasses, and shells.
0.5				SAND	SAND: Well graded, brown, moist. After 1.5 m, underlain brown deposited sandy layer with rock platform and boulders.	Sand with shells. After 1.5 m, Brown coarse sand and sandstone.
1						
	TP35_1.5	Y		Sand with humus hint	Sand: brown, humus hint.	
1.5				Sandstone	Sandstone platform	
					Termination Depth at: 1.5 m	

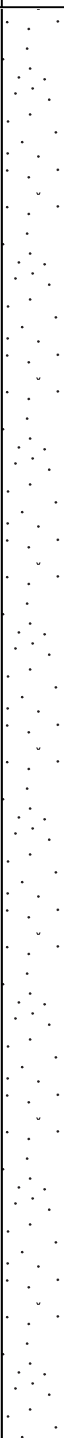
PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 28/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Excavator TOTAL DEPTH 0.5	COORDINATES 338533.032, 6238630.959 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION 2 m LOGGED BY Jeffrey YU CHECKED BY AR

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP36_0.5	Y		SAND	SAND: well graded, brown, and polished ACM fragments.	Dry topsand to sand moist., with rocks, and shells. ACM fragments.
0.5				Sandstone or boulder	Sandstone platform or boulder from 0.5 m.	After 0.5 m, sandstone platform or boulder.
					Termination Depth at: 0.5 m	

PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 28/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Excavator TOTAL DEPTH 0.2	COORDINATES 338551.210, 6238645.407 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION 2 m LOGGED BY Jeffrey YU CHECKED BY AR

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP37A_0.2	Y		SAND	SAND: well graded, dry sand with shell	Dry topsand to sand moist., with shells. Sandstone outcrop from 0.2 m.
					Sandstone platform from 0.2 m. Termination Depth at: 0.2 m	After 0.2 m, sandstone platform.

PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 28/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Excavator TOTAL DEPTH 1.1	COORDINATES 338534.688, 6238643.424 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION 2 m LOGGED BY Jeffrey YU CHECKED BY AR

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP37_1.0	Y		SAND	SAND: well graded, brown with shell	Dry topsand to sand moist., with rocks, and shells.
0.5						
1				Sandstone or boulder	Sandstone platform or boulder from 1 m.	After 1 m, sandstone platform or boulder.
					Termination Depth at: 1.1 m	

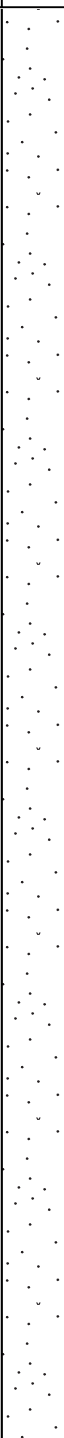
PROJECT NUMBER Little Bay	DRILLING DATE 27/04/2021	COORDINATES 338509.497, 6238634.691
PROJECT NAME Little Bay Beach	DRILLING COMPANY RMA	COORD SYS GDA94 MGA Zone 56
CLIENT RCC	DRILLER RMA	SURFACE ELEVATION 3 m
ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING METHOD Excavator	LOGGED BY Jeffrey YU
	TOTAL DEPTH 2.5	CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
0.5	TP38_0.5	Y		SAND	SAND: Dry topsand, well graded, brown, minor shell, minor glasses up to 1.5 m.	Dry topsand to sand moist. with minor glasses and shells.
1					SAND: well graded, brown, shell and minor glasses up to 1.5 m.	
1.5	TP38_1.5	Y		SAND	SAND: Brown deposited shell sandy layers. Refusal, collapsed sand walls.	After 1.5 m, Brown coarse sand and dominant shell deposit layers with humus hint. Refusal due to rock platform at the bottom.
					Termination Depth at: 1.6 m	

PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 26/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Excavator TOTAL DEPTH 0.1	COORDINATES 338521.049, 6238659.145 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION 0 m LOGGED BY Jeffrey YU CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP39_0.1, TP39_0.1FC01, TP39_0.1FC02	Y		SAND and Boulder	SAND: well graded, brown, shell, glasses, tiles, rocks and ACM fragments (~1.5 Kg). Underlain outcrop.	Wet topsand to sand saturated with rocks, shells and ACM fragments (over 1.5 Kg). Underlain outcrop.
0.1					Termination Depth at: 0.1 m	

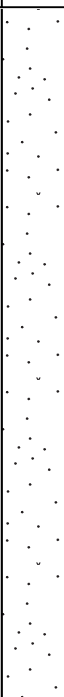
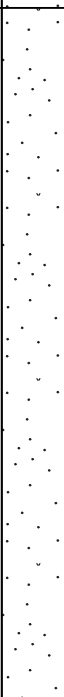
PROJECT NUMBER Little Bay	DRILLING DATE 27/04/2021	COORDINATES 338498.096, 6238650.744
PROJECT NAME Little Bay Beach	DRILLING COMPANY RMA	COORD SYS GDA94 MGA Zone 56
CLIENT RCC	DRILLER RMA	SURFACE ELEVATION 0 - 2 m
ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING METHOD Excavator	LOGGED BY Jeffrey YU
	TOTAL DEPTH 2.0	CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
0.5	TP40_0.5	Y		SAND	SAND: well graded, brown, minor shell, tiles and glasses up to 2 m.	Dry topsand to sand moist., with minor glasses, tiles and shells. Upper tidal line.
1				SAND	SAND: Well graded, brown, moist. After 2 m, underlain brown deposited shell sandy layer with humus hint. Refusal, collapsed sand walls.	Sand with abundant shells. After 2 m, Brown coarse sand and dominant shell deposit layers with humus hint. Refusal.
1.5						
2	TP40_2.0	Y				
					Termination Depth at: 2 m	

PROJECT NUMBER Little Bay	DRILLING DATE 26/04/2021	COORDINATES 338504.697, 6238668.747
PROJECT NAME Little Bay Beach	DRILLING COMPANY RMA	COORD SYS GDA94 MGA Zone 56
CLIENT RCC	DRILLER RMA	SURFACE ELEVATION 0 m
ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING METHOD Excavator	LOGGED BY Jeffrey YU
	TOTAL DEPTH 0.5	CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP41_0.5, TP41_0.5FC01	Y		SAND and Boulder	SAND: well graded, brown, shell, glasses, tiles, rocks and ACM fragments (~1 Kg)	Wet topsand to sand saturated with minor glasses, bricks, shells and ACM fragments.
0.5	TP41_1.0, TP41_1.0FC02	Y		SAND and Boulder	Sand and boulders with several glass, tiles, shells, several ACM fragments (over 1.5 kg)	Sand and boulders with several glass, tiles, shells, several ACM fragments (over 1.5 kg)
1					Termination Depth at: 1.0 m	

PROJECT NUMBER Little Bay	DRILLING DATE 26/04/2021	COORDINATES 338477.904, 6238669.651
PROJECT NAME Little Bay Beach	DRILLING COMPANY RMA	COORD SYS GDA94 MGA Zone 56
CLIENT RCC	DRILLER RMA	SURFACE ELEVATION
ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING METHOD Excavator	LOGGED BY Jeffrey YU
	TOTAL DEPTH 2.5	CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
0.5				SW	SAND: well graded, brown, minor shell	Dry topsand to sand moist.with minor glassess
1				SW	SAND: SW, Well graded, brown, moist.	Sand with abundant shells, minor rock and concrete
1.5						
2	TP42_2.0	Y		SW	SAND: SW, abundant shells, minor rock and minor concrete	
2.5					Termination Depth at: 2.5 m	

PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 26/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Excavator TOTAL DEPTH 0.5	COORDINATES 338490.594, 6238682.849 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION 0 m LOGGED BY Jeffrey YU CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP43_0.5	Y		SAND	SAND: well graded, brown, shell, glasses, tiles, rocks	Wet topsand to sand saturated with minor glasses, bricks, shells
0.5					Termination Depth at: 0.5 m	

PROJECT NUMBER Little Bay PROJECT NAME Little Bay Beach CLIENT RCC ADDRESS 4R Coast Hospital Rd, Little Bay NSW 2036	DRILLING DATE 26/04/2021 DRILLING COMPANY RMA DRILLER RMA DRILLING METHOD Excavator TOTAL DEPTH 0.5	COORDINATES 338480.060, 6238697.349 COORD SYS GDA94 MGA Zone 56 SURFACE ELEVATION LOGGED BY Jeffrey YU CHECKED BY KM

COMMENTS

Depth (m)	Samples	Is Analysed?	Graphic Log	USCS	Material Description	Additional Observations
	TP44_0.5	Y		SW	SAND: well graded, brown, minor shell, bricks, rocks	Wet topsand to sand saturated with minor glasses, bricks, shells
0.5				SW	Termination Depth at: 0.5 m	

Appendix I DSI Analytical Data Summary

Sample No. with Depth	GPS location (GDA 94, MGA Zone 56)	Description	ACM (10L Sample) % w/w	Asbestos NEPM for FA &AF %w/w	Asbestos NEPM for ACM /g	ACM Visually Observed	ACM in 10L Soil collected /g	Depth of Asbestos Contamination /m	Asbestos Type
Northern B each Sand Area (Hotspot along the creek, which originates from Heritage Wall and Crown Gully 1 over 1 m deep eroded)									
TP01_0.2	338516.737, 6238869.021	Fill with bricks, tiles and glasses. Boulders obstacles. NO access for excavation.	NA	<0.001%	NA	N	NA		
TP02_0.3	338506.134, 6238858.629	Silty sand. Rock platform or boulders from 0.3 m.	NA	<0.001%	NA	N	NA		
TP03_0.5	338484.560, 6238858.154	Under weeds, Legacy tip or fill with glasses, tiles, brick, plastic, metal, concrete and coal.	NA	<0.001%	NA	N	NA		
TP03_1.0	338484.560, 6238858.154	Legacy tip or fill with glasses, tiles, brick, plastic, metal, concrete and coal. Boulders and brown silty sand observed from 1 m.	NA	<0.001%	NA	N	NA		
TP04_0.5	338484.560, 6238858.154	Legacy tip or fill with glasses, tiles, brick, plastic, metal, concrete and coal. Boulders and brown silty sand observed from 1 m.	NA	<0.001%	NA	N	NA		
TP04_1.0	338484.560, 6238858.154	Fill with glasses, tiles, brick, plastic, metal, concrete and coal. Boulder and brown silty sand were observed from 1 m.	NA	<0.001%	NA	N	NA		
TP05_0.2	338475.434, 6238855.095	Under weeds, Legacy tip or fill with glasses, tiles, brick, plastic, metal, concrete and coal.	NA	<0.001%	NA	N	NA		
TP05_1.0	338475.434, 6238855.095	Legacy tip or fill with glasses, tiles, brick, plastic, metal, concrete and coal. Boulders and brown silty sand observed from 1 m.	NA	<0.001%	NA	N	NA		
TP06_0.1	338523.700, 6238854.251	Sand. Boulders or outcrop from 0.1 m.	NA	<0.001%	NA	N	NA		
TP07_0.3	338514.733, 6238848.290	Sand. ACM fragment observed on surface. Rock platform or boulders from 0.3 m.	0.0008	<0.001%	NA	Y	1	0.1	Chrysotile
TP08_0.5	338515.524, 6238833.626	Sand with shell, brick, glass, rock over 0.5 m. ACM fragment observed. Refusal due to water seepage. Boulder or sandstone layer from 0.5 m.	NA	<0.001%	NA	Y	NA		Chrysotile
TP09_0.5	338503.813, 6238840.747	Sand with shell, brick, glass, rock over 1.5 m. Silty sand or loam from 1.5 m. Boulder or sandstone layer from 0.5 m up to 1.7 m.	NA	<0.001%	NA	N	NA		
TP09_1.5	338503.813, 6238840.747	Silty sand or loam from 1.5 m. Boulder or sandstone layer from 0.5 m up to 1.7 m.	NA	<0.001%	NA	N	NA		
TP10_0.5	338506.240, 6238829.880	Sand with shell, brick, glass, rock, and tiles up to 0.5 m. ACM fragments observed. Sandstone platform or boulder from 0.3 m.	NA	<0.001%	NA	Y	1	0.5	Chrysotile
TP11_0.5	338484.560, 6238858.154	Sand with boulders. Sandstone platform from 0.5 m.	NA	<0.001%	NA	N	NA		
TP12_01	338497.983, 6238849.011	Boulders or outcrop from 0.1 m.	NA	<0.001%	NA	N	NA		
TP13_0.2	338508.877, 6238850.031	Sand with shell, brick, glass, rock, plastic, and tiles up to 1 m.	NA	<0.001%	NA	N	NA		
TP13_1.0	338508.877, 6238850.031	Sand with shell, brick, glass, rock, plastic, and tiles up to 1 m. Sandstone layer from 1 m.	NA	<0.001%	NA	N	NA		
TP14_0.5	338509.352, 6238841.116	Sand with shell, brick, glass. Water seepage from the creek.	NA	<0.001%	NA	N	NA		
TP15_0.1	338517.348, 6238827.819	Sand with tiles and glasses.	NA	<0.001%	NA	N	NA		
TP16_0.3	338498.011, 6238838.637	Sand with shell, brick, glass, plastic and tiles. ACM fragment observed. Boulders from 0.3 m to over 1 m.	NA	<0.001%	NA	Y	1	0.3	Chrysotile and Crocidolite
TP16_1.0	338498.011, 6238838.637	Boulders from 0.3 m to over 1 m.	NA	<0.001%	NA	N	NA		
TP17_0.5	338498.333, 6238824.666	SAND: well graded, brown with shell, brick, concrete, tiles and glasses up to 1 m.	NA	<0.001%	NA	N	NA		
TP17_1.0	338498.333, 6238824.666	Sand with shell, brick, concrete, tiles and glasses. Sandstone layer observed from 1 m.	NA	<0.001%	NA	N	NA		
TP18_0.5	338510.488, 6238821.828	SAND: well graded, brown with shell, brick, concrete, tiles and glasses up to 1.2 m.	NA	<0.001%	NA	N	NA		
TP18_1.2	338510.488, 6238821.828	Sand with shell, brick, concrete, tiles and glasses. Sandstone layer observed from 1.2 m. Water seepage at around 0.5 m.	NA	<0.001%	NA	N	NA		
TP19_0.3	338487.707, 6238842.207	SAND: well graded, brown with shell and rocks over 1 m. Sandstone boulder gravels from 0.3 m.	NA	<0.001%	NA	N	NA		
TP19_1.0	338487.707, 6238842.207	SAND: with shells and rocks. ACM fragments observed and weathered.	0.0315	<0.001%	NA	Y	42	1	Chrysotile
TP20_0.5	338490.036, 6238830.853	SAND: well graded, brown with shell.	NA	<0.001%	NA	N	NA		
TP20_1.0	338490.036, 6238830.853	SAND: with shells and rocks. Sandstone layer from 1 m.	NA	<0.001%	NA	N	NA		
Middle Beach Sand Area (Hotspot, ACM fragments observed throughout the sand area, up to Rock Area or further into water)									
TP21_0.5	338456.934, 6238798.334	Sand with tiles and glasses. Fill with several bricks, glasses. ACM fragment observed. Sandstone formation from 0.5 m.	0.0023	<0.001%	NA	Y	3	0.5	Chrysotile and Crocidolite
TP22_0.1	338455.440, 6238790.802	Sand with tiles and glasses. ACM fragment observed.	0.0195	<0.001%	NA	Y	26	0.1	Chrysotile and Crocidolite
TP22_1.0	338455.440, 6238790.802	Fill with several bricks, tiles, concrete, glasses. Stained sand from 0.2 m.	NA	<0.001%	NA	N	NA		
TP23_0.1	338457.680, 6238781.403	Sand with bricks, tiles and glasses. Sandstone from 0.1 m	0.0015	<0.001%	NA	Y	2	0.1	Chrysotile and Crocidolite
TP24_0.3	338466.893, 6238784.391	Sand with bricks, tiles and glasses. ACM fragment observed in the following day.	NA	<0.001%	NA	Y	114	0.3	Chrysotile and Crocidolite
TP25_0.3	338468.816, 6238796.992	Sand with bricks, tiles and glasses. ACM fragment observed. Sandstone formation from 0.3 m.	0.0008	<0.001%	NA	Y	1	0.3	Chrysotile
TP26_0.5	338474.809, 6238789.684	Sand with bricks, tiles and glasses. Sandstone formation from 0.7 m.	NA	<0.001%	NA	N	NA		
TP27_0.5	338483.214, 6238796.335	Sand with bricks, tiles and glasses. Sandstone formation from 0.5 m.	NA	<0.001%	NA	N	NA		
TP28_0.5	338483.653, 6238787.930	Sand with bricks, tiles and glasses. ACM fragment observed.	NA	<0.001%	2.4 (0.013% w/w)	N	NA	0.5	Chrysotile
TP29_0.3	338494.529, 6238793.541	Sand with bricks, tiles and glasses.	NA	<0.001%	NA	N	NA		
TP29_0.5	338494.529, 6238793.541	Sand with rocks, tiles and glasses. ACM fragment observed.	0.0008	<0.001%	NA	Y	1	0.5	Chrysotile and Amosite
Southern Beach Sand Area (Hotspot around the downstream of Crown Gully 3, Stormwater Pipe up to Rock Area or further; other sand areas were neither detected nor observed with ACM fragments)									
TP30_1.0	338461.108, 6238702.353	SAND: well graded, brown with shell over 2 m.	NA	<0.001%	NA	N	NA		
TP30_2.2	338461.108, 6238702.353	Brown silty sand layer observed. Refusal due to sand wall collapsed.	NA	<0.001%	NA	N	NA		
TP31_0.5	338463.018, 6238677.383	Dry topsand to sand moist., with shells Over 2 m. Refusal due to sand wall collapsed.	NA	<0.001%	NA	N	NA		
TP31_2.0	338463.018, 6238677.383	Dry topsand to sand moist., with shells Over 2 m. Refusal due to sand wall collapsed.	NA	<0.001%	NA	N	NA		
TP32_1.0	338474.344, 6238657.051	Dry topsand to sand moist., with shells Over 2.5 m. Refusal due to sand wall collapsed.	NA	<0.001%	NA	N	NA		

TP32_2.5	338474.344, 6238657.051	Dry topsand to sand moist., with shells Over 2.5 m. Refusal due to sand wall collapsed.	NA	<0.001%	NA	N	NA		
TP33_1.0	338487.443, 6238639.449	Dry topsand to sand moist., with shells. Over 2.5 m. Refusal due to sand wall collapsed.	NA	<0.001%	NA	N	NA		
TP33_2.2	338487.443, 6238639.449	Dry topsand to sand moist., with shells. Over 2.5 m. Refusal due to sand wall collapsed.	NA	<0.001%	NA	N	NA		
TP34_0.5	338501.361, 6238617.617	SAND: well graded, brown with shell	NA	<0.001%	NA	N	NA		
TP34_2.6	338501.361, 6238617.617	After 2.5 m, Black silty clay or sandy clay with abundant shell deposit.	NA	<0.001%	NA	N	NA		
TP35_0.25	338517.899, 6238621.489	SAND: well graded, brown, minor shell, tiles and glasses up to 1.5 m.	NA	<0.001%	NA	N	NA		
TP35_1.5	338517.899, 6238621.489	SAND: Well graded, brown, moist. After 1.5 m, underlain brown deposited sandy layer with rock platform and boulders.	NA	<0.001%	NA	N	NA		
TP36_0.5	338533.032, 6238630.959	Dry topsand to sand moist., with rocks, and shells. ACM fragments.	NA	<0.001%	NA	Y	NA		0.5
TP37A_0.2	338551.210, 6238645.407	Dry topsand to sand moist., with shells. Sandstone outcrop from 0.2 m.	NA	<0.001%	NA	N	NA		
TP37_1.0	338534.688, 6238643.424	Dry topsand to sand moist., with rocks, and shells.	NA	<0.001%	NA	N	NA		
TP38_0.5	338509.497, 6238634.691	Dry topsand to sand moist. with minor glasses and shells.	NA	<0.001%	NA	N	NA		
TP38_1.5	338509.497, 6238634.691	After 1.5 m, Brown coarse sand and dominant shell deposit layers with humus hint. Refusal due to rock platform at the bottom.	NA	<0.001%	NA	N	NA		
TP39_0.1	338521.049, 6238659.145	SAND: well graded, brown, shell, glasses, tiles, rocks and ACM fragments (~1.5 Kg). Underlain outcrop.	0.121	<0.001%	NA	Y	161	0.1	Chrysotile
TP40_0.5	338498.096, 6238650.744	Dry topsand to sand moist., with minor glasses, tiles and shells. Upper tidal line.	NA	<0.001%	NA	N	NA		
TP40_2.0	338498.096, 6238650.744	Sand with abundant shells. After 2 m, Brown coarse sand and dominant shell deposit layers with humus hint. Refusal.	NA	<0.001%	NA	N	NA		
TP41_0.5	338504.697, 6238668.747	SAND: well graded, brown, shell, glasses, tiles, rocks and ACM fragments (~1 Kg)	0.176	<0.001%	NA	Y	235	1	Chrysotile
TP41_1.0	338504.697, 6238668.747	Sand and boulders with several glass, tiles, shells, several ACM fragments (over 1.5 kg)	1.125	<0.001%	NA	Y	1500	1	Chrysotile
TP42_2.0	338477.904, 6238669.651	Sand with abundant shells, minor rock and concrete.	NA	<0.001%	NA	N	NA		
TP43_0.5	338490.594, 6238682.849	Wet topsand to sand saturated with minor glasses, bricks, shells	NA	<0.001%	NA	N	NA		
TP44_0.5	338480.060, 6238697.349	Wet topsand to sand saturated with minor glasses, bricks, shells	NA	<0.001%	NA	N	NA		

TRINITAS	ACM (10L Sample) /% w/w	Asbestos NEPM for FA & AF %w/w	Asbestos NEPM for ACM /g	ACM Visually Observed	ACM (10L sample) collected /g	Depth of Asbestos Contamination
Bonded Asbestos HSL C	0.02	NA				
Friable Asbestos HSL C	NA	0.001				
NO Asbestos fragment on surface						
TP No. > HSL C	4					
TP No. Positive				15		

Notes to Table

ND – Not detected / below Practical Quantitation Limit (PQL).
NA – Not Applicable
Landuse: Public Open Space C
All FC sheeting fragments on the beach surface are highly polished.
All FC sheeting fragments under rock or under water are in a fair or slightly weathered condition.

Gravimetric Concentration Calculation	asbestos content in %w/w	Soil density /Kg/L	Bucket soil /L
	15	2	10

cement Brown fine-grained sandy soil

Appendix J Laboratory Analysis Results

AI Chain of Custody



Chain of Custody					
Client Name		Trinitas Group Pty Ltd			
Client Address		Level 3, 24 Hunter St, Parramatta NSW 2150			
Project Name		Little Bay Beach			
Project Manager Name		Denny Bolatti			
Project Manager Contact Number		0412827006			
Lab Results Email Distribution		labreports@trinitasgroup.com.au			
Consultant Name		Jeffrey Yu			
Sample Analysis Turn Around Time (TAT)		Standard 5 day			
Relinquished By:		Received by Name:	Received Date:	Received by Time:	Received by Signature:
Jeffrey Yu	Jeffrey Yu	Gina Turnen	30/4	2:15	

791697



AI Chain of Custody



Sample Information					
ITEM		SAMPLE ID and MATERIAL	DATE	TOTAL CONTAINERS	ANALYSIS REQUIRED
1		TP42_0.5, Sand with shell and minor glasses	26/04/2021	1	Asbestos in Soil Analysis NEPM
2		TP42_2.0, Sand with shell	26/04/2021	1	Asbestos in Soil Analysis NEPM
3		TP44_0.5, Sand with rocks, shells and bricks.	26/04/2021	1	Asbestos in Soil Analysis NEPM
4		TP43_0.5, Sand with rock, glass, shell, and tiles	26/04/2021	1	Asbestos in Soil Analysis NEPM
5		TP41_0.5, Sand and rock with tiles, abundant glass and fibro cement pieces	26/04/2021	1	Asbestos in Soil Analysis NEPM
6		TP41_0.5FC01, FC sheeting fragments around 10cm×10cm	26/04/2021	1	Asbestos
7		TP41_1.0FC02, Sand and rock with abundant glass and tiles.	26/04/2021	1	Asbestos



791697

AI Chain of Custody



Sample Information					
ITEM		SAMPLE ID and MATERIAL	DATE	TOTAL CONTAINERS	ANALYSIS REQUIRED
8		TP41_1.0, Sand and rock with glass, tiles and shell, ACM fragments.	26/04/2021	1	Asbestos in Soil Analysis NEPM
9		TP39_0.1FC01, Rock and several FC sheeting fragments (including one 6cm×20cm corrugated sheeting)	26/04/2021	1	Asbestos
10		TP39_0.1, Rock and sand with FC sheeting fragments 1.5 kg.	26/04/2021	1	Asbestos in Soil Analysis NEPM
11		TP39_0.1FC02, Two FC sheeting fragments	26/04/2021	1	Asbestos
TOTAL				11	

791697



Australia
Melbourne

6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney

Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane

1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth

46-48 Banksia Road
Welshpool WA 6106
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Newcastle

4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

New Zealand
Auckland

35 O'Rourke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch

43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Sample Receipt Advice

Company name: Trinitas Group Pty Ltd
Contact name: - RESULTS/SRAs
Project name: LITTLE BAY BEACH
Project ID: Not provided
Turnaround time: 5 Day
Date/Time received: Apr 30, 2021 2:15 PM
Eurofins reference: 791697

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- N/A Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

TP42_0.5 not received, analysis cancelled. TP40_0.5 received extra and placed for analysis, please confirm.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Elvis Dsouza on phone : or by email: ElvisDsouza@eurofins.com

Results will be delivered electronically via email to - RESULTS/SRAs - labreports@trinitasgroup.com.au.

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
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35 O'Rourke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Trinitas Group Pty Ltd
Address: Level 3, 24 Hunter Street
Parramatta
NSW 2150
Project Name: LITTLE BAY BEACH

Order No.:
Report #: 791697
Phone: 02 8810 4445
Fax: 02 8016 0875

Received: Apr 30, 2021 2:15 PM
Due: May 7, 2021
Priority: 5 Day
Contact Name: - RESULTS/SRAs

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
Mayfield Laboratory - NATA Site # 25079								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	TP42_0.5	Apr 26, 2021		Soil	S21-Ap57827			X
2	TP42_2.0	Apr 26, 2021		Soil	S21-Ap57828	X		
3	TP44_0.5	Apr 26, 2021		Soil	S21-Ap57829	X		
4	TP43_0.5	Apr 26, 2021		Soil	S21-Ap57830	X		
5	TP41_0.5	Apr 26, 2021		Soil	S21-Ap57831	X		
6	TP41_0.5FC01	Apr 26, 2021		Building Materials	S21-Ap57832		X	
7	TP41_1.0FC02	Apr 26, 2021		Building Materials	S21-Ap57833		X	
8	TP41_1.0	Apr 26, 2021		Soil	S21-Ap57834	X		

Company Name: Trinitas Group Pty Ltd
Address: Level 3, 24 Hunter Street
Parramatta
NSW 2150
Project Name: LITTLE BAY BEACH

Order No.:
Report #: 791697
Phone: 02 8810 4445
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Received: Apr 30, 2021 2:15 PM
Due: May 7, 2021
Priority: 5 Day
Contact Name: - RESULTS/SRAS

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Sample Detail						Asbestos - WA guidelines	Asbestos Absence / Presence	CANCELLED
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
Mayfield Laboratory - NATA Site # 25079								
External Laboratory								
9	TP39_0.1FC01	Apr 26, 2021		Building Materials	S21-Ap57835		X	
10	TP39_0.1	Apr 26, 2021		Soil	S21-Ap57836	X		
11	TP39_0.1FC02	Apr 26, 2021		Building Materials	S21-Ap57837		X	
12	TP40_0.5	Apr 26, 2021		Soil	S21-Ap58064	X		
Test Counts						7	4	1

Trinitas Group Pty Ltd
Level 3, 24 Hunter Street
Parramatta
NSW 2150



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025—Testing
 NATA is a signatory to the ILAC Mutual Recognition
 Arrangement for the mutual recognition of the
 equivalence of testing, medical testing, calibration,
 inspection and proficiency testing scheme providers
 reports.

Attention: - RESULTS/SRAs
Report 791697-AID
Project Name **LITTLE BAY BEACH**
Received Date Apr 30, 2021
Date Reported May 05, 2021

Methodology:

Asbestos Fibre
 Identification

Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques.
NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.

Unknown Mineral
 Fibres

Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity.
NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.

Subsampling Soil
 Samples

The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed.
NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.

Bonded asbestos-
 containing material
 (ACM)

The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 4964 - 2004.
NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.

Limit of Reporting

The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w).
 The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk).
NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos". This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.

Project Name LITTLE BAY BEACH
Project ID
Date Sampled Apr 26, 2021
Report 791697-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP42_2.0	21-Ap57828	Apr 26, 2021	Approximate Sample 680g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP44_0.5	21-Ap57829	Apr 26, 2021	Approximate Sample 690g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP43_0.5	21-Ap57830	Apr 26, 2021	Approximate Sample 712g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP41_0.5	21-Ap57831	Apr 26, 2021	Approximate Sample 676g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP41_0.5FC01	21-Ap57832	Apr 26, 2021	Approximate Sample 235g / 200x100x7mm Sample consisted of: Grey fibre cement material	Chrysotile asbestos detected.
TP41_1.0FC02	21-Ap57833	Apr 26, 2021	Approximate Sample 5g / 150x50x4mm Sample consisted of: Grey compressed fibre cement material	Chrysotile asbestos detected.
TP41_1.0	21-Ap57834	Apr 26, 2021	Approximate Sample 568g Sample consisted of: Brown coarse-grained sandy soil, plaster, glass, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP39_0.1FC01	21-Ap57835	Apr 26, 2021	Approximate Sample 59g / 200x40x5mm Sample consisted of: Grey fibre cement material	Chrysotile asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP39_0.1	21-Ap57836	Apr 26, 2021	Approximate Sample 661g Sample consisted of: Brown coarse-grained sandy soil, corroded metal, coal, glass, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP39_0.1FC02	21-Ap57837	Apr 26, 2021	Approximate Sample 102g / 160x150x4mm Sample consisted of: Grey compressed fibre cement material	Chrysotile asbestos detected.
TP40_0.5	21-Ap58064	Apr 26, 2021	Approximate Sample 637g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Apr 30, 2021	Indefinite
Asbestos - LTM-ASB-8020	Sydney	Apr 30, 2021	Indefinite

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
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NATA # 1261 Site # 20794

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Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name: Trinitas Group Pty Ltd
Address: Level 3, 24 Hunter Street
Parramatta
NSW 2150
Project Name: LITTLE BAY BEACH

Order No.:
Report #: 791697
Phone: 02 8810 4445
Fax: 02 8016 0875

Received: Apr 30, 2021 2:15 PM
Due: May 5, 2021
Priority: 3 Day
Contact Name: - RESULTS/SRAs

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
Mayfield Laboratory - NATA Site # 25079								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	TP42_0.5	Apr 26, 2021		Soil	S21-Ap57827			X
2	TP42_2.0	Apr 26, 2021		Soil	S21-Ap57828	X		
3	TP44_0.5	Apr 26, 2021		Soil	S21-Ap57829	X		
4	TP43_0.5	Apr 26, 2021		Soil	S21-Ap57830	X		
5	TP41_0.5	Apr 26, 2021		Soil	S21-Ap57831	X		
6	TP41_0.5FC01	Apr 26, 2021		Building Materials	S21-Ap57832		X	
7	TP41_1.0FC02	Apr 26, 2021		Building Materials	S21-Ap57833		X	
8	TP41_1.0	Apr 26, 2021		Soil	S21-Ap57834	X		

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Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
Mayfield Laboratory - NATA Site # 25079								
External Laboratory								
9	TP39_0.1FC0 1	Apr 26, 2021		Building Materials	S21-Ap57835		X	
10	TP39_0.1	Apr 26, 2021		Soil	S21-Ap57836	X		
11	TP39_0.1FC0 2	Apr 26, 2021		Building Materials	S21-Ap57837		X	
12	TP40_0.5	Apr 26, 2021		Soil	S21-Ap58064	X		
Test Counts						7	4	1

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to "non-bonded / friable".
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory's remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Laxman Dias Senior Analyst-Asbestos (NSW)

Authorised by:

Chamath JHM Annakkage Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Chain of Custody					
Client Name		Trinitas Group Pty Ltd			
Client Address		Level 3, 24 Hunter St, Parramatta NSW 2150			
Project Name		Little Bay Beach			
Project Manager Name		Denny Bolatti			
Project Manager Contact Number		0412827006			
Lab Results Email Distribution		labreports@trinitasgroup.com.au			
Consultant Name		Jeffrey Yu			
Sample Analysis Turn Around Time (TAT)		Standard 5 day			
Relinquished By:		Received by Name:	Received Date:	Received by Time:	Received by Signature:
Jeffrey Yu	Jeffrey Yu	Grove Tucker	30/4	2:15	

791702

AI Chain of Custody



Sample Information					
ITEM	SAMPLE ID and MATERIAL	DATE	TOTAL CONTAINERS	ANALYSIS REQUIRED	
1	TP40_0.5, Sand with shells, minor tiles and glass up to 2m.	27/04/2021	1	Asbestos in Soil Analysis NEPM	
2	TP40_2.0, Brown Coarse sand and dominant shell deposit layer with humus hint	27/04/2021	1	Asbestos in Soil Analysis NEPM	
3	TP38_0.5, Sand with shells and minor glasses up to 1.5m.	27/04/2021	1	Asbestos in Soil Analysis NEPM	
4	TP38_1.5, Well graded Brown sand with minor glasses and then dominant shell deposits and rocks at the bottom	27/04/2021	1	Asbestos in Soil Analysis NEPM	
5	TP35_0.25, Sand with shells and glasses and several bricks.	27/04/2021	1	Asbestos in Soil Analysis NEPM	



791702

Sample Information				
ITEM	SAMPLE ID and MATERIAL	DATE	TOTAL CONTAINERS	ANALYSIS REQUIRED
6	TP35_1.5, Rock platform and boulders with dark to brown sandy deposit.	27/04/2021	1	Asbestos in Soil Analysis NEPM
7	TP34_0.5, Sand with shells up to 2.5m.	27/04/2021	1	Asbestos in Soil Analysis NEPM
8	TP34_2.5, Dark silty clay	27/04/2021	1	Asbestos in Soil Analysis NEPM
9	TP33_1.0, Sand with shells up to 2m.	27/04/2021	1	Asbestos in Soil Analysis NEPM
10	TP33_2.2, Sand with shells over 2.5m.	27/04/2021	1	Asbestos in Soil Analysis NEPM
11	TP32_1.0, Sand with shells up to 2.5m.	27/04/2021	1	Asbestos in Soil Analysis NEPM
12	TP32_2.5, Sand with shell over 2.5m.	27/04/2021	1	Asbestos in Soil Analysis NEPM
13	TP31_0.5, Sand with shells.	27/04/2021	1	Asbestos in Soil Analysis NEPM
14	TP31_2.0, Sand with shells over 2m.	27/04/2021	1	Asbestos in Soil Analysis NEPM

291702

Sample Information					
ITEM	SAMPLE ID and MATERIAL	DATE	TOTAL CONTAINERS	ANALYSIS REQUIRED	
15	TP30_1.0, Sand with shells over 2m.	27/04/2021	1	Asbestos in Soil Analysis NEPM	
16	TP30_2.2, Brown silty sand layer with shells.	27/04/2021	1	Asbestos in Soil Analysis NEPM	
TOTAL			16		

791702

Australia

Melbourne

6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney

Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
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IANZ # 1290

Sample Receipt Advice

Company name: Trinitas Group Pty Ltd
Contact name: - RESULTS/SRAs
Project name: LITTLE BAY BEACH
Project ID: Not provided
Turnaround time: 3 Day
Date/Time received: Apr 30, 2021 2:15 PM
Eurofins reference: 791702

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- N/A Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Elvis Dsouza on phone : or by email: ElvisDsouza@eurofins.com

Results will be delivered electronically via email to - RESULTS/SRAs - labreports@trinitasgroup.com.au.

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Phone : 0800 856 450
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Company Name: Trinitas Group Pty Ltd
Address: Level 3, 24 Hunter Street
Parramatta
NSW 2150
Project Name: LITTLE BAY BEACH

Order No.:
Report #: 791702
Phone: 02 8810 4445
Fax: 02 8016 0875

Received: Apr 30, 2021 2:15 PM
Due: May 5, 2021
Priority: 3 Day
Contact Name: - RESULTS/SRAs

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
Mayfield Laboratory - NATA Site # 25079							
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	TP40 0.5	Apr 27, 2021		Soil	S21-Ap57839		X
2	TP40 2.0	Apr 27, 2021		Soil	S21-Ap57840		X
3	TP38 0.5	Apr 27, 2021		Soil	S21-Ap57841		X
4	TP38 1.5	Apr 27, 2021		Soil	S21-Ap57842		X
5	TP35 0.25	Apr 27, 2021		Soil	S21-Ap57843		X
6	TP35 1.5	Apr 27, 2021		Soil	S21-Ap57844		X
7	TP34 0.5	Apr 27, 2021		Soil	S21-Ap57845		X
8	TP34 2.5	Apr 27, 2021		Soil	S21-Ap57846	X	
9	TP33 1.0	Apr 27, 2021		Soil	S21-Ap57847		X
10	TP33 2.2	Apr 27, 2021		Soil	S21-Ap57848		X

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Received: Apr 30, 2021 2:15 PM
Due: May 5, 2021
Priority: 3 Day
Contact Name: - RESULTS/SRAs

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
Mayfield Laboratory - NATA Site # 25079							
External Laboratory							
11	TP32	1.0	Apr 27, 2021	Soil	S21-Ap57849		X
12	TP32	2.5	Apr 27, 2021	Soil	S21-Ap57850		X
13	TP31	0.5	Apr 27, 2021	Soil	S21-Ap57851		X
14	TP31	2.0	Apr 27, 2021	Soil	S21-Ap57852		X
15	TP30	1.0	Apr 27, 2021	Soil	S21-Ap57853		X
16	TP30	2.2	Apr 27, 2021	Soil	S21-Ap57854		X
Test Counts						1	15

Trinitas Group Pty Ltd
Level 3, 24 Hunter Street
Parramatta
NSW 2150



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025—Testing
 NATA is a signatory to the ILAC Mutual Recognition
 Arrangement for the mutual recognition of the
 equivalence of testing, medical testing, calibration,
 inspection and proficiency testing scheme providers
 reports.

Attention: - RESULTS/SRAs
Report 791702-AID
Project Name **LITTLE BAY BEACH**
Received Date Apr 30, 2021
Date Reported May 05, 2021

Methodology:

Asbestos Fibre
 Identification

Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques.

NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.

Unknown Mineral
 Fibres

Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity.

NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.

Subsampling Soil
 Samples

The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed.

NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.

Bonded asbestos-
 containing material
 (ACM)

The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 4964 - 2004.

NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.

Limit of Reporting

The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w).

The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk).

NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos". This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.

Project Name LITTLE BAY BEACH
Project ID
Date Sampled Apr 27, 2021
Report 791702-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP40_0.5	21-Ap57839	Apr 27, 2021	Approximate Sample 562g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP40_2.0	21-Ap57840	Apr 27, 2021	Approximate Sample 606g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP38_0.5	21-Ap57841	Apr 27, 2021	Approximate Sample 841g Sample consisted of: Brown coarse-grained sandy soil, corroded metal, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP38_1.5	21-Ap57842	Apr 27, 2021	Approximate Sample 812g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP35_0.25	21-Ap57843	Apr 27, 2021	Approximate Sample 850g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP35_1.5	21-Ap57844	Apr 27, 2021	Approximate Sample 706g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP34_0.5	21-Ap57845	Apr 27, 2021	Approximate Sample 817g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP34_2.5	21-Ap57846	Apr 27, 2021	Approximate Sample 162g Sample consisted of: Black coarse-grained soil, charcoal, organic debris and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP33_1.0	21-Ap57847	Apr 27, 2021	Approximate Sample 771g Sample consisted of: Brown coarse-grained sandy soil, coal, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP33_2.2	21-Ap57848	Apr 27, 2021	Approximate Sample 705g Sample consisted of: Brown coarse-grained sandy soil, corroded metal, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP32_1.0	21-Ap57849	Apr 27, 2021	Approximate Sample 706g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP32_2.5	21-Ap57850	Apr 27, 2021	Approximate Sample 756g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP31_0.5	21-Ap57851	Apr 27, 2021	Approximate Sample 796g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP31_2.0	21-Ap57852	Apr 27, 2021	Approximate Sample 706g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP30_1.0	21-Ap57853	Apr 27, 2021	Approximate Sample 710g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP30_2.2	21-Ap57854	Apr 27, 2021	Approximate Sample 791g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	May 05, 2021	Indefinite
Asbestos - LTM-ASB-8020	Sydney	May 05, 2021	Indefinite

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
46-48 Banksia Road
Welshpool WA 6106
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name: Trinitas Group Pty Ltd
Address: Level 3, 24 Hunter Street
Parramatta
NSW 2150
Project Name: LITTLE BAY BEACH

Order No.:
Report #: 791702
Phone: 02 8810 4445
Fax: 02 8016 0875

Received: Apr 30, 2021 2:15 PM
Due: May 5, 2021
Priority: 3 Day
Contact Name: - RESULTS/SRAs

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
Mayfield Laboratory - NATA Site # 25079							
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	TP40 0.5	Apr 27, 2021		Soil	S21-Ap57839		X
2	TP40 2.0	Apr 27, 2021		Soil	S21-Ap57840		X
3	TP38 0.5	Apr 27, 2021		Soil	S21-Ap57841		X
4	TP38 1.5	Apr 27, 2021		Soil	S21-Ap57842		X
5	TP35 0.25	Apr 27, 2021		Soil	S21-Ap57843		X
6	TP35 1.5	Apr 27, 2021		Soil	S21-Ap57844		X
7	TP34 0.5	Apr 27, 2021		Soil	S21-Ap57845		X
8	TP34 2.5	Apr 27, 2021		Soil	S21-Ap57846	X	
9	TP33 1.0	Apr 27, 2021		Soil	S21-Ap57847		X
10	TP33 2.2	Apr 27, 2021		Soil	S21-Ap57848		X

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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Lane Cove West NSW 2066
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NATA # 1261 Site # 18217

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Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

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PO Box 60 Wickham 2293
Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

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Phone : +64 9 526 45 51
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Christchurch
43 Detroit Drive
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ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name: Trinitas Group Pty Ltd
Address: Level 3, 24 Hunter Street
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NSW 2150
Project Name: LITTLE BAY BEACH

Order No.:
Report #: 791702
Phone: 02 8810 4445
Fax: 02 8016 0875

Received: Apr 30, 2021 2:15 PM
Due: May 5, 2021
Priority: 3 Day
Contact Name: - RESULTS/SRAs

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Asbestos - AS4964	Asbestos - WA guidelines
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
Mayfield Laboratory - NATA Site # 25079							
External Laboratory							
11	TP32	1.0	Apr 27, 2021	Soil	S21-Ap57849		X
12	TP32	2.5	Apr 27, 2021	Soil	S21-Ap57850		X
13	TP31	0.5	Apr 27, 2021	Soil	S21-Ap57851		X
14	TP31	2.0	Apr 27, 2021	Soil	S21-Ap57852		X
15	TP30	1.0	Apr 27, 2021	Soil	S21-Ap57853		X
16	TP30	2.2	Apr 27, 2021	Soil	S21-Ap57854		X
Test Counts						1	15

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to "non-bonded / friable".
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory's remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Laxman Dias Senior Analyst-Asbestos (NSW)

Authorised by:

Chamath JHM Annakkage Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

AI Chain of Custody



Chain of Custody				
Client Name	Trinitas Group Pty Ltd			
Client Address	Level 3, 24 Hunter St, Parramatta NSW 2150			
Project Name	Little Bay Beach			
Project Manager Name	Denny Bolatti			
Project Manager Contact Number	0412827006			
Lab Results Email Distribution	labreports@trinitasgroup.com.au			
Consultant Name	Jeffrey Yu			
Sample Analysis Turn Around Time (TAT)	Standard 5 day			
Relinquished By:	Received by Name:	Received Date:	Received by Time:	Received by Signature:
Jeffrey Yu	Grave Tumareu Jeffrey Yu	29/14	2:15	

29/14/23



AI Chain of Custody

Sample Information					
ITEM		SAMPLE ID and MATERIAL	DATE	TOTAL CONTAINERS	ANALYSIS REQUIRED
1		TP17_0.5, sand with brick concrete tile and glass up to 1.0 m, bedrock and water table at 1.0	28/04/2021	1	Asbestos in Soil Analysis NEPM
2		TP17_1.0, wet sand with shells	28/04/2021	1	Asbestos in Soil Analysis NEPM
3		TP18_0.5, Coarse sand with brick, tile, gravels, pebbles and shells up to 1.2m	28/04/2021	1	Asbestos in Soil Analysis NEPM
4		TP18_1.2, bedrock and water table at 1.2, sand with gravels and shells	28/04/2021	1	Asbestos in Soil Analysis NEPM
TOTAL				4	

791703

Australia

Melbourne 6 Monterey Road Dandenong South VIC 3175 Phone : +61 3 8564 5000 NATA # 1261 Site # 1254 & 14271	Sydney Unit F3, Building F 16 Mars Road Lane Cove West NSW 2066 Phone : +61 2 9900 8400 NATA # 1261 Site # 18217	Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone : +61 7 3902 4600 NATA # 1261 Site # 20794	Perth 46-48 Banksia Road Welshpool WA 6106 Phone : +61 8 9251 9600 NATA # 1261 Site # 23736	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079	New Zealand Auckland 35 O'Rorke Road Penrose, Auckland 1061 Phone : +64 9 526 45 51 IANZ # 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Phone : 0800 856 450 IANZ # 1290

Sample Receipt Advice

Company name:	Trinitas Group Pty Ltd
Contact name:	- RESULTS/SRAs
Project name:	LITTLE BAY BEACH
Project ID:	Not provided
Turnaround time:	5 Day
Date/Time received	Apr 30, 2021 2:15 PM
Eurofins reference	791703

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Elvis Dsouza on phone : or by email: ElvisDsouza@eurofins.com

Results will be delivered electronically via email to - RESULTS/SRAs - labreports@trinitasgroup.com.au.

Australia

Melbourne
6 Monterey Road
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Site # 1254 & 14271

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Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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PO Box 60 Wickham 2293
Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

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IANZ # 1327

Christchurch
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Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name: Trinitas Group Pty Ltd
Address: Level 3, 24 Hunter Street
Parramatta
NSW 2150
Project Name: LITTLE BAY BEACH

Order No.:
Report #: 791703
Phone: 02 8810 4445
Fax: 02 8016 0875

Received: Apr 30, 2021 2:15 PM
Due: May 7, 2021
Priority: 5 Day
Contact Name: - RESULTS/SRAs

Eurofins Analytical Services Manager : Elvis Dsouza

Asbestos - WA guidelines

Sample Detail

Melbourne Laboratory - NATA Site # 1254 & 14271

Sydney Laboratory - NATA Site # 18217

Brisbane Laboratory - NATA Site # 20794

Perth Laboratory - NATA Site # 23736

Mayfield Laboratory - NATA Site # 25079

External Laboratory

No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
1	TP17 0.5	Apr 28, 2021		Soil	S21-Ap57855	X
2	TP17 1.0	Apr 28, 2021		Soil	S21-Ap57856	X
3	TP18 0.5	Apr 28, 2021		Soil	S21-Ap57857	X
4	TP18 1.2	Apr 28, 2021		Soil	S21-Ap57858	X
Test Counts						4

Trinitas Group Pty Ltd
Level 3, 24 Hunter Street
Parramatta
NSW 2150



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025—Testing
 NATA is a signatory to the ILAC Mutual Recognition
 Arrangement for the mutual recognition of the
 equivalence of testing, medical testing, calibration,
 inspection and proficiency testing scheme providers
 reports.

Attention: - RESULTS/SRAs
Report 791703-AID
Project Name LITTLE BAY BEACH
Received Date Apr 30, 2021
Date Reported May 05, 2021

Methodology:

Asbestos Fibre
 Identification

Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques.
NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.

Unknown Mineral
 Fibres

Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity.
NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.

Subsampling Soil
 Samples

The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed.
NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.

Bonded asbestos-
 containing material
 (ACM)

The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 4964 - 2004.
NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.

Limit of Reporting

The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w).
 The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk).
NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos". This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.

Project Name LITTLE BAY BEACH
Project ID
Date Sampled Apr 28, 2021
Report 791703-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP17_0.5	21-Ap57855	Apr 28, 2021	Approximate Sample 791g Sample consisted of: Brown coarse-grained sandy soil, coal, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP17_1.0	21-Ap57856	Apr 28, 2021	Approximate Sample 766g Sample consisted of: Brown coarse-grained sandy soil, corroded metal, glass, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP18_0.5	21-Ap57857	Apr 28, 2021	Approximate Sample 650g Sample consisted of: Brown coarse-grained sandy soil, glass, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP18_1.2	21-Ap57858	Apr 28, 2021	Approximate Sample 650g Sample consisted of: Brown coarse-grained sandy soil, glass, brick, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Apr 30, 2021	Indefinite

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
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Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

New Zealand

Auckland
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Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name: Trinitas Group Pty Ltd
Address: Level 3, 24 Hunter Street
Parramatta
NSW 2150
Project Name: LITTLE BAY BEACH

Order No.:
Report #: 791703
Phone: 02 8810 4445
Fax: 02 8016 0875

Received: Apr 30, 2021 2:15 PM
Due: May 5, 2021
Priority: 3 Day
Contact Name: - RESULTS/SRAs

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Asbestos - WA guidelines
						X
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						
Mayfield Laboratory - NATA Site # 25079						
External Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
1	TP17 0.5	Apr 28, 2021		Soil	S21-Ap57855	X
2	TP17 1.0	Apr 28, 2021		Soil	S21-Ap57856	X
3	TP18 0.5	Apr 28, 2021		Soil	S21-Ap57857	X
4	TP18 1.2	Apr 28, 2021		Soil	S21-Ap57858	X
Test Counts						4

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to "non-bonded / friable".
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory's remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Laxman Dias Senior Analyst-Asbestos (NSW)

Authorised by:

Chamath JHM Annakkage Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Chain of Custody				
Client Name	Trinitas Group Pty Ltd			
Client Address	Level 3, 24 Hunter St, Parramatta NSW 2150			
Project Name	Little Bay Beach			
Project Manager Name	Denny Bolatti			
Project Manager Contact Number	0412827006			
Lab Results Email Distribution	labreports@trinitasgroup.com.au			
Consultant Name	Jeffrey Yu			
Sample Analysis Turn Around Time (TAT)	Standard 5 day			
Relinquished By:	Received by Name:	Received Date:	Received by Time:	Received by Signature:
Jeffrey Yu	Jeffrey Yu	30/4	2:15	

Supplier on scheme
Performance and Management Ratings

NSW
Government

S **Investment**
90% Profit
Quality
Safety
Service
People

S **Investment**
90% Profit
Quality
Safety
Service
People

S **Investment**
90% Profit
Quality
Safety
Service
People

AI Chain of Custody

Sample Information					
ITEM		SAMPLE ID and MATERIAL	DATE	TOTAL CONTAINERS	ANALYSIS REQUIRED
1		TP37_0.2, Sand with shells, sandstone at 0.2m	28/04/2021	1	Asbestos in Soil Analysis NEPM
2		TP36_0.5, sand and shells, small suspected ACM fragment 1cm, sandstone boulders at 0.6	28/04/2021	1	Asbestos in Soil Analysis NEPM
3		TP37_1.0, Sandstone layer, small shell and sand with sandstone boulders	28/04/2021	1	Asbestos in Soil Analysis NEPM
4		TP19_0.3, sand with some shell material, sandstone gravel at 0.3	28/04/2021	1	Asbestos in Soil Analysis NEPM
5		TP19_1.0FC01, Fibre cement sheet	28/04/2021	1	Asbestos
6		TP19_1.0, large sandstone boulders,	28/04/2021	1	Asbestos in Soil Analysis NEPM



Supplier on scheme
Performance and Management Services

791704

AI Chain of Custody

Sample Information					
ITEM		SAMPLE ID and MATERIAL	DATE	TOTAL CONTAINERS	ANALYSIS REQUIRED
		building debris, bricks, sand			
7		TP20_0.5, sand with some shell fragments	28/04/2021	1	Asbestos in Soil Analysis NEPM
8		TP20_1.0, sandstone layer at 1.0m, sand with some shell fragments	28/04/2021	1	Asbestos in Soil Analysis NEPM
TOTAL				8	

7a1 7024

Australia
Melbourne

6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney

Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane

1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth

46-48 Banksia Road
Welshpool WA 6106
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Newcastle

4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

New Zealand
Auckland

35 O'Rourke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch

43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Sample Receipt Advice

Company name: Trinitas Group Pty Ltd
Contact name: - RESULTS/SRAs
Project name: LITTLE BAY BEACH
Project ID: Not provided
Turnaround time: 3 Day
Date/Time received: Apr 30, 2021 2:15 PM
Eurofins reference: 791704

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- N/A Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Elvis Dsouza on phone : or by email: ElvisDsouza@eurofins.com

Results will be delivered electronically via email to - RESULTS/SRAs - labreports@trinitasgroup.com.au.

Australia

Melbourne
6 Monterey Road
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Site # 1254 & 14271

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Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name: Trinitas Group Pty Ltd
Address: Level 3, 24 Hunter Street
Parramatta
NSW 2150
Project Name: LITTLE BAY BEACH

Order No.:
Report #: 791704
Phone: 02 8810 4445
Fax: 02 8016 0875

Received: Apr 30, 2021 2:15 PM
Due: May 5, 2021
Priority: 3 Day
Contact Name: - RESULTS/SRAs

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
Mayfield Laboratory - NATA Site # 25079							
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	TP37_0.2	Apr 28, 2021		Soil	S21-Ap57859	X	
2	TP36_0.5	Apr 28, 2021		Soil	S21-Ap57860	X	
3	TP37_1.0	Apr 28, 2021		Soil	S21-Ap57861	X	
4	TP19_0.3	Apr 28, 2021		Soil	S21-Ap57862	X	
5	TP19_1.0FC01	Apr 28, 2021		Building Materials	S21-Ap57863		X
6	TP19_1.0	Apr 28, 2021		Soil	S21-Ap57864	X	
7	TP20_0.5	Apr 28, 2021		Soil	S21-Ap57865	X	
8	TP20_1.0	Apr 28, 2021		Soil	S21-Ap57866	X	
Test Counts						7	1

Trinitas Group Pty Ltd
Level 3, 24 Hunter Street
Parramatta
NSW 2150



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025—Testing
 NATA is a signatory to the ILAC Mutual Recognition
 Arrangement for the mutual recognition of the
 equivalence of testing, medical testing, calibration,
 inspection and proficiency testing scheme providers
 reports.

Attention: - RESULTS/SRAs
Report 791704-AID
Project Name LITTLE BAY BEACH
Received Date Apr 30, 2021
Date Reported May 05, 2021

Methodology:

Asbestos Fibre
 Identification

Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques.
NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.

Unknown Mineral
 Fibres

Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity.
NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.

Subsampling Soil
 Samples

The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed.
NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.

Bonded asbestos-
 containing material
 (ACM)

The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 4964 - 2004.
NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.

Limit of Reporting

The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w).
 The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk).
NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos". This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.

Project Name LITTLE BAY BEACH
Project ID
Date Sampled Apr 28, 2021
Report 791704-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP37_0.2	21-Ap57859	Apr 28, 2021	Approximate Sample 696g Sample consisted of: Brown coarse-grained soil, organic debris, glass, corroded metal and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP36_0.5	21-Ap57860	Apr 28, 2021	Approximate Sample 737g Sample consisted of: Brown coarse-grained soil, organic debris, glass, and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP37_1.0	21-Ap57861	Apr 28, 2021	Approximate Sample 690g Sample consisted of: Brown coarse-grained soil, organic debris, glass, corroded metal and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP19_0.3	21-Ap57862	Apr 28, 2021	Approximate Sample 796g Sample consisted of: Brown coarse-grained sandy soil, glass and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP19_1.0FC01	21-Ap57863	Apr 28, 2021	Approximate Sample 42g / 100x40x4mm Sample consisted of: Grey fibre plaster cement material	Chrysotile asbestos detected.
TP19_1.0	21-Ap57864	Apr 28, 2021	Approximate Sample 754g Sample consisted of: Brown coarse-grained sandy soil, glass and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP20_0.5	21-Ap57865	Apr 28, 2021	Approximate Sample 604g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP20_1.0	21-Ap57866	Apr 28, 2021	Approximate Sample 623g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Apr 30, 2021	Indefinite
Asbestos - LTM-ASB-8020	Sydney	Apr 30, 2021	Indefinite

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
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Site # 1254 & 14271

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NATA # 1261 Site # 18217

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IANZ # 1327

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Rolleston, Christchurch 7675
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IANZ # 1290

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name: Trinitas Group Pty Ltd
Address: Level 3, 24 Hunter Street
Parramatta
NSW 2150
Project Name: LITTLE BAY BEACH

Order No.:
Report #: 791704
Phone: 02 8810 4445
Fax: 02 8016 0875

Received: Apr 30, 2021 2:15 PM
Due: May 5, 2021
Priority: 3 Day
Contact Name: - RESULTS/SRAs

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
Mayfield Laboratory - NATA Site # 25079							
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	TP37_0.2	Apr 28, 2021		Soil	S21-Ap57859	X	
2	TP36_0.5	Apr 28, 2021		Soil	S21-Ap57860	X	
3	TP37_1.0	Apr 28, 2021		Soil	S21-Ap57861	X	
4	TP19_0.3	Apr 28, 2021		Soil	S21-Ap57862	X	
5	TP19_1.0FC01	Apr 28, 2021		Building Materials	S21-Ap57863		X
6	TP19_1.0	Apr 28, 2021		Soil	S21-Ap57864	X	
7	TP20_0.5	Apr 28, 2021		Soil	S21-Ap57865	X	
8	TP20_1.0	Apr 28, 2021		Soil	S21-Ap57866	X	
Test Counts						7	1

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to "non-bonded / friable".
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory's remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Laxman Dias Senior Analyst-Asbestos (NSW)

Authorised by:

Sayed Abu Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Chain of Custody

Client Name	Trinitas Group Pty Ltd				
Client Address	Level 3, 24 Hunter St, Parramatta NSW 2150				
Project Name	Little Bay Beach				
Project Manager Name	Denny Bolatti				
Project Manager Contact Number	0412827006				
Lab Results Email Distribution	labreports@trinitasgroup.com.au				
Consultant Name	Jeffrey Yu				
Sample Analysis Turn Around Time (TAT)	Standard 5 day				
Relinquished By:	Received by Name:	Received Date:	Received by Time:	Received by Signature:	
Jeffrey Yu	 Bronie Turney	30/14	2:15		

791709

Sample Information					
ITEM	SAMPLE ID and MATERIAL	DATE	TOTAL CONTAINERS	ANALYSIS REQUIRED	
1	TP05_0.2, Fill with glasses, tiles, brick, plastic, metal, concrete and coal.	29/04/2021	1	Asbestos in Soil Analysis NEPM	
2	TP05_1.0, Fill with glasses, tiles, brick, plastic, metal, concrete and coal.	29/04/2021	1	Asbestos in Soil Analysis NEPM	
3	TP04_0.5, Fill with glasses, plastic, bricks, coal and rocks. up to 1m.	29/04/2021	1	Asbestos in Soil Analysis NEPM	
4	TP04_1.0, Silty sand with boulders.	29/04/2021	1	Asbestos in Soil Analysis NEPM	
5	TP03_0.5, Fill with Silty sand, boulders, bricks, plastic, glasses and shells.	29/04/2021	1	Asbestos in Soil Analysis NEPM	
6	TP03_1.5, Fill with bricks, boulders, minor plastic.	29/04/2021	1	Asbestos in Soil Analysis NEPM	

79709

Sample Information					
ITEM	SAMPLE ID and MATERIAL	DATE	TOTAL CONTAINERS	ANALYSIS REQUIRED	
7	TP11_0.5, Sand with boulders.	29/04/2021	1	Asbestos in Soil Analysis NEPM	
8	TP13_0.2, Sand with shell fragments up to 1m brick, glass, rock, plastic, tile up to 1.0m.	29/04/2021	1	Asbestos in Soil Analysis NEPM	
9	TP10_0.5, sand, rocks, shell fragments, glass, soil, brick, sandstone layer at 0.3m.	29/04/2021	1	Asbestos in Soil Analysis NEPM	
10	TP10_0.5FC01, FC Fragment	29/04/2021	1	Asbestos	
11	TP16_0.3FC01, FC fragments	29/04/2021	1	Asbestos	
12	TP16_0.3, Brick, shell, sand, FC fragments, glass, plastic	29/04/2021	1	Asbestos in Soil Analysis NEPM	
13	TP16_1.0, Fill with Glass, brick, sandstone, sand, shells, plastic, tile.	29/04/2021	1	Asbestos in Soil Analysis NEPM	

Sample Information					
ITEM	SAMPLE ID and MATERIAL	DATE	TOTAL CONTAINERS	ANALYSIS REQUIRED	
14	TP14_0.5, Sand, brick, rock, glass, shell	29/04/2021	1	Asbestos in Soil Analysis NEPM	
15	TP21_0.5, Brick, sand, shell, glass, FC fragments, Sandstone platform at 0.5m.	29/04/2021	1	Asbestos in Soil Analysis NEPM	
16	TP21_0.5FC01, FC fragments	29/04/2021	1	Asbestos	
17	TP22_0.1FC01, FC fragments	29/04/2021	1	Asbestos	
18	TP22_0.1, Fill with Sand, brick, building debris, FC fragments, tile, stone.	29/04/2021	1	Asbestos in Soil Analysis NEPM	
19	TP22_1.0, Fill with Brick, glass, sand, tile, shell, concrete under top sand.	29/04/2021	1	Asbestos in Soil Analysis NEPM	
20	TP23_0.1FC01, FC fragments	29/04/2021	1	Asbestos	

791709

AI Chain of Custody



Sample Information					
ITEM	SAMPLE ID and MATERIAL	DATE	TOTAL CONTAINERS	ANALYSIS REQUIRED	
21	TP23_0.1, Brick, sand, shell, glass, tile, sandstone layer at 0.1m.	29/04/2021	1	Asbestos in Soil Analysis NEPM	
22	TP24_0.3, Fill with Brick, sand, glass, shell	29/04/2021	1	Asbestos in Soil Analysis NEPM	
23	TP29_0.3, Fill with Brick, glass, sand, shell, rocks	29/04/2021	1	Asbestos in Soil Analysis NEPM	
24	TP29_0.5FC01, FC fragments	29/04/2021	1	Asbestos	
25	TP27_0.5, Sand, brick, shell, stone	29/04/2021	1	Asbestos in Soil Analysis NEPM	
26	TP28_0.5, Brick, FC fragments, sand, shell	29/04/2021	1	Asbestos in Soil Analysis NEPM	
27	TP28_0.5FC01, FC fragments	29/04/2021	1	Asbestos	
28	TP26_0.5, Fill with Sand, brick, shell	29/04/2021	1	Asbestos in Soil Analysis NEPM	
29	TP25_0.3, Brick, FC fragment, sand, shell	29/04/2021	1	Asbestos in Soil Analysis NEPM	



701709

Sample Information					
ITEM	SAMPLE ID and MATERIAL	DATE	TOTAL CONTAINERS	ANALYSIS REQUIRED	
30	TP25_0.3FC01, FC fragments	29/04/2021	1	Asbestos	
31	TP24_0.3FC01, Fill with building rubble and ACM fragments	29/04/2021	1	Asbestos	
TOTAL			31		

701709

RE: Attention: Eurofins - Report 791709 : Site LITTLE BAY BEACH

Jeffrey Yu <jeffrey.yu@trinitasgroup.com.au>

Sat 5/1/2021 2:22 PM

To: Trinitas Lab Reports <labreports@trinitasgroup.com.au>; Elvis Dsouza <ElvisDsouza@eurofins.com>

Cc: #AU04_Enviro_Sample_NSW <EnviroSampleNSW@eurofins.com>

 1 attachments (425 KB)

Update COC5_29042021 Little Bay Beach-Chain Of Custody.docx;

Hi Grace

The update COC was attached.

The sample **TP24_0.3FC01** and air samples are ready for picking up from my mailbox.

Best regards,

Jeffrey Yu

PhD (EnvEng), PhD (MedChem)

Senior Environmental Consultant

NSW Licensed Asbestos Assessor (LAA 001366)

A: Level 3, 24 Hunter Street Parramatta NSW 2150

T: 1800 4 TRINITAS M: 0406 201 136

E: jeffrey.yu@trinitasgroup.com.au

W: www.trinitasgroup.com.au



From: EnviroSampleNSW@eurofins.com <EnviroSampleNSW@eurofins.com>

Sent: Friday, 30 April 2021 11:23 PM

To: Trinitas Lab Reports <labreports@trinitasgroup.com.au>

Cc: Jeffrey Yu <jeffrey.yu@trinitasgroup.com.au>

Subject: A en on: Eurofins - Report 791709 : Site LITTLE BAY BEACH

Dear Valued Client,

TP24_0.3FC01 not received, analysis cancelled. TP03_1.5 received as TP03_1.0, logged as per COC.

Please find attached a Sample Receipt Advice (SRA), a Summary Sheet and a scanned copy of your Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers as well as the requested analysis. If there are any irregularities then please contact your Eurofins | Environment Testing Analytical Services Manager as soon as possible to make certain that they get changed.

Regards

Grace Tuckwell

Sample Receipt

Eurofins | Environment Testing

Unit F3, Parkview Building

16 Mars Road

LANE COVE WEST NSW 2066

AUSTRALIA

Phone: +61 29900 8421

Email: EnviroSampleNSW@eurofins.com

Website: <http://environment.eurofins.com.au>

[EnviroNote 1108 - Emissions from Stationary Sources](#)

[EnviroNote 1103 - NATA Accreditation for Dioxins](#)

Click [here](#) to report this email as spam.

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Australia
Melbourne

6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
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Site # 1254 & 14271

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43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Sample Receipt Advice

Company name: Trinitas Group Pty Ltd
Contact name: - RESULTS/SRAs
Project name: LITTLE BAY BEACH
Project ID: Not provided
Turnaround time: 3 Day
Date/Time received: Apr 30, 2021 2:15 PM
Eurofins reference: 791709

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- N/A Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

TP03_1.5 received as TP03_1.0, logged as per COC.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Elvis Dsouza on phone : or by email: ElvisDsouza@eurofins.com

Results will be delivered electronically via email to - RESULTS/SRAs - labreports@trinitasgroup.com.au.

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
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Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
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New Zealand

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35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
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ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name: Trinitas Group Pty Ltd
Address: Level 3, 24 Hunter Street
Parramatta
NSW 2150
Project Name: LITTLE BAY BEACH

Order No.:
Report #: 791709
Phone: 02 8810 4445
Fax: 02 8016 0875

Received: Apr 30, 2021 2:15 PM
Due: May 5, 2021
Priority: 3 Day
Contact Name: - RESULTS/SRAs

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
Mayfield Laboratory - NATA Site # 25079							
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	TP05_0.2	Apr 29, 2021		Soil	S21-Ap57884	X	
2	TP05_1.0	Apr 29, 2021		Soil	S21-Ap57885	X	
3	TP04_0.5	Apr 29, 2021		Soil	S21-Ap57886	X	
4	TP04_1.0	Apr 29, 2021		Soil	S21-Ap57887	X	
5	TP03_0.5	Apr 29, 2021		Soil	S21-Ap57888	X	
6	TP03_1.5	Apr 29, 2021		Soil	S21-Ap57889	X	
7	TP11_0.5	Apr 29, 2021		Soil	S21-Ap57890	X	
8	TP13_0.2	Apr 29, 2021		Soil	S21-Ap57891	X	
9	TP10_0.5	Apr 29, 2021		Soil	S21-Ap57892	X	
10	TP10_0.5FC0	Apr 29, 2021		Building	S21-Ap57893		X

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Mayfield Laboratory - NATA Site # 25079							
External Laboratory							
	1			Materials			
11	TP16_0.3FC0 1	Apr 29, 2021		Building Materials	S21-Ap57894		X
12	TP16_0.3	Apr 29, 2021		Soil	S21-Ap57895	X	
13	TP16_1.0	Apr 29, 2021		Soil	S21-Ap57896	X	
14	TP14_0.5	Apr 29, 2021		Soil	S21-Ap57897	X	
15	TP21_0.5	Apr 29, 2021		Soil	S21-Ap57898	X	
16	TP21_0.5FC0 1	Apr 29, 2021		Building Materials	S21-Ap57899		X
17	TP22_0.1FC0 1	Apr 29, 2021		Building Materials	S21-Ap57900		X
18	TP22_0.1	Apr 29, 2021		Soil	S21-Ap57901	X	

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External Laboratory							
19	TP22_1.0	Apr 29, 2021		Soil	S21-Ap57902	X	
20	TP23_0.1FC01	Apr 29, 2021		Building Materials	S21-Ap57903		X
21	TP23_0.1	Apr 29, 2021		Soil	S21-Ap57904	X	
22	TP24_0.3	Apr 29, 2021		Soil	S21-Ap57905	X	
23	TP29_0.3	Apr 29, 2021		Soil	S21-Ap57906	X	
24	TP29_0.5FC01	Apr 29, 2021		Building Materials	S21-Ap57907		X
25	TP27_0.5	Apr 29, 2021		Soil	S21-Ap57908	X	
26	TP28_0.5	Apr 29, 2021		Soil	S21-Ap57909	X	
27	TP28_0.5FC01	Apr 29, 2021		Building Materials	S21-Ap57910		X

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Mayfield Laboratory - NATA Site # 25079							
External Laboratory							
28	TP26 0.5	Apr 29, 2021		Soil	S21-Ap57911	X	
29	TP25 0.3	Apr 29, 2021		Soil	S21-Ap57912	X	
30	TP25_0.3FC0 1	Apr 29, 2021		Building Materials	S21-Ap57913		X
31	TP24_0.3FC0 1	Apr 29, 2021		Building Materials	S21-Ap57914		X
Test Counts						22	9

Trinitas Group Pty Ltd
Level 3, 24 Hunter Street
Parramatta
NSW 2150



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025—Testing
 NATA is a signatory to the ILAC Mutual Recognition
 Arrangement for the mutual recognition of the
 equivalence of testing, medical testing, calibration,
 inspection and proficiency testing scheme providers
 reports.

Attention: - RESULTS/SRAs
Report 791709-AID
Project Name LITTLE BAY BEACH
Received Date Apr 30, 2021
Date Reported May 05, 2021

Methodology:

Asbestos Fibre
 Identification

Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques.
NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.

Unknown Mineral
 Fibres

Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity.
NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.

Subsampling Soil
 Samples

The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed.
NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.

Bonded asbestos-
 containing material
 (ACM)

The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 4964 - 2004.
NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.

Limit of Reporting

The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w).
 The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk).
NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos". This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.

Project Name LITTLE BAY BEACH
Project ID
Date Sampled Apr 29, 2021
Report 791709-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP05_0.2	21-Ap57884	Apr 29, 2021	Approximate Sample 500g Sample consisted of: Brown coarse-grained sandy soil, coal, corroded metal and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP05_1.0	21-Ap57885	Apr 29, 2021	Approximate Sample 578g Sample consisted of: Brown coarse-grained sandy soil, glass, corroded metal and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP04_0.5	21-Ap57886	Apr 29, 2021	Approximate Sample 667g Sample consisted of: Brown coarse-grained sandy soil, coal, corroded metal and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP04_1.0	21-Ap57887	Apr 29, 2021	Approximate Sample 756g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP03_0.5	21-Ap57888	Apr 29, 2021	Approximate Sample 800g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP03_1.5	21-Ap57889	Apr 29, 2021	Approximate Sample 660g Sample consisted of: Brown coarse-grained sandy soil, glass, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP11_0.5	21-Ap57890	Apr 29, 2021	Approximate Sample 773g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP13_0.2	21-Ap57891	Apr 29, 2021	Approximate Sample 669g Sample consisted of: Brown coarse-grained sandy soil, glass, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP10_0.5	21-Ap57892	Apr 29, 2021	Approximate Sample 535g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP10_0.5FC01	21-Ap57893	Apr 29, 2021	Approximate Sample 1g / 25x20x1mm Sample consisted of: Brown fibre cement material	Chrysotile asbestos detected.
TP16_0.3FC01	21-Ap57894	Apr 29, 2021	Approximate Sample 1g / 25x20x1mm Sample consisted of: Brown fibre cement material	Chrysotile and crocidolite asbestos detected.
TP16_0.3	21-Ap57895	Apr 29, 2021	Approximate Sample 786g Sample consisted of: Brown fine-grained sandy soil, glass, rocks and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP16_1.0	21-Ap57896	Apr 29, 2021	Approximate Sample 682g Sample consisted of: Brown fine-grained sandy soil, glass, coal, rocks and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP14_0.5	21-Ap57897	Apr 29, 2021	Approximate Sample 730g Sample consisted of: Brown fine-grained sandy soil, glass, coal, rocks and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP21_0.5	21-Ap57898	Apr 29, 2021	Approximate Sample 906g Sample consisted of: Brown fine-grained sandy soil, glass, coal, rocks and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP21_0.5FC01	21-Ap57899	Apr 29, 2021	Approximate Sample 3g / 35x20x3mm Sample consisted of: Brown fibre cement material	Chrysotile and crocidolite asbestos detected.
TP22_0.1FC01	21-Ap57900	Apr 29, 2021	Approximate Sample 26g / 105x50x4mm Sample consisted of: Brown fibre cement material	Chrysotile and crocidolite asbestos detected.
TP22_0.1	21-Ap57901	Apr 29, 2021	Approximate Sample 832g Sample consisted of: Brown fine-grained sandy soil, glass, coal, brick, fragments of ceramic material, rocks and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP22_1.0	21-Ap57902	Apr 29, 2021	Approximate Sample 803g Sample consisted of: Brown fine-grained sandy soil, glass, coal, brick, bitumen, fragments of ceramic material, rocks and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP23_0.1FC01	21-Ap57903	Apr 29, 2021	Approximate Sample 2g / 30x16x5mm Sample consisted of: Brown fibre cement material	Chrysotile and crocidolite asbestos detected.
TP23_0.1	21-Ap57904	Apr 29, 2021	Approximate Sample 868g Sample consisted of: Brown fine-grained sandy soil, brick, rocks and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP24_0.3	21-Ap57905	Apr 29, 2021	Approximate Sample 667g Sample consisted of: Brown fine-grained sandy soil, glass, rocks and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP29_0.3	21-Ap57906	Apr 29, 2021	Approximate Sample 728g Sample consisted of: Brown fine-grained sandy soil, glass, coal, rocks and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP29_0.5FC01	21-Ap57907	Apr 29, 2021	Approximate Sample 1g / 20x17x2mm Sample consisted of: Brown fibre cement material	Chrysotile and amosite asbestos detected.
TP27_0.5	21-Ap57908	Apr 29, 2021	Approximate Sample 882g Sample consisted of: Brown fine-grained sandy soil, glass, rocks and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP28_0.5	21-Ap57909	Apr 29, 2021	Approximate Sample 920g Sample consisted of: Brown fine-grained sandy soil, brick, coal, glass and rocks	ACM: Chrysotile asbestos detected in fibre cement fragment. Approximate raw weight of ACM = 2.4g Total estimated asbestos content in ACM = 0.12g* Total estimated asbestos concentration in ACM = 0.013% w/w* Organic fibre detected. No trace asbestos detected.
TP28_0.5FC01	21-Ap57910	Apr 29, 2021	Approximate Sample 1g / 22x16x2mm Sample consisted of: Brown fibre cement material	Chrysotile asbestos detected.
TP26_0.5	21-Ap57911	Apr 29, 2021	Approximate Sample 936g Sample consisted of: Brown fine-grained sandy soil, rocks and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP25_0.3	21-Ap57912	Apr 29, 2021	Approximate Sample 865g Sample consisted of: Brown fine-grained sandy soil, coal, brick, rocks and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP25_0.3FC01	21-Ap57913	Apr 29, 2021	Approximate Sample <1g / 20x15x2mm Sample consisted of: Brown fibre cement material	Chrysotile asbestos detected.
TP24_0.3FC01	21-Ap57914	Apr 29, 2021	Approximate Sample 114g / 170x80x6mm Sample consisted of: Grey compressed fibre cement material	Chrysotile and crocidolite asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	May 03, 2021	Indefinite
Asbestos - LTM-ASB-8020	Sydney	May 03, 2021	Indefinite

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Sydney Laboratory - NATA Site # 18217

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External Laboratory

No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
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4	TP04_1.0	Apr 29, 2021		Soil	S21-Ap57887	X	
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6	TP03_1.5	Apr 29, 2021		Soil	S21-Ap57889	X	
7	TP11_0.5	Apr 29, 2021		Soil	S21-Ap57890	X	
8	TP13_0.2	Apr 29, 2021		Soil	S21-Ap57891	X	
9	TP10_0.5	Apr 29, 2021		Soil	S21-Ap57892	X	
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14	TP14_0.5	Apr 29, 2021		Soil	S21-Ap57897	X	
15	TP21_0.5	Apr 29, 2021		Soil	S21-Ap57898	X	
16	TP21_0.5FC0 1	Apr 29, 2021		Building Materials	S21-Ap57899		X
17	TP22_0.1FC0 1	Apr 29, 2021		Building Materials	S21-Ap57900		X
18	TP22_0.1	Apr 29, 2021		Soil	S21-Ap57901	X	

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Site # 1254 & 14271

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NATA # 1261 Site # 18217

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ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name: Trinitas Group Pty Ltd
Address: Level 3, 24 Hunter Street
Parramatta
NSW 2150
Project Name: LITTLE BAY BEACH

Order No.:
Report #: 791709
Phone: 02 8810 4445
Fax: 02 8016 0875

Received: Apr 30, 2021 2:15 PM
Due: May 5, 2021
Priority: 3 Day
Contact Name: - RESULTS/SRAs

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
Mayfield Laboratory - NATA Site # 25079							
External Laboratory							
19	TP22_1.0	Apr 29, 2021		Soil	S21-Ap57902	X	
20	TP23_0.1FC01	Apr 29, 2021		Building Materials	S21-Ap57903		X
21	TP23_0.1	Apr 29, 2021		Soil	S21-Ap57904	X	
22	TP24_0.3	Apr 29, 2021		Soil	S21-Ap57905	X	
23	TP29_0.3	Apr 29, 2021		Soil	S21-Ap57906	X	
24	TP29_0.5FC01	Apr 29, 2021		Building Materials	S21-Ap57907		X
25	TP27_0.5	Apr 29, 2021		Soil	S21-Ap57908	X	
26	TP28_0.5	Apr 29, 2021		Soil	S21-Ap57909	X	
27	TP28_0.5FC01	Apr 29, 2021		Building Materials	S21-Ap57910		X

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Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
Mayfield Laboratory - NATA Site # 25079							
External Laboratory							
28	TP26 0.5	Apr 29, 2021		Soil	S21-Ap57911	X	
29	TP25 0.3	Apr 29, 2021		Soil	S21-Ap57912	X	
30	TP25_0.3FC01	Apr 29, 2021		Building Materials	S21-Ap57913		X
31	TP24_0.3FC01	Apr 29, 2021		Building Materials	S21-Ap57914		X
Test Counts						22	9

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to "non-bonded / friable".
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory's remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Laxman Dias Senior Analyst-Asbestos (NSW)

Authorised by:

Chamath JHM Annakkage Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

AI Chain of Custody



Chain of Custody				
Client Name	Trinitas Group Pty Ltd			
Client Address	Level 3, 24 Hunter St, Parramatta NSW 2150			
Project Name	Little Bay Beach			
Project Manager Name	Denny Bolatti			
Project Manager Contact Number	0412827006			
Lab Results Email Distribution	labreports@trinitasgroup.com.au			
Consultant Name	Jeffrey Yu			
Sample Analysis Turn Around Time (TAT)	Standard 5 day			
Relinquished By:	Received by Name:	Received Date:	Received by Time:	Received by Signature:
Jeffrey Yu	Gene Tucker	30/11	2:15	

114167



AI Chain of Custody



Sample Information					
ITEM		SAMPLE ID and MATERIAL	DATE	TOTAL CONTAINERS	ANALYSIS REQUIRED
1		TP08_0.5FC01, Sand with shells, boulders, tiles, glasses. Rock platform from 0.5m.	30/04/2021	1	Asbestos in Soil Analysis NEPM
2		TP08_0.5, Fill under sand with shells, glass, tiles, bricks. ACM fragments. Rock platform from 0.5m.	30/04/2021	1	Asbestos in Soil Analysis NEPM
3		TP09_0.5, Sand and boulders, Sediment around boulders.	30/04/2021	1	Asbestos in Soil Analysis NEPM
4		TP09_1.5, Fill with abundant glasses, brick, tiles and plastic.	30/04/2021	1	Asbestos in Soil Analysis NEPM
5		TP06_0.3, Silty sand and boulders.	30/04/2021	1	Asbestos in Soil Analysis NEPM
6		TP07_0.1FC01, Sand with shells and ACM fragments.	30/04/2021	1	Asbestos



791711

AI Chain of Custody

Sample Information					
ITEM		SAMPLE ID and MATERIAL	DATE	TOTAL CONTAINERS	ANALYSIS REQUIRED
7		TP07_0.3, Sand with shells. Rock or boulders from 0.3m.	30/04/2021	1	Asbestos in Soil Analysis NEPM
8		TP01_0.2,mFill with bricks, clay and tiles, glasses. No access.	30/04/2021	1	Asbestos in Soil Analysis NEPM
9		TP06_0.1, Sand. Rock platform from 0.1m.	30/04/2021	1	Asbestos in Soil Analysis NEPM
TOTAL				9	

7911711

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Sample Receipt Advice

Company name: Trinitas Group Pty Ltd
Contact name: - RESULTS/SRAs
Project name: LITTLE BAY BEACH
Project ID: Not provided
Turnaround time: 5 Day
Date/Time received: Apr 30, 2021 2:15 PM
Eurofins reference: 791711

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- N/A Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

TP06_0.3 not received, analysis cancelled. TP02_0.3 received extra and placed for analysis, please confirm.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Elvis Dsouza on phone : or by email: ElvisDsouza@eurofins.com

Results will be delivered electronically via email to - RESULTS/SRAs - labreports@trinitasgroup.com.au.

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NSW 2150
Project Name: LITTLE BAY BEACH

Order No.:
Report #: 791711
Phone: 02 8810 4445
Fax: 02 8016 0875

Received: Apr 30, 2021 2:15 PM
Due: May 7, 2021
Priority: 5 Day
Contact Name: - RESULTS/SRAs

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
Mayfield Laboratory - NATA Site # 25079								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	TP08_0.5FC01	Apr 30, 2021		Building Materials	S21-Ap57950		X	
2	TP08_0.5	Apr 30, 2021		Soil	S21-Ap57951	X		
3	TP09_0.5	Apr 30, 2021		Soil	S21-Ap57952	X		
4	TP09_1.5	Apr 30, 2021		Soil	S21-Ap57953	X		
5	TP06_0.3	Apr 30, 2021		Soil	S21-Ap57954			X
6	TP07_0.1FC01	Apr 30, 2021		Building Materials	S21-Ap57955		X	
7	TP07_0.3	Apr 30, 2021		Soil	S21-Ap57956	X		
8	TP01_0.2	Apr 30, 2021		Soil	S21-Ap57957	X		

Company Name: Trinitas Group Pty Ltd
Address: Level 3, 24 Hunter Street
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NSW 2150
Project Name: LITTLE BAY BEACH

Order No.:
Report #: 791711
Phone: 02 8810 4445
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Received: Apr 30, 2021 2:15 PM
Due: May 7, 2021
Priority: 5 Day
Contact Name: - RESULTS/SRAS

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
Mayfield Laboratory - NATA Site # 25079								
External Laboratory								
9	TP06 0.1	Apr 30, 2021		Soil	S21-Ap57958	X		
10	TP02 0.3	Apr 30, 2021		Soil	S21-Ap58045	X		
Test Counts						7	2	1

Trinitas Group Pty Ltd
Level 3, 24 Hunter Street
Parramatta
NSW 2150



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025—Testing
 NATA is a signatory to the ILAC Mutual Recognition
 Arrangement for the mutual recognition of the
 equivalence of testing, medical testing, calibration,
 inspection and proficiency testing scheme providers
 reports.

Attention: - RESULTS/SRAs
Report 791711-AID
Project Name LITTLE BAY BEACH
Received Date Apr 30, 2021
Date Reported May 05, 2021

Methodology:

Asbestos Fibre
 Identification

Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques.
NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.

Unknown Mineral
 Fibres

Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity.
NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.

Subsampling Soil
 Samples

The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed.
NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.

Bonded asbestos-
 containing material
 (ACM)

The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 4964 - 2004.
NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.

Limit of Reporting

The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w).
 The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk).
NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos". This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.

Project Name LITTLE BAY BEACH
Project ID
Date Sampled Apr 30, 2021
Report 791711-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP08_0.5FC01	21-Ap57950	Apr 30, 2021	Approximate Sample 1g / 17x13x2mm Sample consisted of: Brown fibre cement material	Chrysotile asbestos detected.
TP08_0.5	21-Ap57951	Apr 30, 2021	Approximate Sample 717g Sample consisted of: Brown fine-grained sandy soil, rocks and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP09_0.5	21-Ap57952	Apr 30, 2021	Approximate Sample 712g Sample consisted of: Light-brown fine-grained sandy soil, rocks and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP09_1.5	21-Ap57953	Apr 30, 2021	Approximate Sample 792g Sample consisted of: Brown fine-grained sandy soil, brick, coal, corroded metal, rocks and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP07_0.1FC01	21-Ap57955	Apr 30, 2021	Approximate Sample 3g / 52x26x1mm Sample consisted of: Brown fibre cement material	Chrysotile asbestos detected.
TP07_0.3	21-Ap57956	Apr 30, 2021	Approximate Sample 761g Sample consisted of: Light-brown fine-grained sandy soil, rocks and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP01_0.2	21-Ap57957	Apr 30, 2021	Approximate Sample 523g Sample consisted of: Brown fine-grained sandy soil, rocks and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP06_0.1	21-Ap57958	Apr 30, 2021	Approximate Sample 805g Sample consisted of: Light-brown fine-grained sandy soil, rocks and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.



Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP02_0.3	21-Ap58045	Apr 30, 2021	Approximate Sample 710g Sample consisted of: Brown fine-grained sandy soil, rocks and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Apr 30, 2021	Indefinite
Asbestos - LTM-ASB-8020	Sydney	Apr 30, 2021	Indefinite

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Eurofins Analytical Services Manager : Elvis Dsouza

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Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
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External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	TP08_0.5FC01	Apr 30, 2021		Building Materials	S21-Ap57950		X	
2	TP08_0.5	Apr 30, 2021		Soil	S21-Ap57951	X		
3	TP09_0.5	Apr 30, 2021		Soil	S21-Ap57952	X		
4	TP09_1.5	Apr 30, 2021		Soil	S21-Ap57953	X		
5	TP06_0.3	Apr 30, 2021		Soil	S21-Ap57954			X
6	TP07_0.1FC01	Apr 30, 2021		Building Materials	S21-Ap57955		X	
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Mayfield Laboratory - NATA Site # 25079								
External Laboratory								
9	TP06 0.1	Apr 30, 2021		Soil	S21-Ap57958	X		
10	TP02 0.3	Apr 30, 2021		Soil	S21-Ap58045	X		
Test Counts						7	2	1

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to "non-bonded / friable".
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory's remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Laxman Dias Senior Analyst-Asbestos (NSW)

Authorised by:

Chamath JHM Annakkage Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Appendix K Air Monitoring, Clearance and Laboratory Analysis Results

Asbestos Daily Air Monitoring Report



26 April 2021

Randwick City Council

30 Frances Street
Randwick NSW 2031

Attention: Joe Santangelo

joe.santangelo@randwick.nsw.gov.au

RE: Asbestos Daily Air Monitoring Report

Dear Joe Santangelo

Please find below daily Asbestos air monitoring report for:

Location:	Little Bay Beach

All works have been completed in accordance with relevant state WHS Legislation and approved Codes of Practices.

See following pages for results.

Regards,

A handwritten signature in black ink that reads "Jeffrey Yu".

Jeffrey Yu

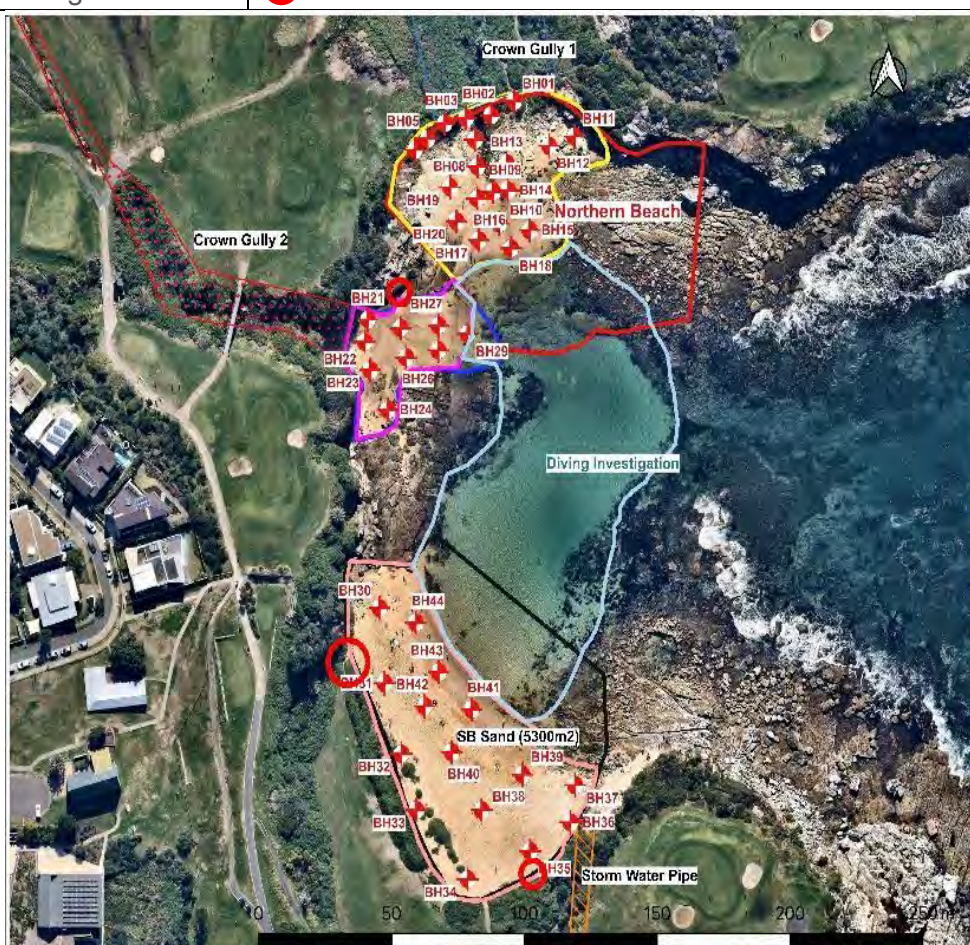
Senior Occupational Hygienist

Licensed Asbestos Assessor #001366

26/04/2021

Asbestos Daily Air Monitoring Report

Requested by:	
Client Contact Name	Joe Santangelo
Client Contact Number	0436839760
Client Contact Email	joe.santangelo@randwick.nsw.gov.au
Site:	
Address	2 Coast Hospital Rd, Little Bay NSW 2036
Local Government Area	Randwick City Council
Site Boundary	
Air Monitoring Locations	



Air Monitoring Details:	
Date of Field Work:	26/04/2021
Start Time:	07:00
Consultant:	Jeffrey Yu Licensed Asbestos Assessor #001366
Sampling Type:	Asbestos
Temperature	25°C
Wind Speed	20km/h
Scope of Work:	Air monitoring

Asbestos Daily Air Monitoring Report

Methodology:							
Asbestos fibre static air monitoring and analysis was conducted in accordance with Guidance Note on the Membrane Filter Method for the Estimation of Airborne Asbestos Fibres (NOHSC:3003: April 2005) and in-house procedures of NATA accredited laboratory for the estimation of airborne fibres. The sample collection was performed using SKC portable sampling pumps fitted with sampling cassettes containing 25 mm membrane filters that were flow tested at the commencement and completion of sampling.							
Exposure Standard							
The Australian exposure standard for asbestos fibers is 0.1 fibres/ml of air and the action limit for asbestos fibres is 0.01 fibres/ml as per the NSW WHS Regulations 2017.							
Sample Location / Person Name	AM Type	Sample ID	Average Flow Rate (L/Min)	Time On	Total Sampling Time (Min)	Total Volume (L)	Results
Southern beach - middle	Co	CX630209	2.0	09:11	314	628.00	<0.01 f/ml
Southern beach - rock area	Co	CX630468	2.0	09:14	313	626.00	<0.01 f/ml
Middle Beach	Co	CX630327	2.0	09:21	309	618.00	<0.01 f/ml
Blank	Co	CX630885					<0.01 f/ml
AM Type Legend							
B= Background Co= Control CI = Clearance BL= Field Black Pe= Personal							
Comments/Recommendations:							
All air monitoring results were below the exposure standard for asbestos fibers during removal works <0.01 f/ml NATA accredited laboratory results are provided within Appendix 2 .							
Disclaimer:							
The results within this report relate only to the sampling locations specified and their analysis. This report shall not be reproduced, except in full.							
Prepared By				Approved By			
 Jeffrey Yu Senior Occupational Hygienist Licensed Asbestos Assessor #001366 26/04/2021				 Denny Bolatti Managing Director Licensed Asbestos Assessor LAA001132 11/05/2021			

Asbestos Daily Air Monitoring Report

Appendix 1: Air Monitoring Locations



Location: Southern beach - middle

Result: <0.01 f/ml

Image Id: 210426-091028



Location: Southern beach - rock area

Result: <0.01 f/ml

Image Id: 210426-091345



Location: Middle Beach

Result: <0.01 f/ml

Image Id: 210426-092040



Location: Blank

Result: <0.01 f/ml

Image Id: 210426-092859

Asbestos Daily Air Monitoring Report



How to Contact Us

Mail Trinitas Group
PO Box 1376 Parramatta NSW 2124
Email admin@trinitasgroup.com.au
Address Level 3 Hunter Street, Parramatta NSW 2150
Website www.trinitasgroup.com.au
Telephone 1800 4 TRINITAS
Facsimile 02 8016 0875

Trinitas Group Pty Ltd

ABN 12 161 759 708

Disclaimer: This report is prepared for the use of the recipient for the purpose of risk evaluation, risk improvement and or loss control. It is based upon prevailing conditions at the time of inspection, our observations and information provided by the client contact/s at the site. No responsibility is accepted, and liability disclaimed for the use of this report for any other purpose, or by any third party, nor does it imply that no other hazardous

Asbestos Daily Air Monitoring Report



Appendix 2: Laboratory Analysis Results

Trinitas Group Pty Ltd
Level 3, 24 Hunter Street
Parramatta
NSW 2150



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025—Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection and proficiency testing scheme providers
reports.

Attention: - RESULTS/SRAs
Report 790191-AFA
Project Name **LITTLE BAY BEACH**
Received Date Apr 26, 2021
Date Reported Apr 27, 2021

METHODOLOGY:

Asbestos Counting

Conducted in accordance with the National Occupational Health & Safety Commission -
Guidance Note on The Membrane Filter Method For Estimating Airborne Asbestos
Fibres 2nd Edition [NOHSC:3003(2005)] and in-house Method LTM-ASB-8010.

Project Name LITTLE BAY BEACH
Project ID
Date Sampled Apr 26, 2021
Report 790191-AFA

Eurofins Sample No.	Client Sample ID	Location	Fibres/100 fields
21-Ap44831	CX630209	SOUTHERN BEACH - MIDDLE	0/100
21-Ap44832	CX630327	MIDDLE BEACH	0/100
21-Ap44833	CX630468	SOUTHERN BEACH - ROCK AREA	0/100
21-Ap44834	CX630885	BLANK	0/100

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8010	Sydney	Apr 26, 2021	Indefinite

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
46-48 Banksia Road
Welshpool WA 6106
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Trinitas Group Pty Ltd
Address: Level 3, 24 Hunter Street
Parramatta
NSW 2150
Project Name: LITTLE BAY BEACH

Order No.:
Report #: 790191
Phone: 02 8810 4445
Fax: 02 8016 0875

Received: Apr 26, 2021 5:50 PM
Due: Apr 27, 2021
Priority: 1 Day
Contact Name: - RESULTS/SRAs

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Asbestos (amount of fibres in air)
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						
Mayfield Laboratory - NATA Site # 25079						
External Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
1	CX630209	Apr 26, 2021	9:11AM	Air	S21-Ap44831	X
2	CX630327	Apr 26, 2021	9:21AM	Air	S21-Ap44832	X
3	CX630468	Apr 26, 2021	9:14AM	Air	S21-Ap44833	X
4	CX630885	Apr 26, 2021		Air	S21-Ap44834	X
Test Counts						4

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to "non-bonded / friable".
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory's remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Kang Kang Wang Senior Analyst-Asbestos (NSW)

Authorised by:

Laxman Dias Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Asbestos Daily Air Monitoring Report



27 April 2021

Randwick City Council

30 Frances Street
Randwick NSW 2031

Attention: Joe Santangelo

joe.santangelo@randwick.nsw.gov.au

RE: Asbestos Daily Air Monitoring Report

Dear Joe Santangelo

Please find below daily Asbestos air monitoring report for:

Location:	Little Bay Beach

All works have been completed in accordance with relevant state WHS Legislation and approved Codes of Practices.

See following pages for results.

Regards,

A handwritten signature in black ink that reads "Jeffrey Yu".

Jeffrey Yu

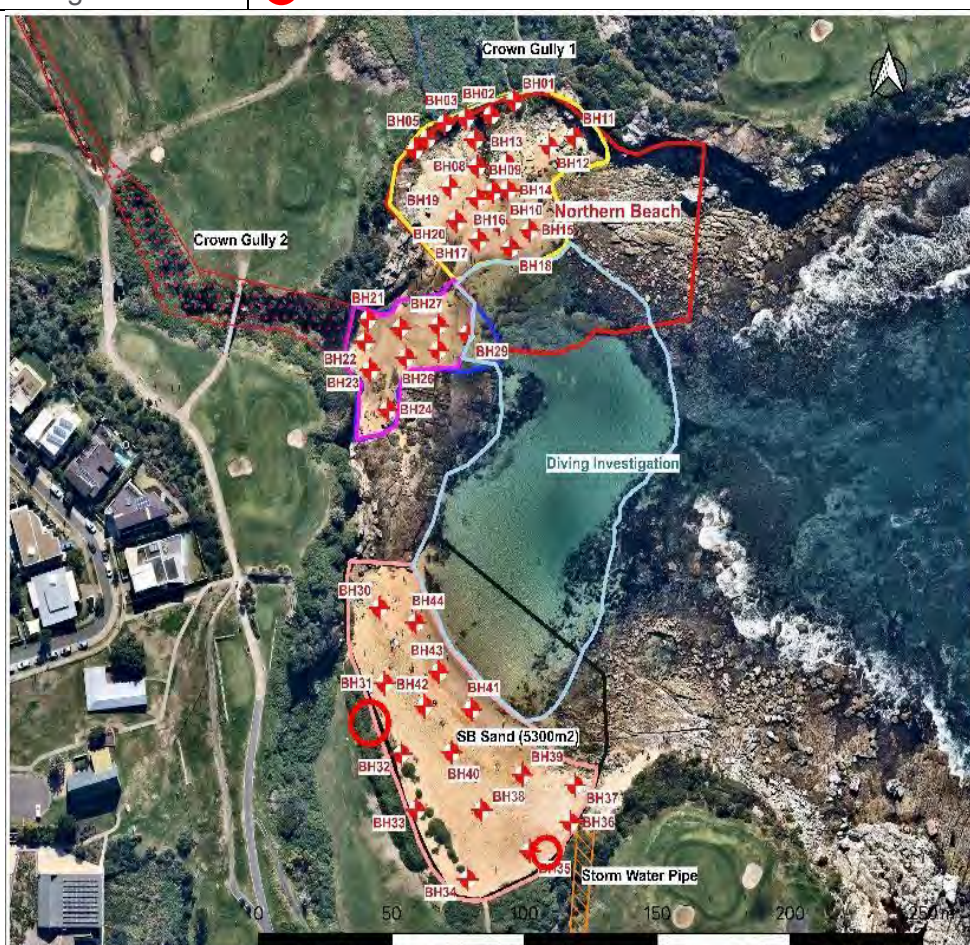
Senior Occupational Hygienist

Licensed Asbestos Assessor #001366

27/04/2021

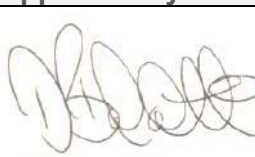
Asbestos Daily Air Monitoring Report

Requested by:	
Client Contact Name	Joe Santangelo
Client Contact Number	0436839760
Client Contact Email	joe.santangelo@randwick.nsw.gov.au
Site:	
Address	2 Coast Hospital Rd, Little Bay NSW 2036
Local Government Area	Randwick City Council
Site Boundary	
Air Monitoring Locations	



Air Monitoring Details:	
Date of Field Work:	27/04/2021
Start Time:	07:52
Consultant:	Jeffrey Yu Licensed Asbestos Assessor #001366
Sampling Type:	Asbestos
Temperature	20°C
Wind Speed	20km/h
Scope of Work:	Air monitoring

Asbestos Daily Air Monitoring Report

Methodology:							
Asbestos fibre static air monitoring and analysis was conducted in accordance with Guidance Note on the Membrane Filter Method for the Estimation of Airborne Asbestos Fibres (NOHSC:3003: April 2005) and in-house procedures of NATA accredited laboratory for the estimation of airborne fibres. The sample collection was performed using SKC portable sampling pumps fitted with sampling cassettes containing 25 mm membrane filters that were flow tested at the commencement and completion of sampling.							
Exposure Standard							
The Australian exposure standard for asbestos fibers is 0.1 fibres/ml of air and the action limit for asbestos fibres is 0.01 fibres/ml as per the NSW WHS Regulations 2017.							
Sample Location / Person Name	AM Type	Sample ID	Average Flow Rate (L/Min)	Time On	Total Sampling Time (Min)	Total Volume (L)	Results
Southern beach - middle	Co	CX630189	2.0	07:54	396	792.00	<0.01 f/ml
Southern beach - rock area	Co	CX630481	2.0	07:56	393	786.00	<0.01 f/ml
Blank	Co	CX630386					<0.01 f/ml
AM Type Legend							
B= Background Co= Control CI = Clearance BL= Field Black Pe= Personal							
Comments/Recommendations:							
All air monitoring results were below the exposure standard for asbestos fibers during removal works <0.01 f/ml NATA accredited laboratory results are provided within Appendix 2 .							
Disclaimer:							
The results within this report relate only to the sampling locations specified and their analysis. This report shall not be reproduced, except in full.							
Prepared By				Approved By			
 Jeffrey Yu Senior Occupational Hygienist Licensed Asbestos Assessor #001366 27/04/2021				 Denny Bolatti Managing Director Licensed Asbestos Assessor LAA001132 11/05/2021			

Asbestos Daily Air Monitoring Report

Appendix 1: Air Monitoring Locations



Location: Southern beach - middle

Result: <0.01 f/ml

Image Id: 210427-075359



Location: Southern beach - rock area

Result: <0.01 f/ml

Image Id: 210427-075635



Location: Blank

Result: <0.01 f/ml

Image Id: 210427-143237

Asbestos Daily Air Monitoring Report



How to Contact Us

Mail Trinitas Group
PO Box 1376 Parramatta NSW 2124
Email admin@trinitasgroup.com.au
Address Level 3 Hunter Street, Parramatta NSW 2150
Website www.trinitasgroup.com.au
Telephone 1800 4 TRINITAS
Facsimile 02 8016 0875

Trinitas Group Pty Ltd

ABN 12 161 759 708

Disclaimer: This report is prepared for the use of the recipient for the purpose of risk evaluation, risk improvement and or loss control. It is based upon prevailing conditions at the time of inspection, our observations and information provided by the client contact/s at the site. No responsibility is accepted, and liability disclaimed for the use of this report for any other purpose, or by any third party, nor does it imply that no other hazardous

Asbestos Daily Air Monitoring Report



Appendix 2: Laboratory Analysis Results

Trinitas Group Pty Ltd
Level 3, 24 Hunter Street
Parramatta
NSW 2150



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025—Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection and proficiency testing scheme providers
reports.

Attention: - RESULTS/SRAs
Report 790513-AFA
Project Name LITTLE BAY BEACH
Received Date Apr 27, 2021
Date Reported Apr 28, 2021

METHODOLOGY:

Asbestos Counting

Conducted in accordance with the National Occupational Health & Safety Commission -
Guidance Note on The Membrane Filter Method For Estimating Airborne Asbestos
Fibres 2nd Edition [NOHSC:3003(2005)] and in-house Method LTM-ASB-8010.

Project Name LITTLE BAY BEACH
Project ID
Date Sampled Apr 27, 2021
Report 790513-AFA

Eurofins Sample No.	Client Sample ID	Location	Fibres/100 fields
21-Ap47991	CX630189	SOUTHERN BEACH - MIDDLE	0/100
21-Ap47992	CX630386	BLANK	0/100
21-Ap47993	CX630481	SOUTHERN BEACH - ROCK AREA	0/100

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8010	Sydney	Apr 27, 2021	Indefinite

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
46-48 Banksia Road
Welshpool WA 6106
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Trinitas Group Pty Ltd
Address: Level 3, 24 Hunter Street
Parramatta
NSW 2150
Project Name: LITTLE BAY BEACH

Order No.:
Report #: 790513
Phone: 02 8810 4445
Fax: 02 8016 0875

Received: Apr 27, 2021 4:54 PM
Due: Apr 28, 2021
Priority: 1 Day
Contact Name: - RESULTS/SRAs

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Asbestos (amount of fibres in air)
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						
Mayfield Laboratory - NATA Site # 25079						
External Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
1	CX630189	Apr 27, 2021	7:54AM	Animal tissue	S21-Ap47991	X
2	CX630386	Apr 27, 2021		Animal tissue	S21-Ap47992	X
3	CX630481	Apr 27, 2021	7:56AM	Animal tissue	S21-Ap47993	X
Test Counts						3

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to "non-bonded / friable".
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory's remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Kang Kang Wang Senior Analyst-Asbestos (NSW)

Authorised by:

Sayed Abu Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Asbestos Daily Air Monitoring Report



28 April 2021

Randwick City Council

30 Frances Street
Randwick NSW 2031

Attention: Joe Santangelo

joe.santangelo@randwick.nsw.gov.au

RE: Asbestos Daily Air Monitoring Report

Dear Joe Santangelo

Please find below daily Asbestos air monitoring report for:

Location:	Little Bay Beach

All works have been completed in accordance with relevant state WHS Legislation and approved Codes of Practices.

See following pages for results.

Regards,

A handwritten signature in black ink, appearing to read "Kieran Mackowski".

Kieran Mackowski

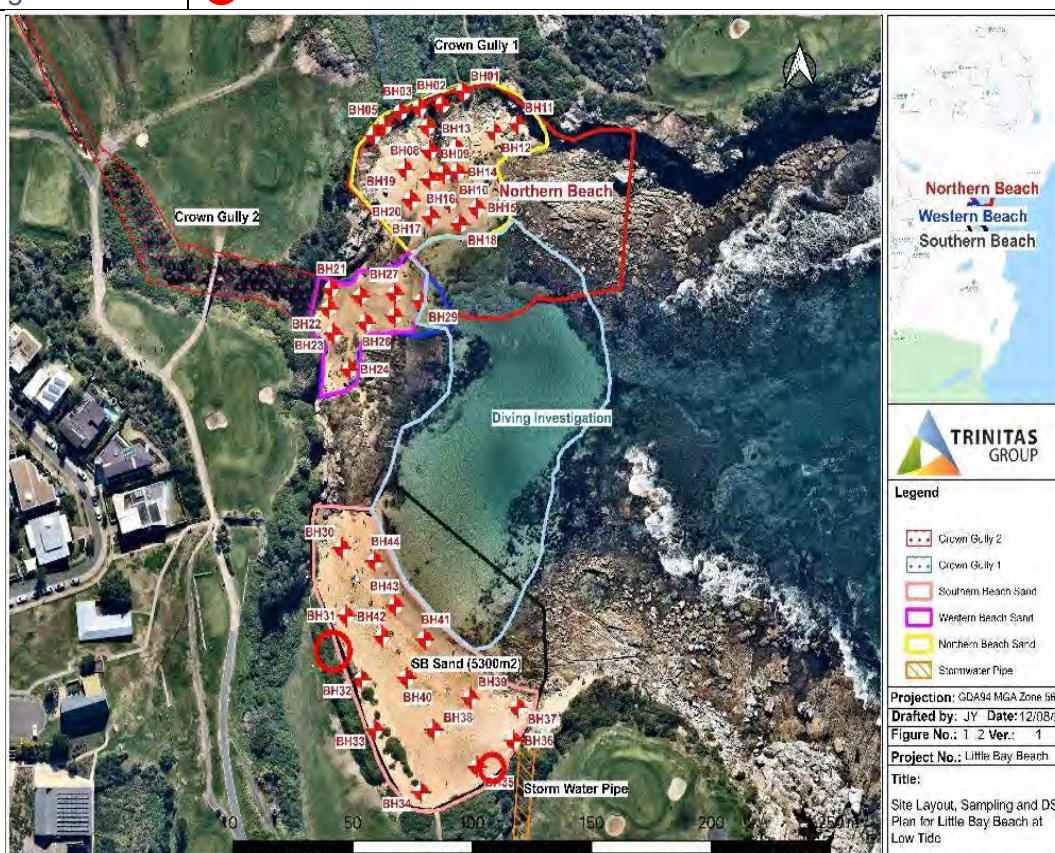
Occupational Hygienist

BSc Environmental Earth Science

28/04/2021

Asbestos Daily Air Monitoring Report

Requested by:	
Client Contact Name	Joe Santangelo
Client Contact Number	0436839760
Client Contact Email	joe.santangelo@randwick.nsw.gov.au
Site:	
Address	2 Coast Hospital Rd, Little Bay NSW 2036
Local Government Area	Randwick City Council
Site Boundary	
Air Monitoring Locations	



Air Monitoring Details:

Date of Field Work:	28/04/2021
Start Time:	07:00
Consultant:	Kieran Mackowski BSc Environmental Earth Science
Sampling Type:	Asbestos
Temperature	14°C
Wind Speed	10km/h
Scope of Work:	Background Air Monitoring during Site Assessment

Methodology:

Asbestos fibre static air monitoring and analysis was conducted in accordance with Guidance Note on the Membrane Filter Method for the Estimation of Airborne Asbestos Fibres (NOHSC:3003: April 2005) and

Asbestos Daily Air Monitoring Report

in-house procedures of NATA accredited laboratory for the estimation of airborne fibres. The sample collection was performed using SKC portable sampling pumps fitted with sampling cassettes containing 25 mm membrane filters that were flow tested at the commencement and completion of sampling.

Exposure Standard

The Australian exposure standard for asbestos fibers is 0.1 fibres/ml of air and the action limit for asbestos fibres is 0.01 fibres/ml as per the NSW WHS Regulations 2017.

Sample Location / Person Name	AM Type	Sample ID	Average Flow Rate (L/Min)	Time On	Total Sampling Time (Min)	Total Volume (L)	Results
Southern beach - middle	B	CX630889	2	07:29	416	832.00	<0.01 f/ml
Field blank	B	CX630917					0 fibres / 100 fields
Southern beach - south	B	CX630494	2	07:29	420	840.00	<0.01 f/ml
Northern beach, western boundary shared with golf course	B	CX630858	2.0	07:35	415	830.00	<0.01 f/ml

AM Type Legend

B= Background **Co**= Control **Cl** = Clearance **BL**= Field Black **Pe**= Personal

Comments/Recommendations:

All air monitoring results were below the exposure standard for asbestos fibers during removal works <0.01 f/ml

NATA accredited laboratory results are provided within **Appendix 2**.

Disclaimer:

The results within this report relate only to the sampling locations specified and their analysis. This report shall not be reproduced, except in full.

Prepared By	Approved By
 Kieran Mackowski Occupational Hygienist BSc Environmental Earth Science 28/04/2021	 Denny Bolatti Managing Director Licensed Asbestos Assessor LAA001132 11/05/2021

Asbestos Daily Air Monitoring Report

Appendix 1: Air Monitoring Locations



Location: Southern beach - middle

Result: <0.01 f/ml

Image Id: 210428-072848



Location: Field blank

Result: 0 fibres / 100 fields

Image Id: 210428-073038



Location: Southern beach - south

Result: <0.01 f/ml

Image Id: 210428-073409



Location: Northern beach, western boundary shared with golf course

Result: <0.01 f/ml

Image Id: 210428-110125

Asbestos Daily Air Monitoring Report



How to Contact Us

Mail Trinitas Group
PO Box 1376 Parramatta NSW 2124
Email admin@trinitasgroup.com.au
Address Level 3 Hunter Street, Parramatta NSW 2150
Website www.trinitasgroup.com.au
Telephone 1800 4 TRINITAS
Facsimile 02 8016 0875

Trinitas Group Pty Ltd

ABN 12 161 759 708

Disclaimer: This report is prepared for the use of the recipient for the purpose of risk evaluation, risk improvement and or loss control. It is based upon prevailing conditions at the time of inspection, our observations and information provided by the client contact/s at the site. No responsibility is accepted, and liability disclaimed for the use of this report for any other purpose, or by any third party, nor does it imply that no other hazardous

Asbestos Daily Air Monitoring Report



Appendix 2: Laboratory Analysis Results

Trinitas Group Pty Ltd
Level 3, 24 Hunter Street
Parramatta
NSW 2150



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025—Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection and proficiency testing scheme providers
reports.

Attention: - RESULTS/SRAs
Report 790835-AFA
Project Name **LITTLE BAY BEACH**
Received Date Apr 28, 2021
Date Reported Apr 29, 2021

METHODOLOGY:

Asbestos Counting Conducted in accordance with the National Occupational Health & Safety Commission -
Guidance Note on The Membrane Filter Method For Estimating Airborne Asbestos
Fibres 2nd Edition [NOHSC:3003(2005)] and in-house Method LTM-ASB-8010.

Project Name LITTLE BAY BEACH
Project ID
Date Sampled Apr 28, 2021
Report 790835-AFA

Eurofins Sample No.	Client Sample ID	Location	Fibres/100 fields
21-Ap50464	CX630494	SOUTHERN BEACH - SOUTH	0/100
21-Ap50465	CX630858	NORTHERN BEACH, WESTERN BOUNDARY SHARED WITH GOLF COURSE	0/100
21-Ap50466	CX630889	SOUTHERN BEACH - MIDDLE	0/100
21-Ap50467	CX630917	BLANK	0/100

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8010	Sydney	Apr 28, 2021	Indefinite

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
46-48 Banksia Road
Welshpool WA 6106
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Trinitas Group Pty Ltd
Address: Level 3, 24 Hunter Street
Parramatta
NSW 2150
Project Name: LITTLE BAY BEACH

Order No.:
Report #: 790835
Phone: 02 8810 4445
Fax: 02 8016 0875

Received: Apr 28, 2021 5:22 PM
Due: Apr 29, 2021
Priority: 1 Day
Contact Name: - RESULTS/SRAs

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Asbestos (amount of fibres in air)
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						
Mayfield Laboratory - NATA Site # 25079						
External Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
1	CX630494	Apr 28, 2021	7:29AM	Air	S21-Ap50464	X
2	CX630858	Apr 28, 2021	7:35AM	Air	S21-Ap50465	X
3	CX630889	Apr 28, 2021	7:29AM	Air	S21-Ap50466	X
4	CX630917	Apr 28, 2021	7:30AM	Air	S21-Ap50467	X
Test Counts						4

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to "non-bonded / friable".
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory's remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Kang Kang Wang Senior Analyst-Asbestos (NSW)

Authorised by:

Laxman Dias Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Asbestos Daily Air Monitoring Report



29 April 2021

Randwick City Council

30 Frances Street
Randwick NSW 2031

Attention: Joe Santangelo

joe.santangelo@randwick.nsw.gov.au

RE: Asbestos Daily Air Monitoring Report

Dear Joe Santangelo

Please find below daily Asbestos air monitoring report for:

Location:	Little Bay Beach

All works have been completed in accordance with relevant state WHS Legislation and approved Codes of Practices.

See following pages for results.

Regards,

A handwritten signature in black ink, appearing to read "Kieran Mackowski".

Kieran Mackowski

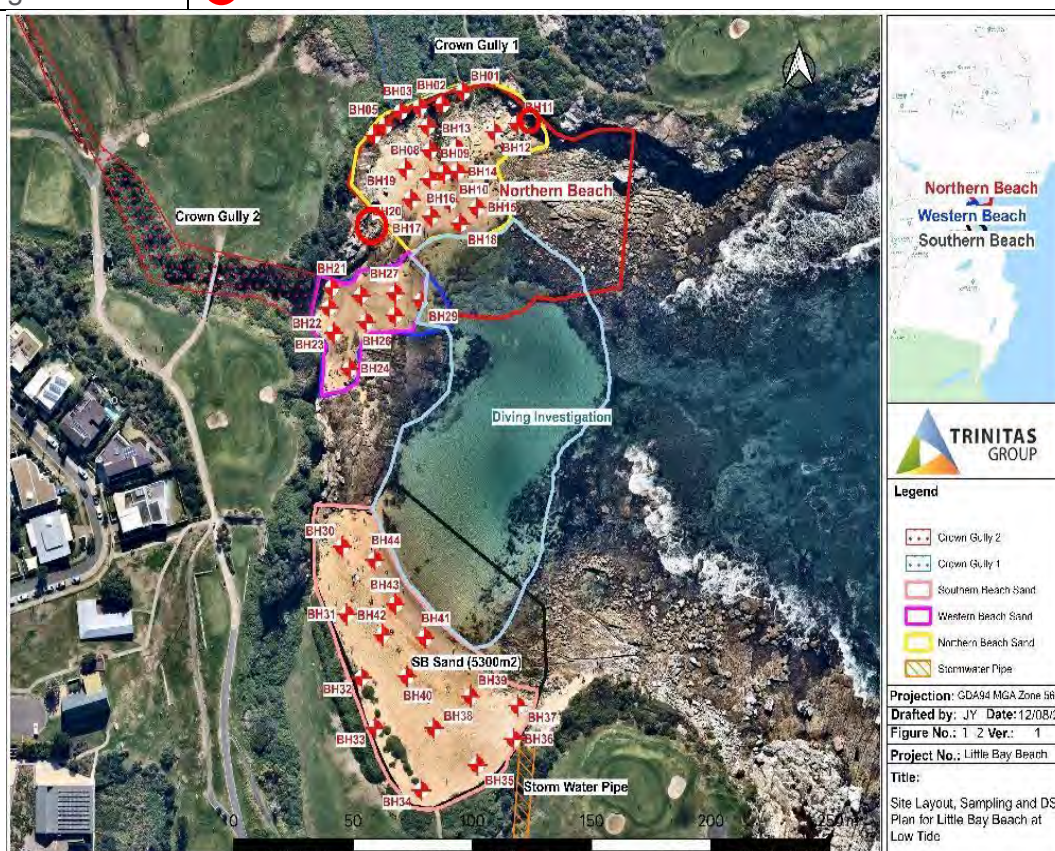
Occupational Hygienist

BSc Environmental Earth Science

29/04/2021

Asbestos Daily Air Monitoring Report

Requested by:	
Client Contact Name	Joe Santangelo
Client Contact Number	0436839760
Client Contact Email	joe.santangelo@randwick.nsw.gov.au
Site:	
Address	2 Coast Hospital Rd, Little Bay NSW 2036
Local Government Area	Randwick City Council
Site Boundary	
Air Monitoring Locations	



Air Monitoring Details:

Date of Field Work:	29/04/2021
Start Time:	07:00
Consultant:	Kieran Mackowski BSc Environmental Earth Science
Sampling Type:	Asbestos
Temperature	20°C
Wind Speed	15km/h
Scope of Work:	Air monitoring

Methodology:

Asbestos fibre static air monitoring and analysis was conducted in accordance with Guidance Note on the Membrane Filter Method for the Estimation of Airborne Asbestos Fibres (NOHSC:3003: April 2005) and

Asbestos Daily Air Monitoring Report

in-house procedures of NATA accredited laboratory for the estimation of airborne fibres. The sample collection was performed using SKC portable sampling pumps fitted with sampling cassettes containing 25 mm membrane filters that were flow tested at the commencement and completion of sampling.

Exposure Standard

The Australian exposure standard for asbestos fibers is 0.1 fibres/ml of air and the action limit for asbestos fibres is 0.01 fibres/ml as per the NSW WHS Regulations 2017.

Sample Location / Person Name	AM Type	Sample ID	Average Flow Rate (L/Min)	Time On	Total Sampling Time (Min)	Total Volume (L)	Results
Northern beach, access boundary shared with golf course	B	CX630311	2.0	09:30	360	720.00	<0.01 f/ml
Northern beach, eastern end of beach on site boundary fence	Co	CX630873	2.0	09:35	350	700.00	<0.01 f/ml
Field blank	Co	CX630408					0 fibres / 100 fields

AM Type Legend

B= Background **Co**= Control **CI** = Clearance **BL**= Field Black **Pe**= Personal

Comments/Recommendations:

All air monitoring results were below the exposure standard for asbestos fibers during removal works <0.01 f/ml

NATA accredited laboratory results are provided within **Appendix 2**.

Disclaimer:

The results within this report relate only to the sampling locations specified and their analysis. This report shall not be reproduced, except in full.

Prepared By	Approved By
 Kieran Mackowski Occupational Hygienist BSc Environmental Earth Science 29/04/2021	 Denny Bolatti Managing Director Licensed Asbestos Assessor LAA001132 11/05/2021

Appendix 1: Air Monitoring Locations



Location: Northern beach, access boundary shared with golf course

Result: <0.01 f/ml

Image Id: 210429-093547



Location: Northern beach, eastern end of beach on site boundary fence

Result: <0.01 f/ml

Image Id: 210429-093939



Location: Field blank

Result: 0 fibres / 100 fields

Image Id: 210429-094124

Asbestos Daily Air Monitoring Report



How to Contact Us

Mail Trinitas Group
PO Box 1376 Parramatta NSW 2124
Email admin@trinitasgroup.com.au
Address Level 3 Hunter Street, Parramatta NSW 2150
Website www.trinitasgroup.com.au
Telephone 1800 4 TRINITAS
Facsimile 02 8016 0875

Trinitas Group Pty Ltd

ABN 12 161 759 708

Disclaimer: This report is prepared for the use of the recipient for the purpose of risk evaluation, risk improvement and or loss control. It is based upon prevailing conditions at the time of inspection, our observations and information provided by the client contact/s at the site. No responsibility is accepted, and liability disclaimed for the use of this report for any other purpose, or by any third party, nor does it imply that no other hazardous

Asbestos Daily Air Monitoring Report



Appendix 2: Laboratory Analysis Results

Trinitas Group Pty Ltd
Level 3, 24 Hunter Street
Parramatta
NSW 2150



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025—Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection and proficiency testing scheme providers
reports.

Attention: - RESULTS/SRAs
Report 791725-AFA
Project Name **LITTLE BAY BEACH**
Received Date Apr 30, 2021
Date Reported May 04, 2021

METHODOLOGY:

Asbestos Counting Conducted in accordance with the National Occupational Health & Safety Commission -
Guidance Note on The Membrane Filter Method For Estimating Airborne Asbestos
Fibres 2nd Edition [NOHSC:3003(2005)] and in-house Method LTM-ASB-8010.

Project Name LITTLE BAY BEACH
Project ID
Date Sampled Apr 29, 2021
Report 791725-AFA

Eurofins Sample No.	Client Sample ID	Location	Fibres/100 fields
21-Ap58091	CX630311	WESTERN SECTION AT NORTHERN BEACH	0/100
21-Ap58092	CX630873	BLANK	0/100
21-Ap58093	CX630408	UPPER NORTHERN BEACH	0/100

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8010	Sydney	Apr 30, 2021	Indefinite

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
46-48 Banksia Road
Welshpool WA 6106
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name: Trinitas Group Pty Ltd
Address: Level 3, 24 Hunter Street
Parramatta
NSW 2150
Project Name: LITTLE BAY BEACH

Order No.:
Report #: 791725
Phone: 02 8810 4445
Fax: 02 8016 0875

Received: Apr 30, 2021 2:15 PM
Due: May 4, 2021
Priority: 5 Day
Contact Name: - RESULTS/SRAs

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Asbestos (amount of fibres in air)
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						
Mayfield Laboratory - NATA Site # 25079						
External Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
1	CX630311	Apr 29, 2021		Air	S21-Ap58091	X
2	CX630873	Apr 29, 2021		Air	S21-Ap58092	X
3	CX630408	Apr 29, 2021		Air	S21-Ap58093	X
Test Counts						3

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to "non-bonded / friable".
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory's remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Md Mominul Haque Senior Analyst-Asbestos (NSW)

Authorised by:

Sayed Abu Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Asbestos Daily Air Monitoring Report



30 April 2021

Randwick City Council

30 Frances Street
Randwick NSW 2031

Attention: Joe Santangelo

joe.santangelo@randwick.nsw.gov.au

RE: Asbestos Daily Air Monitoring Report

Dear Joe Santangelo

Please find below daily Asbestos air monitoring report for:

Location:	Little Bay Beach

All works have been completed in accordance with relevant state WHS Legislation and approved Codes of Practices.

See following pages for results.

Regards,

A handwritten signature in black ink, appearing to read "Kieran Mackowski".

Kieran Mackowski

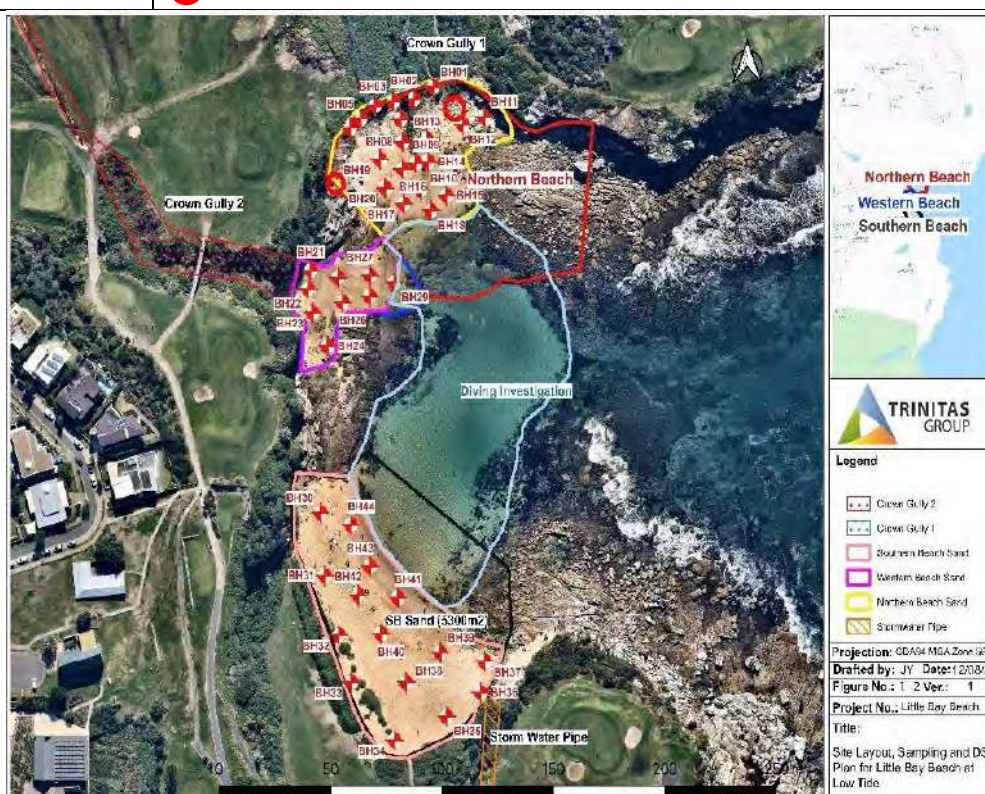
Occupational Hygienist

BSc Environmental Earth Science

04/05/2021

Asbestos Daily Air Monitoring Report

Requested by:	
Client Contact Name	Joe Santangelo
Client Contact Number	0436839760
Client Contact Email	joe.santangelo@randwick.nsw.gov.au
Site:	
Address	2 Coast Hospital Rd, Little Bay NSW 2036
Local Government Area	Randwick City Council
Site Boundary	
Air Monitoring Locations	



Air Monitoring Details:

Date of Field Work:	30/04/2021
Start Time:	07:00
Consultant:	Kieran Mackowski BSc Environmental Earth Science
Sampling Type:	Asbestos
Temperature	20°C
Wind Speed	15km/h
Scope of Work:	Air monitoring

Methodology:

Asbestos fibre static air monitoring and analysis was conducted in accordance with Guidance Note on the Membrane Filter Method for the Estimation of Airborne Asbestos Fibres (NOHSC:3003: April 2005) and in-house procedures of NATA accredited laboratory for the estimation of airborne fibres. The sample

Asbestos Daily Air Monitoring Report

collection was performed using SKC portable sampling pumps fitted with sampling cassettes containing 25 mm membrane filters that were flow tested at the commencement and completion of sampling.

Exposure Standard

The Australian exposure standard for asbestos fibers is 0.1 fibres/ml of air and the action limit for asbestos fibres is 0.01 fibres/ml as per the NSW WHS Regulations 2017.

Sample Location / Person Name	AM Type	Sample ID	Average Flow Rate (L/Min)	Time On	Total Sampling Time (Min)	Total Volume (L)	Results
Upper Northern beach	Co	CX630930	2.0	07:30	410	820.00	<0.01 f/ml
Western Section at Northern beach	Co	CX630185	2.0	06:33	469	938.00	<0.01 f/ml
Field blank	Co	CX630895					<0.01 f/ml

AM Type Legend

B= Background **Co**= Control **Cl** = Clearance **BL**= Field Black **Pe**= Personal

Comments/Recommendations:

All air monitoring results were below the exposure standard for asbestos fibers during removal works <0.01 f/ml

NATA accredited laboratory results are provided within **Appendix 2**.

Disclaimer:

The results within this report relate only to the sampling locations specified and their analysis. This report shall not be reproduced, except in full.

Prepared By	Approved By
 Kieran Mackowski Occupational Hygienist BSc Environmental Earth Science 04/05/2021	 Denny Bolatti Managing Director Licensed Asbestos Assessor LAA001132 11/05/2021

Asbestos Daily Air Monitoring Report

Appendix 1: Air Monitoring Locations



Location: Upper Northern beach

Result: <0.01 f/ml

Image Id: 210430-073456



Location: Western Section at Northern beach

Result: <0.01 f/ml

Image Id: 210430-073705



Location: Field blank

Result: <0.01 f/ml

Image Id: 210430-073831

Asbestos Daily Air Monitoring Report



How to Contact Us

Mail Trinitas Group
PO Box 1376 Parramatta NSW 2124
Email admin@trinitasgroup.com.au
Address Level 3 Hunter Street, Parramatta NSW 2150
Website www.trinitasgroup.com.au
Telephone 1800 4 TRINITAS
Facsimile 02 8016 0875

Trinitas Group Pty Ltd

ABN 12 161 759 708

Disclaimer: This report is prepared for the use of the recipient for the purpose of risk evaluation, risk improvement and or loss control. It is based upon prevailing conditions at the time of inspection, our observations and information provided by the client contact/s at the site. No responsibility is accepted, and liability disclaimed for the use of this report for any other purpose, or by any third party, nor does it imply that no other hazardous

Asbestos Daily Air Monitoring Report



Appendix 2: Laboratory Analysis Results

Trinitas Group Pty Ltd
Level 3, 24 Hunter Street
Parramatta
NSW 2150



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025—Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection and proficiency testing scheme providers
reports.

Attention: Denny Bolatti
Report 791912-AFA
Project Name **LITTLE BAY BEACH**
Received Date May 03, 2021
Date Reported May 04, 2021

METHODOLOGY:

Asbestos Counting

Conducted in accordance with the National Occupational Health & Safety Commission -
Guidance Note on The Membrane Filter Method For Estimating Airborne Asbestos
Fibres 2nd Edition [NOHSC:3003(2005)] and in-house Method LTM-ASB-8010.

Project Name LITTLE BAY BEACH
Project ID
Date Sampled Apr 30, 2021
Report 791912-AFA

Eurofins Sample No.	Client Sample ID	Location	Fibres/100 fields
21-My01615	CX630185 - WESTERN SECTION AT NORTHERN BEACH	WESTERN SECTION AT NORTHERN BEACH	4.5/100
21-My01616	CX630895 - FIELD BLANK	BLANK	0/100
21-My01617	CX630930 - UPPER NORTHERN BEACH	UPPER NORTHERN BEACH	0/100

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8010	Sydney	May 03, 2021	Indefinite

Company Name: Trinitas Group Pty Ltd
Address: Level 3, 24 Hunter Street
Parramatta
NSW 2150
Project Name: LITTLE BAY BEACH

Order No.:
Report #: 791912
Phone: 02 8810 4445
Fax: 02 8016 0875

Received: May 3, 2021 12:57 PM
Due: May 4, 2021
Priority: 1 Day
Contact Name: Denny Bolatti

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Asbestos (amount of fibres in air)
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						
Mayfield Laboratory - NATA Site # 25079						
External Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
1	CX630185 - WESTERN SECTION AT NORTHERN BEACH	Apr 30, 2021		Air	S21-My01615	X
2	CX630895 - FIELD BLANK	Apr 30, 2021		Air	S21-My01616	X
3	CX630930 - UPPER NORTHERN BEACH	Apr 30, 2021		Air	S21-My01617	X
Test Counts						3

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to "non-bonded / friable".
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory's remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Md Mominul Haque Senior Analyst-Asbestos (NSW)

Authorised by:

Sayed Abu Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Asbestos in Soil Clearance Inspection



26 April 2021

Randwick City Council
30 Frances Street
Randwick NSW 2031

Attention: Joe Santangelo
joe.santangelo@randwick.nsw.gov.au

RE: Asbestos in Soil Clearance Inspection

Dear Joe Santangelo

Please find below Asbestos in Soil Clearance Inspection results for the following site:

Site:	Little Bay Beach

All works have been completed in accordance with applicable WHS Legislation, Approved Codes of Practice and Australian Standards

Regards,

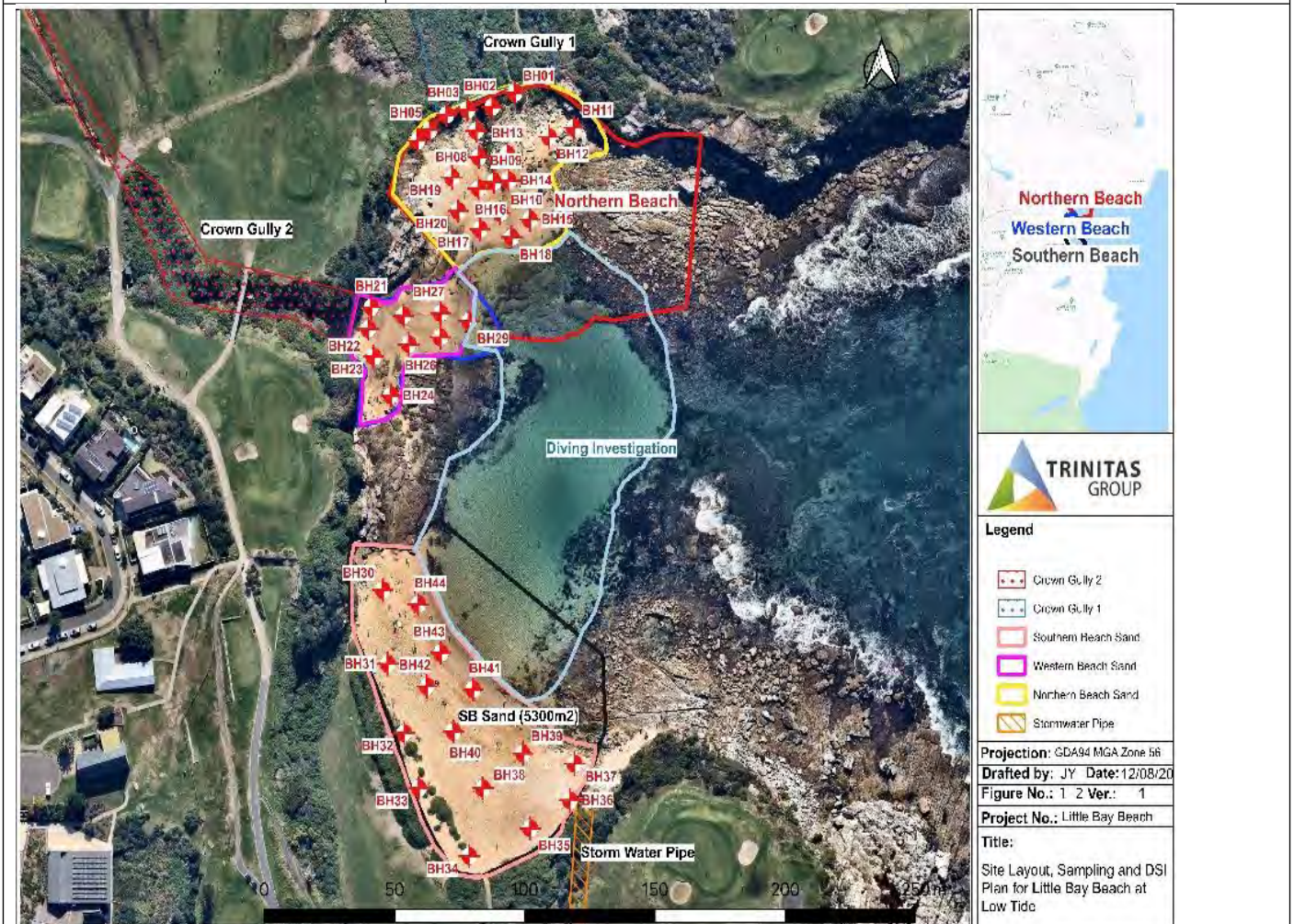
Jeffrey Yu

Jeffrey Yu
Senior Occupational Hygienist
Licensed Asbestos Assessor #001366

Asbestos in Soil Clearance Inspection



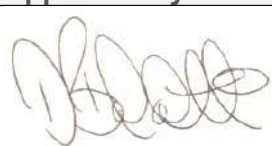
Requested by:	
Name	Joe Santangelo
Contact	0436839760
Email	joe.santangelo@randwick.nsw.gov.au
Site Details:	
Address	2 Coast Hospital Rd, Little Bay NSW 2036
Local Government Area	Randwick City Council



Clearance Area	
Clearance Type:	
Clearance Type	Asbestos in Soil
Application Legislation	2011 WHS Act 2017 WHS Regulations Code of Practice, How to Manage and Control Asbestos in the Workplace 2019 Code of Practice, How to Safely Remove Asbestos 2019 Guidance Note On The Membrane Filter Method For Estimating Airborne Asbestos Fibres 2nd Edition [Nohsc:3003(2005)]

Asbestos in Soil Clearance Inspection



	National Environment Protection Measure Schedule B2__Site Characterisation 2011
Scope of Remediation Work:	
Location of Remediation Work	Southern beach
Material	ACM fragments
Bonded / Friable	Non-Friable
Scope of Remediation	Emu picking
Date of Remediation work	26/04/2021
Documents Reviewed	
Remediation Contractor	
License Number	
Contact Number	
Clearance Inspection:	
Time	14:30
Date	26/04/2021
Consultant	Jeffrey Yu Licensed Asbestos Assessor #001366
Result/s	The inspection found NO VISIBLE ASBESTOS remaining in areas outlined in the removal scope. Visually, all identified asbestos-containing materials had been removed from the identified areas. The removal area and immediate surrounds have been cleaned to a practically achievable standard with no visible asbestos residue.
Notes	
Enclosure Smoke Test:	
Date	N/A
Location	N/A
Results	N/A
Air Monitoring:	
Date – Type – Result	26/04/2021 - Control - All results < 0.01 f/ml
Sampling:	
Date – Type – Result	N/A
Photos:	
Prior to Remediation	See Appendix 1
Post Remediation	See Appendix 2
Disclaimer	
The results within this report relate only to the sampling locations specified and their analysis. This report shall not be reproduced, except in full.	
Prepared By	Approved By
 Jeffrey Yu Senior Occupational Hygienist Licensed Asbestos Assessor #001366 26/04/2021	 Denny Bolatti Managing Director Licensed Asbestos Assessor LAA001132

Appendix 1 – Photos Prior to Remediation



Notes: TP44



Notes: TP43



Notes: TP41



Notes: TP39

Appendix 2 – Photos Post Remediation



Notes: TP42



Notes: TP44



Notes: TP43



Notes: TP41

Asbestos in Soil Clearance Inspection



Notes: TP39

Asbestos in Soil Clearance Inspection



Appendix 3 - Clearance Certificate

Dear Joe Santangelo,

Pursuant to Clause 473 NSW Work Health and Safety Regulation 2017, Trinitas Group was engaged as an Senior Occupational Hygienist to conduct a Clearance Inspection as required

The evidence to form a determination as to whether the Asbestos in Soil remediation area is safe for normal use included the verification methods as outlined within clause 473 (3) of the NSW Work Health and Safety Regulation 2017.

I, Jeffrey Yu, a Senior Occupational Hygienist of Trinitas Group Pty Ltd affirms that I undertook the Clearance Inspection. I am satisfied that the remediation area and area immediately surrounding it, are free from visual contamination.

Pursuant to clause 474 (5) of the NSW Work Health and Safety Regulation 2017, I state that, I, Jeffrey Yu, Senior Occupational Hygienist, found no visible residue from remediation works in the area, or in the vicinity of the area, where the work was carried out.

Based on the verification methods required by the NSW Work Health and Safety Regulation 2017 Clause 473 the remediation area does not pose a risk to health and safety from exposure to Asbestos in Soil during normal use.

Upon receipt of this Clearance Certificate, the remediation area may be re-occupied.

Regards,

A handwritten signature in black ink that reads "Jeffrey Yu".

Jeffrey Yu
Senior Occupational Hygienist
Licensed Asbestos Assessor #001366

Asbestos in Soil Clearance Inspection



How to Contact Us

Mail Trinitas Group
PO Box 1376 Parramatta NSW 2124
Email admin@trinitasgroup.com.au
Address Level 3 Hunter Street, Parramatta NSW 2150
Website www.trinitasgroup.com.au
Telephone 1800 4 TRINITAS
Facsimile 02 8016 0875

Trinitas Group Pty Ltd

ABN 12 161 759 708

Disclaimer: This report is prepared for the use of the recipient for the purpose of risk evaluation, risk improvement and or loss control. It is based upon prevailing conditions at the time of inspection, our observations and information provided by the client contact/s at the site. No responsibility is accepted, and liability disclaimed for the use of this report for any other purpose, or by any third party, nor does it imply that no other hazardous conditions exist.

Asbestos in Soil Clearance Inspection



27 April 2021

Randwick City Council

30 Frances Street
Randwick NSW 2031

Attention: Joe Santangelo
joe.santangelo@randwick.nsw.gov.au

RE: Asbestos in Soil Clearance Inspection

Dear Joe Santangelo

Please find below Asbestos in Soil Clearance Inspection results for the following site:

Site:	Little Bay Beach

All works have been completed in accordance with applicable WHS Legislation, Approved Codes of Practice and Australian Standards

Regards,

A handwritten signature in black ink that reads "Jeffrey Yu".

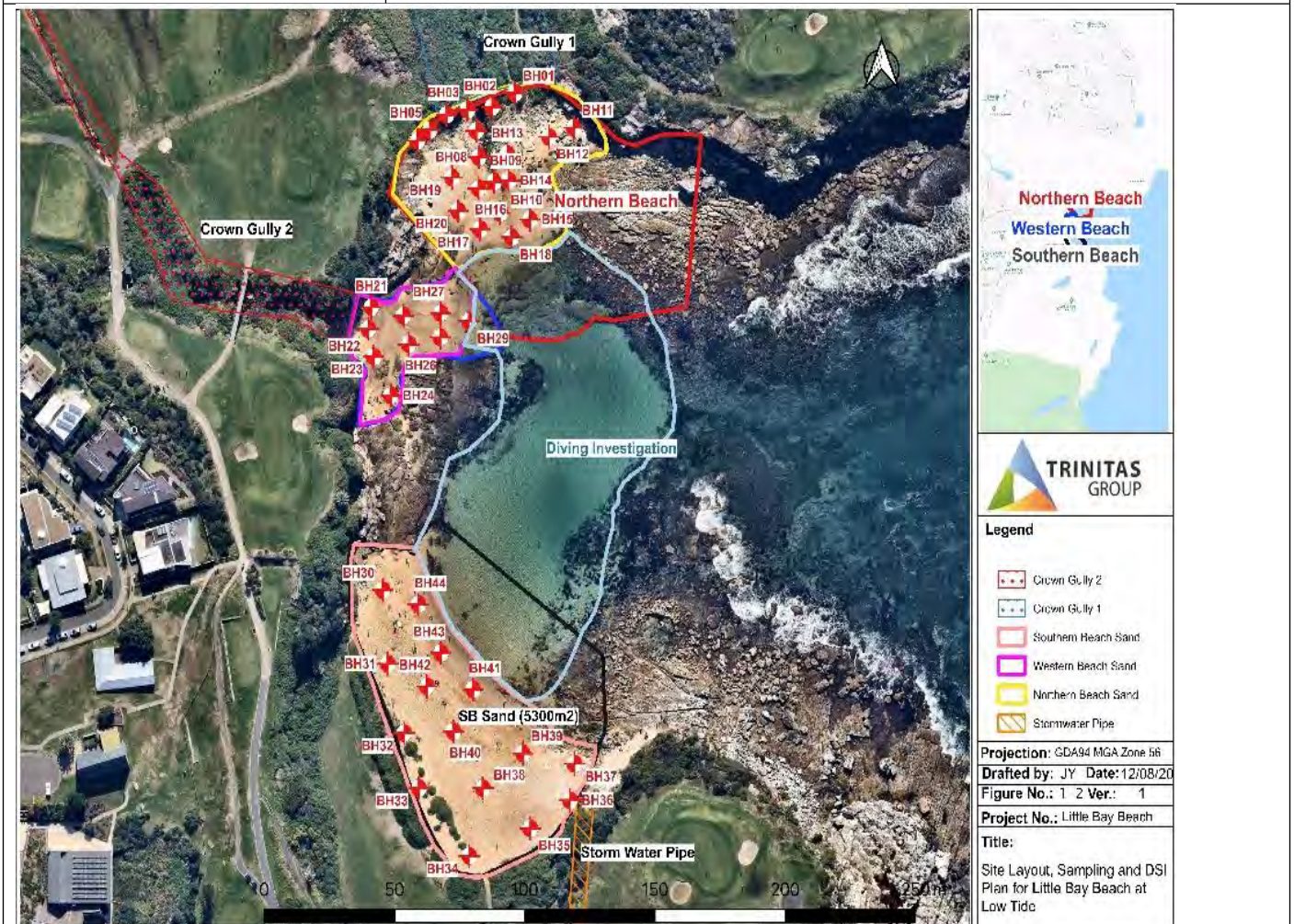
Jeffrey Yu

Senior Occupational Hygienist
Licensed Asbestos Assessor #001366

Asbestos in Soil Clearance Inspection



Requested by:	
Name	Joe Santangelo
Contact	0436839760
Email	joe.santangelo@randwick.nsw.gov.au
Site Details:	
Address	2 Coast Hospital Rd, Little Bay NSW 2036
Local Government Area	Randwick City Council



Clearance Area	
Clearance Type:	
Clearance Type	Asbestos in Soil
Application Legislation	2011 WHS Act 2017 WHS Regulations Code of Practice, How to Manage and Control Asbestos in the Workplace 2019 Code of Practice, How to Safely Remove Asbestos 2019 Guidance Note On The Membrane Filter Method For Estimating Airborne Asbestos Fibres 2nd Edition [Nohsc:3003(2005)]

Asbestos in Soil Clearance Inspection



	National Environment Protection Measure Schedule B2__Site Characterisation 2011
Scope of Remediation Work:	
Location of Remediation Work	Southern beach
Material	ACM fragments
Bonded / Friable	Non-Friable
Scope of Remediation	Emu picking
Date of Remediation work	27/04/2021
Documents Reviewed	
Remediation Contractor	
License Number	
Contact Number	
Clearance Inspection:	
Time	14:30
Date	27/04/2021
Consultant	Jeffrey Yu Licensed Asbestos Assessor #001366
Result/s	The inspection found NO VISIBLE ASBESTOS remaining in areas outlined in the removal scope. Visually, all identified asbestos-containing materials had been removed from the identified areas. The removal area and immediate surrounds have been cleaned to a practically achievable standard with no visible asbestos residue.
Notes	
Enclosure Smoke Test:	
Date	N/A
Location	N/A
Results	N/A
Air Monitoring:	
Date – Type – Result	27/04/2021 - - All results < 0.01 f/ml 27/04/2021 - Control - All results < 0.01 f/ml
Sampling:	
Date – Type – Result	N/A
Photos:	
Prior to Remediation	See Appendix 1
Post Remediation	See Appendix 2
Disclaimer	
The results within this report relate only to the sampling locations specified and their analysis. This report shall not be reproduced, except in full.	
Prepared By	Approved By
 Jeffrey Yu Senior Occupational Hygienist Licensed Asbestos Assessor #001366	 Denny Bolatti Managing Director Licensed Asbestos Assessor LAA001132

Asbestos in Soil Clearance Inspection



30/04/2021	

Asbestos in Soil Clearance Inspection

Appendix 1 – Photos Prior to Remediation



Notes: Southern beach

Appendix 2 – Photos Post Remediation



Notes: Southern beach



Notes: Southern beach



Notes: Southern beach



Notes: Southern beach

Asbestos in Soil Clearance Inspection



Appendix 3 - Clearance Certificate

Dear Joe Santangelo,

Pursuant to Clause 473 NSW Work Health and Safety Regulation 2017, Trinitas Group was engaged as an Senior Occupational Hygienist to conduct a Clearance Inspection as required

The evidence to form a determination as to whether the Asbestos in Soil remediation area is safe for normal use included the verification methods as outlined within clause 473 (3) of the NSW Work Health and Safety Regulation 2017.

I, Jeffrey Yu, a Senior Occupational Hygienist of Trinitas Group Pty Ltd affirms that I undertook the Clearance Inspection. I am satisfied that the remediation area and area immediately surrounding it, are free from visual contamination.

Pursuant to clause 474 (5) of the NSW Work Health and Safety Regulation 2017, I state that, I, Jeffrey Yu, Senior Occupational Hygienist, found no visible residue from remediation works in the area, or in the vicinity of the area, where the work was carried out.

Based on the verification methods required by the NSW Work Health and Safety Regulation 2017 Clause 473 the remediation area does not pose a risk to health and safety from exposure to Asbestos in Soil during normal use.

Upon receipt of this Clearance Certificate, the remediation area may be re-occupied.

Regards,

A handwritten signature in black ink that reads "Jeffrey Yu".

Jeffrey Yu
Senior Occupational Hygienist
Licensed Asbestos Assessor #001366

Asbestos in Soil Clearance Inspection



How to Contact Us

Mail Trinitas Group
PO Box 1376 Parramatta NSW 2124
Email admin@trinitasgroup.com.au
Address Level 3 Hunter Street, Parramatta NSW 2150
Website www.trinitasgroup.com.au
Telephone 1800 4 TRINITAS
Facsimile 02 8016 0875

Trinitas Group Pty Ltd

ABN 12 161 759 708

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Asbestos Containing Material Clearance Inspection



28 April 2021

Randwick City Council
30 Frances Street
Randwick NSW 2031

Attention: Joe Santangelo
joe.santangelo@randwick.nsw.gov.au

RE: Asbestos Containing Material Clearance Inspection

Dear Joe Santangelo

Please find below Asbestos Containing Material Clearance Inspection results for the following site:

Site:	Little Bay Beach

All works have been completed in accordance with applicable WHS Legislation, Approved Codes of Practice and Australian Standards

Regards,

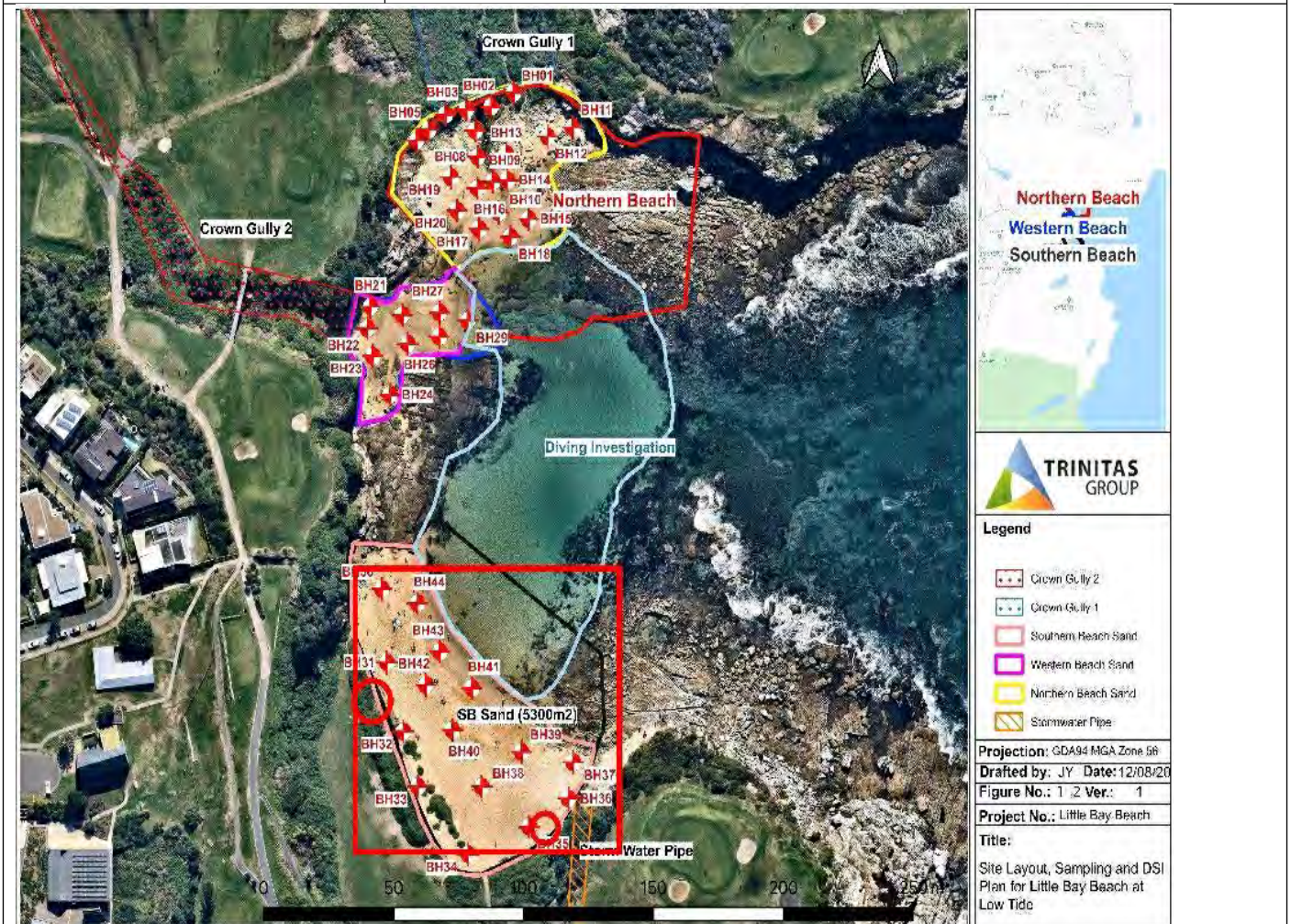
A handwritten signature in black ink, appearing to read "Kieran Mackowski".

Kieran Mackowski
Occupational Hygienist
BSc Environmental Earth Science

Asbestos Containing Material Clearance Inspection



Requested by:	
Name	Joe Santangelo
Contact	0436839760
Email	joe.santangelo@randwick.nsw.gov.au
Site Details:	
Address	2 Coast Hospital Rd, Little Bay NSW 2036
Local Government Area	Randwick City Council



Clearance Area	
Clearance Type:	
Clearance Type	Asbestos Containing Material
Application Legislation	2011 WHS Act 2017 WHS Regulations Code of Practice, How to Manage and Control Asbestos in the Workplace 2019 Code of Practice, How to Safely Remove Asbestos 2019 Guidance Note On The Membrane Filter Method For Estimating Airborne Asbestos Fibres 2nd Edition [Nohsc:3003(2005)]
Scope of Remediation Work:	

Asbestos Containing Material Clearance Inspection



Location of Remediation Work	Little Bay Beach, Southern beach, TP36 and TP37
Material	Suspected ACM within sand
Bonded / Friable	Non-Friable
Scope of Remediation	Remediation of test pit with visual inspection of surface
Date of Remediation work	28/04/2021
Documents Reviewed	Nil
Remediation Contractor	
License Number	
Contact Number	
Clearance Inspection:	
Time	09:15
Date	28/04/2021
Consultant	Kieran Mackowski BSc Environmental Earth Science
Result/s	The inspection found NO VISIBLE ASBESTOS remaining in areas outlined in the removal scope. Visually, all identified asbestos-containing materials had been removed from the identified areas. The removal area and immediate surrounds have been cleaned to a practically achievable standard with no visible asbestos residue.
Notes	
Enclosure Smoke Test:	
Date	N/A
Location	N/A
Results	N/A
Air Monitoring:	
Date – Type – Result	28/04/2021 - Control - All results < 0.01 f/ml 28/04/2021 - - All results < 0.01 f/ml
Sampling:	
Date – Type – Result	N/A
Photos:	
Prior to Remediation	See Appendix 1
Post Remediation	See Appendix 2
Disclaimer	
The results within this report relate only to the sampling locations specified and their analysis. This report shall not be reproduced, except in full.	
Prepared By	Approved By
 Kieran Mackowski Occupational Hygienist BSc Environmental Earth Science 30/04/2021	 Denny Bolatti Managing Director Licensed Asbestos Assessor LAA001132

Appendix 1 – Photos Prior to Remediation



Notes: Southern beach



Notes: Southern beach



Notes: Northern beach



Notes: Northern beach

Appendix 2 – Photos Post Remediation



Notes: Southern beach



Notes: Southern beach



Notes: Northern beach



Notes: Northern beach

Asbestos Containing Material Clearance Inspection



Appendix 3 - Clearance Certificate

Dear Joe Santangelo,

Pursuant to Clause 473 NSW Work Health and Safety Regulation 2017, Trinitas Group was engaged as an Occupational Hygienist to conduct a Clearance Inspection as required

The evidence to form a determination as to whether the Asbestos Containing Material remediation area is safe for normal use included the verification methods as outlined within clause 473 (3) of the NSW Work Health and Safety Regulation 2017.

I, Kieran Mackowski, a Occupational Hygienist of Trinitas Group Pty Ltd affirms that I undertook the Clearance Inspection. I am satisfied that the remediation area and area immediately surrounding it, are free from visual contamination.

Pursuant to clause 474 (5) of the NSW Work Health and Safety Regulation 2017, I state that, I, Kieran Mackowski, Occupational Hygienist, found no visible residue from remediation works in the area, or in the vicinity of the area, where the work was carried out.

Based on the verification methods required by the NSW Work Health and Safety Regulation 2017 Clause 473 the remediation area does not pose a risk to health and safety from exposure to Asbestos Containing Material during normal use.

Upon receipt of this Clearance Certificate, the remediation area may be re-occupied.

Regards,

A handwritten signature in blue ink, appearing to read "Kieran Mackowski".

Kieran Mackowski
Occupational Hygienist
BSc Environmental Earth Science

Asbestos Containing Material Clearance Inspection



How to Contact Us

Mail Trinitas Group
PO Box 1376 Parramatta NSW 2124
Email admin@trinitasgroup.com.au
Address Level 3 Hunter Street, Parramatta NSW 2150
Website www.trinitasgroup.com.au
Telephone 1800 4 TRINITAS
Facsimile 02 8016 0875

Trinitas Group Pty Ltd

ABN 12 161 759 708

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Asbestos in Soil Clearance Inspection



30 April 2021

Randwick City Council

30 Frances Street
Randwick NSW 2031

Attention: Joe Santangelo
joe.santangelo@randwick.nsw.gov.au

RE: Asbestos in Soil Clearance Inspection

Dear Joe Santangelo

Please find below Asbestos in Soil Clearance Inspection results for the following site:

Site:	Little Bay Beach

All works have been completed in accordance with applicable WHS Legislation, Approved Codes of Practice and Australian Standards

Regards,

Jeffrey Yu

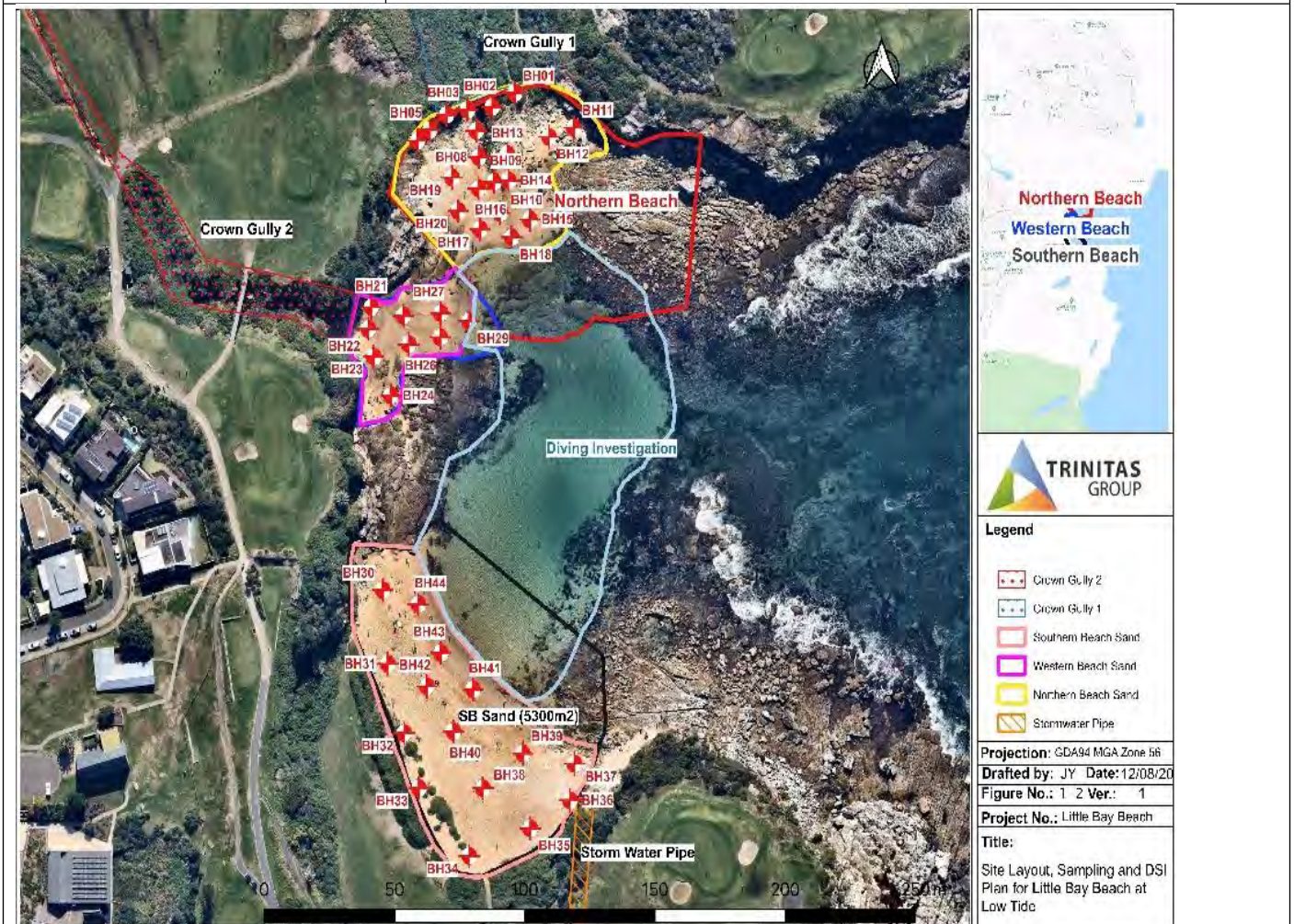
Jeffrey Yu

Senior Occupational Hygienist
Licensed Asbestos Assessor #001366

Asbestos in Soil Clearance Inspection



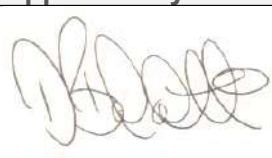
Requested by:	
Name	Joe Santangelo
Contact	0436839760
Email	joe.santangelo@randwick.nsw.gov.au
Site Details:	
Address	2 Coast Hospital Rd, Little Bay NSW 2036
Local Government Area	Randwick City Council



Clearance Area	
Clearance Type:	
Clearance Type	Asbestos in Soil
Application Legislation	2011 WHS Act 2017 WHS Regulations Code of Practice, How to Manage and Control Asbestos in the Workplace 2019 Code of Practice, How to Safely Remove Asbestos 2019 Guidance Note On The Membrane Filter Method For Estimating Airborne Asbestos Fibres 2nd Edition [Nohsc:3003(2005)]

Asbestos in Soil Clearance Inspection



	National Environment Protection Measure Schedule B2__Site Characterisation 2011
Scope of Remediation Work:	
Location of Remediation Work	Three beaches
Material	ACM fragments on surfaces
Bonded / Friable	Non-Friable
Scope of Remediation	Emu picking
Date of Remediation work	30/04/2021
Documents Reviewed	
Remediation Contractor	
License Number	LAA001366
Contact Number	
Clearance Inspection:	
Time	10:35
Date	30/04/2021
Consultant	Jeffrey Yu Licensed Asbestos Assessor #001366
Result/s	The inspection found NO VISIBLE ASBESTOS remaining in areas outlined in the removal scope. Visually, all identified asbestos-containing materials had been removed from the identified areas. The removal area and immediate surrounds have been cleaned to a practically achievable standard with no visible asbestos residue.
Notes	12 ACM fragments collected from intertidal areas
Enclosure Smoke Test:	
Date	N/A
Location	N/A
Results	N/A
Air Monitoring:	
Date – Type – Result	30/04/2021 - Control - All results < 0.01 f/ml
Sampling:	
Date – Type – Result	N/A
Photos:	
Prior to Remediation	See Appendix 1
Post Remediation	See Appendix 2
Disclaimer	
The results within this report relate only to the sampling locations specified and their analysis. This report shall not be reproduced, except in full.	
Prepared By	Approved By
 Jeffrey Yu <i>Senior Occupational Hygienist</i> Licensed Asbestos Assessor #001366 04/05/2021	 Denny Bolatti <i>Managing Director</i> Licensed Asbestos Assessor LAA001132

Asbestos in Soil Clearance Inspection

Appendix 1 – Photos Prior to Remediation



Notes: Middle Beach revisited, overnight after DSI excavation



Notes: Southern beach

Appendix 2 – Photos Post Remediation



Notes: Western beach



Notes: Western beach



Notes: Western beach



Notes: Western beach overnight after test pit digging

Asbestos in Soil Clearance Inspection



Notes: Western beach



Notes: Western beach



Notes: Western beach



Notes: Western beach with bricks, tiles, glasses

Asbestos in Soil Clearance Inspection



Notes: Northern beach



Notes: Northern beach



Notes: Northern beach



Notes: Southern beach

Asbestos in Soil Clearance Inspection



Notes: 12 ACM fragments collected

Asbestos in Soil Clearance Inspection



Appendix 3 - Clearance Certificate

Dear Joe Santangelo,

Pursuant to Clause 473 NSW Work Health and Safety Regulation 2017, Trinitas Group was engaged as an Senior Occupational Hygienist to conduct a Clearance Inspection as required

The evidence to form a determination as to whether the Asbestos in Soil remediation area is safe for normal use included the verification methods as outlined within clause 473 (3) of the NSW Work Health and Safety Regulation 2017.

I, Jeffrey Yu, a Senior Occupational Hygienist of Trinitas Group Pty Ltd affirms that I undertook the Clearance Inspection. I am satisfied that the remediation area and area immediately surrounding it, are free from visual contamination.

Pursuant to clause 474 (5) of the NSW Work Health and Safety Regulation 2017, I state that, I, Jeffrey Yu, Senior Occupational Hygienist, found no visible residue from remediation works in the area, or in the vicinity of the area, where the work was carried out.

Based on the verification methods required by the NSW Work Health and Safety Regulation 2017 Clause 473 the remediation area does not pose a risk to health and safety from exposure to Asbestos in Soil during normal use.

Upon receipt of this Clearance Certificate, the remediation area may be re-occupied.

Regards,

A handwritten signature in black ink that reads "Jeffrey Yu".

Jeffrey Yu
Senior Occupational Hygienist
Licensed Asbestos Assessor #001366

Asbestos in Soil Clearance Inspection



How to Contact Us

Mail Trinitas Group
PO Box 1376 Parramatta NSW 2124
Email admin@trinitasgroup.com.au
Address Level 3 Hunter Street, Parramatta NSW 2150
Website www.trinitasgroup.com.au
Telephone 1800 4 TRINITAS
Facsimile 02 8016 0875

Trinitas Group Pty Ltd

ABN 12 161 759 708

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Appendix L Certificate 10.7

PLANNING CERTIFICATE

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Randwick City Council
C/- EVAN BUNTORO
192-220 Storey St
MAROUBRA NSW 2035

Description of land: LOT 97 DP 270427

Address: 4R Coast Hospital Road, LITTLE BAY NSW 2036

Date of Certificate: 9 August 2021
Certificate No: 58935
Receipt No:
Amount: \$203.00
Reference: LBAYBEACH-10.7-1

This planning certificate should be read in conjunction with the Randwick City Council Local Environmental Plan 2012. This is available on the NSW Legislation website at <https://www.legislation.nsw.gov.au/#/view/EPI/2013/36>

The land to which this planning certificate relates, being the lot or one of the lots described in the application made for this certificate, is shown in the Council's record as being situated at the "Address" stated above. The legal "description of land" (by lot(s) and DP/SP numbers) is obtained from NSW Land Registry Services. It is the responsibility of the applicant to enquire and confirm with NSW Land Registry Services the accuracy of the lot(s) and DP/SP numbers pertaining to the land for which application is made for the certificate.

There is more information about some property conditions than is included on this property certificate.

If this case, after the condition text, there is a URL and a square bar code or 'QR code' which provides the address of a page on the Randwick City Council website.

You will need internet access and either:

- 1. Download a QR code scanner app to your phone and scan the QR code*
- or*
- 2. Type the URL into your internet browser*



INFORMATION PROVIDED UNDER SECTION 10.7 (2)

In accordance with the requirements of section 10.7 of the Environmental Planning and Assessment Act 1979 (as amended), the following prescribed matters relate to the land as at the date of this certificate. The information provided in reference to the prescribed matters has been obtained from Council's records and/or from other authorities/government department. Council provides the information in good faith but disclaims all liability for any omission or inaccuracy. Specific inquiry should be made where doubt exists as to the accuracy of the information so provided.

1 Names of relevant planning instruments and DCPs

(1) The name of each environmental planning instrument that applies to the carrying out of development on the land.

Randwick Local Environmental Plan (LEP) 2012, and relevant State Environmental Planning Policies (SEPPs) apply to the land.

- SEPP No. 19 - Bushland in Urban Areas
- SEPP No. 21 - Caravan Parks
- SEPP No. 33 - Hazardous and Offensive Development
- SEPP No. 55 - Remediation of Land
- SEPP No. 64 - Advertising and Signage
- SEPP No. 65 - Design Quality of Residential Flat Development
- SEPP No. 70 - Affordable Housing
- SEPP - (Affordable Rental Housing) 2009
- SEPP - BASIX (Building Sustainability Index) 2004
- SEPP - (Coastal Management) 2018
- SEPP - (Concurrence) 2018
- SEPP - (Educational Establishments and Child Care Facilities) 2017
- SEPP - (Exempt and Complying Development Codes) 2008
- SEPP - (Housing for Seniors or People with a Disability) 2004
- SEPP - (Infrastructure) 2007
- SEPP - (Mining, Petroleum Production and Extractive Industries) 2007
- SEPP - (Miscellaneous Consent Provisions) 2007
- SEPP - (State and Regional Development) 2011
- SEPP - (State Significant Precincts) 2005
- SEPP - (Three Ports) 2013
- SEPP - (Vegetation in Non-Rural Areas) 2017

Note: Any questions regarding State Environmental Planning Policies and Regional Environmental Plans should also be directed to the Department of Planning & Infrastructure (02) 9228 6111 or www.planning.nsw.gov.au.

Local Environmental Plan (LEP) Gazetted 15 February 2013

- Randwick LEP 2012 (Amendment No1) - Gazetted 21 November 2014
Applies to part of Royal Randwick Racecourse (identified as "Area A" on the LEP Additional Permitted Uses Map). Permits additional uses of hotel or motel accommodation, serviced apartments and function centres with development consent.
- Randwick LEP 2012 (Amendment No2) - Gazetted 2 April 2015
Applies to land at Young Street Randwick – Inglis Newmarket Site (shown as Area 1 on the LEP Key Sites Map). Amendment to planning controls, including zoning, height of buildings, heritage items and heritage area, FSR (subject to new Clause 6.16) and inclusion of the site as a Key Site.



- Randwick LEP 2012 (Amendment No3) - Gazetted 15 July 2016
Amends Schedule 1 to include 'childcare centre' as an additional permitted use (with development consent) at 270 Malabar Road, Maroubra (Lot 3821, DP 752015).
- Randwick LEP 2012 (Amendment No4) - Gazetted 25 January 2018
Applies to part of the land at 1T Romani Way, MATRAVILLE (Lot 1 DP 107189). Amendment to planning controls, including zoning, height of buildings and FSR.
- Randwick LEP 2012 (Amendment No5) - Gazetted 17 August 2018
Applies to subdivision of dual occupancies (attached) in the Zone R2 Low Density Residential for which development consent was granted before 6 July 2018. Permits development consent to be granted for the Torrens Title or Strata subdivision of a dual occupancy if the development meets certain standards specified in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.
- Randwick LEP 2012 (Amendment No 6) – Gazetted 22 February 2019
Applies to the following land in Coogee, 38 Dudley Street (Lot 17 DP 6489), 40 Dudley Street (Lot 18 DP 6489), 42 Dudley Street (Lot 19 DP 6489), 44 Dudley Street (Lot 20 DP 6489 & Lot 1 DP 952229), 46 Dudley Street (Lot 2 in DP 952229) and 122 Mount Street (Lot 22 DP 6489) by incorporating these properties into the Dudley Street Heritage Conservation Area. Further, 38 Dudley Street (Lot 17 DP 6489), 42 Dudley Street (Lot 19 DP 6489), 44 Dudley Street (Lot 20 DP 6489 & Lot 1 DP 952229) and 122 Mount Street (Lot 22 DP 6489) have been listed as local heritage items in Schedule 5 the Randwick LEP 2012.
- Randwick LEP 2012 (Amendment No 7) – Gazetted 10 July 2020
Applies to the following land in Coogee, 39 Dudley Street (Lot B DP 301192), 41 Dudley Street (Lot C DP 301192) and 148 Brook Street (Lot B DP 305284) which have now been listed as Local Heritage Items in Schedule 5 the Randwick LEP 2012.
- Randwick LEP 2012 (Amendment No. 8) - Gazetted 14 August 2020
Applies to all land located within the Kensington and Kingsford town centres. Amendment to planning controls to include maximum height of buildings, FSR, Non-residential FSR, active street frontages, affordable housing inclusionary zoning, a Community Infrastructure Contribution, design excellence and architectural competition requirements and inclusion of the following land in the B2 Local Centre zone: 7 Addison Street KENSINGTON NSW 2033 (SP 11800), 157 Todman Avenue KENSINGTON NSW 2033 (SP 45348), 16,18 & 20 Barker Street, KENSINGTON NSW 2033 (Lot 1 DP 950767, Lot 1 DP 954209 & SP 65941), 582-584 Anzac Parade KINGSFORD NSW 2032 (Lot 1 DP 516025), 586-592 Anzac Parade KINGSFORD NSW 2033 (Lot 1 DP 942606, Pt Lot 1 DP 949009), 63 Harbourne Road, KINGSFORD NSW 2032 (SP 39850) and 12,14,16 & 18 Rainbow Street KINGSFORD NSW 2032 (Lot 13 DP 6134, SP 45197, Lot 15 DP 6134 & Lot 16 DP 6134).

(2) *The name of each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act (unless the Secretary has notified the council that the making of the proposed instrument has been deferred indefinitely or has not been approved).*

- draft Environment State Environmental Planning Policy (SEPP)
- draft Design and Place State Environmental Planning Policy (SEPP)
- On the 15th of May 2019, Council received a Gateway Determination from the Department of Planning, Industry and Environment with conditions to progress a Planning Proposal to amend Schedule 5 of the Randwick Local Environmental Plan 2012 (RLEP) which relates to Environmental Heritage. Part of the proposal seeks to create a new Heritage Conservation Area (HCA) known as 'Edgecumbe Estate' incorporating properties at 142A to 152 Brook Street, COOGEE, 37 to 41 Dudley Street, COOGEE and 5 Edgecumbe Avenue, COOGEE. The proposal was publicly exhibited from Tuesday 28 May to 25 June 2019 and the proposal is now subject to due process.



(3) *The name of each development control plan that applies to the carrying out of development on the land.*

- Randwick DCP adopted by Council on the 28 May 2013 and came into effect on the 14th of June 2013
Provides detailed planning controls and guidance for development applications
- Amendment to Randwick DCP 2013 Newmarket Green, Randwick (E5)
Site-specific DCP controls to supplement Randwick LEP 2012 (Amendment No 2)
- Amendment to Randwick DCP 2013, Public Notification (A3)
Section A3 of the DCP was repealed on the 15 January 2020. The Randwick City Council Community Participation Plan now guides notification requirements previously outlined in Section A3.
- Amendment to Randwick DCP 2013, Kensington and Kingsford Town Centres (E6)
Section E6 of the DCP provides Centre based and site specific DCP controls for land in the Kensington and Kingsford Town Centres .

(4) *In this clause, proposed environmental planning instrument includes a planning proposal for a LEP or a draft environmental planning instrument.*

2 Zoning and land use under relevant LEPs

For each environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP) that includes the land in any zone (however described)

- (a) *The identity of the zone, whether by reference to a name (such as "Residential Zone" or "Heritage Area") or by reference to a number (such as "Zone No 2 (a)")*
- (b) *The purposes for which the instrument provides that development may be carried out within the zone without the need for development consent*
- (c) *The purposes for which the instrument provides that development may not be carried out within the zone except with development consent*
- (d) *The purposes for which the instrument provides that development is prohibited within the zone*

Zone RE1 (Public Recreation) in Randwick LEP 2012.

1. Objectives of zone

- To enable land to be used for public open space or recreational purposes.
- To provide a range of recreational settings and activities and compatible land uses.
- To protect and enhance the natural environment for recreational purposes.
- To protect, manage and restore areas with high biodiversity, ecological and aesthetic values, including buffer areas and habitat corridors.

2. Permitted without consent

Environmental facilities; Environmental protection works; Flood mitigation works; Roads



3. Permitted with consent

Animal boarding or training establishments; Aquaculture; Boat launching ramps; Boat sheds; Building identification signs; Business identification signs; Car parks; Centre-based child care facilities; Community facilities; Heliports; Horticulture; Information and education facilities; Jetties; Kiosks; Markets; Passenger transport facilities; Plant nurseries; Recreation areas; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Respite day care centres; Restaurants or cafes; Water recreation structures

4. Prohibited

Any development not specified in item 2 or 3.

(e) Whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling - house on the land, and if so, the minimum land dimensions so fixed

The land IS NOT subject to any development standards that fix minimum land dimensions for the erection of a dwelling house.

(f) Whether the land includes or comprises critical habitat

The land DOES NOT include or comprise a critical habitat area under the Threatened Species Conservation Act 1995.

(g) Whether the land is in a conservation area (however described)

The land IS located in a heritage conservation area under the Randwick LEP 2012.

(h) Whether an item of environmental heritage (however described) is situated on the land.

The land IS NOT listed as a heritage item under the Randwick LEP 2012.

The land IS listed on the State Heritage Register under the Heritage Act 1977.

2A Zoning and land use under State Environmental Planning Policy (Sydney Region Growth Centres) 2006

To the extent that the land is within any zone (however described) under:

(a) Part 3 of the State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (the 2006 SEPP), or

(b) a Precinct Plan (within the meaning of the 2006 SEPP), or

(c) a proposed Precinct Plan that is or has been the subject of community consultation or on public exhibition under the Act,

the particulars referred to in clause 2 (a)–(h) in relation to that land (with a reference to “the instrument” in any of those paragraphs being read as a reference to Part 3 of the 2006 SEPP, or the Precinct Plan or proposed Precinct Plan, as the case requires).

The land IS NOT within any zone (however described) under this planning policy.



3 Complying Development

(1) *The extent to which the land is land on which complying development may be carried out under each of the codes for complying development because of the provisions of clauses 1.17.A (1) (c) to (e), (2), (3) and (4), 1.18(1)(c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.*

(2) *extent to which complying development may not be carried out on that land because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18(1)(c3) and 1.19 of that Policy and the reasons why it may not be carried out under those clauses.*

(3) *If the council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land, a statement that a restriction applies to the land, but it may not apply to all of the land, and that council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land.*

Housing Code

Complying development under the Housing Code MAY NOT be carried out on the land. The land is:

- The land IS listed on the State Heritage Register under the Heritage Act 1977.
- Land IS within a heritage conservation area, unless the development is a detached outbuilding, detached development (other than a detached studio) or swimming pool.

Low Rise Housing Diversity Code

Complying development under the Low Rise Housing Diversity Code MAY NOT be carried out on the land. The land is:

- The land IS listed on the State Heritage Register under the Heritage Act 1977.
- Land IS within a heritage conservation area, unless the development is a detached outbuilding, detached development (other than a detached studio) or swimming pool.

Rural Housing Code

Complying development under the Rural Housing Code MAY NOT be carried out on the land. The land is:

- The land IS listed on the State Heritage Register under the Heritage Act 1977.
- Land IS within a heritage conservation area, unless the development is a detached outbuilding, detached development (other than a detached studio) or swimming pool.

Housing Alterations Code

Complying development under the Housing Alterations Code MAY NOT be carried out on the land. The land is:

- The land IS listed on the State Heritage Register under the Heritage Act 1977.

General Development Code

Complying development under the General Development Code MAY NOT be carried out on the land. The land is:

- The land IS listed on the State Heritage Register under the Heritage Act 1977.



Commercial and Industrial Alteration Code

Complying development under the Commercial and Industrial Alterations Code MAY NOT be carried out on the land. The land is:

- The land IS listed on the State Heritage Register under the Heritage Act 1977.

Commercial and Industrial (New Buildings and Additions) Code

Complying development under the Commercial and Industrial (New Buildings and Additions) Code MAY NOT be carried out on the land. The land is:

- The land IS listed on the State Heritage Register under the Heritage Act 1977.
- Land IS within a heritage conservation area.

Container Recycling Facilities Code

Complying development under the Container Recycling Facilities Code MAY NOT be carried out on the land. The land is:

- The land IS listed on the State Heritage Register under the Heritage Act 1977.

Subdivisions Code

Complying development under the Subdivisions Code MAY NOT be carried out on the land. The land is:

- The land IS listed on the State Heritage Register under the Heritage Act 1977.

Demolition Code

Complying development under the Demolition Code MAY NOT be carried out on the land. The land is:

- The land IS listed on the State Heritage Register under the Heritage Act 1977.

Fire Safety Code

Complying development under the Fire Safety Code MAY NOT be carried out on the land. The land is:

- The land IS listed on the State Heritage Register under the Heritage Act 1977.

A copy of the Codes SEPP is available at www.planning.nsw.gov.au. For further information please call the Department of Planning, Industry and Environment Information Centre on Free call 1300 305 695.

Note: To be complying development, the development must meet the General requirements set out in clause 1.18 of the Codes SEPP. Development must also meet all development standards set out in the relevant code.



4 Coastal protection

Whether or not the land is affected by the operation of section 38 or 39 of The Coastal Protection Act 1979, but only to the extent that the council has been so notified by the Department of Services, Technology and Administration.

Council HAS NOT been notified by the Department that the land is affected by the operation of section 38 or 39 of the Coastal Protection Act 1979.

4A Certain information relating to beaches and coasts

- (1) *Whether an order has been made under Part 4D of the Coastal Protection Act 1979 in relation to emergency coastal protection works (within the meaning of that Act) on the land (or on public land adjacent to that land), except where the council is satisfied that such an order has been fully complied with.*

An order HAS NOT been made under Part 4D of the *Coastal Protection Act 1979* in relation to emergency coastal protection works (within the meaning of that Act) on the land (or on public land adjacent to that land).

- (2) (a) *Whether the council has been notified under section 55X of the Coastal Protection Act 1979 that emergency coastal protection works (within the meaning of that Act) have been placed on the land (or on public land adjacent to that land), and*

The council HAS NOT been notified under section 55X of the *Coastal Protection Act 1979* that emergency coastal protection works have been placed on the land (within the meaning of that Act) on the land (or on public land adjacent to that land).

- (b) *if works have been so placed – whether the council is satisfied that the works have been removed and the land restored in accordance with that Act.*

Not applicable.

- (3) (Repealed)

4B Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

Whether the owner (or any previous owner) of the land has consented in writing to the land being subject to annual charges under section 496B of the Local Government Act 1993 for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).

Not applicable.

5 Mine subsidence

Whether or not the land is proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

The land IS NOT proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.



6 Road widening and road realignment

Whether or not the land is affected by any road widening or road realignment under:

(a) Division 2 of Part 3 of the Roads Act 1993, or

The land IS NOT affected by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993.

(b) Any environmental planning instrument, or

The land IS NOT affected by any road widening or road realignment under the provisions of Randwick LEP 2012.

(c) Any resolution of the council.

The land IS NOT affected by any resolution of the Council for any road widening or road realignment.

7 Council and other public authority policies on hazard risk restrictions

Whether or not the land is affected by a policy:

(a) adopted by the council

The land IS affected by a policy adopted by the Council as follows:

Contaminated Land Policy. This policy does not specifically identify the subject land (or any other land) as contaminated. The policy does, however, apply to all land in the City of Randwick. The policy requires Council to consider the possibility of land contamination and its implications for any proposed or permissible future uses of the land, including all rezoning, subdivision and development applications. This policy will restrict development of land:

- (1) Which is affected by contamination; or
- (2) Which has been used for certain purposes; or
- (3) In respect of which there is not sufficient information about contamination; or
- (4) Which is proposed to be used for certain purposes; or
- (5) In other circumstances contained in the policy.

Excluding Councils Contaminated Land Policy, the subject land IS NOT affected by any other council policy relating to hazard risk restrictions.

(b) adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council, that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

The land IS NOT affected by a policy adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council that restricts the development of the land because of the likelihood of land slip, bushfire, (other than flooding), tidal inundation, subsidence, acid sulphate soils or any other risk.



7A Flood related development controls information

(1) If the land or part of the land is within the flood planning area and subject to flood related development controls.

Yes.

(2) If the land or part of the land is between the flood planning area and the probable maximum flood and subject to flood related development controls.

Yes.

(3) In this clause—
flood planning area has the same meaning as in the Floodplain Development Manual.

Floodplain Development Manual means the *Floodplain Development Manual* (ISBN 0 7347 5476 0) published by the NSW Government in April 2005.

probable maximum flood has the same meaning as in the Floodplain Development Manual.

8 Land reserved for acquisition

Whether or not any environmental planning instrument or proposed environmental planning instrument referred to in clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the Act.

The land IS NOT affected by any environmental planning instrument or proposed environmental planning instrument referred to in clause 1 that makes provision in relation to the acquisition of the land by a public authority, as referred to in Section 27 of the Act.

9 Contributions plans

The name of each contributions plan applying to the land.

Randwick City Council Section 7.12 (previously Section 94A) Development Contributions Plan (effective 21 April 2015).

9A Biodiversity certified land

If the land is biodiversity certified land under Part 8 of the Biodiversity Conservation Act 2016, a statement to that effect.

The land IS NOT biodiversity certified land.

Note. Biodiversity certified land includes land certified under Part 7AA of the Threatened Species Conservation Act 1995 that is taken to be certified under Part 8 of the Biodiversity Conservation Act 2016. (within the meaning of Part 7AA of the Threatened Species Conservation Act 1995).



10 Biodiversity stewardship sites

If the land is a biodiversity stewardship site under a biodiversity stewardship agreement under Part 5 of the Biodiversity Conservation Act 2016, a statement to that effect (but only if the council has been notified of the existence of the agreement by the Chief Executive of the Office of Environment and Heritage).

Council HAS NOT been notified that the land is a biodiversity stewardship site by the Chief Executive of the Office of Environment and Heritage.

Note. Biodiversity stewardship agreements include biobanking agreements under Part 7A of the Threatened Species Conservation Act 1995 that are taken to be biodiversity stewardship agreements under Part 5 of the Biodiversity Conservation Act 2016.

10A Native vegetation clearing set asides

If the land contains a set aside area under section 60ZC of the Local Land Services Act 2013, a statement to that effect (but only if the council has been notified of the existence of the set aside area by Local Land Services or it is registered in the public register under that section).

The land DOES NOT contain a set aside area under section 60ZC of the Local Land Services Act 2013.

11 Bush fire prone land

If any of the land is bush fire prone land (as defined in the Act), a statement that all or, as the case may be, some of the land is bush fire prone land.

If none of the land is bush fire prone land, a statement to that effect.

The land IS NOT bush fire prone land (as defined in the act).

12 Property vegetation plans

If the land is land to which a property vegetation plan approved under Part 4 of the Native Vegetation Act 2003 (and that continues in force) applies, a statement to that effect (but only if the council has been notified of the existence of the plan by the person or body that approved the plan under that Act).

Council HAS NOT been notified of any property vegetation plan under the Native Vegetation Act 2003 applying to the land.

13 Orders under Trees (Disputes Between Neighbours) Act 2006

Whether an order has been made under Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land (but only if the council has been notified of the order).

The land IS NOT land to which an order under Trees (Disputes Between Neighbours) Act 2006 applies.

14 Directions under Part 3A

If there is a direction by the Minister in force under section 75P (2) (c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect, a statement to that effect identifying the provision that does not have effect.

There IS NOT a direction by the Minister under section 75P (2) (c1) of the Act that a provision of an environmental planning instrument does not have effect.



15 Site compatibility certificates and conditions for seniors housing

If the land is land to which State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 applies:

(a) a statement of whether there is a current site compatibility certificate (seniors housing), of which the council is aware, in respect of proposed development on the land and, if there is a certificate, the statement is to include:

- (i) the period for which the certificate is current, and*
- (ii) that a copy may be obtained from the head office of the Department, and*

(b) a statement setting out any terms of a kind referred to in clause 18 (2) of that Policy that have been imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land.

The land IS NOT subject of a current site compatibility certificate (of which the Council is aware) that has been issued under the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004.

16 Site compatibility certificates for infrastructure

A statement of whether there is a valid site compatibility certificate (of which the council is aware), issued under clause 19 of State Environmental Planning Policy (Infrastructure) 2007 in respect of proposed development on the land and, if there is a certificate, the statement is to include:

- (a) the period for which the certificate is valid, and*
- (b) that a copy may be obtained from the head office of the Department of Planning.*

The land IS NOT subject to a valid site compatibility certificate (of which the Council is aware), issued under clause 19 of State Environmental Planning Policy (Infrastructure) 2007.

17 Site compatibility certificates and conditions for affordable rental housing

(1) A statement of whether there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land and, if there is a certificate, the statement is to include:

- (a) the period for which the certificate is current, and*
- (b) that a copy may be obtained from the head office of the Department of Planning.*
- (2) A statement setting out any terms of a kind referred to in clause 17 (1) or 38 (1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 that have been imposed as a condition of consent to a development application in respect of the land.*

The land IS NOT subject to a current site compatibility certificate (of which the council is aware) for affordable rental housing.

18 Paper subdivision information

- (1) The name of any development plan adopted by a relevant authority that applies to the land or that is proposed to be subject to a consent ballot.*
- (2) The date of any subdivision order that applies to the land.*
- (3) Words and expressions used in this clause have the same meaning as they have in Part 16C of this Regulation.*

The land IS NOT land to which a development plan or subdivision order applies.



19 Site verification certificates

A statement of whether there is a current site verification certificate, of which the council is aware, in respect of the land and, if there is a certificate, the statement is to include:

(a) the matter certified by the certificate, and

Note. A site verification certificate sets out the Secretary's opinion as to whether the land concerned is or is not biophysical strategic agricultural land or critical industry cluster land—see Division 3 of Part 4AA of State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

(b) the date on which the certificate ceases to be current (if any), and

(c) that a copy may be obtained from the head office of the Department of Planning and Environment.

The land IS NOT subject to a current site verification certificate (of which the council is aware), in relation to State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

20 Loose-fill asbestos insulation

If the land includes any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register that is required to be maintained under that Division, a statement to that effect.

The land DOES NOT include any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register that is required to be maintained under that Division.

21 Affected building notices and building product rectification orders

(1) A statement of whether there is any affected building notice of which the council is aware that is in force in respect of the land

(2) A statement of:

(a) whether there is any building product rectification order of which the council is aware that is in force in respect of the land and has not been fully complied with, and

(b) whether any notice of intention to make a building product rectification order of which the council is aware has been given in respect of the land and is outstanding.

(3) In this clause:

Affected building notice has the same meaning as in Part 4 of the Building Products (Safety) Act 2017.

Building product rectification order has the same meaning as in the Building Products (Safety) Act 2017.

The land IS NOT affected by any notice or order within the meaning of the Building Products (Safety) Act 2017.



Contaminated Land Management Act 1997

Note. The following matters are prescribed by section 59 (2) of the [Contaminated Land Management Act 1997](#) as additional matters to be specified in a planning certificate:

(a) that the land to which the certificate relates is significantly contaminated land within the meaning of that Act—if the land (or part of the land) is significantly contaminated land at the date when the certificate is issued,

The land IS NOT significantly contaminated land within the meaning of the Contaminated Land Management Act 1997.

(b) that the land to which the certificate relates is subject to a management order within the meaning of that Act—if it is subject to such an order at the date when the certificate is issued,

The land IS NOT subject to a management order within the meaning of the Contaminated Land Management Act 1997.

(c) that the land to which the certificate relates is the subject of an approved voluntary management proposal within the meaning of that Act—if it is the subject of such an approved proposal at the date when the certificate is issued,

The land IS NOT the subject of an approved voluntary management proposal within the meaning of the Contaminated Land Management Act 1997.

(d) that the land to which the certificate relates is subject to an ongoing maintenance order within the meaning of that Act—if it is subject to such an order at the date when the certificate is issued,

The land IS NOT the subject to an ongoing maintenance order within the meaning of the Contaminated Land Management Act 1997.

(e) that the land to which the certificate relates is the subject of a site audit statement within the meaning of that Act—if a copy of such a statement has been provided at any time to the local authority issuing the certificate,

Council HAS received a copy of a site audit statement, within the meaning of the Contaminated Land Management Act 1997, for this land.

Note. Section 26 of the Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009 provides that a planning certificate must include advice about any exemption under section 23 or authorisation under section 24 of that Act if the council is provided with a copy of the exemption or authorisation by the Co-ordinator General under that Act.



INFORMATION PROVIDED UNDER SECTION 10.7(5)

NOTE:

Council has no obligation to provide any advice in this planning certificate in response to a request made under s.10.7 (5) of the Act.

If Council does include advice in this planning certificate in response to a s.10.7 (5) request then, as far as practicable on the information available to Council, the advice shall be current as at 12:noon two(2) working days prior to the date of issue of this planning certificate.

Council draws your attention to the fact that if there is an omission or absence of reference in any advice given in this planning certificate, that is or may be relevant to the subject land, that shall not imply that the land is not affected by any matter not mentioned or referred to in this planning certificate.

Council draws your attention to s.10.7(6) of the Act which provides that Council shall not incur any liability in respect of any advice provided in good faith pursuant to s.10.7(5) of the Act.

Additional Relevant Matters

At the date of this certificate, the following relevant matters affecting the land are provided in good faith in accordance with the requirements of Section 10.7(5) of the Environmental Planning and Assessment Act 1979.

Council resolutions to prepare draft Local Environmental Plans

Name of proposed environmental planning instrument that includes a planning proposal for LEP or a draft environmental planning instrument.

- On the 1st of June 2021, Council resolved to endorse a draft Planning Proposal and place on exhibition the Local Strategic Planning Statement (LSPS) and a draft Housing Strategy (HS) for the Randwick City Council Local Government Area. Further to this, it was resolved to commence preparation of a planning proposal which gives effect to the planning priorities and actions outlined in Councils LSPS and HS including the recommendation of rezoning requests. For further information, please see the link provided below:

<http://www.randwick.nsw.gov.au/planning-and-building/planning/vision-2040-shaping-randwicks-future>

Note: Draft Local Environmental Plans that have yet to be placed on Community Consultation under the Environmental Planning and Assessment Act, 1979.

Terrestrial Biodiversity

The land IS NOT identified and mapped as 'Biodiversity' in Randwick LEP 2012.

Foreshore Scenic Protection Areas

The land IS NOT identified and mapped within a Foreshore Scenic Protection Area in Randwick LEP 2012.

Foreshore Area (Foreshore Building Line)

The land IS NOT identified and mapped as "Foreshore Area" within the Randwick LEP 2012 Foreshore Building Line Map.

Licences Under The Water Act 1912

The Property IS NOT within the ground water extraction embargo area or the water shortage zone declared under the Water Act 1912.



Aircraft Noise (ANEF)

This property IS NOT affected by aircraft noise levels as measured by the Australian Noise Exposure Forecast (ANEF) identified by Sydney Airport Corporation Limited (SACL), endorsed by Air Services Australia (ASA).

Flood Studies

Council IS in possession of a flood study that covers the catchment in which this property is located. The flood study is available for inspection at the Council if required.

For more information please see:

www.randwick.nsw.gov.au/149-Flooding



Residential Parking Schemes

No resident parking permits will be issued for new development or for significant alterations and additions to residential flat buildings that have been determined under Randwick Local Environmental Plan 2012 and Randwick Development Control Plan 2013.

Stella Agagiotis
Manager Strategic Planning
1300 722 542

Date:09-Aug-2021



How to Contact Us

Mail	Trinitas Group PO Box 1376 Parramatta NSW 2124
Email	admin@trinitasgroup.com.au
Address	Level 3, 24 Hunter Street, Parramatta NSW 2150
Website	www.trinitasgroup.com.au
Telephone	1800 4 TRINITAS
Facsimile	02 8016 0875

Trinitas Group Pty Ltd

ABN 12 161 759 708

Disclaimer: This report is prepared for the use of the recipient for the purpose of risk evaluation, risk improvement and or loss control. It is based upon prevailing conditions at the time of inspection, our observations and information provided by the client contact/s at the site. No responsibility is accepted, and liability disclaimed for the use of this report for any other purpose, or by any third party, nor does it imply that no other hazardous conditions exist.

Appendix B

The HHRA



**Randwick City Council
Updated Human Health Risk Assessment for
Asbestos**

**Little Bay Beach
4R Coast Hospital Road,
LITTLE BAY, NSW**

**24 September 2021
59811-138906 (Revision 0)
JBS&G Australia Pty Ltd**

Randwick City Council
Updated Human Health Risk Assessment for
Asbestos

Little Bay Beach
4R Coast Hospital Road
LITTLE BAY NSW

24 September 2021
59811-138906 (Revision 0)
JBS&G Australia Pty Ltd

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Figure 1 – Site Location

Figure 2 – Site Extent

Figure 3 – Site Assessment Areas

Appendices

Appendix A – Trinitas (2021) DSI Sampling Locations

Appendix B – Statistical Analysis

List of Abbreviations

Term	Definition
ACM	Asbestos Containing Material
AEC	Area of Environmental Concern
AF/FA	Asbestos Fines / Fibrous Asbestos
AHD	Australian Height Datum
bgl	Below Ground Level
COPC	Contaminant of Potential Concern
CoS	City of Sydney
Cr	Chromium
CSM	Conceptual Site Model
DA	Development Application
DQI	Data Quality Indicator
DQO	Data Quality Objectives
DP	Deposited Plan
DPI Water	NSW Department of Primary Industry - Water
EPA	NSW Environment Protection Authority
Ha	Hectare
HIL	Health-based Investigation Level
HSL	Health Screening Level
JBS&G	JBS&G Australia Pty Ltd
LOR	Limit of Reporting
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
OEH	NSW office of Environment and Heritage
PIL	Phytotoxicity Based Investigation Level
QA/QC	Quality Assurance/Quality Control
RCC	Randwick City Council
RME	Reasonably Maximum Exposed
RPD	Relative Percentage Difference
SAS	Site Audit Statement
SAR	Site Audit Report
SCS	Significantly Contaminated Site
SWA	Safe Work Australia
UR	Unit Risk
VENM	Virgin Excavation Natural Material (as defined in POEO Act)

Executive Summary

JBS&G Australia Pty Ltd (JBS&G) was previously engaged by Randwick City Council (Council, the client) to complete an interim health risk assessment of the potential health risk posed by the occurrence of asbestos impact at Little Bay Beach accessed from 4R Coast Hospital Rd Little Bay NSW. A range of earlier contamination assessments and remedial work reports as completed by Trinitas Group Pty Ltd (Trinitas), had identified significant asbestos impacts, occurring as fibre cement sheet fragments, across the extent of the Beach. This assessment was issued as *Randwick City Council Interim Human Health Risk Assessment for Asbestos Little Bay Beach 4R Coast Hospital Road, Little Bay, NSW rev A, 7 October 2020*, JBS&G Australia Pty Ltd (JBS&G 2020). The Trinitas works, with the assessment of health risk completed, was restricted to the area legally described as Lot 97 DP270427.

More recently, detailed site investigations have been undertaken on the Beach. Council has further requested that the health risk assessment be updated with the availability of a detailed site investigation.

On the basis of all available asbestos data, a human health risk assessment has been undertaken to determine whether the levels of asbestos as estimated on Little Bay Beach are potentially present at a level that poses an unacceptable health risk to an ongoing recreational use of the site / sites in proximity and/or residents in proximity of the site. A sensitivity analysis undertaken of the risk assessment process has found that risk estimates are appropriately conservative and suitable for decision making as to the suitability of the site. The assessment has been based on estimates of surface levels of asbestos as present on the Beach, and further considered levels of asbestos measured in sub-surface soils / sands on the Beach.

In accordance with the limitations provided as **Section 11**, and subject to a remediation / management response to address high levels of sub-surface asbestos occurrence at the south-eastern portion of the southern beach area, levels of asbestos on the site have not been found to pose a potentially unacceptable health risk to current / future users of the site as consistent with a recreational land-use, recreational uses in proximity of the site, nor occupants of residential properties in proximity of the site.

The fate and transport assessment has estimated the potential worse case airborne concentration of asbestos fibres on the site. This has been found to be well below a level of 0.01 fibres per millilitre (f/ml) of air, as identified in *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997*, 2015, NSW EPA as a potential trigger to warrant reporting under the *Contaminated Lands Management Act 1997*. Further recent respirable fibre monitoring undertaken by Trinitas during site assessment / remediation works has not identified airborne levels of fibres equal to or exceeding 0.01 f/ml. It is concluded on this basis that there is not a requirement to report asbestos impact to the NSW EPA.

Recommendations

Notwithstanding the conclusions in respect of the potential human health risk, soils on the site are impacted with asbestos. Requirements with respect to asbestos as informed to the *Work Health and Safety Regulation 2017* (WHS Reg) do not differentiate as to whether levels of asbestos are sufficient to pose a health risk. On this basis, and the form and levels of asbestos measured, the following recommendations are presented:

- An Asbestos Register and Asbestos Management Plan are required to be prepared for Little Bay Beach;
- The high levels of asbestos as measured at depth at the south-eastern portion of the southern beach do not pose a current health risk, as they are present in a bonded form and are buried at a sub-surface depth. However the occurrence of ACM at a frequency

approaching 10% within a recreational area is not consistent with community expectations for the Beach, and poses a potential risk of being caused to be present at the surface of the Beach in the future. A remediation / management response is required for this localised area of impact; and

- The ongoing occurrence of ACM at the Beach surface is not consistent with the aesthetic requirements for a recreational area. Based on the consultant observations, small quantities of ACM are anticipated to continue to be present at the surface of the Beach. On the basis of the occurrence of asbestos as bonded forms only, and small quantities being present, it is considered most appropriate that the ongoing response to the asbestos impact be restricted to normal Council maintenance being requested to remove visible ACM at the same time that normal Beach maintenance activities are undertaken. Nominated Council staff should receive asbestos awareness training prior to commencing these works.

1. Introduction and Background

1.1 Background

JBS&G Australia Pty Ltd (JBS&G) was previously engaged by Randwick City Council (Council, the client) to complete an interim health risk assessment of the potential health risk posed by the occurrence of asbestos impact at Little Bay Beach accessed from 4R Coast Hospital Rd Little Bay NSW. A range of earlier contamination assessments and remedial work reports as completed by Trinitas Group Pty Ltd (Trinitas) had identified significant asbestos impact, occurring as fibre cement sheet fragments, across the extent of the Beach. This assessment was issued as *Randwick City Council Interim Human Health Risk Assessment for Asbestos Little Bay Beach 4R Coast Hospital Road, Little Bay, NSW rev A*, 7 October 2020, JBS&G Australia Pty Ltd (JBS&G 2020). The Trinitas works, with the assessment of health risk completed, was restricted to the area legally described as Lot 97 DP270427.

More recently detailed site investigations have been undertaken on the Beach. Council has further requested that the health risk assessment be updated with the availability of a detailed site investigation. This document presents the updated health risk assessment as based on quantified measurements of asbestos in soils / sands within the extent of the Beach.

The risk assessment has been undertaken by a process of estimating the concentration of each form of asbestos as able to be estimated from the extent of investigations and data reported to date. Fate and transport modelling has been undertaken of potential asbestos emissions from the site and considered with toxicological review and exposure assessment to estimate levels of health risk. Site specific factors to assist in fate and transport calculations have also been considered here.

Risk assessment is the process of estimating the potential impact of a chemical, physical, microbiological or psychosocial hazard on a specified human population or ecological system under a specific set of conditions and for a certain timeframe. The risk assessment here is restricted to the consideration of asbestos based materials present in soil (i.e. beach sands and overlying rock platforms) within the site and the potential interactions with current and future human populations as may occur with the ongoing use of the site for recreational purposes, and further potentially sensitive receptors in proximity of the site (i.e. residents on Murra Murra Place Little Bay).

The risk assessment has been undertaken by the methodology outlined in *Environmental Health Risk Assessment Guidelines for assessing human health risks from environmental hazards*, 2012, Department of Health and Ageing and enHealth Council (enHealth 2012) and *National Environment Protection (Assessment of Site Contamination) Measure*, 2013, National Environment Protection Council (NEPC 2013).

1.2 Objectives

The objective of the HHRA is to determine whether levels of asbestos present within the extent of Little Bay Beach site pose a potential human health risk as per an ongoing recreational / open space use of the site and to further determine if levels pose a potential health risk to potentially sensitive receptors in proximity of the site. An additional objective has been to determine whether the occurrence of asbestos impact poses a significant enough risk to necessitate a duty to report under section 60 of the *Contaminated Lands Management Act 1997*.

1.3 Risk Assessment Process

Risk assessment is the process of estimating the potential impact of a chemical, physical, microbiological or psychosocial hazard on a specified human population or ecological system under a specific set of conditions and for a certain timeframe. A schematic of the risk assessment process is shown in the diagram below (source: enHealth 2004).

- Issue Identification identifies issues amenable to the risk assessment and assists in establishing a context for the risk assessment by a process of identifying the problems that the risk assessment needs to address. This includes the selection of Constituents of Potential Concern (COPC's) for the site and each identified potential exposure population.
- Hazard Assessment including toxicological assessment and dose-response assessment. Toxicological assessment involves determining what types of (adverse) health effects might be caused by the agent; and how quickly the adverse health effects might be experienced and their duration. Dose-response assessment considers both qualitative and quantitative toxicity information to determine 'the incidence of adverse effects occurring in humans at different exposure levels'.
- Exposure Assessment involves the determination of the frequency, extent, duration and character of exposures in the past, currently, and in the future. There is also the identification of exposed populations, particularly sensitive sub populations, and potential exposure pathways.
- Risk Characterisation provides a qualitative and / or quantitative estimate, including attendant uncertainties, of the nature, severity and potential incidence of effects in a given population, based on the hazard identification and exposure assessments.

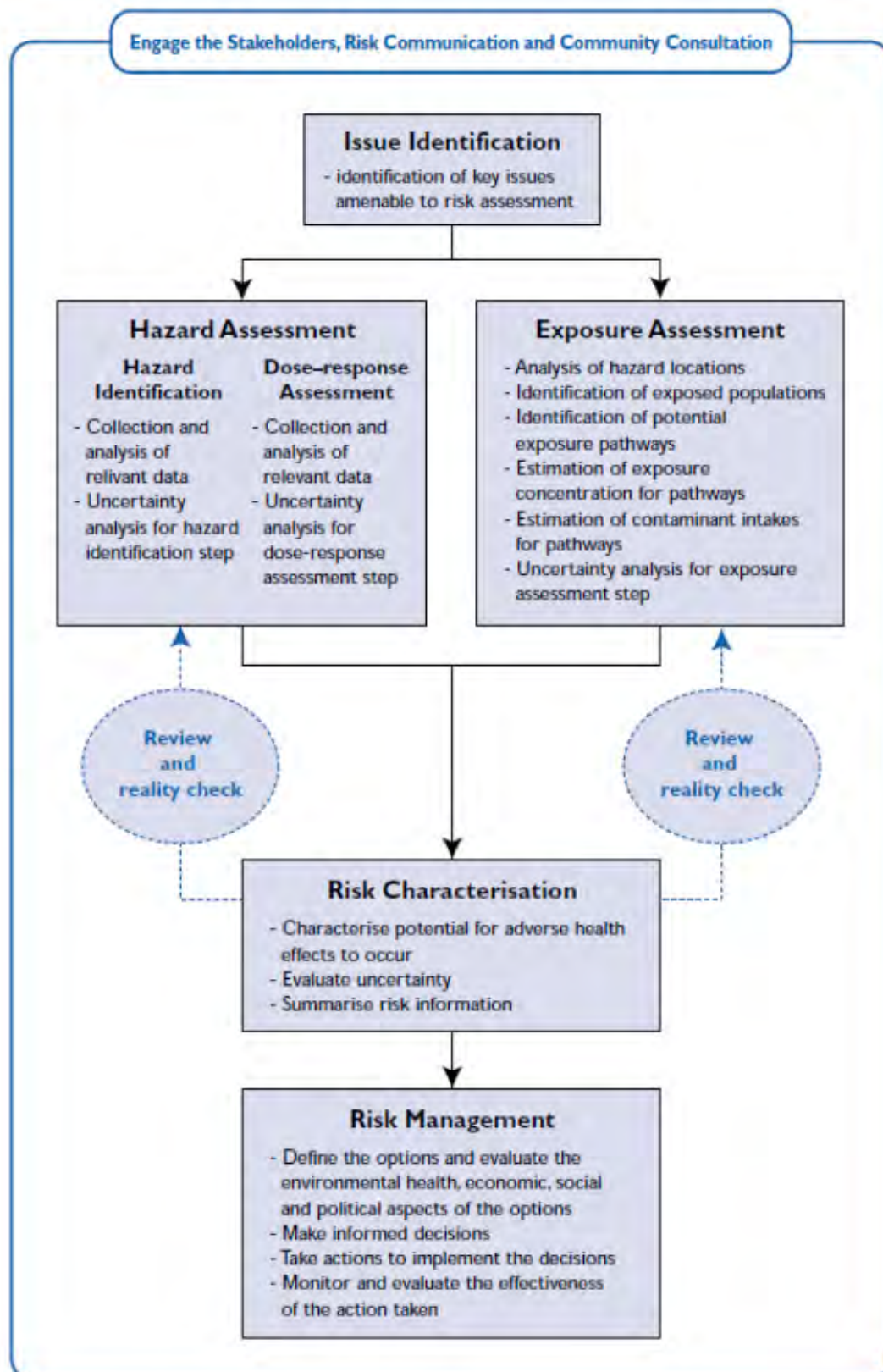
The risk assessment has specifically considered a range of potential human receptors who may use the site in the future, and existing and future human receptors in proximity of the site.

Specific guidance to the completion of a human health risk assessment for an asbestos impacted site has been recently issued with *New Zealand Guidelines for Managing Asbestos in Soil*, November 2017, Australian Land and Groundwater Associated (ALGA 2017). Though this document is intended for use in New Zealand, it has been peer reviewed and endorsed by a number of Australian based regulators and experts. The guidance in this document is substantially more recent than the historical guidance provided to Australian guidelines.

It is advised that here that a 'site-specific' Tier 2 risk assessment is recommended to be undertaken for asbestos impact in soils that exceeds published guidelines as provided in NEPC (2013). It is recommended that the Tier 2 assessment consider:

- Depth of contamination, noting the buried asbestos tends not to pose a risk;
- Asbestos physical form or condition, with the exposure potential of friable asbestos reported as being much greater than bound asbestos;
- Asbestos physico-chemical nature;
- Matrix type;
- Soil moisture content, with a discussion provided that soil moisture levels above 10% are not consistent with soils that would otherwise described as dry;
- Land use on the basis that asbestos only poses a risk when released into respirable air; and
- Duration of exposure and exposure frequency.

It is required that the tier 2 risk assessment follows a line of evidence approach and assumes a reasonable worst case scenario based on site specific data.



1.4 Site Identification

The location of the site is shown in **Figure 1**, and the site extent is shown in **Figure 2**. Site details are summarised in **Table 1.1**.

Table 1.1: Summary Site Details

Lot/DP	Lot 97 DP270427
Address	4R Coast Hospital Road Little Bay NSW
Local Government Authority	Randwick City Council
Site Zoning	Open Space / Recreational
Current Use	Little Bay Beach, open space / recreational / car parking
Proposed Use	Ongoing open space / recreational
Geographical Co-ordinates	E338461, N6238749 (MGA56)
Area of the site	Approximately 1 hectare

1.5 Current Site Condition

A detailed site description has been provided to Trinitas (2020i and 2021) which has been confirmed by JBS&G site inspection as appropriate. The site is referred to as northern, western and southern sections, as shown on **Figure 3**.

The Northern Beach area (approximately 3600 m²):

- A feature referred to as Crown Gully 1 runs from the northern golf course, where a historical retaining wall forms a barrier with stormwater outlet;
- A channel with boulders runs from the retaining wall towards the Bay. Anthropogenic materials were observed in this area inclusive of several fibre cement sheet fragments;
- Fill materials such as building rubble and solid waste (including plastic, tiles, rubber, tyre, bricks) were observed along the edge of the hill slope;
- Visible fibre cement sheet fragments were identified throughout the whole beach sand area;
- The eastern section of Northern Beach under the cliff was characterised with a sandstone platform and abundant boulders;
- Visible fibre cement sheet fragments were identified under the rock platform immediately adjacent to the low tide water line; and
- Up to the Golf Course between Crown Gully 1 and Crown Gully 2, fibre cement sheet fragments were observed as scattered with disturbed and eroded soil (land bush clearance, golf car drive path, stormwater runoff channels, fill slopes).

The Western Beach area (approximately 1200 m²):

- Fill material was observed to include a feature referred to as Crown Gully 2. A stockpile of old bricks and concrete were observed to have been placed at the outlet of the gully; and
- Fibre cement sheet fragments were identified and confirmed on the gully soil ground and in buried demolition material.

The Southern Beach area (approximately 5300 m²):

- A feature referred to as Crown Gully 3 was located in the southwest section with a stormwater pipe (around 80 cm in diameter) observed;
- Bush clearance works in August 2020 (over an area of approximately 60 m²) had identified fibre cement sheet fragments at around 50 m upstream of the concrete stormwater pipe;
- Soil erosion was observed at the slope of the golf course;

- Fibre cement sheet fragments were identified and confirmed around the channel outlet and further distributed across the whole beach sand; and
- Fibre cement sheet was reported to consist of super 6 corrugated sheeting chunks, flat ACM sheeting and highly polished ACM fragments.

Rock outcrops and platforms separate Western Beach and Southern Beach. However, there is no apparent physical boundary between Northern Beach and Western Beach.

1.6 Surrounding Land Uses

The surrounding land uses have been identified as comprising:

- North – A golf course is present adjoining the northern portion of the Beach. Existing residential dwellings are located further to the north, an approximate distance of 300 m from the northern extent of the beach;
- East – Little Bay and the Pacific Ocean are located adjoining the east of the beach, as consistent with the coastline;
- South – The Golf Course is present adjoining the immediate south of the site, with parking and club house facilities located an approximate distance of 200 m from the southern extent of the Beach;
- West – The golf course is present at the immediate west of the Beach, consisting of fairway and green areas. Residential areas of Little Bay are located further to the west, being an approximate distance of 50 m from the western extent of the Beach.

The nearest potentially sensitive human exposures can be identified as the recreational users of the Beach and Golf Course, commercial workers (i.e. Greenskeepers) to the Golf Course, maintenance workers to the Beach (i.e. cleaning the beach) and residential dwellings located in closest proximity to the west of the Beach.

1.7 Topography

Trinitas (2020i) reports that reference to the Bondi 9130-2S topographic map (1:25000) indicates that the Site is situated under the cliffs in the north and in the south. The Site steeply slopes toward the Bay. The approximate elevation of the timber entry to the beach is 20 m (AHD).

1.8 Geology

Soils on the site have been observed to generally consist of a shallow depth of sands overlying a sandstone bedrock. The sandstone can be observed to outcrop in several areas of the site, particularly in proximity of the boundary with the Ocean. Fill materials are potentially present adjoining the Beach as associated with the steep elevation to the Golf Course / embankment adjoining the Beach.

1.9 Site History

A brief site history as relevant to the occurrence of asbestos has been provided to Trinitas (2020i), with an expanded discussion provided to Trinitas (2021). The beach is noted as being in proximity of the historical Prince Henry Hospital. Prince Henry Hospital is reported to have been initially used as a quarantine facility in the late 19th century. Following this, it was known as the Coast Hospital, with a golf course additionally developed surrounding in 1922.

The hospital closed in 1988, and was subsequently demolished, with part of the lands used for residential development, and the golf course remaining operational. Golf course facilities and buildings have been regularly renovated through the operational history which continues until today.

Anecdotal evidence further presented in Trinitas (2020i and 2021) reported that potential asbestos containing materials had been present on the beach for many years, and there was a potential history of illegal dumping / filling having occurred adjoining the Beach that was the potential source of the asbestos containing materials.

1.10 Meteorology

A review of average climatic data for the nearest comprehensive Bureau of Meteorology monitoring location (Sydney Airport) indicates the site is located within the following meteorological setting:

- Average minimum temperatures vary from 7.2 in July to 19.1 in February;
- Average maximum temperatures vary from 17.0 in July to 26.5 in January;
- The average annual rainfall is approximately 1083.7 mm with rainfall greater than 1 mm occurring on an average of 95.9 days per year; and
- Monthly rainfall varies from 60.3 mm in September to 122.5 mm in June with the wettest periods occurring on average in March and June.

1.11 Previous Investigations

Council has made available a range of assessments to advise the risk assessment. This includes:

- *Asbestos Identification Report*, 3 August 2020, Trinitas Group (Trinitas 2020a);
- *Asbestos Clearance Inspection and Clearance Certificate (northern section)*, 4 August 2020, Trinitas Group (Trinitas 2020b);
- *Asbestos Clearance Inspection and Clearance Certificate (western section)*, 4 August 2020, Trinitas Group (Trinitas 2020c);
- *Asbestos Clearance Inspection and Clearance Certificate*, 5 August 2020, Trinitas Group (Trinitas 2020d);
- *Asbestos Clearance Inspection and Clearance Certificate*, 6 August 2020, Trinitas Group (Trinitas 2020e);
- *Asbestos Daily Air Monitoring Report*, 6 August 2020, Trinitas Group (Trinitas 2020f);
- *Asbestos Clearance Inspection and Clearance Certificate*, 7 August 2020, Trinitas Group (Trinitas 2020g);
- *Asbestos Daily Air Monitoring Report*, 7 August 2020, Trinitas Group (Trinitas 2020h);
- *Preliminary Technical Brief for Potential Asbestos Contamination at Little Bay Beach, Little Bay NSW*, 24 August 2020, Trinitas Group (Trinitas 2020i);
- *Request for Quotation – Detailed Site Investigation 1A for Three Sand Areas at Little Bay Beach, Little Bay NSW*, 25 August 2020, Trinitas Group (Trinitas 2020j);
- *Asbestos Clearance Inspection and Clearance Certificate*, 2 September 2020, Trinitas Group (Trinitas 2020k);
- *Asbestos Daily Air Monitoring Report*, 2 September 2020, Trinitas Group (Trinitas 2020l); and
- *Detailed Site Investigation of Potential Asbestos Contamination at Little Bay Beach, Little Bay NSW rev 6*, 17 September 2021, Trinitas Group (Trinitas 2021).

In addition to these assessments, daily air monitoring reports and clearance certificates have been undertaken: on the 9th, 11th, 15th, 18th, 23rd, 25th and 30th September 2020; 7th, 8th and 16th October 2020; 11th, 13th, 18th, 20th, 25th and 27th November 2020; 3rd, 6th, 8th, 12th, 16th, 19th, 25th, 27th and 31st December 2020; 2nd, 8th, 12th, 16th, 17th, 21st, 22nd, 29th and 30th January 2021; 8th, 12th, 18th, 19th and

24th February 2021; 4th, 6th, 8th, 12th, 15th, 17th, 24th, 26th, 27th and 31st March 2021; 1st, 6th, 9th, 15th, 16th, 20th, 22nd, 26th, 27th, 28th, 29th and 30th April 2021; 10th, 14th, 17th, 20th, 24th and 28th May 2021; and 4th, 5th, 11th, 12th, 17th, 18th, 24th and 25th June 2021.

The works and findings of each of these assessments is summarised following.

1.11.1 Asbestos Identification (Trinitas 2020a)

The works undertaken consisted of a walkover inspection of two areas of Little Bay Beach reported as northern beach near the gully and adjacent western beach near the gully. A number of asbestos fibre cement sheets were identified, generally described as being highly polished. The sheets typically appeared to consist of 4 mm thick fibre cement sheet with dimensions of 20 mm to 100 mm. Asbestos was confirmed by laboratory analysis to be present as chrysotile and crocidolite forms

The description of 'highly polished' fragments has been interpreted by JBS&G to be indicative of weathering of the fibre cement sheets being evident.

1.11.2 Clearance Inspection and Certificate (Trinitas 2020b and 2020c)

Emu picking of suspected fibre cement fragments has been reported as being undertaken at the western section and northern section of Little Bay Beach. The picking works were undertaken on the 4th August 2020. Similarly sized fragments to those reported in Trinitas (2020a) are shown as being present. Air monitoring as undertaken during the works have reported all levels of respirable fibres below 0.01 fibres/ml.

1.11.3 Clearance Inspection and Certificate (Trinitas 2020d)

Emu picking of suspected fibre cement fragments has been reported as being undertaken at the northern, western and southern sections of Little Bay Beach. The picking works were undertaken on the 5th August 2020. Smaller fragments than those presented in Trinitas (2020a) are shown as present, with fragments as small as 10 mm. A covering email reported that seven fragments were removed from the three sections of the Beach.

1.11.4 Clearance Inspection and Certificate (Trinitas 2020e and 2020f)

Emu picking of suspected fibre cement fragments has been reported as being undertaken at the northern, western and southern sections of Little Bay Beach. The picking works were undertaken on the 6th August 2020. Smaller fragments than those presented in Trinitas (2020a) are shown as present, with fragments as small as 10 mm. Air monitoring as undertaken during the works have reported all levels of respirable fibres below 0.01 fibres/ml.

1.11.5 Clearance Inspection and Certificate (Trinitas 2020g and 2020h)

Emu picking of suspected fibre cement fragments has been reported as being undertaken at the northern, western and southern sections of Little Bay Beach. The picking works were undertaken on the 7th August 2020. Similarly sized and smaller fragments to those reported in Trinitas (2020a) are shown as being present. Air monitoring as undertaken during the works have reported all levels of respirable fibres below 0.1 fibres/ml.

1.11.6 Technical Brief (Trinitas 2020i)

Trinitas (2020i) has reported site identification and background information for the site as has been summarised in the earlier sections to this report. Trinitas (2020i) has also summarised the asbestos assessment and removal works as completed to the issue of the report in August 2020. The works have included / identified:

- Suspected asbestos containing fibre cement sheet fragments were identified across the Beach area;

- All fragments suspected of containing asbestos and submitted for laboratory analysis have confirmed the presence of asbestos (17 samples);
- Over 200 fragments of fibre cement sheet were collected from the Beach area over the period 4th to 21st August 2020 at the Northern and Western Beach areas;
- Approximately 1 kg of fibre cement sheet fragments were collected on the 21st August as an accumulation adjacent to a stormwater pipe outlet in the southern beach area;
- The fibre cement sheet fragments were observed to be distributed throughout the Beach area, with Trinitas (2020i) reporting no obvious decreasing trend of fragments through the three specific areas assessed (**Figure 3**); and
- Fibre cement sheet fragments are visually characterised as being highly polished, which is inferred to be characteristic of the weathering of the fragments.

1.11.7 Detailed Site Investigation Brief (Trinitas 2020j)

Trinitas (2020j) contains a summary of all background / available information for the asbestos assessment and remedial works as completed at the Little Bay beach. The beach is reported as currently and proposed to be used for an open space / recreational land use.

It is reported that the works completed between the 4th and prior to the 21st August (Trinitas 2020a to 2020f) had resulted in the collection / removal of 200 fragments of ACM. Works as undertaken on the 21st August (Trinitas 2020g and 2020h) resulted in the removal of 1 kg of fibre cement sheet fragments.

1.11.8 Clearance Inspection and Certificate (Trinitas 2020k and 2020l)

Emu picking of suspected fibre cement fragments has been reported as being undertaken at the northern, western and southern sections of Little Bay Beach. The picking works were undertaken on the 2nd September 2020. Similarly sized and smaller fragments to those reported in Trinitas (2020a) are shown as being present. It is reported that over 1 kg of fibre cement fragments have been removed by the works which equated to 40 fragments. Air monitoring as undertaken during the works have reported all levels of respirable fibres below 0.1 fibres/ml.

1.11.9 Clearance Inspection and Certificate 2020 to 2021 (Trinitas various)

As discussed in **Section 1.11**, a substantial number of picking events and clearance inspections have been undertaken on the Beach between September 2020 and at the time of preparation of this report at the end of June 2021. Similarly sized and smaller fragments to those reported in Trinitas (2020a) are shown as being present through these clearance inspections. Each event is noted to typically report collection of a handful of fragments, assuming that the full extent of fragments collected is shown photographed in the attachments to the reports. Air monitoring as undertaken during the works have reported all levels of respirable fibres below 0.01 fibres/ml.

1.11.10 Detailed Site Investigation (Trinitas 2021)

A detailed site investigation was completed by Trinitas across the accessible beach area between the 26th and 30th April 2021. The works are reported to have comprised:

- A visual assessment comprising transects of the Beach at a 5 m spacing;
- Completion of 44 testpits across the beach, with collection of bulk samples at each location to assess for the presence of ACM, and further collection and submission of 500 ml samples for laboratory analysis to determine the presence of asbestos fines / free asbestos fibres;
- From the observation of the distribution of sample locations and the general comments to the report, it is presumed that the sample locations have been targeted to locations where asbestos impact was considered most likely. This has consisted of several sample locations

placed in areas of the embankment adjoining the Beach that are not readily accessible to members of the general public or otherwise within gully areas that are further unlikely to have been accessed by members of the public;

- Asbestos was detected at 15 of the 44 testpit locations with all asbestos detections reported as consisting of bonded asbestos; and
- An assessment that the collected data is reliable.

The Trinitas (2021) report further contains detail on potential sources, site histories, anecdotal evidence and recommended future actions that are of little value in the completion of this assessment as restricted to the Little Bay beach area.

1.11.11 Data Reliability

All Trinitas assessments are noted to have been completed by Licensed Asbestos Assessors. Sampling methods, for the quantification of asbestos, have generally complied with the guidance provided in NEPC (2013) and WA DoH (2009) for the collection of samples to premise quantified estimates of the levels of asbestos in soils. It is acknowledged that these have likely over-estimated the level of asbestos present in near surface soils but an apparent bias to target horizons / depths where asbestos is most likely present. All analysis of samples have been undertaken by NATA accredited laboratories. It is noted that field assessments of quality assurance / quality control (QA/QC) were available to Trinitas but have not been undertaken. However noting the assessed media and the contaminant the absence of these QA/QC checks is considered unlikely to substantially affect the reliability of the data.

On this basis – and with the extent of conservative assumptions adopted in the handling of Trinitas data, the data is considered sufficiently reliable to premise the risk assessment.

2. Conceptual Site Model

National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No.1) (NEPC 2013) identifies a conceptual site model (CSM) as a representation of site related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The development of a CSM is an essential part of all site assessments.

NEPC (2013) identified the essential elements of a CSM as including:

- Known and potential sources of contamination and contaminants of concern including the mechanism(s) of contamination;
- Potentially affected media (soil, sediment, groundwater, surface water, indoor and ambient air);
- Human and ecological receptors;
- Potential and complete exposure pathways; and
- Any potential preferential pathways for vapour migration (if potential for vapours identified).

The CSM has been defined following as restricted to the potential occurrence of asbestos impact.

2.1 Known and Potential Sources of Contamination

Asbestos impact has been identified occurring as fibre cement sheet debris as present across the site. Laboratory analysis of the fibre cement sheet fragments has confirmed that they contain asbestos (i.e. are asbestos containing material, ACM). Site inspection with laboratory analysis of soil samples as collected from the extent of the Beach, and embankments and gullies adjoining the Beach has reported that soils / sands on the beach are not impacted by asbestos fibres / asbestos fines / friable asbestos.

2.2 Extent of Environmental Impact

Asbestos has been identified across the area of the Beach as bonded asbestos. Trinitas (2021) reports that an increasing incidence of an occurrence of bonded asbestos was identified at the 'middle' beach areas as compared to the southern and northern portions of the beach. The highest levels of ACM impact have been measured at depth at the south-eastern portion of the Southern Beach area. Specific areas of likely asbestos presence were also reported as:

- With sand and/or under rocks including inundated areas of the Bay;
- Adjacent to an outlet of a stormwater pipe at 'Crown Gully 3' as extending to the rocky area of the Bay within the southern portion of the Beach;
- The whole extent of the 'middle' portion of the Beach; and
- The areas adjacent to a creek at the Heritage Wall and Crown Gully 1 in the northern portion of the Beach.

Recent extensive works have been undertaken to remove the fibre cement sheet fragments from the Beach area (Trinitas 2020 and 2021 various). While these works will have been effective at reducing the point in time occurrence of ACM, they have not been effective in removing all ACM. It is inferred from the number of repeat events that sub-surface ACM is likely present on the site and is caused to become visible at the surface by the movement of sands in response to wind and wave action, as well as overland stormwater discharge flows. Or otherwise / additionally is being caused to continually migrate to the extent of the Beach from asbestos impacted areas adjoining the Beach. Trinitas (2021) reports that the extent of visual occurrence of ACM does not appear to have reduced over the extent of the asbestos removal events undertaken.

Where ACM has been observed, it typically occurs with construction and building wastes, and is present as fibre cement sheet fragments. This indicates that historically asbestos impacted material has been imported to the proximity of the site and used as fill material, or has otherwise been sourced from historical demolition activities as undertaken in proximity of the site. The site is noted to be downstream of overland flows from the Little Bay suburb, and historical Prince Henry Hospital. Trinitas (2021) notes areas of gullies adjoining the beach as a likely source of continued migration of asbestos containing materials onto the site.

2.2.1 Preliminary Estimate of Asbestos Occurrence

No definitive quantitative data has been provided to the clearance certificates as presented as Trinitas (2020 to 2021 various) to estimate levels of asbestos. However the extent of data available has been interrogated to determine a basis to estimate an extent of ACM as present on the surface of the Beach area. The following data has been used in this estimation:

- A total of 200 fragments of ACM having been removed from the Beach area by initial works (Trinitas 2020i and 2020j);
- A total of 1 kg of fragments of ACM having been removed from the stormwater outlet at the southern beach (Trinitas 2020i and 2020j);
- 40 fragments of ACM equates to 1 kg of ACM (Trinitas 2020k); and
- Each of the picking / inspection events have resulted in the removal of all visible / surface ACM (Trinitas 2020 and 2021 various).

On the basis of the available data in the clearance inspections, it has been assumed that a typical fragment of ACM present on the Beach weighs 25 grams. On the basis of asbestos fibre cement sheet having a typical density of 1000 kg/m^3 a typical fragment will have a volume of $2.5 \times 10^{-5} \text{ m}^3$. Further based on the observation of typically 4 mm thickness fragments, an ACM fragment would be characterised as having an area of $6.25 \times 10^{-3} \text{ m}^2$ (equivalent 80 mm length and width). Observation of photos of works would indicate a significant range either side of this typical estimate.

Where 200 fragments is equivalent to 5 kg of ACM, and an additional 1 kg was collected from near to a stormwater outlet during the initial mobilisations, it can be estimated that 6 kg of ACM was present during the initial works. NEPC (2013) advises that asbestos content of ACM can be up to 15%. Where it is further assumed, based on typical minimum dimensions of sheets observed being 10 mm, that these fragments were restricted to the upper 5 mm of soils observed, the extent of the northern, southern and western beach area (**Section 1.5**) is $10\,000 \text{ m}^2$, and the beach sands are a typical density of 1500 kg/m^3 , then an asbestos (in a bonded form) in soil concentration of 12 mg/kg (0.0012% w/w) is estimated.

Based on the number of repeat events, it is likely that asbestos picking works have not been completely efficient. A range of picking events as reported as Trinitas (2020 and 2021 various) typically report a handful of small fragments as being collected from the Beach during each mobilisation. The efficiency of ACM collection / identification cannot be readily estimated from the Trinitas assessments. However the comparison of Trinitas (2020i and 2020j) and Trinitas (2020 and 2021 various) estimates indicates that a non-trivial amount of ACM is not being identified / removed. This would also be combined with additional ACM either migrating to the site or otherwise becoming visible at the site surface. For the purposes of this assessment, an extremely conservative collection / identification efficiency of 50% (i.e. half) has been estimated for the removal of asbestos. Applying the factor to the estimate of bonded asbestos present, an asbestos concentration of 24 mg/kg (0.0024% w/w) is estimated. This estimate is the level of asbestos containing material that is present at the site surface.

Noting that no previous remedial / asbestos removal works are known to have taken place prior to Trinitas (2020a to 2020j) this can be considered indicative of a potential maximum extent of ACM historically present, and likely present, on the Beach surface in the future.

2.2.2 Trinitas (2021) DSI Estimate of Asbestos Occurrence

The Trinitas (2021) assessment has been undertaken to assess the presence of asbestos in sub-surface soils. Testpit locations as undertaken in Trinitas (2021) are reported to have been terminated at depths between 0.1 and 1.7 m below ground surface (bgs). This assessment is considered to have characterised the levels of ACM / asbestos as present in sub-surface soils.

Detections of bonded as asbestos as reported in Trinitas (2021) are summarised following in **Table 3.1**. Only sample locations where bonded asbestos has been detected has been reported in the table. Trinitas (2021) sample location plans are included as **Appendix A**.

Table 3.1: Summary of Trinitas (2021) Asbestos Detections

Sample Location / ID	Sample Size ¹	Asbestos Detected	ACM Concentration (mg/kg / %w/w)	Asbestos Concentration ⁴ (mg/kg / %w/w)	Form of Asbestos / Description
TP07_0.3	10 litres	1 gram	61 / 0.0061	9.2 / 0.00092	Chrysotile
TP08_0.5	10 litres	1 gram	61 / 0.0061	9.2 / 0.00092	Chrysotile
TP10_0.5	10 litres	1 gram	61 / 0.0061	9.2 / 0.00092	Chrysotile
TP16_0.3	10 litres	1 gram	61 / 0.0061	9.2 / 0.00092	Chrysotile and Crocidolite
TP19_1.0	10 litres	42 grams	2500 / 0.25	380 / 0.038	Chrysotile
TP21_0.5	10 litres	3 grams	180 / 0.018	27 / 0.0027	Chrysotile and Crocidolite
TP22_0.1	10 litres	26 grams	1600 / 0.16	240 / 0.024	Chrysotile and Crocidolite
TP23_0.1	10 litres	2 grams	120 / 0.012	18 / 0.0018	Chrysotile and Crocidolite
TP24_0.3	10 litres	114 grams	6900 / 0.69	1000 / 0.1	Chrysotile and Crocidolite
TP25_0.3	10 litres	1 gram	61 / 0.0061	9.2 / 0.00092	Chrysotile
TP28_0.5	920 grams	2.4 grams	2600 / 0.26	390 / 0.039	Chrysotile
TP29_0.5	10 litres	1 gram	61 / 0.0061	9.2 / 0.00092	Chrysotile and Amosite
TP36_0.5	10 litres	0.3 grams ²	18 / 0.0018	2.7 / 0.00027	Chrysotile
TP39_0.1	10 litres	161 grams	9800 / 0.98	1500 / 0.15	Chrysotile
TP41_0.5 and TP41_1.0	10 litres	235 – 1500 grams ³	91 000 / 9.1	14 000 / 1.4	Chrysotile

- Note:
1. Soils assumed to be density of 1.65 g/cm³ (16.5 kg per 10 litres)
 2. No mass reported in report, mass estimated based on visual observation of 1 cm fragment, assumed to be 1 cm in diameter, 4 mm thick and a density of 1 g/cm³.
 3. Maximum concentration of 1500 g adopted.
 4. Based on asbestos present at 15% in ACM.

All other samples have reported non-detect concentrations of asbestos. On the basis of consistent identification of 1 gram of asbestos in a 10 litre sample (16.5 kg) of soils and noting that asbestos is present at a concentration of 15%, this is equivalent to a field detection limit of asbestos of 9.2 mg/kg (0.00092 % w/w).

The laboratory analysis of soil samples as collected during this assessment did not identify any asbestos present as asbestos fines / friable asbestos / free asbestos fibres. Asbestos has been confirmed as being present in a bonded form only.

2.2.3 Summary of Asbestos Occurrence

Asbestos has only been identified as bonded asbestos. On the basis of laboratory analysis of samples from 44 sample locations, the laboratory has not reported any detections of asbestos fines or otherwise free asbestos fibres. The consultant has not reported that any detections of asbestos would be considered to be friable asbestos.

An asbestos concentration at the site surface (i.e. available to site receptors) was conservatively estimated from site clean-up records at 24 mg/kg (0.0024% w/w). The Trinitas (2021) assessment as completed has reported asbestos ranging between non detect levels (estimated at 9.2 mg/kg /

0.00092% w/w based on field assessment, and 2.7 mg/kg / 0.00027% w/w from lab analysis of 500 ml samples) to 14 000 mg/kg / 1.4% w/w (sample location TP41 consisting of 9.1% ACM by weight in soils at depth) in sub-surface soils. As discussed in **Section 1.11.15** it is likely that the Trinitas (2021) sample locations have biased the sampling to locations where asbestos is most likely / most abundant, and it is further likely that sampling depths have been similarly biased.

2.3 Potential and Complete Exposure Pathways

Future human receptors on and in immediate proximity of the site can be characterised as consisting of:

- Recreational users of the Beach and Golf Course adjoining;
- Landscapers / gardening personnel as more likely retained on the Golf Course adjoining, but also potentially engaged within the Beach (periodic clean up / maintenance works); and
- Potential future sub-surface maintenance / excavation workers.

Receptors will be potentially exposed to soil contaminants by oral, dermal and inhalation pathways. Oral and dermal exposures have not been considered any further as asbestos is not toxic by these pathways. Inhalation exposures will potentially occur by the release of fibres from impacted soils into human breathing zones.

Where asbestos fibres are released from soils on the site there is a potential that residential occupants in proximity of the site may be affected. Potentially complete exposure pathways may occur where airborne respirable asbestos fibres migrate to the extent of these properties. Residential dwellings are located in close proximity to the west on Murra Murra Place Little Bay.

2.4 Preferential Pathways

A range of preferential pathways are currently present on the site as associated with sandy soil horizons and potential services present across the site area (i.e. stormwater outlet at southern Beach etc.). A significant preferential pathway is the steep slope of the potential asbestos soils / materials adjoining the boundary of the Beach.

These preferential pathways are not considered significant as asbestos occurs as a solid and is not readily transportable within the sub-surface. However gravity / overland run-off assisted processes can cause increased movement of ACM down the steep slope and onto the Beach.

2.5 Complete Source-Pathway-Receptor Linkages

Potentially complete source-pathway-receptor linkages are considered to be limited to potential inhalation exposures of fibres of on-site receptors, and recreational areas and residential properties in proximity of the site.

3. Issue Identification

Issue identification is the first step of the risk assessment process.

3.1 Issue Identification

Issue identification determines whether risk assessment is useful, and establishes a context for the risk assessment by a process of identifying the concerns the risk assessment needs to address. Issue identification draws on all relevant lines of information.

Issue identification comprises several phases:

1. Identification of environmental health issues (or an individual issue) and determining whether there are hazards amenable to risk assessment. This will involve demarcating 'hazards' from 'issues' and may require environmental sampling;
2. Putting the hazards into their environmental health context (clarification and prioritising of problems and hazards);
3. Identification of potential interactions between agents; and
4. Stating clearly why risk assessment is needed and the scope and objectives of the risk assessment. This will involve identifying problems for which information is, or can be, available to undertake adequate risk assessments and problems which risk assessment cannot assist.

3.2 Identification of Environmental Hazards

Environmental health hazards may be caused by physical, chemical, biological or social factors in the environment. Physical factors include heat, cold, noise, mechanical hazards etc. Chemical factors include synthetic and naturally occurring substances. Biological factors include viruses, prions, bacteria, parasites and vermin.

Environmental impact is currently widespread in soils and sands across the Beach, reported to be consequent of historical placement of fill materials in proximity of the Beach and the release by weathering / erosion process of asbestos containing anthropogenic material.

The sands within the extent of the Beach are impacted at least with bonded forms of asbestos, and potentially further impacted with asbestos fibres. Bonded ACM products have been observed distributed across the surface of the Beach.

3.3 Environmental Sampling and Analysis

Environmental sampling and analysis are a key factor in identifying the agents that may be present, their concentrations and distributions. Environmental sampling and analysis should be targeted to address the identified potential environmental hazards.

Environmental sampling and analysis has been detailed in previous investigations (Trinitas 2020 to 2021 various) as reported in **Sections 1.11** and **2.2**.

3.4 Putting Hazards into their Environmental Health Context

Putting the hazards into their environmental context entails a consideration of:

- Whether the hazard has single or multiple sources;
- Whether the type of environmental impact affects multiple environmental media;
- How stakeholders perceive the problem including the consideration of different groups; and
- How do the hazards compare to other environmental hazards affecting the community.

The environmental hazards across the open space / parkland are restricted to the impacted Beach sands and associated near surface soils within the Beach which have been historically disturbed on the site, or otherwise impacted from off-site locations.

The risk assessment takes into consideration the ongoing use of the site as per the current recreational setting. The major human stakeholders identified for the ongoing use of the Beach include recreational users, landscapers, Beach surface maintenance / cleaning and maintenance workers of above-ground and sub-surface services in proximity. Potential exposures of further recreational and residential receptors in proximity of the site have also been identified.

As the environmental hazards present on the Beach are generally related to commonly occurring commercial / industrial contaminants, (i.e. asbestos) and are also commonly identified on urban development site in established areas of Sydney and/or commonly used in a range of processes, it can be assumed that the environmental hazard does not pose a unique hazard to the community. However, the presence of these contaminants in uncontrolled locations, potentially in proximity of sensitive populations, may serve to increase the exposure of the community and/or the environment to the environmental hazard.

3.5 Identification of Potential Interactions between Agents

There may be interactions between the physical, chemical, biological and social hazards that require identification and consideration as part of a risk assessment. There are several potential types of interactions between hazardous agents which include: additive effects; synergistic effects; potentiation effects and antagonistic effects.

It is widely acknowledged that activities such as smoking can increase the susceptibility of a person to the potential effects of some carcinogens. To this effect, it will be required to be ensured that conservatively derived data and reasonably maximum exposed receptors are used as the basis for any risk assessment.

3.6 Why is Risk Assessment Needed?

The occurrence of environmental hazards in a site sub-surface is unique for every site and location. Further, the particular populations exposed to an environmental hazard are unique for every occurrence of the environmental hazard. Regulatory authorities within NSW do not provide comprehensive guidance for the assessment of the asbestos contaminant as identified within the Beach site as an environmental hazard. As consistent with the advocated approach in ALGA (2017) the limited guidance available is considered unsuitable to be solely applied to the ongoing use of the site, as based on potential human exposures. For example, the guidance provided for asbestos in NEPC (2013) and endorsed by the NSW EPA for investigation purposes, is based on assumptions derived from substantially drier Western Australian soils and very simplistic estimates as to potential exposures.

The requirement, and method, for remediation/management for an environmental hazard needs to be determined. The extent of this potential requirement must be determined by the assessment of the presence of an environmental hazard; the degree of potential harm posed by the environmental hazard (in an isolated environment); and the likely exposure of the environment to the

environmental hazard. Only through the assessment of all these factors can the true impact of the environmental hazard be assessed. The risk assessment process is designed to include all of these factors to determine a site-specific estimate of the risk posed by the level of asbestos present in soils on the Beach.

3.7 Limitations and Uncertainties

Potential limitations and uncertainties that may occur in the risk assessment process include:

- Information gaps, e.g. effects of mixtures, low level and variable exposures over time, relative contribution of 'lifestyle' factors;
- Poor exposure information, e.g. complex mixtures of hazards with complex behaviours in the environment; limited knowledge about the actual or potential sub-population;
- Limitations of toxicological or epidemiological research, e.g. small populations and limited exposure information, multifactorial causes of many diseases on health impacts; 'background noise' affecting research into common diseases or symptoms; population heterogeneity;
- Complexity, e.g. large numbers of combinations of hazards, exposures and health states;
- Confidentiality of health and commercial information;
- Charged atmosphere of fear, antagonism and distrust; and
- Value conflicts.

The risk assessment requires a thorough sensitivity analysis subsequent to the provision of the risk outcomes. The sensitivity analysis will take these matters into account, testing the outcome of the risk assessment of reasonable upper and lower bounds of each. Sensitivity analysis of all assumptions has been undertaken throughout the risk assessment. Risk assessment outcomes may require to be modified where sensitive parameters are observed to have large reasonable potential deviations.

4. Selection of Constituents of Potential Concern

The risk assessment has been restricted to the assessment of asbestos. Asbestos has been identified as bonded asbestos only and occurring in the form of fibre cement sheet fragments. The extent of assessments completed has not identified asbestos as occurring in friable forms, or otherwise identified the occurrence of asbestos fines / free asbestos fibres.

5. Toxicological Assessment

There are two elements to the toxicological review for the human health risk assessment: hazard identification (using toxicological studies) and dose-response assessment. The Australian approach to each is discussed in detail following.

5.1 Hazard Identification

Hazard identification examines the capacity of an agent to cause adverse health effects in humans and other animals. The dose-response assessment examines the quantitative relationships between exposure and the effects of concern.

Hazard identification uses:

- Animal data. This is usually assessed by toxicological methods;
- Human data. This usually assessed by epidemiological methods when groups of people are involved, or by toxicological methods when using case studies and acute chamber studies; and
- Other data. This includes structure data such as structure activity data or in vitro data assessed by toxicologists.

Hazard identification mostly relies on the results of in vitro toxicity studies conducted according to standard protocols (e.g. OECD Test Guidelines). The following types of studies are defined:

- Acute toxicity studies are studies which investigate the effects of single doses of a substance. The standard acute toxicity studies include tests for: acute, oral, dermal and inhalational toxicity, eye irritation, skin irritation and skin sensitisation;
- Sub-chronic toxicity studies are short term repeat-dose studies. The main purpose of sub-chronic testing is to identify any target organs and to establish dose levels for chronic exposure studies;
- Chronic toxicity studies, or long-term studies, are defined as studies lasting for the greater part of the lifespan of the test animals. The protocol for these studies may cover the investigation of chronic toxicity or carcinogenicity, or both;
- Reproductive toxicity studies are studies designed to provide general information about the effects of a test substance on reproductive performance in both male and female animals;
- Developmental toxicity studies are studies which examine the spectrum of possible in utero outcomes for the conceptus, including death, malformations, functional deficits and developmental delays; and
- Genotoxicity studies are designed to determine whether test chemicals can perturb genetic material to cause gene or chromosomal mutations.

The essential purpose of toxicity studies is the detection of valid biological evidence of the hazard potential of the substance being investigated. The evaluation of the weight of evidence produced by toxicity studies is that process which considers the cumulative data pertinent to arriving at a level of concern about the potential adverse effects of a substance. In assessing toxicological studies and hazard analysis, judgement and supporting rationale are provided for:

- The acceptability of the study and its database;
- The existence of biologically important adverse effects;
- The relevance of any factors noted during the evaluation which might have had some bearing on the outcomes of the study and modified the findings in some way; and

- The likelihood that any of the observed effects were induced by the administered substance.

Toxicology assessments are often complemented with epidemiological studies in hazard assessment. Epidemiology is the direct human evidence component of the assessment. Epidemiological studies are used to investigate the cause of adverse health effects; the natural history of health conditions; the description of the health status of populations; and to evaluate the health status of populations; and to evaluate health related interventions.

5.2 Dose-Response Assessment

There are different ways of characterising dose-response relationships including:

- Effect levels (e.g. LD50, LC50, ED10) and no observed adverse effect levels (NOELs);
- Margins of safety;
- Therapeutic indices; and
- Models to interpolate high dose experimental data to the low doses likely to be experienced in the environment.

There are often limited human exposure data, animal bio-assay data are most often used for dose-response assessment. The use of these data requires extrapolations from animals to humans and interpolations from high doses to low doses.

Dose-response assessments and calculations are generally undertaken by either of a threshold approach or a non-threshold approach. Each is described in further detail following.

5.2.1 Threshold Approaches

A threshold is considered to occur because of biological mechanisms such as the ability to metabolise or excrete a toxin to repair damage up to a certain dose.

The approach with these models is to derive exposure limits such as an Acceptable Daily Intake (ADI), Tolerable Daily Intake (TDI) or Reference Dose (RfD). This approach makes no attempt to calculate a level of risk at low exposures. Rather, it derives a dose which is apparently without effect in a human population or suitable animal model, and then applies a factor to derive an exposure which has a high likelihood that no effect will occur in the general human population.

These exposure limits are first derived by determining the No Observed Adverse Effect Level (NOAEL) or, if the NOAEL cannot be determined, the Lowest Observed Adverse Effect Level (LOAEL) and dividing the value by factors to account for:

- Interspecies differences (extrapolating from animals to humans);
- Intraspecies differences (differing sensitivities between individuals);
- The severity of the adverse effect; and
- The quantity and quality of the scientific data.

Traditionally, safety factors for intraspecies and interspecies differences have each been assigned values of ten, and the other two have been assigned values between 1 and 10. An additional factor of ten is sometimes used if the NOAEL was not established in the study. The individual factors are then multiplied to determine an overall safety factor by which the NOAEL is divided to give the ADI, TDI or RfD.

Historically, the most common overall factor used by a number of regulatory bodies is 100, if a large toxicological database has been assessed, although the overall factor can range from 10 to 10,000. From the data available on humans and experimental animals, it appears that interspecies and intraspecies differences are in general less than 10, hence the often used safety factor of 100 for these two factors is conservative and adequately protective of public health.

5.2.2 Non-Threshold Approaches

These approaches do not recognise the possibility of a threshold effect and are appropriate for radiation and some genotoxic carcinogens. It is, as a science policy decision, applied to all carcinogens by the US EPA.

Non-threshold models assume linearity between the lowest experimentally derived dose and the zero dose (the origin). This implies that there is a calculable probability of an adverse effect (risk) no matter how small the dose. This does not mean that there is no dose that could be considered safe unless safety must be equated with zero risk.

Numerical estimates of risk probabilities are generated by fitting one or more mathematical models to the data in the experimental dose range and extrapolating to the low environmental exposure doses. For example, low-dose extrapolation using a linear model is a default approach for cancer risk assessment in the USA and is one approach which has been used by the WHO for genotoxic carcinogens in deriving water quality guidelines.

The outcomes are estimates of either:

- The dose at a predetermined acceptable risk level (note that this requires some judgement on what constitutes an acceptable level of risk); or
- The estimated risk level at any particular dose.

It has been recognised by IARC and other European based agencies that not all carcinogens have genotoxicity as their prime mode of action, the dose-response curve is assumed to be non-threshold for genotoxic carcinogens and threshold for non-genotoxic carcinogens. Accordingly, the Australian approach is to apply non-threshold and threshold models to genotoxic and non-genotoxic carcinogens.

5.3 Sources of Toxicological and Tolerable Intake Data

NEPC (2013) provides toxicological data sources that are considered to provide information that is compliant with Australian requirements for setting public health standards in the context of assessing potential human health risks. These sources include:

1. National Health and Medical Research Council documents (e.g. Australian Drinking Water Guidelines);
2. National Environmental Protection Council documents (e.g. NEPM Air Toxics, NEPM Ambient Air Quality and Air Quality Standard Setting Methodology);
3. Other Australian government sources of toxicity data (e.g. ADI list from the Therapeutic Goods Administration, enHealth Council documents and National Environmental Health Forum documents distributed by the Commonwealth Department of Health and Ageing);
4. South Australian Health which has published a series of workshops on risk assessment of contaminated land;
5. World Health Organisation (WHO) documents. Australia is a party to the WHO process and has incorporated their material in a variety of environmental health criteria. A range of documents include those from the WHO/ILO/UNEP International Programme on Chemical Safety (IPCS) which produces Environmental Health Criteria monographs and Concise International Chemical Assessment documents (CICADs). Documents detailing international Acceptable Daily Intakes (ADI's), Tolerable Daily Intakes (TDI) or Tolerable Weekly Intakes (TWI) may be found in evaluations by the WHO/FAO Joint Meeting on Pesticide Residues (JMPR) and by the Joint FAO/WHO Expert Committee on Food Additives (JECFA);
6. International Agency for Research on Cancer (IARC) documents;

7. US Agency for Toxic Substances and Disease Registry (ATSDR) minimal risk levels and toxicological reviews;
8. Other Governmental sources of information (e.g. NICNAS, USEPA IRIS database and European Government Guidance);
9. Other sources of peer reviewed toxicity criteria (US EPA's PPRTV/HEAST, Cal EPA toxicity values and OEHHHA); and
10. Peer reviewed journals for which robust justification is required if information is to be sourced as they generally are not compliant with the requirement for having carried out an extensive literature review.

Where physical and chemical data are necessary requirements in the risk assessment process, the following sources, in order, are recommended:

1. ORNL (Oak Ridge National Laboratory) Risk Assessment Information System (RAIS);
2. ATSDR toxicological profiles; and
3. Peer reviewed journals.

5.4 Review of Published Hazard Data

Available toxicological, epidemiological studies and dose-response studies have been reviewed for asbestos, as identified in **Section 4**, by the protocols established in **Section 5.1**. Consequently, citing the relevant agencies, there has been no requirement in this risk assessment to further review and comment upon the hazard studies reviewed by each organisation, or those that may be available elsewhere that are not endorsed by these organisations.

Instead, the pertinent toxicological effects identified for asbestos by the agencies has been reviewed and summarised. Risk / hazard factors and guideline values have also been identified from these sources.

5.5 Asbestos

Asbestos has been selected as a contaminant of potential concern (COPC) for the assessment of potential human health impacts. A brief summary of the toxicological data available for asbestos has been provided following. The summary has been generated by a review of the available data held by the agencies outlined in **Section 5.3**, as summarised in **Table 5.1**.

Table 5.1: Summary of Published Hazard Data for Asbestos

Organisation	Availability	Reference
NHMRC	YES	'Lung Cancer', Section 1, Epidemiology. http://www.nhmrc.gov.au/publications/synopses/_files/cp97_1.pdf 'Asbestos Related Diseases' http://www.nhmrc.gov.au/your_health/issues/asbestos.htm
NEPC	YES	NEPC (2013) 'Schedule B1: Soil and Groundwater Investigation Levels'
Therapeutic Goods Administration	No	
WHO	YES	'Elimination of Asbestos Related Diseases' http://whqlibdoc.who.int/hq/2006/WHO_SDE_OEH_06.03_eng.pdf 'Asbestos in Drinking Water' http://www.who.int/water_sanitation_health/dwq/asbestos.pdf Air Quality Guidelines, 2nd Edition, Section 6.2, 'Asbestos'. http://www.euro.who.int/document/aig/6_2_asbestos.pdf 'Environmental exposure to asbestos and the exposure-response relationship with mesothelioma' http://www.emro.who.int/publications/emhj/1501/PDF/03.pdf
enHealth	YES	'Management of Asbestos in the Non-Occupational Environment' http://www.nphp.gov.au/enhealth/council/pubs/pdf/asbestos.pdf
NEHF	No	
S.A Health	No	
IARC	No	
WHO/FAO JMPR	No	
NICNAS PEC	YES	'Chrysotile Asbestos Priority Existing Chemical No. 9' http://www.nicnas.gov.au/publications/CAR/PEC/PEC9/PEC_9_Full_Report_PDF.pdf
ATSDR	YES	'ToxFAQs™ for Asbestos' http://www.atsdr.cdc.gov/tfacts61.html 'Regulations and Advisories' http://www.atsdr.cdc.gov/toxprofiles/tp61-c8.pdf
NTP	YES	Lifetime Carcinogenesis Studies of Amosite Asbestos in Syrian Golden Hamsters http://ntp.niehs.nih.gov/ntp/htdocs/LT_rpts/tr249.pdf Toxicology and Carcinogenesis Studies of Crocidolite Asbestos in F344/N Rats http://ntp.niehs.nih.gov/ntp/htdocs/LT_rpts/tr280.pdf Toxicology and Carcinogenesis Studies of Chrysotile Asbestos in F344/N Rats http://ntp.niehs.nih.gov/ntp/htdocs/LT_rpts/tr295.pdf
OECD SIDS SIAR	No	
US EPA	YES	'Asbestos (CASRN 1332-21-4)' http://www.epa.gov/NCEA/iris/subst/0371.htm US EPA (December 2014) 'Toxicological Review of Libby Amphibole Asbestos'

NHMRC

NHMRC define asbestos as a carcinogen with no clearly delineated limiting threshold, and support a cumulative exposure model for risk as defined by exposure. Asbestos has been found to cause pleural disease, asbestosis, lung cancer and mesothelioma.

NEPC

NEPC (2013) has adopted the asbestos criteria as provided in *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, 2009, Western Australian Department of Health (WA DoH, 2009).

WA DoH (2009) provide assessment levels for asbestos cement products and free asbestos fibres in soils. The assessment criteria are based on the work of Swartjes et al (2003) and Swartjes & Tromp (2008), WHO risk figures for mesothelioma and division by a factor of ten, to account for greater dryness and dust generating potential of WA soils and treating all forms of asbestos as being of equivalent toxicity. The soil investigation criteria provided by WA DoH (2009) are listed as follows:

- 0.001% asbestos for all site uses, based on free asbestos fibres and asbestos fines;

- 0.01% asbestos for residential use, based on ACM;
- 0.04% asbestos for residential use with minimal soil access, based on ACM;
- 0.02% asbestos for parks, public open spaces, playing fields, based on ACM; and
- 0.05% asbestos for commercial / industrial based on ACM.

It is noted that only residential criterion are based on toxicology and risk based assessments using exposure parameters and unit risk levels. The other criteria are derived from the residential criteria using adopted exposure ratios which are loosely based on comparative exposure durations on the assessed populations.

WHO

WHO classify asbestos (actinolite, amosite, anthophyllite, chrysotile, crocidolite and tremolite) as carcinogenic, based on a statement by the International Agency for Research on Cancer. Exposure to amosite, anthophyllite, chrysotile or crocidolite results in the increased risk of lung cancer, while occupational exposure to crocidolite, amosite, tremolite and chrysotile has resulted in mesotheliomas. The risk of bronchial cancer also increases, as may that of cancers of the larynx and gastrointestinal tract.

WHO finds that the occurrence of asbestos-related diseases is related to fibre type, size and dose, and to the industrial procession of that asbestos, while cigarette smoking increases the associated risk. Fibres with a diameter greater than 3 µm are not respirable; fibres shorter than 5 µm and thicker than 2 µm elicit little response, while those longer than 10 µm and thinner than 0.5 µm yield the highest response.

Asbestosis has only been found related to occupational asbestos exposure, while non-occupational asbestos exposure does not appear sufficient. The incidence of mesothelioma has been shown to increase with increased exposure.

WHO studies have not found asbestos to be teratogenic or mutagenic in mice, while there is no conclusive evidence that ingested asbestos is carcinogenic. Drinking water containing high levels of asbestos have not been shown to be carcinogenic.

WHO (2000) provides estimates of mesothelioma risk resulting from lifetime inhalation exposure to asbestos with a best estimate of a risk of $2 * 10^{-5}$ for a lifetime exposure to 100 f/m³ ($1 * 10^{-4}$ f/ml). WHO (2000) further provides an estimate of $2.2 * 10^{-5}$ risk of lung cancer for a non-smoker exposed to a fibre concentration of 100 f/m³. These values are each equivalent to an approximate unit risk of 0.2 (f/ml)^{-1} . The unit risk is a measure of the incremental lifetime risk of cancer associated with lifetime exposure to a unit concentration (1 f/ml)⁻¹ of asbestos in air. Unit risk factors are derived from the cancer slope factor for the inhalation of carcinogenic chemicals.

enHealth

enHealth defines asbestos as a carcinogen, with amphibole fibres (crocidolite, tremolite and amosite) considered more dangerous and the primary agents in the increased incidence of mesothelioma. enHealth quotes studies suggesting there is a direct correlation between exposure and risk, with chronic exposure being the largest contributor to asbestos related health risks, with significantly increased mortality rates reported in exposed workers with cumulative exposure estimates greater than 25-100 f/mL-years. A further study estimated a 1 per cent increase in the standardised mortality ratio for lung cancer per year of exposure to 1 f/mL

The shape and length of asbestos fibres are also found to alter health risks, with fibres >20 µm <100 µm consider to be most carcinogenic, while in terms of shape, those with fibres >8 µm long and <0.25 µm diameter, with an aspect ratio (length/width) ≥10 appear to be most dangerous.

For non-occupational risk, studies of a crocidolite mining town showed a mesothelioma rate of 260 per 100 million person-years, while the mesothelioma rate for residents living near an asbestos cement factory was 73 (female) and 114 (male) per million person-years, as compared to a background incidence rate of one per million person-years. enHealth quotes guidelines for asbestos exposure as 0.1 f/mL for occupational exposure in Australia, and para-occupational sampling if using a limit of detection of 0.01 f/mL, while there is a proposed standard of 0.033f/mL for ambient air in Tasmania. Further, Australia has set a cut-off of 0.1 per cent by weight asbestos in products for the purpose of carcinogenic classification of the products.

NEHF/NICNAS

NICNAS has declared chrysotile a Priority Existing Chemical (PEC) as it is prevalent and a known human carcinogen, causing asbestosis, mesothelioma, and lung cancer. No estimate is given as to a limiting threshold, but lung cancer occurrence estimates for the Australian friction material manufacturing industry are given as 1 to 2 cases from exposure to 1 f/mL, 1 case at 0.5 f/mL and 0.2 case at 0.1 f/mL, per 1000 workers. The PEC also cites the 1999 national exposure standard (TWA) for chrysotile as 1 f/mL, but suggests that monitoring methods do not distinguish between types of asbestos and a limit of 0.1 f/mL would protect against other forms of asbestos.

ATSDR

ATSDR recognizes asbestos as a carcinogen responsible for mesothelioma and lung cancer. They quote the US EPA as proposing a concentration limit of 7 million fibres per litre of drinking water for long fibres (lengths greater than or equal to 5 µm), while the Occupational Safety and Health Administration has set a limit of 100,000 f/m³ with lengths greater than or equal to 5 µm for workplace air for 8-hour shifts and 40-hour work weeks. A number of sources are quoted as given US standards for limits, typically 0.1 – 1.0 f/mL.

NTP

NTP studies on hamsters and rats show that asbestos is not carcinogenic from ingestion.

US EPA

The US EPA established asbestos as a human carcinogen based on consistently higher mortality rates and cancers among occupationally exposed workers. Inhalation was identified as the primary cause, while evidence for carcinogenicity from ingestion remains inconclusive, as studies on white rats resulted in the development of benign polyps. A synergistic interaction between asbestos exposure and cigarette smoking, contributing to the development of lung cancer but not mesothelioma, was identified.

The US EPA identifies the Inhalation Unit Risk as 0.23 (f/mL)⁻¹. The unit risk is a measure of the incremental lifetime risk of cancer associated with lifetime exposure to a unit concentration (1 f/ml)-1 of asbestos in air. Unit risk factors are derived from the cancer slope factor for the inhalation of carcinogenic chemicals. The US EPA unit risk factor is very similar to the unit risk as derived from WHO reports.

Air Concentrations at Specified Risk Levels as provided by the US EPA are summarised following:

Risk Level	Concentration
E-4 (1 in 10,000)	4*10 ⁻⁴ f/mL
E-5 (1 in 100,000)	4*10 ⁻⁵ f/mL
E-6 (1 in 1,000,000)	4*10 ⁻⁶ f/mL

Different types and fibre sizes of asbestos appear to have different health impacts, with fibre size and processing method appearing to impact relative risk as much as the specific type of asbestos. Evidence remains inconclusive as to the exact nature of these differences.

US EPA (2014) provides a further discussion of potential noncancer effects of exposure to amphibole forms of asbestos. These have been found to include pleural abnormalities, asbestosis, and reduced lung function as well as increased mortality from noncancer causes. Experimental animal studies are further reported to have demonstrated increased collagen deposition consistent with fibrosis following intratracheal instillation of asbestos fibre in mice as well as increased markers of pulmonary inflammation in a rat model for human cardiovascular disease.

US EPA (2014) nominates a reference concentration (RfC) of 9×10^{-5} f/ml for amphibole forms of asbestos as based on observations of increased pleural thickening (localized and diffuse) and signs of interstitial fibrosis (i.e. small opacities) in occupationally exposed workers. Localized pleural thickening (LPT) was selected as the critical effect due to its higher prevalence for the purposes of deriving an RfC. The RfC is intended to be applied on the basis of continuous exposure (i.e. 24 hours/day, 365 days/year, with exposure beginning at birth and continuing for 70 years). The derivation of the RfC is reported to have included three uncertainty factors (UF) for a composite UF of 300 (comprising an intraspecies UF of 10 and a database UF of 10). The RfC is reported to be applied by calculating the average concentration over a lifetime period – that is the RfC is intended to be applied to an averaging time of a lifetime exposure.

US EPA (2014) also present an estimate of unit risk, on the basis of combined mesothelioma and lung cancer mortality from exposure to amphibole asbestos on the basis of the workers assessed. The unit risk value of 0.17 (f/ml)^{-1} provided for amphibole asbestos is similar to the unit risk of 0.23 (f/ml)^{-1} recommended by the US EPA IRIS database for all forms of asbestos.

5.6 Adopted Value to Assess Risk of Asbestos

Potential toxicological effects of asbestos exposure will be assessed by the WHO recommended unit risk of 0.2 (f/ml)^{-1} . Asbestos is not toxic by oral or dermal exposure pathways. The unit risk to assess non-threshold effects, has been demonstrated as being suitably conservative to account for potential threshold effects of exposure to amphibole forms of asbestos.

6. Exposure Assessment

Exposure assessment involves the determination of the magnitude, frequency, extent, character and duration of exposures currently and into the future. This includes the identification of exposed populations and potential exposure pathways. The exposure assessment has derived exposure scenarios that are the most potentially conservative for the site and the surrounding area.

6.1 Potential Exposure Pathways and Populations

On the basis of preceding discussion, the potential receptors of concern for further assessment are:

- Recreational users of the Beach;
- Landscapers / Gardeners / Beach maintenance workers;
- Sub-surface maintenance / excavation workers; and
- Residents adjoining / in proximity of the site.

Recreational users will potentially undertake a range of surface activities across the Beach, as consistent with the locality and open space nature of the site. It is noted that these would be anticipated to be of short duration in nature as consistent with the absence of any fixed equipment, camping etc within the extent of the Beach.

Landscapers are understood to be occupationally engaged to maintain the adjoining Golf Course and likely undertake minor works associated with the maintenance / upkeep of the Beach. Though these are a commercial / industrial receptor, exposure durations will not be consistent with the duration of commercial / industrial exposures, as only a minor amount of landscaping / maintenance works are required for the grassed / open areas in proximity of the Beach – or otherwise for the limited works required to maintain / clean the area of the Beach. There are no significant garden / landscaped areas within the Beach that would warrant detailed works from a gardener / landscaper. However particular factors as unique to landscaping / gardening works may potentially cause increased exposures.

Periodic sub-surface / excavation works may be required in proximity of the site as associated with future maintenance of services (i.e. stormwater services known to pass through the Beach, irrigation systems on the adjoining Golf Course etc). These exposures would be anticipated to be of short duration and intermittent. However, as noted for landscapers there is a potential for unique factors within these works that may potentially cause increased exposures to airborne asbestos fibres. Sub-surface maintenance worker exposures may further be caused to be highly localised, and assessment should be undertaken to maximum concentrations of constituents to remain conservative.

Asbestos fibres as potentially generated from exposed asbestos fibres within the beach may potentially migrate to affect residential properties in proximity. The residential properties will likely have sensitive receptors present. Further exposure durations within residential properties would be anticipated to be greater than exposure durations of recreational users on the Beach. The risk assessment also requires to consider the potential levels of asbestos as may be caused at these adjoining residential properties. This will require additional factors to be considered in the fate and transport assessment, inclusive of the proportion of time that a residence may be downwind of the site, dispersion and associated reduction in concentration of airborne fibres between the Beach and the residential dwelling / property, and reductions of indoor to outdoor levels of respirable particles/ fibres.

6.2 Exposure Estimation

Exposure estimation has been undertaken by the consideration of a reasonable maximum exposure (RME) on a particular site (USEPA, 1989a). The goal of RME is to combine upper bound and average exposure factors in a manner such that the result represents an exposure scenario that is both protective and reasonable. This is not one which is the absolute worst case but that which represents a reasonable maximum exposure.

The approach for exposure assessment used here is based on the procedures developed by the US EPA (1989a and 1991). In general, assumptions employed in risk assessments are based on information presented by local authorities (i.e. enHealth (2001) 'Exposure Scenarios and Settings'), precedents established in previous risk assessments and recommendations by the US EPA.

The estimated exposure (or intake) of a person is normalised for time and body weight and is generally calculated as:

$$\text{Intake} = \frac{\text{Concentration} \times \text{Contact Rate} \times \text{Exposure Frequency} \times \text{Exposure Duration}}{\text{Body Weight} \times \text{Averaging Time}}$$

As an alternative to deriving criteria based on RME, probabilistic techniques such as Monte Carlo analysis can be used to account more realistically for variability and uncertainty. However, there is generally insufficient information available in an Australian context to allow reliable Monte Carlo analysis to be undertaken. Monte Carlo analysis has not been undertaken here.

6.3 Exposure Factors

The exposure factors adopted for the purposes of assessing risks from the site are consistent with those adopted in NEPC (2013) in the first instance. Where insufficient guidance is provided in NEPC (2013), further reference has been made to enHealth (2012) 'Environmental Health Risk Assessment: Guidelines for assessing human health risks from environmental hazards', enHealth (2012b) 'Australian Exposure Factor Guidance: Guidelines for assessing human health risks from environmental hazards' and CRC CARE (2011) 'Technical Report no.10: Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater' where available. For some exposure scenarios, specific or appropriate exposure factors have not been provided in enHealth (2012) or CRC CARE (2011). In these cases, available literature has been reviewed to determine the parameters that are most appropriate for an Australian context. Additional parameters, where required, are based on an RME receptor.

Exposure factors are summarised for each of these populations in the following **Tables 6.1 to 6.4**.

Table 6.1: Exposure Parameters – Recreational User

Exposure Parameter	Units	Factor	Reference
Exposure Frequency	days/year	365	NEPC (2013), assumed continuous
Exposure Duration	Years	70	NEPC (2013), assumed lifetime
Exposure Time	Hours	2	NEPC (2013), as recommended for recreational exposure durations
Averaging Time – non Threshold	Years	70	NEPC (2013)

Table 6.2: Exposure Parameters – Gardener / Landscaper

Exposure Parameter	Units	Factor	Reference
Exposure Frequency	days/year	52	Assumption of one day per week, 52 weeks per year. Protective of exposures on the Beach, or otherwise exposures in close proximity on the Golf Course
Exposure Duration	Years	30	NEPC (2013), commercial / industrial exposure duration
Exposure Time	Hours	8	NEPC (2013)
Averaging Time – non Threshold	Years	70	NEPC (2013)

Table 6.3: Exposure Parameters – Adult Sub-Surface Maintenance Workers

Exposure Parameter	Units	Factor	Reference
Exposure Frequency	days/year	15	Assumption of maximum time spent undertaking maintenance works, three weeks. CRCCARE (2011)
Exposure Duration	Years	10	Based on 10 repeat events, CRCCARE (2011)
Exposure Time	Hours	8	NEPC (2013)
Averaging Time – non Threshold	Years	70	NEPC (2013)

Table 6.4: Exposure Parameters – Adjoining Resident

Exposure Parameter	Units	Factor	Reference
Exposure Frequency	days/year	365	NEPC (2013)
Exposure Duration	Years	35	enHealth (2012), 95% RME time at single residence.
Exposure Time	Hours	20	enHealth (2012)
Averaging Time – non Threshold	Years	70	NEPC (2013)

6.4 Estimation of Inhalation Exposure

When deriving risk estimated for exposure to asbestos, inhalation exposures have been estimated by the approach in *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment)*, January 2009, US EPA. Equations are provided here for estimating exposure concentrations for assessing cancer risks and for calculating hazard quotients from chronic exposures as per the following:

$$EC = (CA * ET * EF * ED) / AT \text{ (cancer risks)}$$

$$EC = (CA * ET * EF * ED) / AT \text{ (hazard quotients)}$$

Where: EC – exposure concentration ($\mu\text{g}/\text{m}^3$);

CA – contaminant concentration in air ($\mu\text{g}/\text{m}^3$);

ET – exposure time (hours/day)

EF – exposure frequency (days/year)

ED – exposure duration (years)

AT – averaging time, cancer risks (lifetime in years * 365 days/year * 24 hours/day)

AT – averaging time, hazard quotient (ED in years * 365 days/year * 24 hours/day)

Table 6.5, summarises each of the adjustment factors to be used for each of the receptors assessed by the risk assessment.

Table 6.5: Summary of Factors to Adjust Airborne Concentrations for Inhalation Exposure

Receptor	Cancer Risks (EC)
Recreational Site User	$EC = 8.33 * 10^{-2} * CA$
Landscaper / Gardener	$EC = 2.04 * 10^{-2} * CA$
Sub-Surface Maintenance Worker	$EC = 1.96 * 10^{-3} * CA$
Adjoining Resident	$EC = 0.417 * CA$

6.5 Asbestos Fibre Fate and Transport

Environmental assessment works undertaken have identified asbestos as present on the site as summarised in **Sections 1.11** and **2.2** as restricted to assessment of asbestos occurring as bonded ACM. The quantitative data as generated from the assessments to date has presented a concentration of bonded asbestos present in site surface soils of 24 mg/kg / 0.0024% w/w (**Section 2.2.1**). Detailed investigation of deeper soils as present at the Beach has reported levels of asbestos between 2.7 and 14 000 mg/kg / 0.00027 and 1.4% w/w (**Section 2.2.2**), or otherwise absent at the majority of locations.

Potential exposures require to be based on airborne concentrations of asbestos. On this basis, a fate and transport assessment has been completed to estimate potential airborne levels of asbestos from the site, as generated from known levels of asbestos in site soils.

6.5.1 Level of Asbestos in Site Soils

Two datasets are available in **Sections 2.2.1** and **2.2.2** to estimate levels of asbestos present in site soils. The dataset as present in **Section 2.2.1** is based on levels of accessible asbestos as present in surface soils. The dataset as presented in **Section 2.2.2** is based on levels of asbestos as present in deeper soils, that may be caused to be available at the site surface in the future. The dataset in **Section 2.2.2** presents the worse-case and has been adopted for the purposes of this assessment, i.e. the levels of asbestos as measured in the site sub-surface have been assumed to be present at the surface of the Beach.

The risk assessment requires to be based on a reasonable maximum exposed (RME) receptor. On this basis, statistical analysis has been undertaken of the dataset as presented in Trinitas (2021) to characterise a 95% UCL_{avg} estimate of the level of asbestos present on the Beach. This is consistent with the requirements of *Sampling Design Guidelines*, 1995, NSW EPA.

Statistical analysis of the Trinitas (2021) dataset has been undertaken and is summarised in **Appendix B**. The higher of the detection limits as estimated from the Trinitas (2021) dataset has been adopted for the non-detect locations in preparing the dataset for analysis (to ensure a conservative approach). In undertaking the statistical analysis, the asbestos impact reported at sample locations TP39 and TP41 (at the south-eastern portion of the Southern Beach and downstream of the Crown Gully 3 feature) have been excluded. Soils / sands at a depth of up to 1 m were observed to contain nearly 10% by weight asbestos cement content. It is highly unlikely that an excavation to a depth of 1 m will be undertaken at the perimeter of the Beach. Notwithstanding, these locations are an outlier and will require ongoing management / remediation irrespective of the findings of the risk assessment.

Results of statistical analysis are summarised in **Table 6.6** following.

Table 6.6: Statistical Analysis of DSI Asbestos Concentrations

Descriptor	Result (mg/kg / % w/w)
95% U _{avg}	177 / 0.0177
Average	53 / 0.0053
Standard deviation	177 / 0.0177
Maximum	1036 / 0.1036
Number	42 / 0.0042

For the purposes of the risk assessment, the 95% UCL_{avg} level of asbestos is 177 mg/kg (0.0177% w/w), and the maximum concentration of asbestos is 1036 mg/kg (0.1036% w/w, subject to management of asbestos impact present at the south-eastern portion of the southern beach) have been adopted for the risk assessment calculations.

6.5.2 Fibre Release from Contaminated Soils

Two published studies are available which have attempted to quantify the rate of asbestos fibre release from soils. These include Addison, J., Davies, L.S.T., Robertson, A., and Willey, R.J, 1988, *'The Release of Dispersed Asbestos Fibres from Soils Technical Memoranda'*, TM/88/14, Institute of Occupational Medicine: 50, Edinburgh, UK (Addison et al 1988) and Swartjes, F.A., Tromp, P.C., , 2008, 'A Tiered Approach for the Assessment of Human Health Risks of Asbestos in Soils', *Soil and Sediment Contamination*, Volume 14, Issue 4, pp. 137 – 149 incorporating Swartjes F.A, Tromp P.C, Wezenbeek J.M, 2003, *'Assessment of the Risks of Soil Contamination with Asbestos'*, National Health and Environmental Institute, Netherlands, RIVM Report 711701034/2003 (Swartjes and Tromp 2008), as discussed below.

Addison et al (1988)

Assessment of the potential for asbestos fibre generation from asbestos contaminated soils has been undertaken in Addison et al (1988). This study assessed the potential generation of free asbestos fibres from asbestos contaminated soils.

It was found that potentially high concentrations of asbestos fibres could be present in dust as generated from contaminated soils. It was found that soils with a concentration of free asbestos fibre of 1% by weight could generate airborne fibre concentrations greater than 20 f/ml where dust levels were below 5 mg/m³. Dry loose soils with 0.001% asbestos fibres reported respirable asbestos concentrations greater than 0.01 f/ml while dust levels were below 5 mg/m³.

The potential generation of asbestos fibres was found to be reduced for chrysotile forms of asbestos when compared to amphibole forms. Increasing moisture content of soils reduced potential asbestos fibre generation. Clayey soils generated less asbestos fibres than loose sandy soils.

On the basis of the tests completed by Addison et al (1988) a relationship between the normalised airborne fibre concentration (f/ml / mg/m³) and the proportion of asbestos in soil was produced (Diagram 6.1).

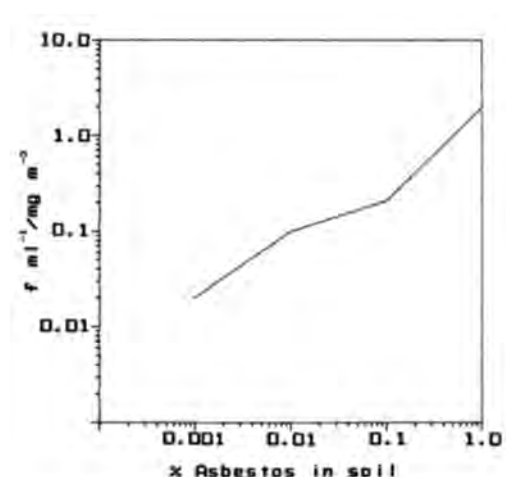


Diagram 6.1: The relationship between the normalised airborne fibre concentration (f/ml / mg/m³) and the proportion of asbestos in soil; average results from all test runs (Addison et al 1988)

Swartjes et al (2003) and Swartjes & Tromp (2008)

A more recent assessment than Addison et al (1998) of the generation of asbestos fibres from soils has been undertaken by Swartjes & Tromp (2008) as incorporating the findings of Swartjes et al (2003). An inventory of more than 1000 measurements of asbestos fibre generation from asbestos impacted soils is reported to have been reviewed. These data resulted from:

- Worst case simulation experiments (wind blower with dry soil and loose asbestos fibres);
- Field experiments consisting of daily practice activities including driving on contaminated roads, digging and dumping and sifting of humid soil on sites contaminated with:
 - Friable asbestos in soils; and
 - Bound asbestos (i.e. ACM) in soils.

Diagram 6.2 shows the data obtained by Swartjes et al (2003) and Swartjes & Tromp (2008) showing the relationship between soil and air concentrations of asbestos. The graph shows the airborne asbestos concentration during the simulation experiments and field measurements with friable and bound asbestos impact in soils. 95% confidence intervals are also shown. The lower fitted line is based on field measurements of asbestos fibre generation from impacted soils, and the upper fitted line is based on simulations of worst case asbestos fibre dispersal from impacted soils (i.e. lab based trials).

It is noted by the authors in the preparation of the graph that the worst case simulation experiments (i.e. lab based) give higher airborne asbestos concentrations. This is shown by the higher of the fitted lines on **Diagram 6.2**.

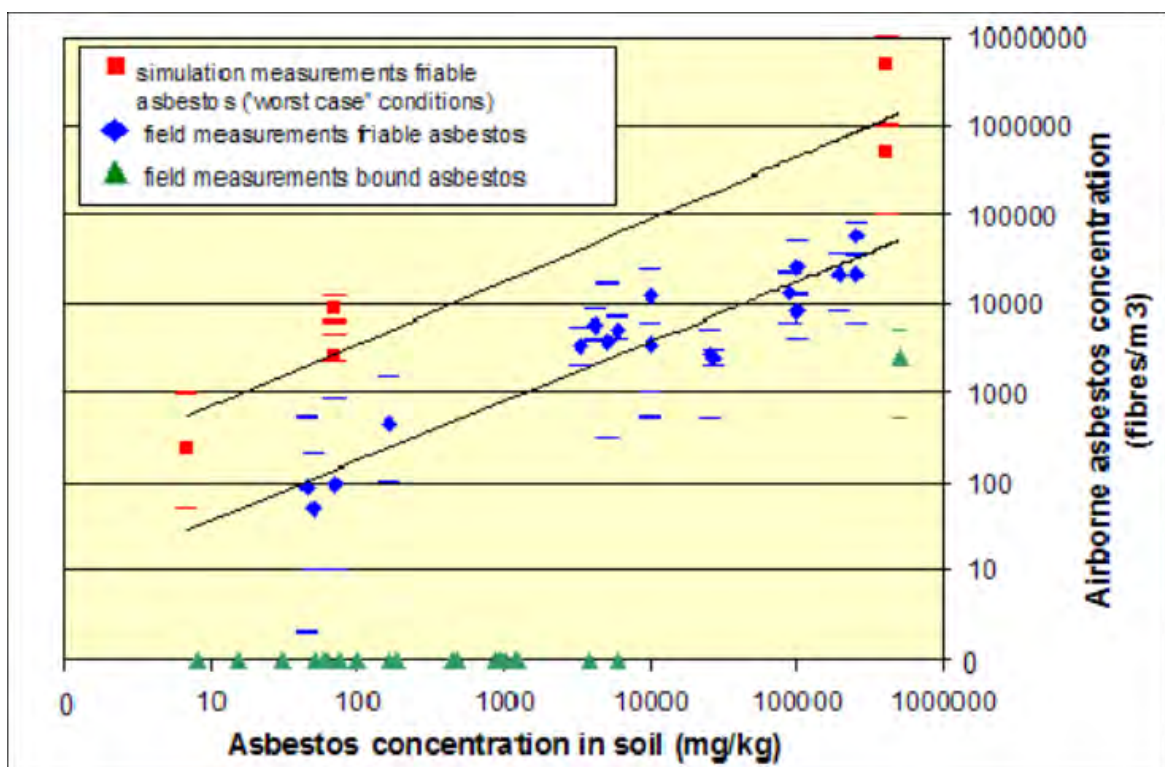


Diagram 6.2: Results showing the relationship developed between soil and air concentrations of asbestos

Preferred Method

The Swartjes and Tromp (2008) method has been adopted to estimate potential airborne asbestos concentrations as caused by fibres in soils. This method is considered appropriately conservative for adoption on the site on the basis of:

- The asbestos fibre generation measurements in the field based data set have been collected during daily practice activities where soils are being actively agitated. Examples of the sort of agitation works being undertaken on the soils includes driving on contaminated roads and digging, dumping and sifting of humid soil. These activities will typically not be undertaken within the Beach, or will be highly localised and of short duration when undertaken. This causes the estimated levels of asbestos over the chronic timescale of the majority of exposure assessed to be highly conservative;
- Soil moisture content is reported to control asbestos emissions as discussed further in **Section 6.5.3**. The Dutch soils on which the Swartjes and Tromp (2008) emissions data are based are reported to have a typical soil moisture content of 10% (MHSP&E 2000). Noting that the site is a beach area, and is subject to regular inundation and further drainage outflows, this is a conservative characterisation of the actual levels of soil moisture that will be present, and ensures that underestimates of asbestos fibre release will not occur. This confirms that Dutch data is appropriate to characterise the potential future behaviour of soils on the site. A basis to estimate reduced asbestos emissions with increasing soil moisture, as would be relevant to the context of the Beach being assessed here, is also provided (discussed further in **Section 6.5.4**);
- It is assumed with application of the method that exposures occur in direct proximity of the asbestos fibres. However, Swartjes and Trompe (2008) reports substantial reductions in airborne levels of asbestos fibres at small distances from the source of the fibres. These have not been considered in the assessment; and
- For the purposes of the modelling, it has been assumed that all asbestos fibres are present in near surface soils and are available to be released into the atmosphere. This is again highly conservative as it assumes that asbestos fibres are relocated to the upper surface layer of soils only and no vegetation is present in landscaped areas adjoining the Beach, or otherwise present over the remainder of the site.

6.5.3 Locations of Asbestos Exposure

It has been assumed that recreational users, landscapers / gardeners and sub-surface excavation / intrusive workers will be exposed to asbestos fibres in soils consistent with the predicted airborne concentration above the asbestos fibres. There is also a potential that asbestos fibres may blow into nearby residential dwellings (in closest proximity to the west).

Langley & Sobardo (1996) 'Exposure factors in risk assessment' in Langley, Markey & Hill (eds) The health risk assessment and management of contaminated sites: proceedings of the Third National Workshop on the Health Risk Assessment and Management of Contaminated Sites, Contaminated Sites Monograph Series No. 3, South Australia Health Commission reports that 'inspirable particulates inside a house will be 75% of the level of inspirable particulates outdoors'. On this basis, it has been assumed that the 0.75 of the maximum concentration of asbestos fibres will occur within the residential buildings in proximity of the site.

It is further noted that the nearest residence is located at least 50 m from the boundary of the Beach. Reduction in airborne concentrations of asbestos fibres would occur over this distance by dispersion of any asbestos emissions from the Beach. Reductions in concentrations as caused by these dispersion processes have not been considered in the risk assessment, causing estimated airborne concentrations at adjoining residents to be conservative.

6.5.4 Reduced Asbestos Exposure during Rain Days

Review of meteorological data for the Sydney region indicates that the area is subject to rainfall approximately 96 days per year as discussed in **Section 1.10**. Significant asbestos fibre emissions are not anticipated to occur during periods of rainfall. Consistent with the guidance provided in Swartjes and Trompe (2008) and shown on **Diagram 6.3**, emissions of asbestos fibres substantially reduce with increased levels of soil moisture. This is particularly the case for sandy soils, as are observed on the site.

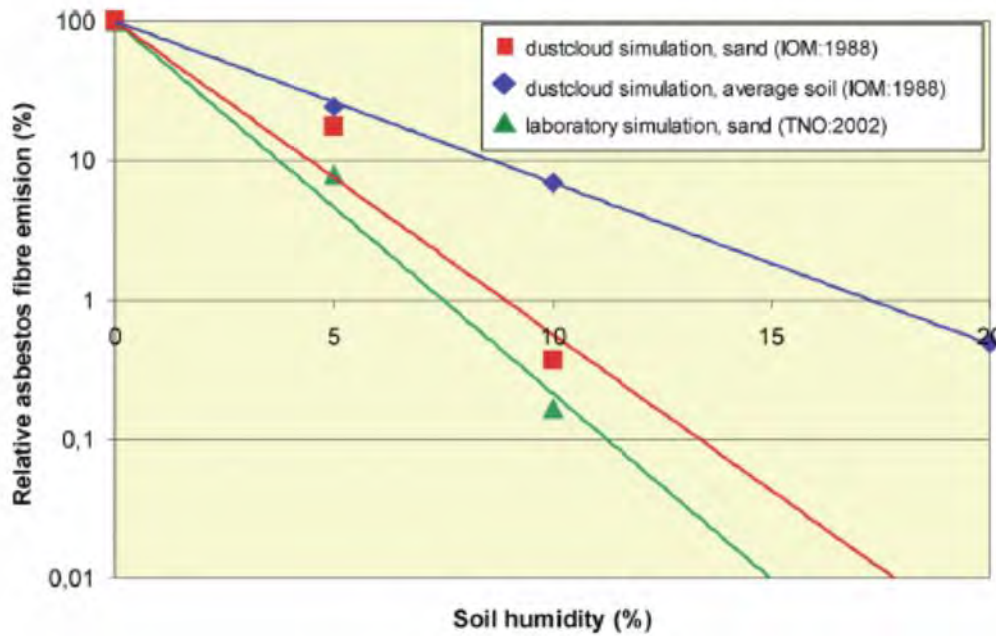


Diagram 6.3: Comparison of Soil Moisture and Relative Level of Asbestos Fibres Released

On this basis, it has been assumed that no significant emissions of asbestos fibres will occur on rainy days. The potential assessment of long term exposures have been reduced by a factor consistent with (365-96)/365 days.

No correction has been made for the increased soil moisture, anticipated to be significantly greater than 10%, that would be present within beach sands. The higher moisture content of soils on the Beach would mitigate the potential release of asbestos fibres.

6.5.5 Reduced Asbestos Exposure based on Wind Direction

For human exposure to occur to asbestos emissions, the receptor is required to be downwind of the source of the asbestos fibres. However, for the risk calculations undertaken here, it has been assumed that the on-site receptors are constantly downwind of the source of asbestos fibres.

For the residential receptors in proximity, an adjustment factor of two has been adopted to occur for periods when the residential dwelling is cross-wind or otherwise upwind of the Beach.

6.5.6 Potential Increased Exposure of Excavation Workers and Gardeners

It is noted that some of the factors as summarised in **Section 6.5.2** to support the use of the Swartjes and Trompe (2008) relationship as conservative for the risk assessment may not apply to short duration excavation worker exposures and works where significant soil agitation may occur (i.e. raking of beach sands to remove wastes, excavations near stormwater pipes etc). On this basis, an additional order of magnitude safety factor has been adopted with these receptors, including potential intrusive / excavation workers and site maintenance staff / gardeners / landscapers in estimating potential levels of asbestos fibres.

6.5.7 Asbestos Release from Bonded Asbestos

All detected asbestos on the site occurs in a bonded matrix. As can be observed from the green data points on **Diagram 6.2**, asbestos emissions do not occur from bonded matrices. For asbestos emissions to occur from bonded asbestos, the bonded matrix is required to break down to release the asbestos fibres into the soils.

A minimum thickness of fibre cement sheet fragment of 4 mm has been observed on the site by the interpretation of the assessments completed. A fibre cement sheet weathering rate of 0.024 mm/year has been reported in *Asbestos fibre release by corroded and weather asbestos-cement products*, 1989, Spurney K R in IARC Science Publication. On the basis of 30, 35 and 70 year duration exposures in proximity of the site, this would indicate that between 18, 21 and 42% of asbestos fibres caused to be released and occur as asbestos fines over the extent of the exposure periods. This would preclude a substantial portion of the asbestos detected from being considered to potentially be present as fibres, and requiring to be excluded from the risk assessment calculations. Asbestos weathering rates would be further reduced in practice by the asbestos as measured in Trinitas (2021) and adopted in the risk assessment calculations occurring at sub-surface depths and being protected from surface weathering processes.

These factors have been adopted as specific to the exposure duration of the receptor being assessed. In adopting these factors, it has been assume that the extent of the weathering process to cause the release of the fibres occurs instantaneously at the commencement of the exposure period, and is present at the same level throughout the exposure period. This is highly conservative noting that the fibres would be gradually released over the exposure period as consistent with the weathering rate.

6.5.8 Summary of Exposure Concentrations

On the basis of the preceding sections, the potential exposure adjusted asbestos fibre concentration as estimated from the level of asbestos fibres in soils, is summarised for each of the site receptors in **Table 6.7**. This has been undertaken by the adopted concentrations of asbestos in soils / sands.

Table 6.7: Summary of Exposure Concentrations for Airborne Asbestos Fibres for Each Receptor Type Based on Asbestos Fines

Factor	Recreational User	Landscaper / Gardener / Beach Maintenance	Sub-Surface Excavation Worker	Adjoining Resident
Free Asbestos in Soils, mg/kg / % w/w	177 / 0.0177	177 / 0.0177	1036 / 0.1036	177 / 0.0177
Estimated Airborne Concentration (Swartjes and Tromp), f/m ³	300	300	1000	300
Rain day adjustment	0.74	0.74	1	0.74
Excavation works adjustment	1	10	10	1
Outdoor-Indoor Air adjustment	1	1	1	0.75
Wind direction adjustment	1	1	1	0.5
ACM weathering factor	0.42	0.18	0.18	0.21
RAGS F Exposure Adjustment	0.0833	0.0204	0.00196	0.417
Exposure Concentration (f/ml)	7.8*10 ⁻⁶	8.2*10 ⁻⁶	3.5*10 ⁻⁶	7.3*10 ⁻⁶

95% UCL_{avg} levels of asbestos have been used for all receptors apart from the assessment of the sub-surface excavation worker. A maximum concentration of impact has been used to characterise exposures of the sub-surface excavation worker noting the potential that these works may be localised to a small area of the Beach / adjoining embankment.

It is noted that an additional order of magnitude conservative factor was provided for potential excavation worker, beach maintenance worker and landscaper / gardener exposures only, which is a substantial adjustment to the exposure level of these populations. Consistent with the discussion in **Section 6.5.2**, the data used to premise the estimate of the release of asbestos fibres from the site

soils has been based on data collected from active excavation / earthworks / remediation sites. These activities are not consistent with normal site activities as associated with the anticipated chronic duration exposures for normal site users (i.e. passive beach use under high moisture content conditions). However these activities may be consistent with a significant duration of intrusive / maintenance worker exposures and/or increased rates of soil agitation by beach maintenance, and the additional factor of ten has been adopted here to ensure a conservative approach to exposure characterisation.

7. Criteria for Assessment of Risk

7.1 Risk Measurement

For carcinogens, risks are estimated as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the potential carcinogen. The slope factor (SF) converts estimated daily intakes averaged over a lifetime of exposure directly to incremental risk of an individual of developing cancer. Because relatively low intakes (compared to those experienced by test animals) occur with exposures on most contaminated sites it can generally be assumed that the dose response relationship is linear in the low-dose portion of the multistage model dose-response curve. Under this assumption the slope factor is constant and risk is directly related to intake. Thus the following linear based carcinogenic risk equation is used:

$$\text{Risk} = \text{CDI} * \text{SF}$$

where: Risk – unitless probability of an individual developing cancer;

CDI – chronic daily intake averaged over 70 years (mg/kg-day); and

SF – slope factor expressed in (mg/kg-day)⁻¹.

The slope factor is often an upper 95% percentile confidence limit of the probability of response based on experimental animal data used in the multistage model. Consequently, the carcinogenic risk estimate will often be an upper bound estimate (US EPA, 1989a).

For the case of estimating risk from asbestos exposure the following linear based carcinogenic risk equation is used:

$$\text{Risk} = \text{C}_{\text{adj}} * \text{Unit Risk}$$

where: Risk – unitless probability of an individual developing cancer;

C_{adj} – adjusted asbestos fibre air concentration (f/ml); and

Unit Risk – equal to 0.2 (f/ml)⁻¹ for asbestos fibres based on WHO increased incidence of mesothelioma and/or lung cancer.

7.2 Adopted Risk Criteria

Acceptable risk guidelines are available from a range of national and international environmental agencies. These include:

- US EPA (1991) states that “Where the cumulative site risk to an individual based on a reasonable maximum exposure for both current and future land use is less than 10⁻⁴, action is generally not warranted unless there are adverse environmental impacts”. Where the level of risk exceeds 10⁻⁴ it is recommended that remediation goals are developed based on a 10⁻⁶ cancer risk;
- WHO (2004b) ‘Guidelines for Drinking Water Quality’ are based on a risk of 1 in 100,000 (1 x 10⁻⁵); and
- NHMRC/ARMCANZ (2011) ‘Australian Drinking Water Guidelines’ nominate a negligible level of risk of 1 in 1,000,000 (1 x 10⁻⁶).

Risk based criteria have been derived by the risk assessment. Guidance for the Australia approach to the derivation of risk based criteria for the assessment of contaminated sites can be observed in NEPC (2013). To this extent, the worked examples provided to NEPC (2013) for the derivation of risk based criteria adopt a target risk of 1*10⁻⁵. The derivation of risk based criteria for benzene in CRC CARE (2011), as adopted in NEPC (2013), has adopted a target risk of 1*10⁻⁵. The guidelines for human health risk assessment as provided to NEPC (2013) further instructs that when using non-

threshold TRV as dose-response criteria, the recommended acceptable incremental lifetime risk of developing cancer arising from exposure to single or multiple carcinogens is 1 in 100,000 (10^{-5}).

For the purposes of this risk assessment an acceptable level of risk is defined as risk less than 1×10^{-5} incremental lifetime risk of cancer.

8. Assessment of Risk

Estimates of carcinogenic risk have been prepared for each of the nominated receptors on the basis of the exposure concentrations as summarised in **Table 6.7** and the unit risk adopted for asbestos inhalation. The estimates of carcinogenic risk for each of the receptors assessed are summarised within **Table 8.1** following.

Table 8.1: Estimate of Carcinogenic Risk for Each Receptor

Receptor	Cancer Risk Estimate
Recreational User	1.6×10^{-6}
Landscaper / Gardener / Beach Maintenance Worker	1.6×10^{-6}
Sub-Surface Maintenance Worker	7.1×10^{-7}
Adjoining Resident	1.5×10^{-6}

Each of the estimated levels of risk are well below the adopted acceptable level of risk for the site.

It is further noted that there is a likelihood that a resident located in the Little Bay residential area, including the residence in closest proximity to the Beach, may further use the Beach for recreational purposes. As per this scenario, the incremental risk estimated for 'adjoining resident' and 'recreational user' scenarios should be added. The sum of these risk estimates is 3.0×10^{-6} which is still well below the adopted risk criterion.

On this basis, subject to future works to cause the remediation / management of gross levels of buried asbestos at the south-eastern portion of the southern beach area, it is considered that the levels of asbestos as present on the Beach will not pose an unacceptable health risk to ongoing / potential future users of the site and/or potentially sensitive populations in proximity of the site.

9. Sensitivity Analysis

An assessment has been required to be undertaken of the sensitivity of the risk assessment outcomes. Risk assessment calculations can be observed to have been based on:

- Levels of COPCs (free asbestos fibres / asbestos fines and bonded asbestos) as estimated by soil sampling programs completed on the site;
- Toxicological parameters used to characterise COPCs;
- Anticipated and assessed current and future land-uses;
- Exposure parameters used to characterise future population behaviours on the site;
- Physical parameters used to characterise site areas and buildings where exposures may occur; and
- Equations and related relationships used to estimate levels of COPCs from reported levels in soils and groundwater to points of exposure.

Each of these are discussed as follows.

9.1 Sampling Programs

The risk assessment has been based on asbestos levels as measured in sub-surface soils and reported in Trinitas (2021). This is caused to be a highly conservative approach as the asbestos levels adopted as levels of asbestos present at soils at depth and not necessarily present at the site surface to release asbestos fibres. The sampling locations are further noted to have likely been biased to locations where the occurrence of asbestos is more likely, or were otherwise extended to depth where asbestos was observed to occur.

The data has been statistically analysed to determine a 95% UCL_{avg} level of asbestos. All exposure scenarios, apart from the sub-surface maintenance worker, have been based on the 95% UCL_{avg} concentration. This is a significantly more conservative approach than the adoption of an average concentration that could of otherwise been undertaken. The conservatism can be demonstrated by the comparison of the 95% UCL_{avg} level of asbestos of 176 mg/kg (0.0176% w/w) as present in soils at depth on the Beach, to the level of asbestos otherwise conservatively estimated to be present across the beach surface of 24 mg/kg (0.0024% w/w).

Further, the assessment of a sub-surface excavation / maintenance worker has been based on a maximum concentration, which has been estimated at an even higher level than the conservative estimate of the 95% UCL_{avg} level of asbestos as adopted for the other receptors.

It is considered that the use and selection of environmental data has caused risk assessment to derive overly conservative estimates of risk.

9.2 Toxicological Parameters

Toxicological data are generally derived by the conversion of dose factors as developed based on animal studies to appropriate levels for human exposure. The conservatism of these values is achieved through the use of uncertainty factors. An uncertainty factor of 100 is commonly applied in converting measured animal toxicity data for use for humans, comprising:

- A factor of 10 to allow for differences that affect the way a chemical behaves in humans rather than the animal species tested; and
- Another factor of 10 adequate to allow for differences in the way the chemical might affect different people, to allow for the most sensitive individuals.

Though the two processes most likely act in two separate ways, indicating a summed factor of 20 should be used, the factors are multiplied to generate an uncertainty factor of 100. It is also noted that most agencies will incorporate an additional factor of 10 where long term toxicity data are not available for a particular constituent, resulting in a total factor of 1 000.

Actual conversion factors used in the derivation of toxicological values has been extensively detailed in **Section 5**. Toxicological data used in the risk assessment has incorporated these uncertainty factors. This is considered an appropriately conservative process for the site.

9.3 Land-Use

The risk assessment outcomes are only valid for the assumed future land-use of the site. The risk assessment would need to be revised where the site was used for a future use other than what has been considered in this assessment.

It is noted that it has been assumed in the fate and transport assessment that the whole of the site is unpaved and clear of vegetation, and all asbestos within Beach sands is potentially accessible to surface wind processes and in a general dried condition. With particular respect to the moisture content, this is a highly conservative assumption. Sand moisture contents will be substantially higher than the level of 10% that asbestos emission rates have been based on.

A consideration has been undertaken of the potential for extreme weather events to occur in the future (i.e. East Coast lows, king tides etc). The potential consequent of these weather events may be that the soils on the Beach are displaced and the additional ACM is caused to be present at the site surface. This is considered to have been addressed in the use of the data in the risk assessment. The Trinitas sampling targeted sub-surface occurrences of asbestos and presented the highest levels present in the near-surface depth profile. These are the same highest levels that could be present for a short period following the weather event. The levels at the surface could not exceed these levels. On this basis, the risk assessment methodology and use of data is considered sufficiently robust to characterise an altered beach condition as may occur following a significant weather event.

9.4 Exposure Parameters

Exposure parameters have been derived for the range of receptors as based on published guidance provided in Australian guidelines. Exposure parameters are based on reasonably maximum exposed persons and are considered to be conservative.

Risk results are generally found to adjust linearly with adjustments in exposure parameters.

9.5 Air Monitoring Data

It is noted that several air monitoring events for airborne asbestos fibres have been completed on the site as reported across Trinitas (2020 and 2021 various). Levels of potential respirable fibres have been reported below 0.01 fibres/ml. Though these results are encouraging, the detection limit of 0.01 fibres / ml (1000 fibres/m³) is substantially above the level of airborne asbestos fibres as predicted by the risk assessment.

9.6 Assessment of Sensitivity of Risk Estimates

A quantified assessment has been further completed of the sensitivity of the risk estimates to the range of parameters as adopted to characterise the source, fate, transport and exposure to asbestos fibres. This has considered the recreational receptor on the Beach scenario. This is summarised following:

- Where the level of asbestos in site soils was characterised at the maximum surface concentration of 24 mg/kg (0.0024% w/w), the estimated risk for a recreational receptor would have been 4.1×10^{-7} ;
- Where all asbestos was assumed to be present as free asbestos fibres (i.e. instantaneous degradation of bonded asbestos and availability at the site surface), the estimated risk for a recreational receptor would have been 3.7×10^{-6} ;
- Where it was assumed that a recreational receptor was present at the Beach on weekends only (2 days/week), though present for 8 hours a day, the estimated risk would be revised to 2.4×10^{-7} ;
- Where the lab based data presented in **Diagram 6.2** was used to estimate airborne asbestos levels instead of the field based data, a risk estimate of 5.2×10^{-5} would have been estimated, exceeding the acceptable level of risk;
- Where the data for airborne emissions from bonded asbestos was considered in the assessment, then no estimate of risk would have been generated, as no airborne emissions are predicted from levels of bonded asbestos below 50% concentration of ACM in soils; and
- Where the statistical analysis was restricted only the sample locations with detections of asbestos (i.e. the non detect locations were excluded from the dataset), an alternate 95% UCL_{avg} of asbestos occurrence of 526 mg/kg (0.0526% w/w) would have been estimated, leading to a risk estimate of 3.6×10^{-6} .

The risk estimate can be observed to be sufficiently robust, particularly where the conservatism of the approach adopted is considered.

9.7 Conclusion

There are several factors which may have caused the risk and hazard estimates provided in this risk assessment to be underestimated. However, it is more than likely that any underestimation caused by the risk assessment process and limitations of available data and modelling techniques has been overcome by the use of conservative assumptions throughout the assessment. Examples of conservative assumptions provided in this assessment include:

- Adoption of a conservatively characterised dataset to estimate levels of free asbestos fibres as present in beach sands as based on asbestos levels measured at sands in depth which were found to be significantly higher than estimated surface levels of asbestos as available to cause release of fibres;
- Assumption of the occurrence of free asbestos fibres / asbestos fines as being present in surface soils on the Beach in absence of any measurement of the same;
- Consideration of estimated maximum values for asbestos contaminant concentrations across the whole of the Beach in the characterisation of potential exposure levels of occupationally engaged receptors;
- Used of a conservative modelling approach and associated physical parameters to characterise fate and transport of asbestos; and
- Use of RME (reasonable maximum exposed) based exposure parameters for receptors where locally available data is not present.

It is concluded that the risk estimates provided are overestimates of actual risk levels and can be used for future decision making for the site.

10. Conclusions and Recommendations

A human health risk assessment has been undertaken to determine whether the levels of asbestos as estimated on Little Bay Beach are potentially present at a level that poses an unacceptable health risk to an ongoing recreational use of the site / sites in proximity and/or residents in proximity of the site. A sensitivity analysis undertaken of the risk assessment process has found that risk estimates are appropriately conservative and suitable for decision making as to the suitability of the site. The assessment has been based on estimates of surface levels of asbestos as present on the Beach, and further considered levels of asbestos measured in sub-surface soils / sands on the Beach.

In accordance with the limitations provided as **Section 11**, and subject to a remediation / management response to address high levels of sub-surface asbestos occurrence at the south-eastern portion of the southern beach area, levels of asbestos on the site have not been found to pose a potentially unacceptable health risk to current / future users of the site as consistent with a recreational land-use, recreational uses in proximity of the site, nor occupants of residential properties in proximity of the site.

The fate and transport assessment has estimated the potential worse case airborne concentration of asbestos fibres on the site. This has been found to be well below a level of 0.01 f/ml as identified in *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997*, 2015, NSW EPA as a potential trigger to warrant reporting under the *Contaminated Lands Management Act 1997*. Further recent respirable fibre monitoring undertaken by Trinitas during site assessment / remediation works has not identified airborne levels of fibres equal to or exceeding 0.01 f/ml. It is concluded on this basis that there is not a requirement to report asbestos impact to the NSW EPA.

10.1 Recommendations

Notwithstanding the conclusions in respect of the potential human health risk, soils on the site are impacted with asbestos. Requirements with respect to asbestos as informed to the *Work Health and Safety Regulation 2017* (WHS Reg) do not differentiate as to whether levels of asbestos are sufficient to pose a health risk. On this basis, and the form and levels of asbestos measured, the following recommendations are presented:

- An Asbestos Register and Asbestos Management Plan are required to be prepared for Little Bay Beach;
- The high levels of asbestos as measured at depth at the south-eastern portion of the southern beach do not pose a current health risk, as they are present in a bonded form and are buried at a sub-surface depth. However the occurrence of ACM at a frequency approaching 10% within a recreational area is not consistent with community expectations for the Beach, and poses a potential risk of being caused to be present at the surface of the Beach in the future. A remediation / management response is required for this localised area of impact; and
- The ongoing occurrence of ACM at the Beach surface is not consistent with the aesthetic requirements for a recreational area. Based on the consultant observations, small quantities of ACM are anticipated to continue to be present at the surface of the Beach. On the basis of the occurrence of asbestos as bonded forms only, and small quantities being present, it is considered most appropriate that the ongoing response to the asbestos impact be restricted to normal Council maintenance being requested to remove visible ACM at the same time that normal Beach maintenance activities are undertaken. Nominated Council staff should receive asbestos awareness training prior to commencing these works.

11. Limitations

This report has been prepared for use by the client who commissioned the works in accordance with the project brief only and has been based in part on information obtained from other parties. The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquires.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements and site history, not on sampling and analysis of all media at all locations for all potential contaminants.

Limited sampling and laboratory analyses were undertaken as part of the investigations, as described herein. Ground conditions between sampling locations may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the sites, which were not identified in the site history and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

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, JBS&G reserves the right to review the report in the context of the additional information.

Figures



Legend:
 Approximate Site Extent



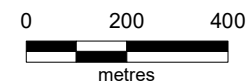
Job No: 59811

Client: Randwick City Council

Version: R01 Rev 0 Date 24/09/2021

Drawn By: RF Checked By: MS

Scale 1:15,000



Coord. Sys. GDA 1994 MGA Zone 56

**Little Bay Beach,
 2 Coast Hospital Road,
 Little Bay Road, NSW**

SITE LOCATIONS

FIGURE 1


Legend:

- Approximate Site Extent
- NSW Cadastre (DFS, 2021)



Job No: 59811

Client: Randwick City Council

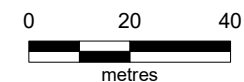
Version: R01 Rev 0

Date 24/09/2021

Drawn By: RF

Checked By: MS

Scale 1:1,500



Coord. Sys. GDA 1994 MGA Zone 56

**Little Bay Beach,
2 Coast Hospital Road,
Little Bay Road, NSW**

SITE EXTENT

FIGURE 2



Legend:

- Approximate Site Extent
- Beach Assessment Areas
- NSW Cadastre (DFS1, 2021)



Job No: 59811

Client: Randwick City Council

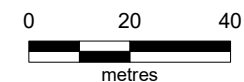
Version: R01 Rev 0

Date 24/09/2021

Drawn By: RF

Checked By: MS

Scale 1:1,500



Coord. Sys. GDA 1994 MGA Zone 56

**Little Bay Beach,
2 Coast Hospital Road,
Little Bay Road, NSW**

BEACH ASSESSMENT AREAS

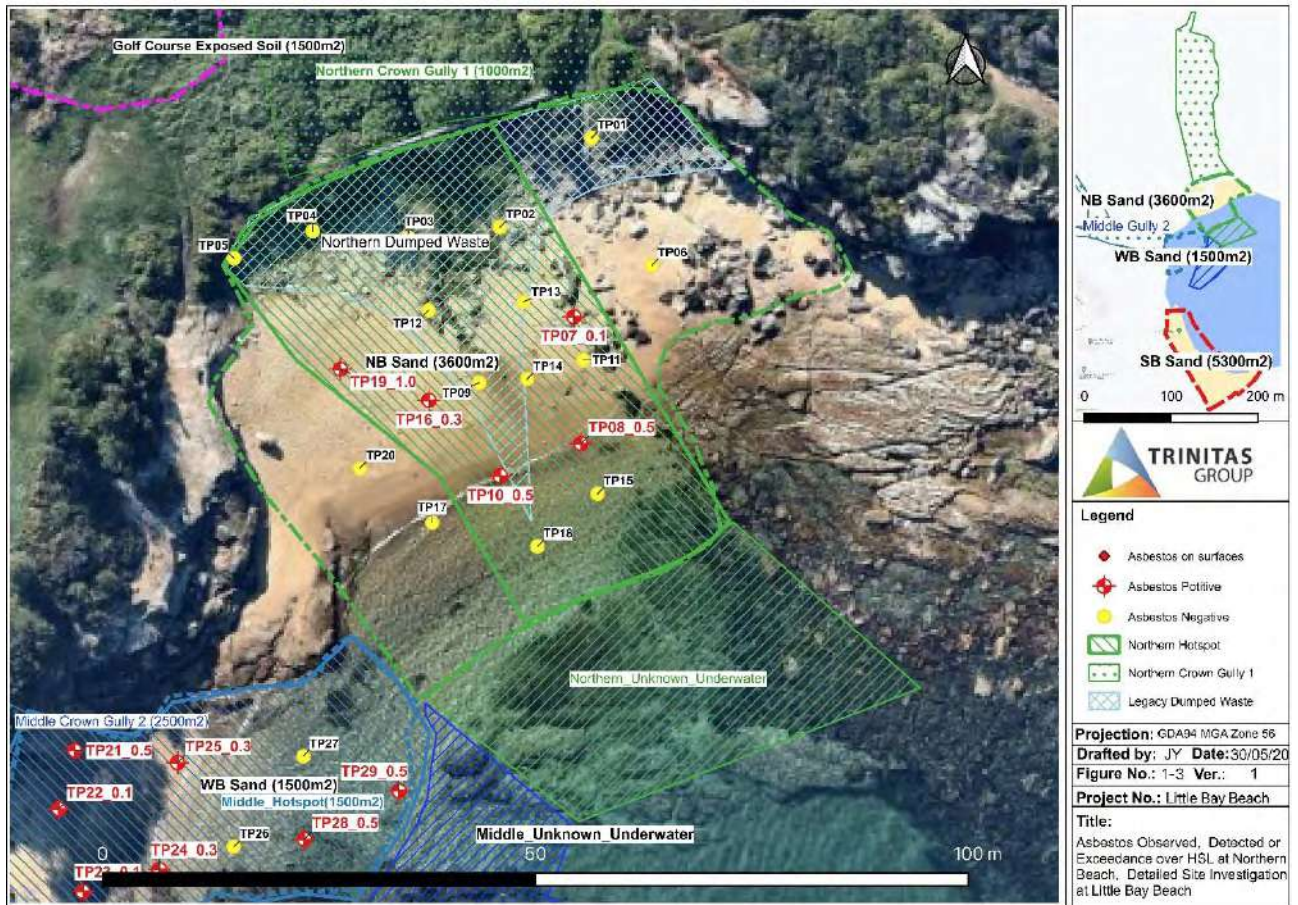
FIGURE 3

Appendix A – Trinitas (2021) Sample Locations

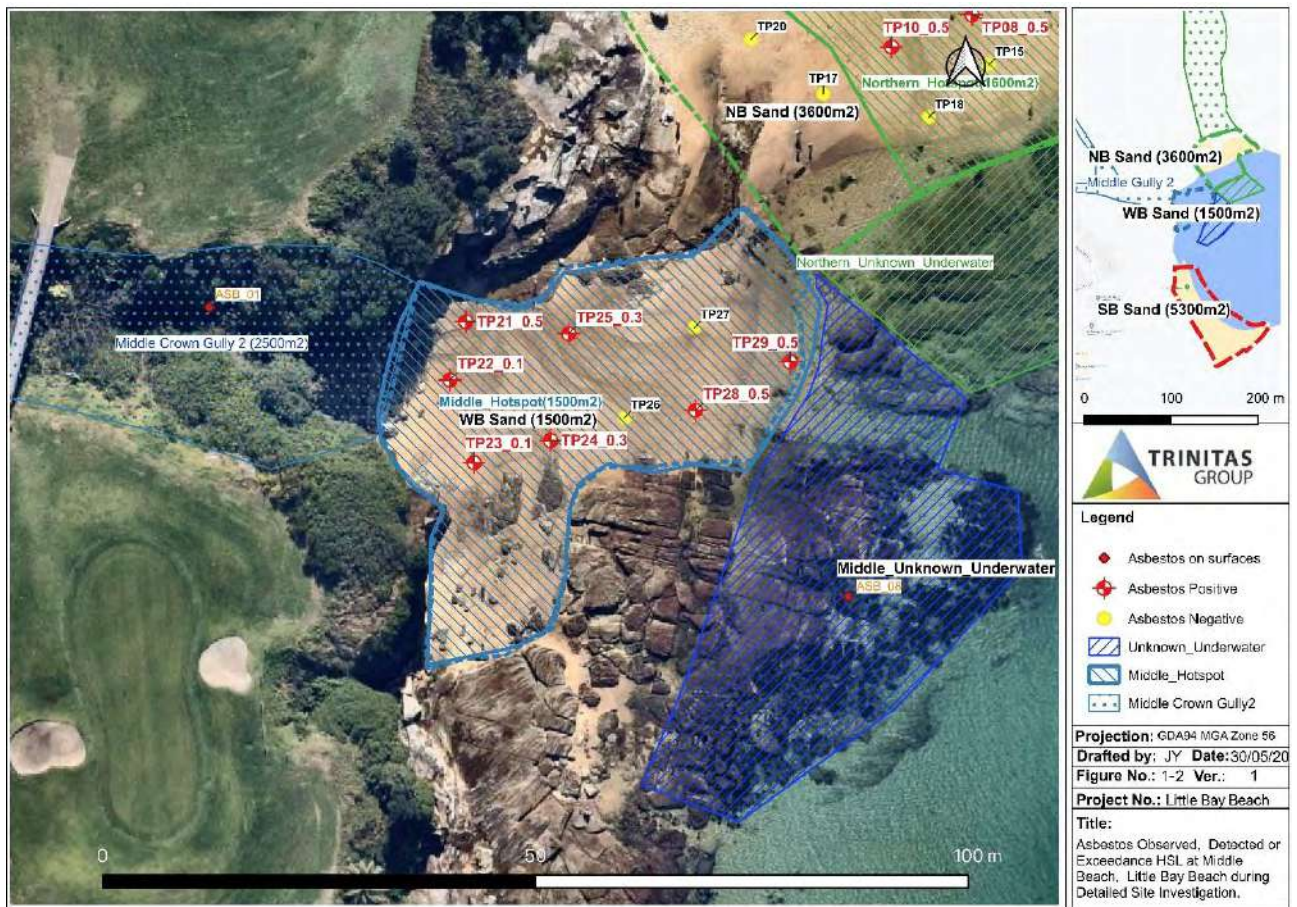
Surrounding Areas or Potential Contamination Sources



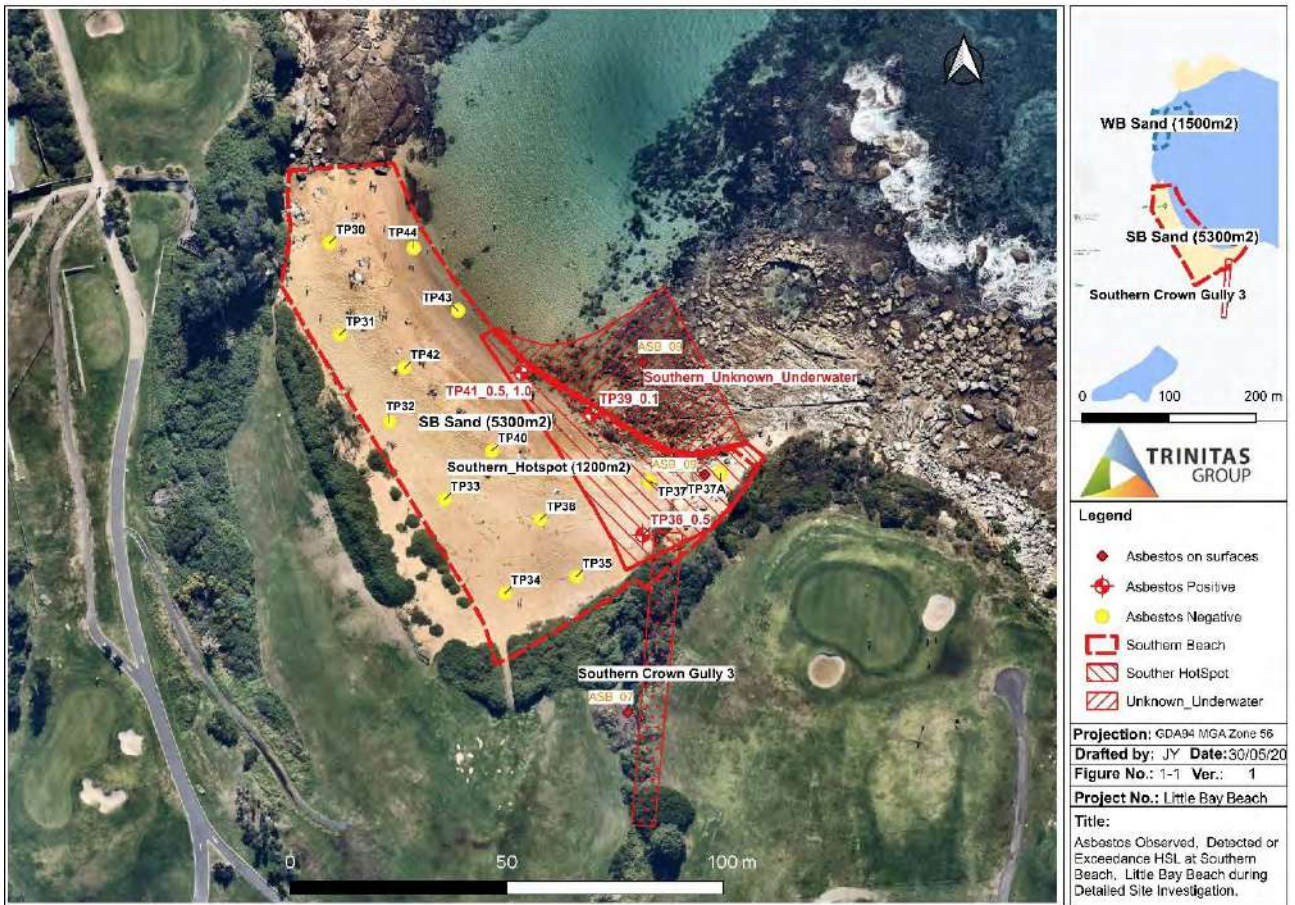
Sampling Locations and Positive Test Pits at Northern Beach



Sampling Locations and Positive Test Pits at Middle Beach



Sampling Locations and Positive Test Pits at Southern Beach



Appendix B – Statistical Analysis

	0	1	2	3
	Asb	d_Asb	Asb1	d_Asb1
1	9.090909091	1	090909091	1
2	9.090909091	1	090909091	1
3	9.090909091	1	090909091	1
4	9.090909091	1	090909091	1
5	381.8181818	1	31.8181818	1
6	27.27272727	1	7.27272727	1
7	236.3636364	1	36.3636364	1
8	18.18181818	1	3.18181818	1
9	1036.363636	1	136.363636	1
10	9.090909091	1	090909091	1
11	391.3043478	1	31.3043478	1
12	9.090909091	1	090909091	1
13	2.727272727	1	727272727	1
14	1463.636364	1	090909091	0
15	9.090909091	0	090909091	0
16	9.090909091	0	090909091	0
17	9.090909091	0	090909091	0
18	9.090909091	0	090909091	0
19	9.090909091	0	090909091	0
20	9.090909091	0	090909091	0
21	9.090909091	0	090909091	0
22	9.090909091	0	090909091	0
23	9.090909091	0	090909091	0
24	9.090909091	0	090909091	0
25	9.090909091	0	090909091	0
26	9.090909091	0	090909091	0
27	9.090909091	0	090909091	0
28	9.090909091	0	090909091	0
29	9.090909091	0	090909091	0
30	9.090909091	0	090909091	0
31	9.090909091	0	090909091	0
32	9.090909091	0	090909091	0
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39	9.090909091	0	090909091	0
40	9.090909091	0	090909091	0
41	9.090909091	0	090909091	0
42	9.090909091	0	090909091	0
43	9.090909091	0		

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Data Sets with Non-Detects											
2												
3	User Selected Options											
4	Date/Time of Computation			ProUCL 5.129/06/2021 9:01:29 AM								
5	From File			WorkSheet.xls								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	Number of Bootstrap Operations			2000								
9												
10	Asb1											
11												
12	General Statistics											
13	Total Number of Observations				42		Number of Distinct Observations				8	
14	Number of Detects				13		Number of Non-Detects				29	
15	Number of Distinct Detects				8		Number of Distinct Non-Detects				1	
16	Minimum Detect				2.727		Minimum Non-Detect				9.091	
17	Maximum Detect				1036		Maximum Non-Detect				9.091	
18	Variance Detects				89608		Percent Non-Detects				69.05%	
19	Mean Detects				165.3		SD Detects				299.3	
20	Median Detects				9.091		CV Detects				1.811	
21	Skewness Detects				2.387		Kurtosis Detects				6.13	
22	Mean of Logged Detects				3.444		SD of Logged Detects				1.924	
23												
24	Normal GOF Test on Detects Only											
25	Shapiro Wilk Test Statistic				0.613		Shapiro Wilk GOF Test					
26	5% Shapiro Wilk Critical Value				0.866		Detected Data Not Normal at 5% Significance Level					
27	Lilliefors Test Statistic				0.37		Lilliefors GOF Test					
28	5% Lilliefors Critical Value				0.234		Detected Data Not Normal at 5% Significance Level					
29	Detected Data Not Normal at 5% Significance Level											
30												
31	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
32	KM Mean				53.04		KM Standard Error of Mean				28.39	
33	KM SD				176.8		95% KM (BCA) UCL				109.8	
34	95% KM (t) UCL				100.8		95% KM (Percentile Bootstrap) UCL				103.6	
35	95% KM (z) UCL				99.74		95% KM Bootstrap t UCL				170.5	
36	90% KM Chebyshev UCL				138.2		95% KM Chebyshev UCL				176.8	
37	97.5% KM Chebyshev UCL				230.3		99% KM Chebyshev UCL				335.5	
38												
39	Gamma GOF Tests on Detected Observations Only											
40	A-D Test Statistic				1.476		Anderson-Darling GOF Test					
41	5% A-D Critical Value				0.811		Detected Data Not Gamma Distributed at 5% Significance Level					
42	K-S Test Statistic				0.317		Kolmogorov-Smirnov GOF					
43	5% K-S Critical Value				0.253		Detected Data Not Gamma Distributed at 5% Significance Level					
44	Detected Data Not Gamma Distributed at 5% Significance Level											
45												
46	Gamma Statistics on Detected Data Only											
47	k hat (MLE)				0.396		k star (bias corrected MLE)				0.356	
48	Theta hat (MLE)				417.1		Theta star (bias corrected MLE)				464.2	
49	nu hat (MLE)				10.3		nu star (bias corrected)				9.258	
50	Mean (detects)				165.3							
51												
52	Gamma ROS Statistics using Imputed Non-Detects											
53	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											

	A	B	C	D	E	F	G	H	I	J	K	L
54	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
55	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
56	This is especially true when the sample size is small.											
57	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
58	Minimum				0.01		Mean				51.16	
59	Maximum				1036		Median				0.01	
60	SD				179.5		CV				3.508	
61	k hat (MLE)				0.13		k star (bias corrected MLE)				0.136	
62	Theta hat (MLE)				394.4		Theta star (bias corrected MLE)				375.3	
63	nu hat (MLE)				10.9		nu star (bias corrected)				11.45	
64	Adjusted Level of Significance (β)				0.0443							
65	Approximate Chi Square Value (11.45, α)				4.868		Adjusted Chi Square Value (11.45, β)				4.715	
66	95% Gamma Approximate UCL (use when n>=50)				120.4		95% Gamma Adjusted UCL (use when n<50)				124.3	
67												
68	Estimates of Gamma Parameters using KM Estimates											
69	Mean (KM)				53.04		SD (KM)				176.8	
70	Variance (KM)				31249		SE of Mean (KM)				28.39	
71	k hat (KM)				0.09		k star (KM)				0.0995	
72	nu hat (KM)				7.562		nu star (KM)				8.355	
73	theta hat (KM)				589.2		theta star (KM)				533.2	
74	80% gamma percentile (KM)				36.52		90% gamma percentile (KM)				140.9	
75	95% gamma percentile (KM)				308		99% gamma percentile (KM)				844.8	
76												
77	Gamma Kaplan-Meier (KM) Statistics											
78	Approximate Chi Square Value (8.36, α)				2.942		Adjusted Chi Square Value (8.36, β)				2.829	
79	95% Gamma Approximate KM-UCL (use when n>=50)				150.6		95% Gamma Adjusted KM-UCL (use when n<50)				156.7	
80	95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)											
81												
82	Lognormal GOF Test on Detected Observations Only											
83	Shapiro Wilk Test Statistic				0.824		Shapiro Wilk GOF Test					
84	5% Shapiro Wilk Critical Value				0.866		Detected Data Not Lognormal at 5% Significance Level					
85	Lilliefors Test Statistic				0.278		Lilliefors GOF Test					
86	5% Lilliefors Critical Value				0.234		Detected Data Not Lognormal at 5% Significance Level					
87	Detected Data Not Lognormal at 5% Significance Level											
88												
89	Lognormal ROS Statistics Using Imputed Non-Detects											
90	Mean in Original Scale				52.1		Mean in Log Scale				0.474	
91	SD in Original Scale				179.2		SD in Log Scale				2.757	
92	95% t UCL (assumes normality of ROS data)				98.63		95% Percentile Bootstrap UCL				99.67	
93	95% BCA Bootstrap UCL				126.2		95% Bootstrap t UCL				171.9	
94	95% H-UCL (Log ROS)				560.2							
95												
96	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
97	KM Mean (logged)				1.759		KM Geo Mean				5.806	
98	KM SD (logged)				1.527		95% Critical H Value (KM-Log)				2.999	
99	KM Standard Error of Mean (logged)				0.245		95% H-UCL (KM -Log)				38.07	
100	KM SD (logged)				1.527		95% Critical H Value (KM-Log)				2.999	
101	KM Standard Error of Mean (logged)				0.245							
102												
103	DL/2 Statistics											
104	DL/2 Normal					DL/2 Log-Transformed						
105	Mean in Original Scale				54.3		Mean in Log Scale				2.112	
106	SD in Original Scale				178.6		SD in Log Scale				1.378	

	A	B	C	D	E	F	G	H	I	J	K	L	
107	95% t UCL (Assumes normality)					100.7	95% H-Stat UCL						39.06
108	DL/2 is not a recommended method, provided for comparisons and historical reasons												
109													
110	Nonparametric Distribution Free UCL Statistics												
111	Data do not follow a Discernible Distribution at 5% Significance Level												
112													
113	Suggested UCL to Use												
114	95% KM (Chebyshev) UCL					176.8							
115													
116	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.												
117	Recommendations are based upon data size, data distribution, and skewness.												
118	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).												
119	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.												
120													

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0	Matt Parkinson CEnvP (SC)	Michael Samuel LAA	Michael Samuel		24/09/2021

Appendix C

Relevant Correspondence

Randwick City Council
30 Frances Street
Randwick NSW 2031

Project 205690.00
2 July 2021
IAA1-205690
JMN:jl

Attention: Stephen Leung

Email: stephen.leung@randwick.nsw.gov.au

Interim Advice Letter 1
Non-Statutory Site Audit DPNS/19
Lot 97 Little Bay Beach, Little Bay Lot 97 DP270427

1. Introduction

This letter provides Randwick City Council (RCC) and their Environmental Consultant - Trinitas Group (Trinitas) with interim advice (IAL) as part of Non-Statutory Site Audit DPNS/19 being undertaken by Mike Nash, an NSW EPA Site Auditor accredited under the Contaminated Land Management (CLM) Act. The advice concerns the assessment of contamination risks at the site located at Lot 97 Little Bay Beach, Little Bay Lot 97 DP270427 (Figure 1 – the site). The interim advice has been provided in accordance with a proposal issued by DP dated 8 June 2021 and a purchase order PIS20761 provided by RCC dated 18 June 2021, subject to DP terms and conditions.

The purpose of the non-statutory audit is to determine whether the following detailed site investigation (DSI) meets the requirements of, and is compliant with, the guidelines made and endorsed under the Contaminated Land Management Act, 1997:

- Trinitas Group (June 2021) *Detailed Site Investigation of Potential Asbestos Contamination at Little Bay Beach, Little Bay NSW* Randwick City Council, Little Bay Beach - 4R Coast Hospital Rd, Little Bay NSW, dated 29/06/2021 Revision 3 ('the DSI report').

Two reports were also provided to the auditor as part of the RFQ for this audit, including:

- Trinitas Group (August 2020) *Preliminary Technical Brief for Potential Asbestos Contamination*, dated 24 August 2020 (Trinitas 2020); and
- JBS&G (October 2020), *Interim Human Health Risk Assessment for Asbestos* (JBS, 2020).

These reports were also considered by the auditor as part of this IAL, but have been superseded by the DSI report.

This IAL does not pre-empt the conclusions which may be drawn at the end of the site audit process and does not represent a Site Audit Statement (SAS) or a site audit report (SAR). These documents are intended to be prepared following agreement that the DSI and subsequent HHRA have been completed satisfactorily and that the degree and extent of asbestos contamination in the defined site

has been properly characterised and the related risks identified. Copies of the SAS and SAR will then be provided to the NSW EPA and Council in accordance with the CLM Act.

In particular, the review was undertaken with reference to the *National Environment Protection (Assessment of Site Contamination) Amendment Measure* (NEPM 2013), *Schedule B2 – Guideline on Site Characterisation* (NEPM (2013) and *NSW EPA Consultants Reporting on Contaminated Land Contaminated Land Guidelines April 2020, Table 2.3 – Detailed Site Investigations*. Reference was also made to the *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated sites in Western Australia* (WA DOH, 2009).

2. The Site

The site is located at Little Bay Beach as shown in Figure 1 below (extracted from Trinitas 2021).



Figure 1 – Layout of the Site

The Six Maps imagery of the site described as Lot 97 DP270427 is shown on Figure 2, including the lot boundary. The land immediately adjacent to Lot 97 (the site) comprises Lot 98 DP270427.

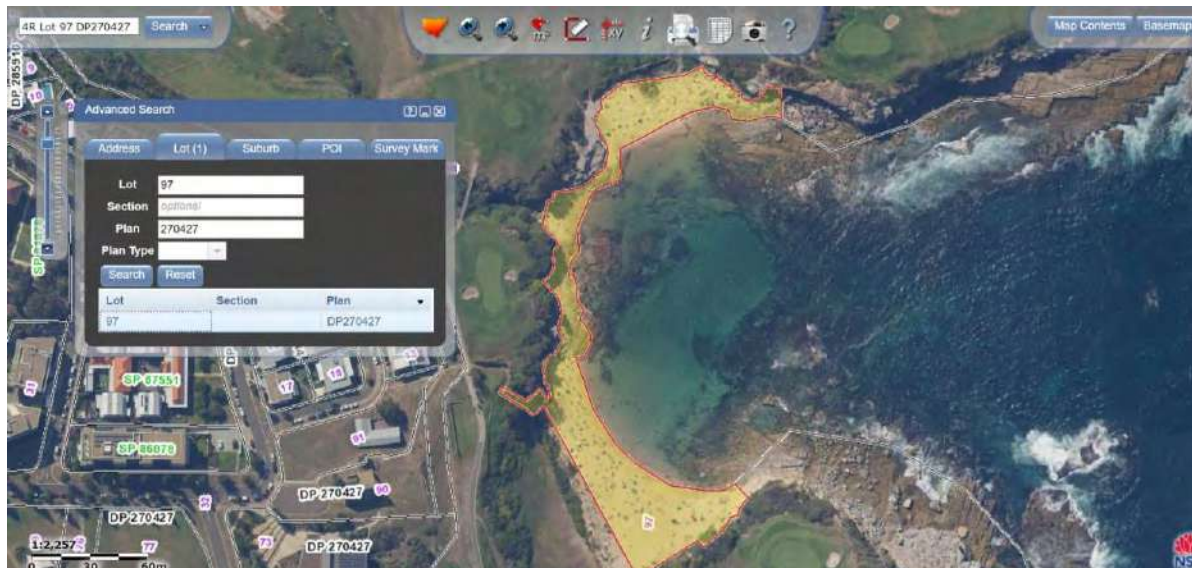


Figure 2 – Lot 97 DP270427 Boundary (red)

The auditor notes that the lot boundary of the defined site appears to differ from that shown on Figure 1. See later comments.

3. Auditor Comments

The auditor has conducted a review of the DSI and provides the following comments:

3.1 Overall Comments

- A1 The site is described by Trinitas in Table 1 of the DSI as comprising the Northern Beach (~3600 m²), Western Beach (1200 m²) and Southern Beach (5300 m²). The total site area is quoted as 11000 m² in Table 1, however the sum of the 3 areas is 10,100 m².

Trinitas describes in Section 5.1.22 that *'The temporal boundaries were determined on the basis of the timeline of one week for the current investigation. Especially, this report intentionally selected the lowest tide period of 0.3 m to cover all practical exposed soil/rock/sand areas as much as possible, as Dr Jeffrey Yu proposed that at 2 m highest tide, most of the investigation areas could be under water or impacted by tides, there would be very low possibility to delineate the contamination. Therefore, Trinitas propose that in the boundaries of this Study there could be some "grey areas": Land, water and soil are under the Council or the Crown or both of them, which are out of the scope of this DSI report...'*

A precise site boundary and area will need to be established for the purposes of the site audit, especially given the discrepancy between the cadastral boundary in Figure 2 and the boundary shown in Figure 1 above. If the site needs to be surveyed to achieve this then this should be undertaken. The site area and boundary should be checked and confirmed by Trintas.

- A2 The auditor considers the DSI should be streamlined to include only factual observations, data and related interpretation and opinion. The descriptions of the site are only relevant if they relate to the visual and physical elements (aesthetics) which are relevant to the nature, degree and extent of asbestos contamination. The auditor refers Trintas to the *Schedule B2 – Guideline on Site Characterisation* (NEPM (2013) and *NSW EPA* (April 2020) *Consultants Reporting on Contaminated Land Contaminated Land Guidelines*.
- A3 Trintas should include a specific section on the dynamic erosional environment at the site and how conditions might change over short or longer periods of time and indeed how representative the DSI is likely to be over any given time period. Trintas should include a review of erosional mechanisms, tidal regimes, storm and rainfall events which may affect beach geometry? In this regard the auditor considers that any DSI for this site could only provide a spatio-temporal snapshot of the site conditions, and that the reported conditions would probably vary over short periods, possibly within one tidal cycle and would certainly change over longer periods particularly after rainstorm events and/or very high tides or storms. A review of such conditions, particularly over the last two years would be appropriate particularly as these are precisely the conditions when asbestos could be mobilised from the various potential source(s) and then be transported downslope onto the beach area. This apparently occurs largely from off-site areas via a combination of mechanisms including *inter alia* sheet, rill and gully erosion and stream flow. Accordingly, can Trintas include a discussion of the likely changes in asbestos distribution within (and outside) the site over time, and how this might affect any future remediation strategy?
- A4 The auditor requires the CSM be revised to include a discussion of the suspected source(s) of the asbestos e.g., hinterland, gullies, slopes, reclaimed beach, others, and a pathway for the asbestos – e.g., mass movement, erosion, water runoff etc from the fill slopes adjacent to and above and beyond the beach. The CSM will also need to consider movement of asbestos (vertically and horizontally) once present on the beach i.e., as a result of tidal movement and sand movement both on the sand and rock platforms. A series of stylized or schematic graphic cross sections (beach and hinterland profiles) would be appropriate as part of the CSM and certainly the CSM should be provided in tabular form to enable consideration of these factors. The auditor has attached a suggested format for such a visual CSM (see attached stylised cross-section).
- A5 Further to A4 and in this regard, the auditor recommends a 4-dimensional CSM which looks at not just the nature, degree and extent of site (and source site) contamination at the time of the DSI but also the way in which the vertical, horizontal and temporal distribution of asbestos in the site might change over time and whether there is likely to be a spike in occurrence after heavy rainfall and / or large tidal events which result in significant discharge onto the beach and or wave erosion at the head of the beach where fill may be exposed (note such phenomena occurred at Wamberal Beach in 2020 as referenced in the DSIⁱ). In this regard the shape of asbestos fragments (flat, flaky or elongate see AS 1141.15-1999) and its specific gravity (low density) would likely lend themselves to mobilisation by sheet, rill and gully erosion and water transport through

sheet, rill and gully flow on the side slopes which during rainstorms would be quite high velocity. A detailed description of asbestos fragments found during the DSI would be beneficial in this regard. The auditor considers that there are specific geomorphological issues which need to be examined in terms of sediment (including asbestos) transport both within the site and onto the site.

- A6 Can Trinitas provide a discussion on whether the asbestos has been accumulating on the beach for many years or whether this is a recent phenomenon possibly exacerbated by an increase in supply due to the recent weather events, including the storms of June- July 2020 and more recent heavy rainfall. The depth profile of asbestos in the sand is also important in this context as it might be expected that asbestos would have found its way into the deeper sand layers rather than being purely superficial or at relatively shallow depth if accumulation had been occurring for a lengthier period. An appreciation of depth and frequency would therefore be beneficial.

3.2 Specific Comments

The checklist – Table 2.3 of NSW EPA *Consultants Reporting on Contaminated Land Contaminated Land Guidelines* April 2020 has been completed for this IAL and the Site Auditor's comments are provided in the following table.

DSI Section	Auditor Comments
Executive Summary	Please add clear Objectives, Scope of works and summary of conclusions and recommendations.
Executive Summary	Please clarify inconsistencies in these statements: '...few highly weathered FC sheeting fragments and/or friable asbestos were collected and recorded...' This suggests that some fibrous asbestos was collected during this period, but the DSI indicates that no AF/FA was recorded during sampling. Following on this statement was noted: '...site inspections and periodical emu-picking indicate that there is no decreasing trend of visible ACM fragments at the time of this report (the DSI) preparation...' '...There are high uncertainties of ACM fragments in other areas of the Site (especially on the Coast Golf Course Exposed soils as several ACM fragments were observed) (outside the scope of this DSI)...',

	The golf course is not only outside the scope of the DSI, but is also external to the defined site boundary. See similar comments later in this IAL. Can Trinitas please discuss? In addition, mention of 3 hotspots in the context of asbestos detections is quite misleading as is the determination of hotspot areas. Can Trinitas clarify how these 'hotspots' were determined or demarcated and how persistent they are likely to be bearing in mind the dynamic nature of the beach environment and likelihood of asbestos movement in any given period. In addition, it is noted that on the 3 figures showing sampling locations that no surface asbestos (red dots) appears to be present except in the Northern, Middle and Southern Crown Gully which are outside the site boundary. Can Trinitas confirm that no surficial asbestos was observed during the DSI in the defined site area, noting that the photos from page 58 appear to suggest otherwise as does Section 2.2 ('...visible ACM fragments were identified throughout the whole beach sand area....'). Or is there a suggestion that all surficial asbestos (at the time of the DSI) had been removed by emu picking which commenced on 7 August 2020 and has continued twice weekly since then?
1. Introduction	Figure 1 shows the site layout (which differs from the specified lot (Lot 97 DP270427) and includes areas of environmental concern and areas of potential contamination (presumably asbestos) sources. It is also noted that sampling was undertaken in these areas. It is however noted that the various sources are not labelled on the legend and for the most part appear to be outside the defined site boundary, which should be clearly acknowledged in the report (although it is noted that Table 1 indicates that the gullies and golf course etc comprise surrounding land uses). Notwithstanding, it is agreed that the identification of these off-site sources (as shown on Figure 1) is important in the wider context of this DSI and it is axiomatic that they are highly relevant to any future remediation strategy.
2. Background	The auditor considers descriptions of the site should be factual and not subjective. (Please summarise this section and consider removing information which is not relevant to this contamination investigation report).
2. Background	Please include a discussion of whether Trinitas considers it likely that asbestos was present in the site (on the beach and rock shelves) before August 2020 or whether asbestos was only noticed around this time. Could the storms of June/July cause mass migration down gullies slopes etc? See later comments.
2.1 Table 1	See A1 above – please clarify site area and boundary.
2.1 Table 1	Please clarify whether the topographical details are for the specified site i.e., 3 zones specified in Table 1 - Northern Beach, Western Beach and Southern Beach. or for a wider area including the adjacent hinterland.

Section 2.2	Section 2.2. notes that; ‘...during heavy rain events, the three creeks from the gullies change subsequently in terms of soil disturbance, flow direction and bed depths. Overall, the site is very dynamic...’. This is agreed, however further detail is required and would be best considered as part of the CSM.
Section 2.3	Please add relevant data from BOM or other sources and provide a discussion on rainfall events. In addition, information on creek hydrographs, typical creek flows and high stage events and erosion potential particularly those in the last 18 months including those during the early part of 2021 is also required. It may be that such information is not site specific, but provision of such information would assist in understanding the mechanisms of asbestos release/transport into the site from the source areas. Similarly, please provide tidal hydrographs particularly making reference to the storm events and massive tides experienced on the eastern seaboard in June and July 2020.
New Section Required	Add new section - Objectives which establishes the objectives of the DSI.
New Section Required	Add new section - Scope of Works (including site history, review of previous reports and field work and analysis, reporting etc). The scope and objectives should differentiate between the site (Lot 97 DP270427) and the adjacent sites and note that the DSI focusses on the investigation and assessment of the site. Separate consideration should be given to the apparent source of asbestos on the beach from the adjacent land.
3 Limited Site History	NEPM states that the site history should contain, as far as practicable, <u>all available information</u> that assists in identifying the potential nature and extent of site contamination. The ‘limited’ site history in this DSI will need to be expanded including a review of historical aerial photographs of the surrounding sites (see above) since 1900 which may provide additional information relating to the timing and extent of cut and fill operations adjacent to the site, particularly gully filling. A GIPA (RCC), Randwick Library archive search, Trove website and EPA websites should also be completed. The objective the site history search will be to gain additional information on the potential source(s) of the asbestos filling and the approximate extent of the filled areas as well as those areas most likely to be the primary sources of the asbestos which is present on the site. If possible, summarise the information in a table.
3 Limited Site History	Trinitas refers to a review of Nearmap images of the beach since 2008. Has the geometry of the beach changed during this time? Can the photos be presented in an appendix or table showing the changes to the beach and perimeter/surrounding sites from 2008 – 2021, and in particular any changes which occurred following the storms of June-July 2020?
3 Limited Site History	The auditor requests a specific focus on the location of former landfill sites in the vicinity of Little Bay beach.
Table 2	Please add dates to photographs in Table 2

3.1 Information Services	The auditor agrees that the site history search needs to be expanded and include surrounding sites.
5.1 Data Quality Objectives	Section 5.1 details DQO – please include details and results from QA/QC samples taken as part of this DSI. Parts of the DQO section which are not relevant to this (asbestos) report should be removed/revised. In section 5.1 the DSI states that: ‘...Some of the structures located in the lot and adjacent properties may have been constructed with asbestos containing materials (ACM). Legacy dumping and layers of fill may (have) happened in the past decades....’. Please advise what structures and legacy dumping was conducted on the site (Lot 97) and what evidence there is to confirm the presence of structures and legacy dumping in Lot 97. As noted earlier this statement is confusing as it combines the probable activities which occurred off-site (with conditions on site) and it seems reasonable to assume that these activities occurred on Lot 98 and that contaminants (asbestos) was transported onto the beach area (i.e. Lot 97) by mass movement mechanisms alluded to elsewhere. Please clarify. Please also explain/clarify the statement: ‘...ACM fragments are observed extensively throughout the worst Middle Beach, the worse Northern Beach and the slightly contaminated Southern Beach...’. In Section 5.1.2 a series of dot point questions were posed. Please confirm that the DSI has answered each of these and clarify the meaning of the latter part of the last dot point, viz: ‘...Will the DSI recommend further site investigation based on limited sampling locations and strict testing numbers....’. Regarding S.5.1.2.1, please clarify what hydrogeological data is required to assist the assessment of asbestos contamination in Lot 97 or indeed in Lot 98 should this be further required. S.5.1.2.2 defines the spatial site boundary (restricted to Lot 97) and also mentions that the temporal boundary of the investigation is one week from the date of the investigation (see related comments elsewhere). Accordingly, a discussion on the useability of the investigation results needs to be included in an appropriate section of the report, noting that for the purposes of remedial planning (on the site)

	the results may be deemed to be no longer relevant due to the short period specified above. In S.5.1.3 please clarify the reference to statistical parameters in the statement: ‘...The statistical parameters of interest are the COPC and the assessment criteria are presented in Section 0. ...’. In S.5.1.3.1 and S.5.1.3.3 please clarify the applicability of the use of 95% UCL of the mean concentrations in terms of asbestos assessment and confirm if this approach was actually adopted in this DSI. The same applies to the statements in S.5.1.3.7 regarding RPDs and precision. Please advise if and how RPDs were calculated for asbestos. In addition, in S.5.1.3.8 please advise if and how the laboratory undertook control and spike samples for asbestos and confirm what the results were in a section on field and laboratory QA/QC results. In S.5.2 Table 4, please advise how some of the PARCC items were assessed in terms of asbestos sampling and analysis and complete the table accordingly. Also please note that text appears to be missing in the second column (Laboratory Control Sample), confirm what sample extraction was required (for asbestos) and what field equipment required calibration and advise where the records are provided.
Section 6 Site Assessment Criteria	The Auditor considers that the asbestos acceptance criteria presented in the DSI were adequate and generally in accordance with the requirements of NEPM (2013) and WA DOH (2009).
Section 7.3	Please explain the reference to footings in this section. Does this refer to off-site locations?
7.3.1 Sampling Plan and Methodology (SAQP)	Please advise whether the sampling density accounted for Table 1 of the WA DOH (2009) specified that where asbestos is ‘likely’ 2 x CSMS grid sampling is required. Can Trintas expand the discussion in this section to reference Table 1? Does Trintas consider sufficient samples were taken from shallow depth and deeper for the purpose of determining if the asbestos is restricted to the upper sands (say top 100-200mm) or is it found deeper down in the sand profile? Note it is recognised that in places testing has indicated that sand has (presumably) been deposited above fill possibly as a result of slope wash of fill being subsequently being superimposed by sand deposits (e.g., TP09). In addition, in some of the logs the description indicates fill, but the graphical log indicates natural sand (i.e., and in situ deposit at the time of sampling). Please indicate whether the materials are natural sand which contains some anthropogenic materials derived from off site or whether they are genuine fill materials.

7.3.1 Sampling Plan and Methodology	Does the SAQP account for the lateral, vertical and temporal distribution of asbestos, given the asbestos may be deeply entrained in the beach sands or conversely just entrained in the top 100 mm or so? Does Trintias consider enough samples (including bulk sieved samples) were analysed below 1m depth?
Section 7 Table 6	The number of test pits listed in the table are 20 (north), 9 (middle) and 9 (south) i.e., 38. The total is however listed at 45 test pits. Accordingly, these numbers do not seem to correspond. In the text following the table 44 test pits are listed. Please clarify. Note from the logs there are 45 test pits TP1-TP44 including TP37A. Also, can Trintias advise if they consider it reasonable to determine hotspots in relation to asbestos, noting that 'hotspots are defined as areas where: 1. The 95% upper confidence limit (UCL) of the arithmetic mean concentration of the contaminant is less than the relevant HIL value. 2. No individual sample concentration exceeds 250% of the HIL value. 3. The standard deviation of the sample concentrations does not exceed 50% of the HIL value. 4. A sufficient number of samples has been collected using a spatially representative sampling design (Schedule B2 provides advice on sampling requirements). Can Trintias advise if this approach was used to define asbestos hotspots within the site, if not please provide alternative terminology? Also, in Table 6 please note which samples were from the specified site (Lot 97) and which were obtained from Lot 98.
7.3.1 Sampling Plan and Methodology	The test pits were reportedly excavated to 2.5m depth, however a review of the test bore logs and the results table has revealed many of the test pits were shallow (0.5m) and it is not clear how many of these involved were bulk samples North – 2 of 20 test pits >1m, 7 = 1m Middle – all 10 test pits <0.5m South – 9 out of 15 test pits >1m In section 7.3.1 the DSI states: <i>a 10 L soil sample collected from each sample location, which will be weighed...</i> Are field notes available for 10L sample sieving and analysis? Can Trintias also confirm which of the samples were tested as grab samples and which were bulk samples obtained for sieving? Please provide a detailed description of the methods employed in each case, including the decontamination procedures applied for the sampling and sieving equipment between each sample and location. Please also advice what (if any) chemical analysis was undertaken and why glass jars are mentioned when sampling was apparently in >500 gm and 10 L sample size. Viz: '...Soil samples collected for chemical analysis will be placed into NATA accredited laboratory supplied glass jars...'

7.3.4 Air Monitoring	Are air monitoring results available for this DSI – can these be appended to the DSI?
8. Conceptual Site Model	See A3 – A6 above. The CSM should identify the known and potential sources of contamination, potentially affected media (soil, sediment, ambient air), human and ecological receptors and potential and complete exposure pathways. Given, the beach itself is unlikely to be a source area the CSM should list possible alternative sources.
CSM	The CSM should state that the DSI assessment was limited to asbestos only. A brief discussion of other COC should, however, perhaps note that other contaminants may be present derived from adjacent source sites
Table 8	The auditor considers that the risk of contamination on the beach (site) from asbestos is actually high given the results. Please explain the rating of low to medium in Table 8 given that asbestos contamination is known to have occurred previously and was detected by the DSI. The auditor also notes that the risk of contamination is different to the human health risk, which may well be relatively low (as determined by JBS&G (2020) and noting presumably that this issue will be further assessed in the proposed HHRA.
Table 8	Please add a discussion of potential sources of the asbestos contamination – including off site gullies, catchments, golf course land etc. It is noted that the likely sources are outside the specified site area and therefore beyond the scope of the DSI, but it is reasonably likely that contaminants are migrating onto the site from adjacent areas (source sites – apparently within Lot 98 DP270427) and these need to be at least tentatively identified as they will have a bearing on future remediation strategies for Lot 97.
Table 8 and new section	Please add a discussion on tidal effects and the transient nature of the site characterisation (assessment). See previous comments.
Table 9	Please explain the phrase ‘...Importation of potentially contaminated fill under three beaches...’. Does this mean that the beach or part of it is considered to be reclaimed or over tipped with fill, and if so what is the geotechnical / physiographic evidence? Please also clarify the phrase ‘...Inhalation of mist after ACM fragments polished were flushed into water...’. Presumably this means breathing in fibres rather than ingestion/drinking of fibres? In any event, please advise whether these issues will be covered by the proposed HHRA.
Section 9 Findings and Conclusions	Given the ACM fragments were/are reported as being washed up and down throughout the three beaches at Little Bay is there any case/evidence to consider classifying all asbestos as friable?

Section 9	The auditor notes the recommendations in this section as follows: ‘...Trinitas recommends a series of approaches, measures, and strategies including further risk assessment, additional site investigation, Remedial Action Plan and Environmental Management Plan for the site subject to change with the required consultation among the client, community, decision makers and stakeholders...’. These are generally agreed. The auditor also requests that Trinitas adds a section on the relevance of the sampling undertaken in areas of tidal influence – and confirms whether they have considered sampling along the site boundaries in the vicinity of the asbestos positive locations, but outside the tidal influence, the auditor notes that such zones may be within Lot 98? Presumably such sampling might be included in the recommended further investigations. The auditor generally concurs with the above recommendations in particularly (at this stage) that additional investigations are required. Accordingly, the auditor requires that Trinitas specify the purpose, nature and location of these investigations and prepares a detailed SAQP prior to undertaking any further sampling. Trinitas, however, need to make a formal statement regarding the findings of the DSI report specifically whether the site is or can be made suitable for the specified land use, in particular whether any or all of the site assessment criteria have been met (viz ACM <0.02% w/w, FA/AF <0.001% w/w and NVA at the surface).
Section 10	Following the necessary amendments to the current DSI and recommended further investigations, the auditor concurs that an RAP should be prepared for the site in accordance with <i>Schedule B2 – Guideline on Site Characterisation</i> (NEPM (2013) and NSW EPA (April 2020) <i>Consultants Reporting on Contaminated Land Contaminated Land Guidelines</i>. It is however noted that remediation of the beach areas will likely be ineffective without remediation of the source areas (of asbestos).
Appendix F Test Pit Logs	Please clarify on the logs if these are Test pits or Boreholes, presumably the former and amend minor typos (shovel for showel etc), For USCS – please check that material with building rubble and inclusions is correctly identified as FILL rather than SAND (see earlier comment). Please define ‘legacy tip’. Please confirm if sand with building rubble should be classified as fill? See earlier comment. TP21 – Please discuss the sand logged over fill in this location in the appropriate part of the report?

Appendix G Data Summary	Reference Eurofins Report 791709-AID Can Trinitas explain the analysis/results from sample TP28_0.5 and TP28_0.5FC01
Appendix G Data Summary	Field notes for 10L sieved samples need to be added to the DSI.

4. Conclusion

In summary, the auditor considers that the DSI report is quite poorly drafted and lacks attention to detail and reporting precision throughout.

In general, the auditor is of the view that the report should be carefully rewritten to record what was actually done and how this was achieved (i.e. written in the past tense), and not what will be done (future tense), as it is in parts, and should reflect the actual works/sampling undertaken (asbestos only) rather than describing extraneous details relevant to chemical contaminants which were not addressed as part of the DSI as these were beyond the agreed scope. The auditor assumes that in part this may be a cut and paste issue with insufficient editorial checking.

The site area and boundary must be accurately defined, such that the site and the adjacent lands are clearly defined and articulated as separate sites. It is noted that sampling was undertaken beyond the specified lot boundary, and this should be acknowledged. Descriptions of the site and adjacent lands should also be separated and not merged as this makes comprehension of the report quite difficult. In addition, it should be acknowledged that where observations and/ or sampling was undertaken beyond the specified site/lot boundary that these are reported as being off-site.

In general, there are numerous technical issues associated with the DSI report that these make a comprehensive and detailed review quite difficult, notwithstanding this IAL has attempted to highlight the main technical issues which need to be addressed.

Accordingly, it is considered that the DSI report requires considerable amendment before it can be deemed to meet the requirements set out in the various relevant guidelines made and endorsed under Part 4 of the CLM Act. In addition, the auditor notes that if the DSI is to put on public exhibition on the Council website (similar to previous reports), then it is essential that the report is properly and coherently drafted and is technically robust.

Having said this the auditor does not disagree with the consultant's overall findings and recommendations as set out in Table 10.6 and concurs that further investigations are required (which need to be specified via the preparation of a detailed SAQP). The auditor also agrees that a formal risk assessment should be conducted. It is however recommended that an interim EMP is drafted to formalise the make safe measures for Little Bay Beach, and that significant revision of the DSI is required before it is issued to other parties as mentioned in Items 3 and 4 of the Table 10.6.

The auditor considers that the risk of site contamination is high (i.e., the auditor disagrees with consultant in this regard) and that the risk of beach contamination from asbestos is likely to remain high for the foreseeable future. However, the auditor is currently unable to form an opinion on the risk to human health posed by the asbestos within the subject site or beyond, or indeed the likely changes to these risks over time. In large part this due to the constantly changing (dynamic) environment in both the subject site and in all likelihood the source site(s).

It is however, noted from the laboratory results that for the most part the asbestos detected was in particles of building materials rather than being disseminated throughout the sand (or fill) and that the analysis further suggests that the asbestos detected is in the form of bonded ACM rather than FA/AF (fibrous) asbestos materials.

In this regard the auditor considers that the highly attritional conditions of the beach environment may be a significant factor in reducing the likelihood of FA/AF (fibrous) asbestos materials being present although this situation could change and it is noted in this context that the DSI is time limited viz '*...the temporal boundaries were determined on the basis of the timeline of one week for the current investigation...*' (S.5.1.2.2 of the DSI).

Yours faithfully
Douglas Partners Pty Ltd



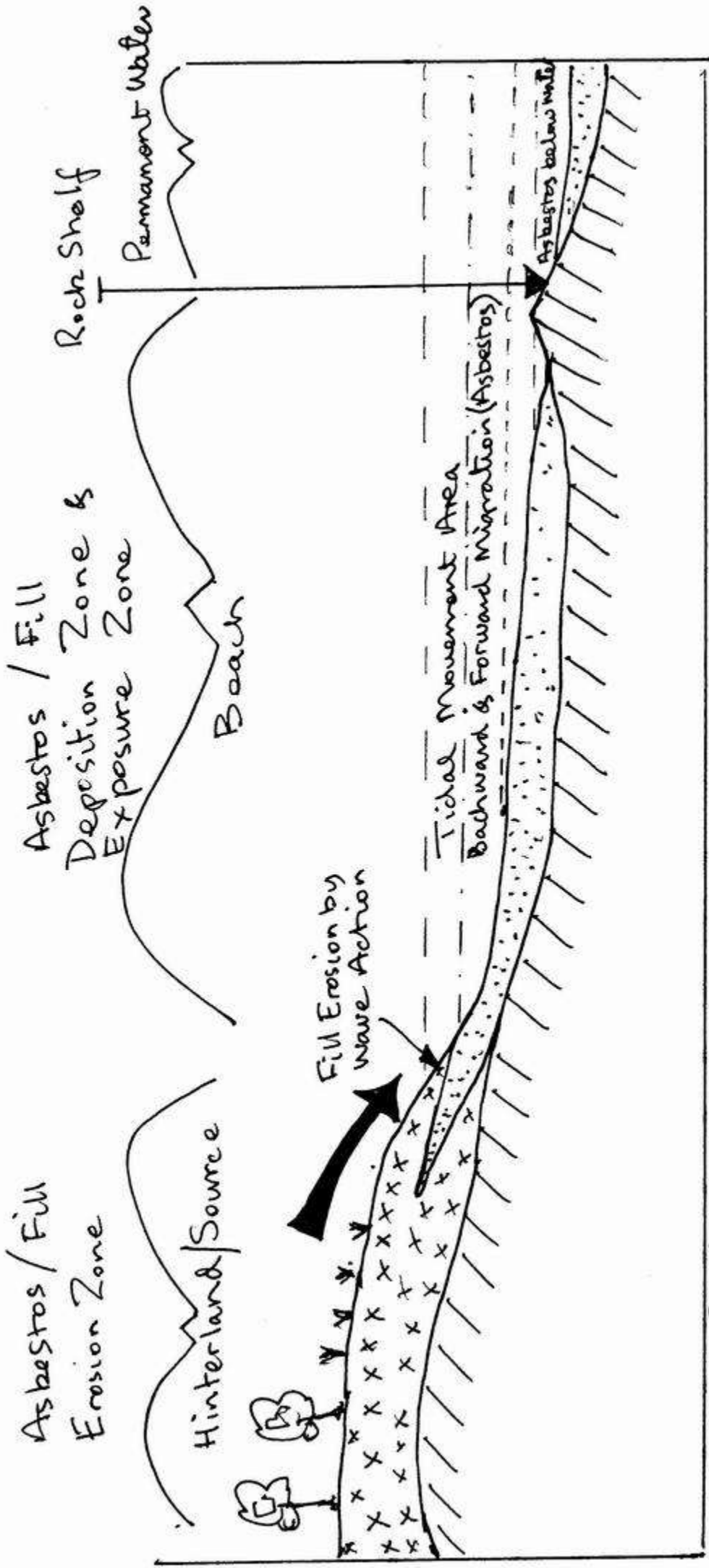
J M Nash
Principal

Please note that the above information, interim advice and opinions do not pre-empt the eventual site audit findings nor do they constitute a site audit as defined under Part 4 of the Contaminated Land Management Act, 1997.

Attachment
Stylized Cross Section

ⁱ <https://www.wrl.unsw.edu.au/file/wamberal-coastal-erosion-july-2020>

STYLIZED CROSS SECTION - BEACH



- *** Fill (uncontrolled)
- Beach Sand
- ////// Bedrock
- Storm Tide
- - - High Tide
- . - Low Tide (Range)

Randwick City Council
30 Frances Street
Randwick NSW 2031

Project 205690.00
2 July 2021
IAA1-205690
JMN:jl

Attention: Stephen Leung

Email: stephen.leung@randwick.nsw.gov.au

Interim Advice Letter 1
Non-Statutory Site Audit DPNS/19
Lot 97 Little Bay Beach, Little Bay Lot 97 DP270427

1. Introduction

This letter provides Randwick City Council (RCC) and their Environmental Consultant - Trinitas Group (Trinitas) with interim advice (IAL) as part of Non-Statutory Site Audit DPNS/19 being undertaken by Mike Nash, an NSW EPA Site Auditor accredited under the Contaminated Land Management (CLM) Act. The advice concerns the assessment of contamination risks at the site located at Lot 97 Little Bay Beach, Little Bay Lot 97 DP270427 (Figure 1 – the site). The interim advice has been provided in accordance with a proposal issued by DP dated 8 June 2021 and a purchase order PIS20761 provided by RCC dated 18 June 2021, subject to DP terms and conditions.

The purpose of the non-statutory audit is to determine whether the following detailed site investigation (DSI) meets the requirements of, and is compliant with, the guidelines made and endorsed under the Contaminated Land Management Act, 1997:

- Trinitas Group (June 2021) *Detailed Site Investigation of Potential Asbestos Contamination at Little Bay Beach, Little Bay NSW* Randwick City Council, Little Bay Beach - 4R Coast Hospital Rd, Little Bay NSW, dated 29/06/2021 Revision 3 ('the DSI report').

Two reports were also provided to the auditor as part of the RFQ for this audit, including:

- Trinitas Group (August 2020) *Preliminary Technical Brief for Potential Asbestos Contamination*, dated 24 August 2020 (Trinitas 2020); and
- JBS&G (October 2020), *Interim Human Health Risk Assessment for Asbestos* (JBS, 2020).

These reports were also considered by the auditor as part of this IAL, but have been superseded by the DSI report.

This IAL does not pre-empt the conclusions which may be drawn at the end of the site audit process and does not represent a Site Audit Statement (SAS) or a site audit report (SAR). These documents are intended to be prepared following agreement that the DSI and subsequent HHRA have been completed satisfactorily and that the degree and extent of asbestos contamination in the defined site

has been properly characterised and the related risks identified. Copies of the SAS and SAR will then be provided to the NSW EPA and Council in accordance with the CLM Act.

In particular, the review was undertaken with reference to the *National Environment Protection (Assessment of Site Contamination) Amendment Measure* (NEPM 2013), *Schedule B2 – Guideline on Site Characterisation* (NEPM (2013) and *NSW EPA Consultants Reporting on Contaminated Land Contaminated Land Guidelines April 2020, Table 2.3 – Detailed Site Investigations*. Reference was also made to the *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated sites in Western Australia* (WA DOH, 2009).

2. The Site

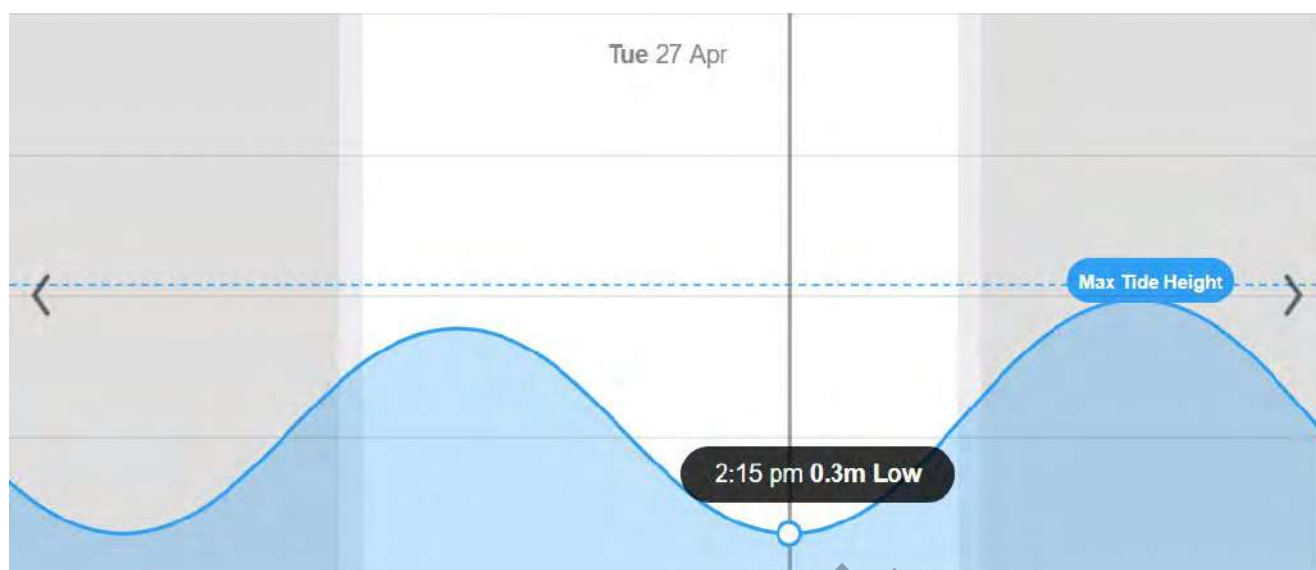
The site is located at Little Bay Beach as shown in Figure 1 below (extracted from Trinitas 2021).



Figure 1 – Layout of the Site

This site layout was extracted from Trinitas Brief, rather than from the Trinitas DSI 2021. Refer to Appendix D: DSI Site Layout, Sampling Locations, Positive Test Pits and Maps.

The week from 26 April 2021 featured lowest tide 0.3 m, highest tide 1.8 m, light or fresh wind, slight swell. Sampling taken above 0.4 m tide as much as practical, but not for sand areas underwater.



All these maps will be updated.



Figure1-1 Investigation Area in DSI 1A (Beach Areas varies)

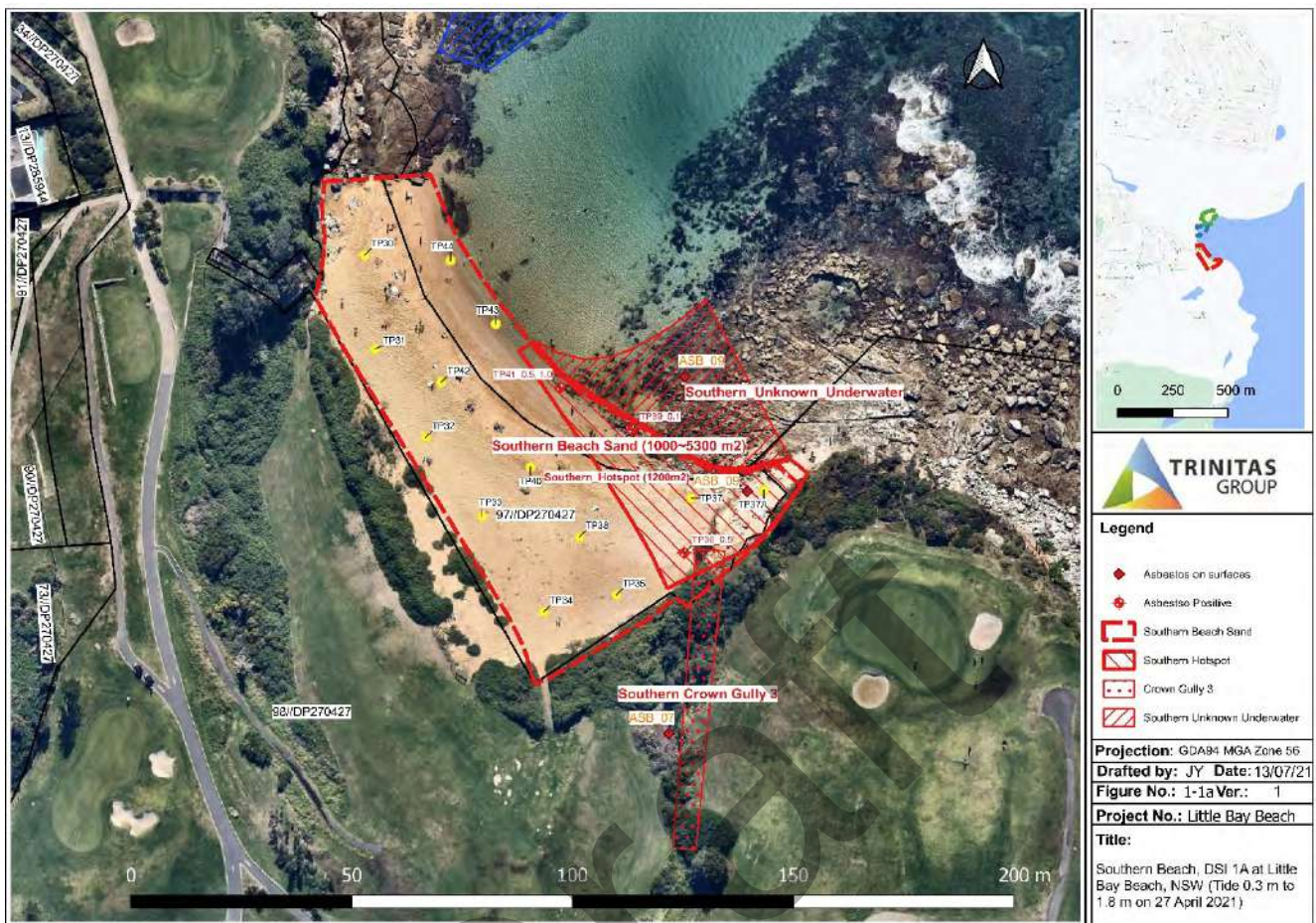


Figure 1-1a Detailed Site Layout at Southern Beach in DSI 1A (Beach Areas varies)

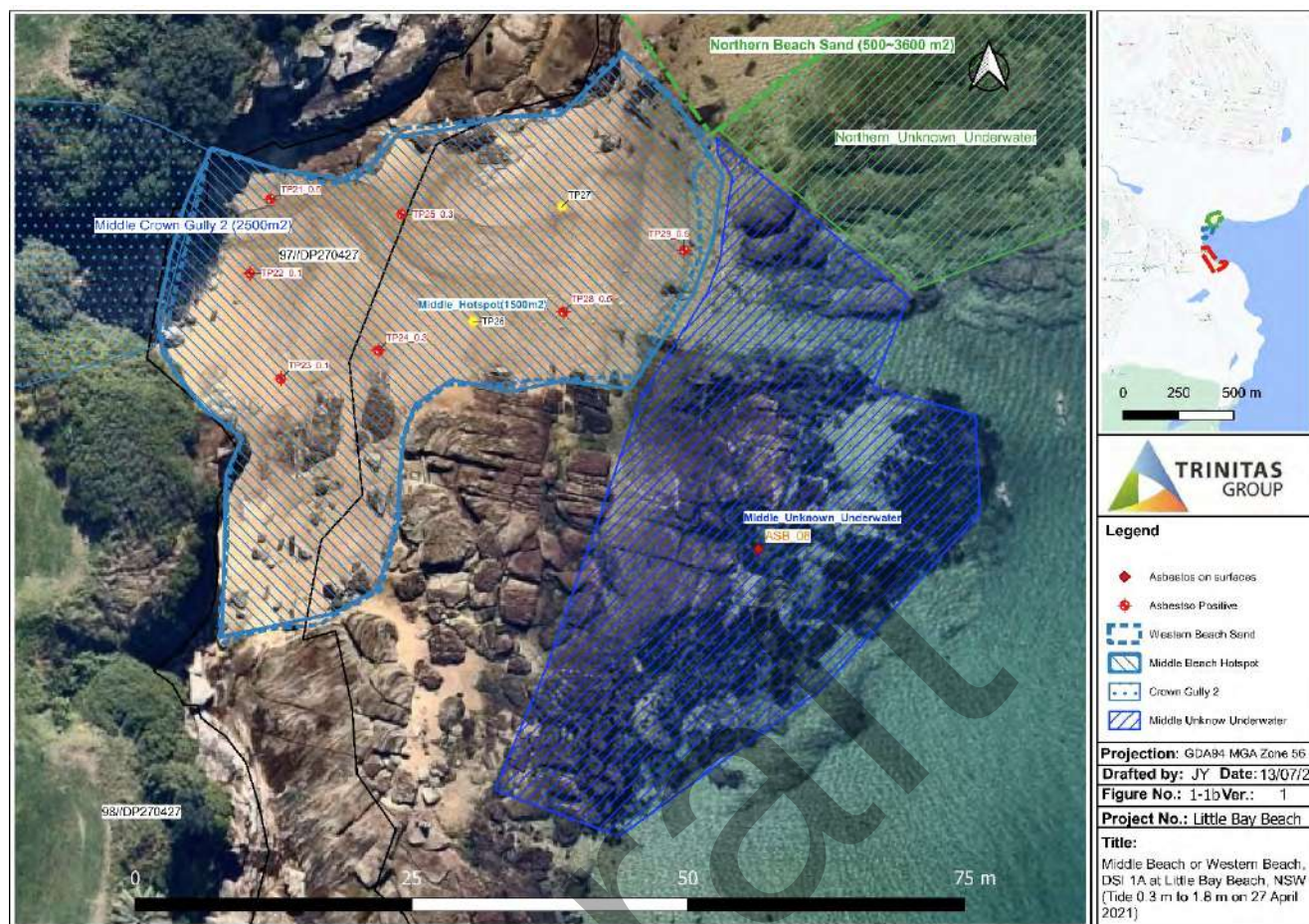


Figure 1-1b Detailed Site Layout at Middle Beach in DSI 1A (Beach Areas varies)

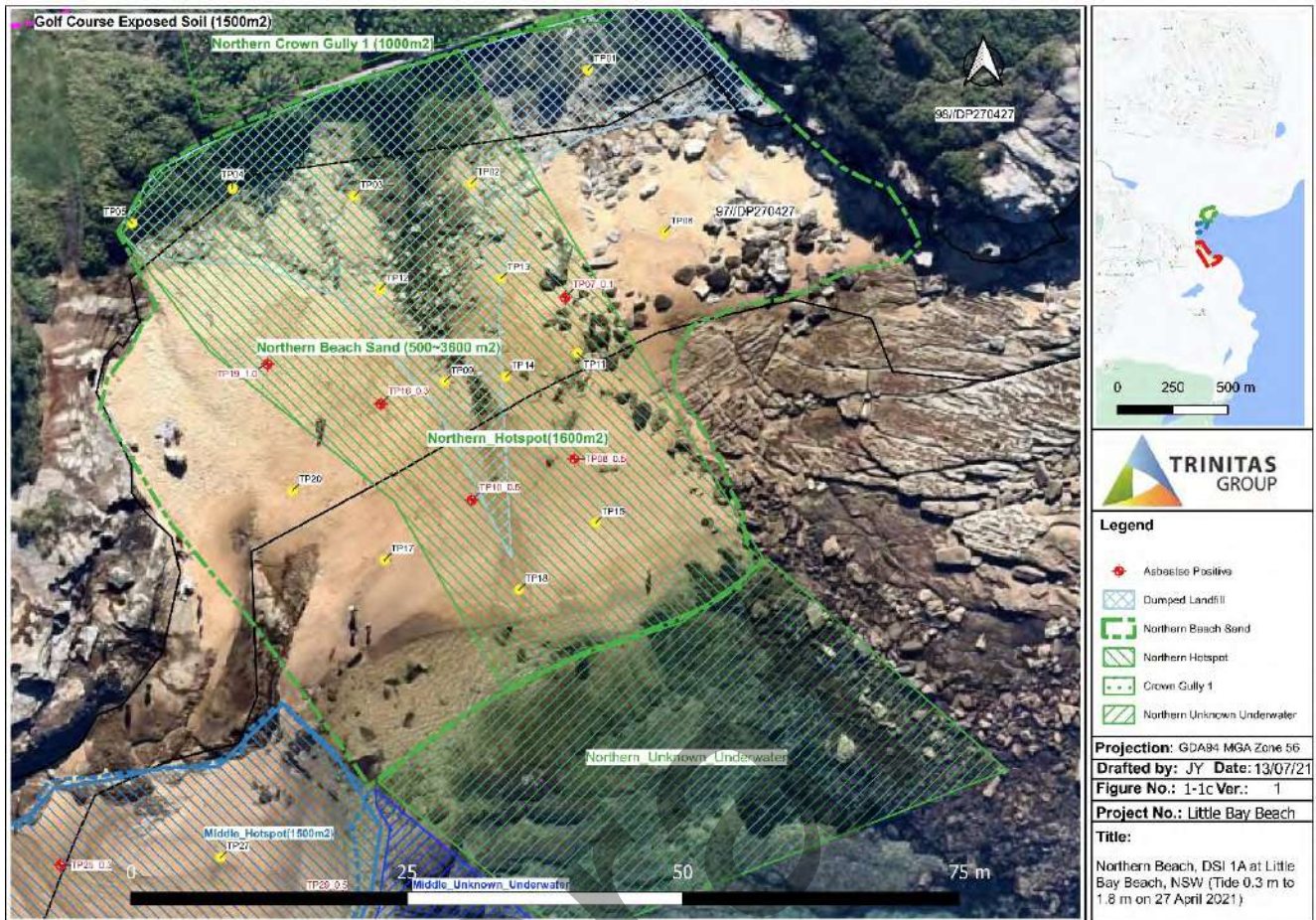


Figure 1-1c Detailed Site Layout at Northern Beach in DSI 1A (Beach Areas varies)

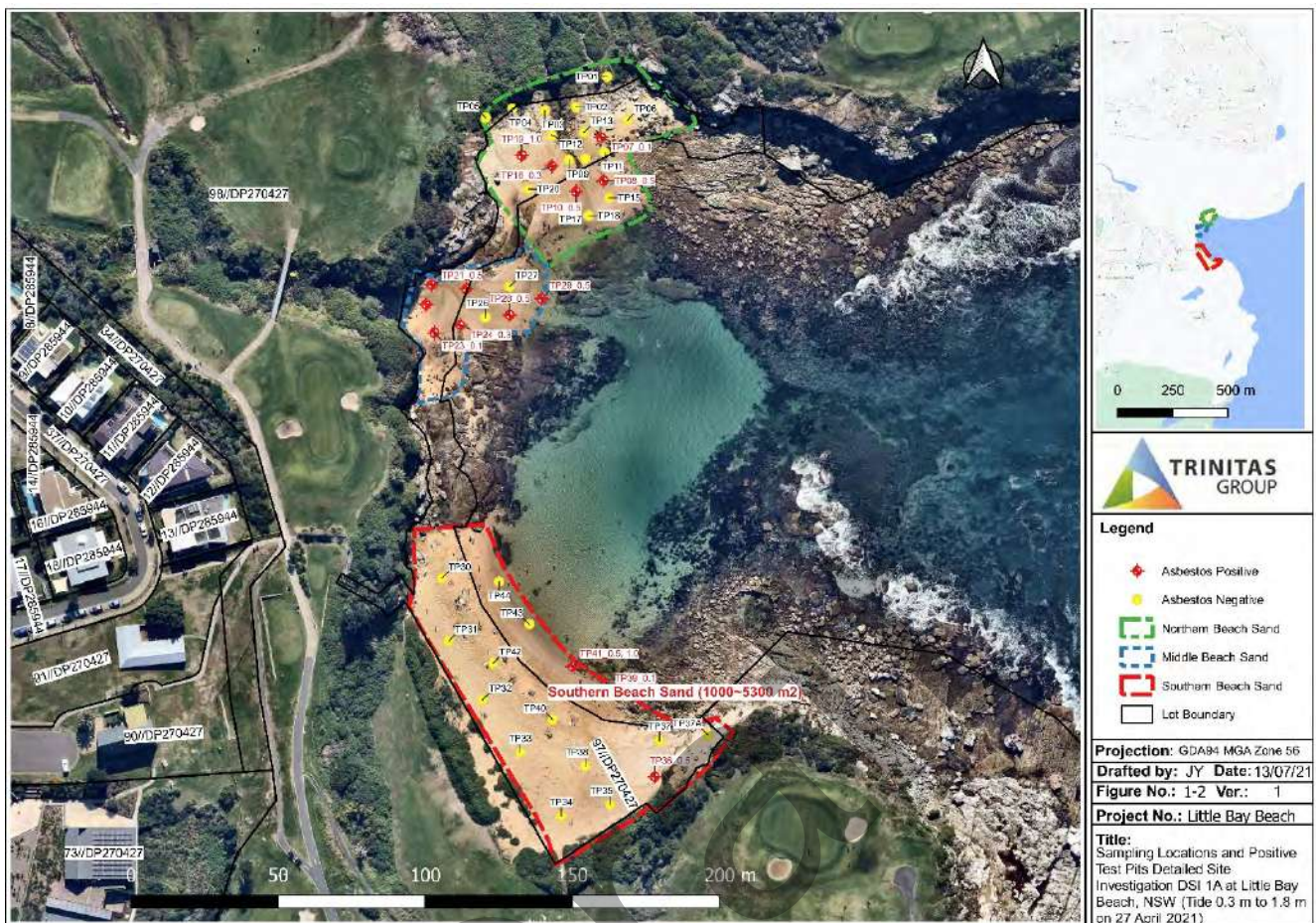
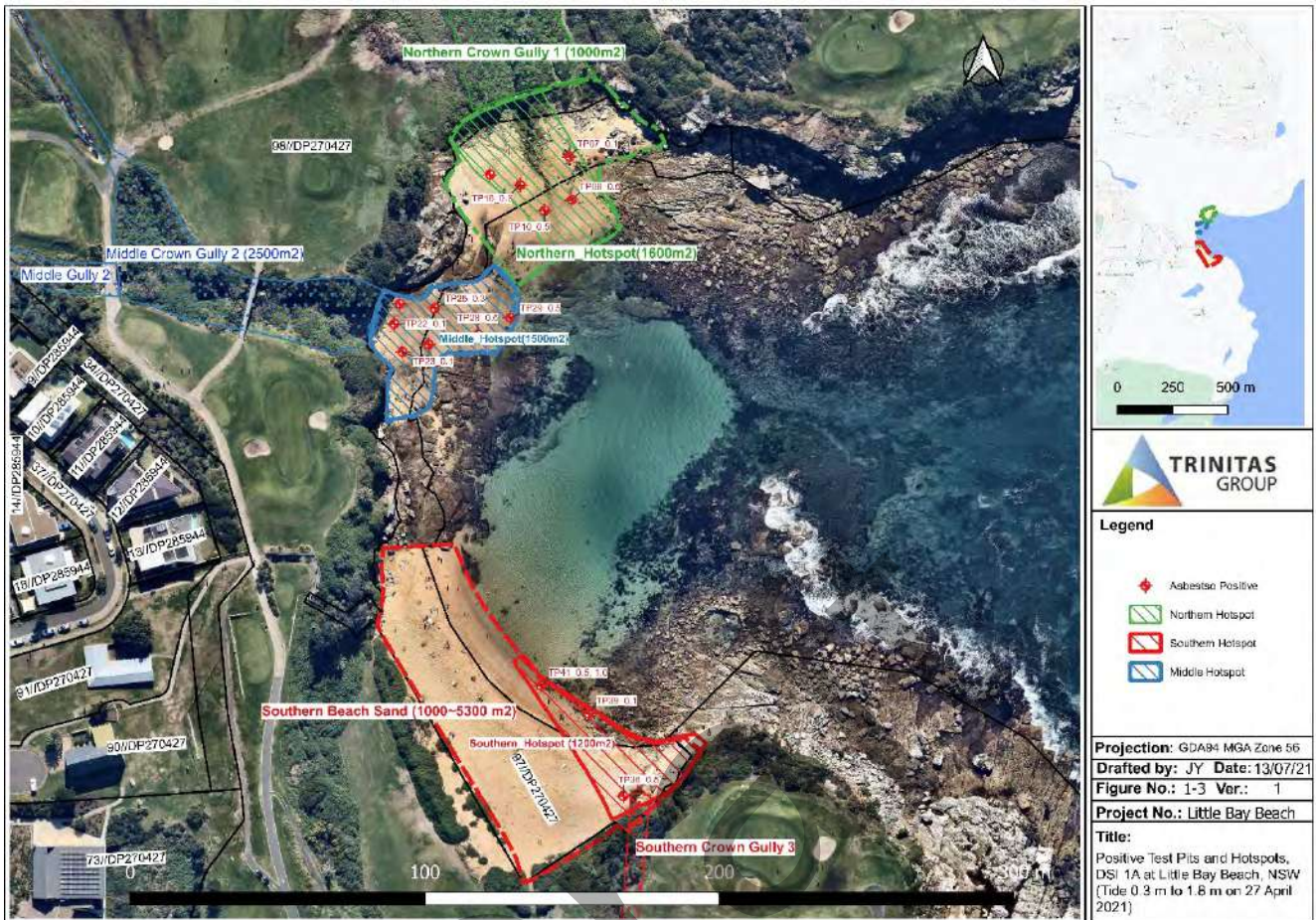


Figure1-2 Sampling Locations and Positive Test Pits in DSI 1A (Beach Areas varies)



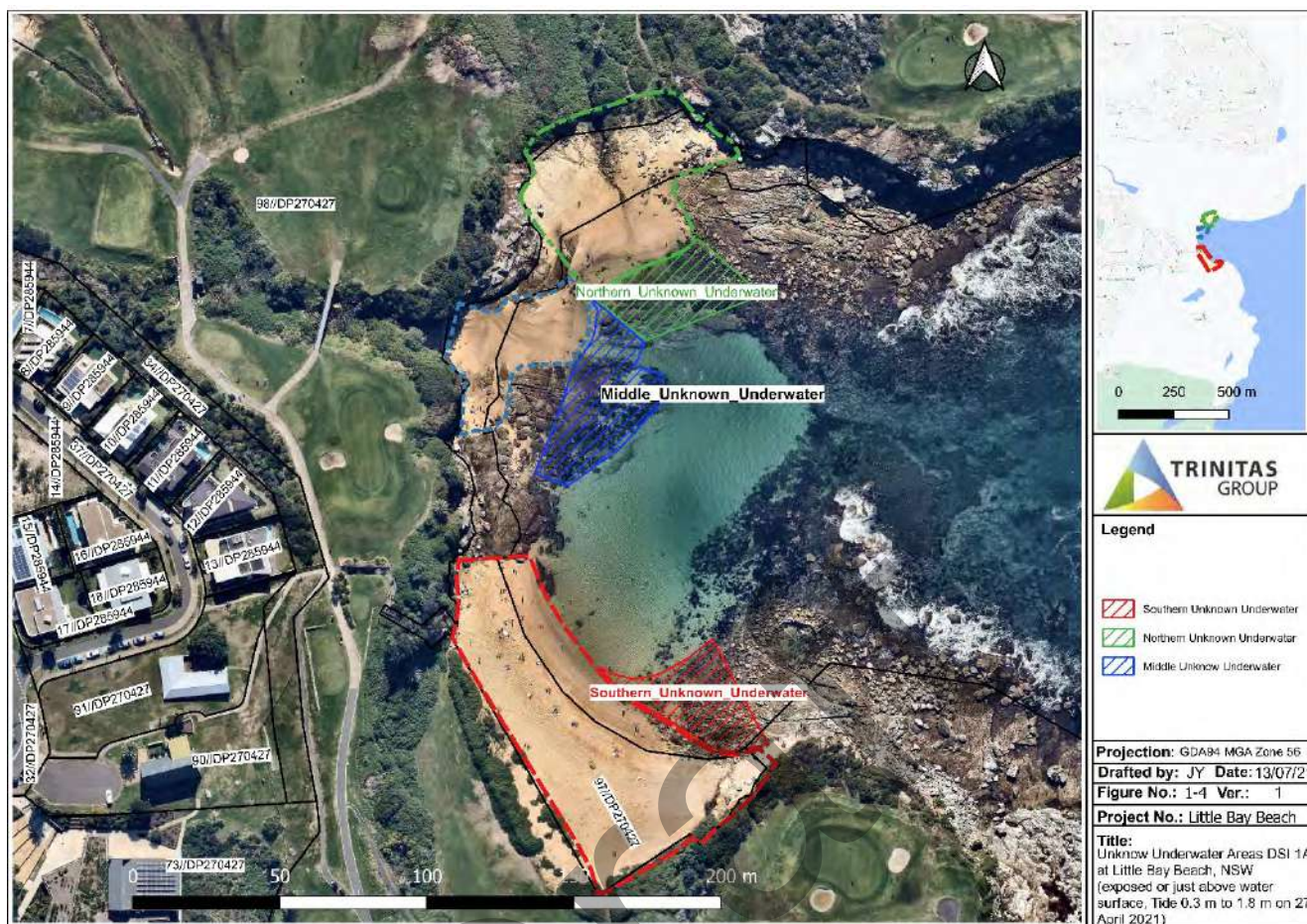


Figure1-4 Under Underwater Areas (at lowest tide, above water surface) in DSI 1A (Beach Areas varies)



Figure1-5 Point Sources and Landfill/Tips in DSI 1A (Beach Areas varies)

The Six Maps imagery of the site described as Lot 97 DP270427 is shown on Figure 2, including the lot boundary. The land immediately adjacent to Lot 97 (the site) comprises Lot 98 DP270427.

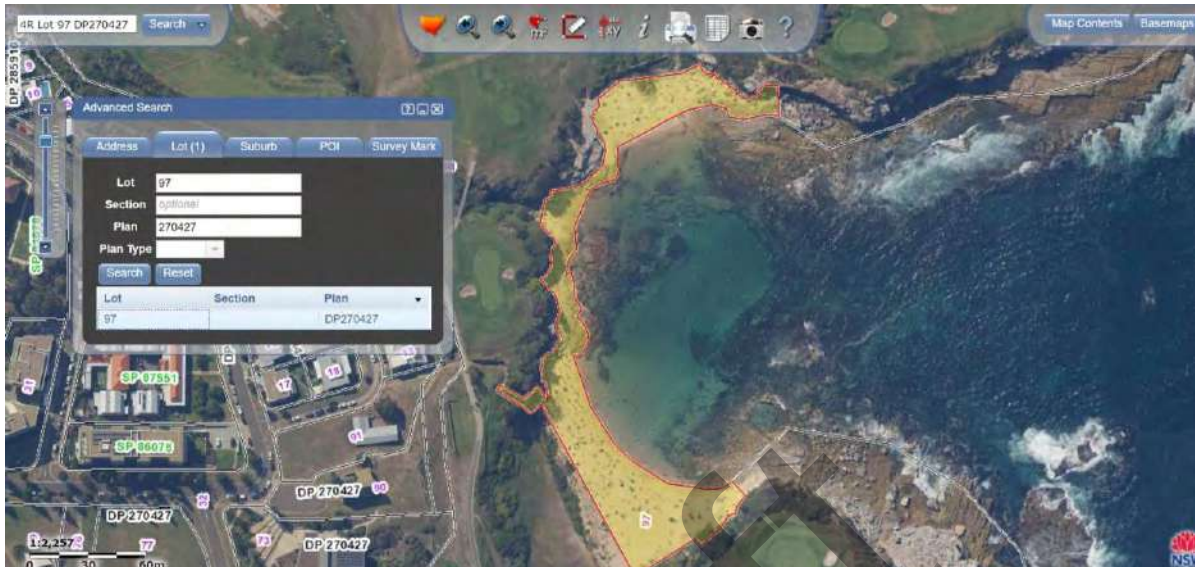


Figure 2 – Lot 97 DP270427 Boundary (red)

This site layout was copied pasted from Six Maps NSW, <https://maps.six.nsw.gov.au/>. However, There is no clear definition of the lower tidal line (lowest tide 0.2 m? 1.8 m?; Highest tide 2 m? 1.3 m?). Trinitas recommends a certified surveyor to define the boundaries for the site, crown land and adjacent lands and properties, which was out of the scope of work in the DSI.





The auditor notes that the lot boundary of the defined site appears to differ from that shown on Figure 1. See later comments.

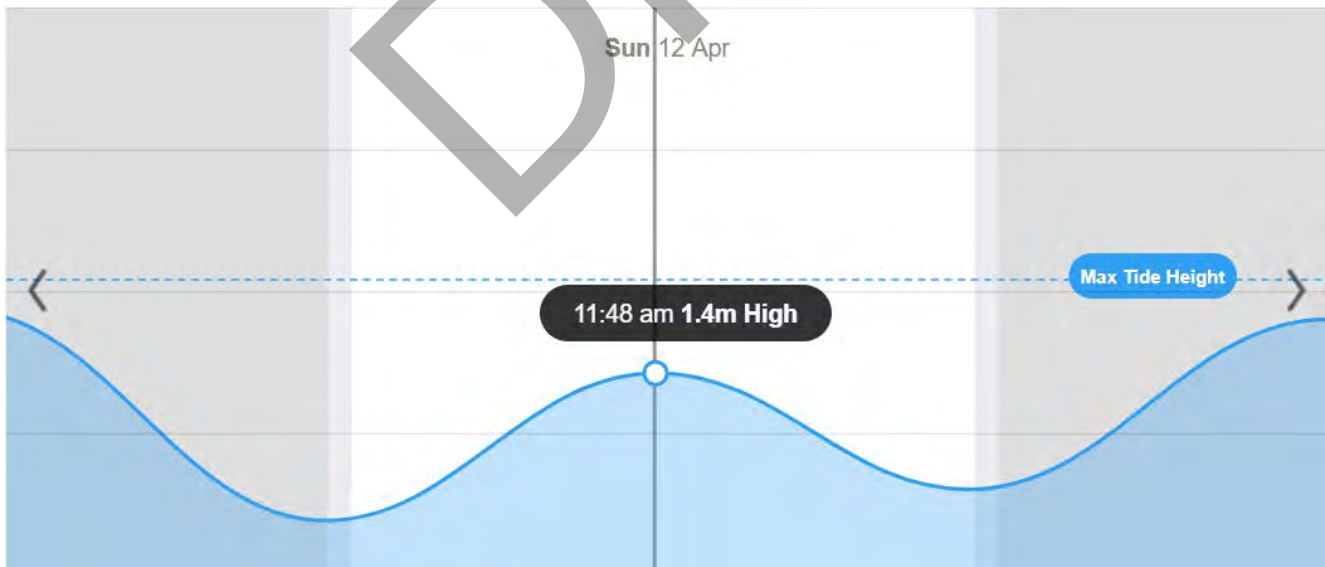
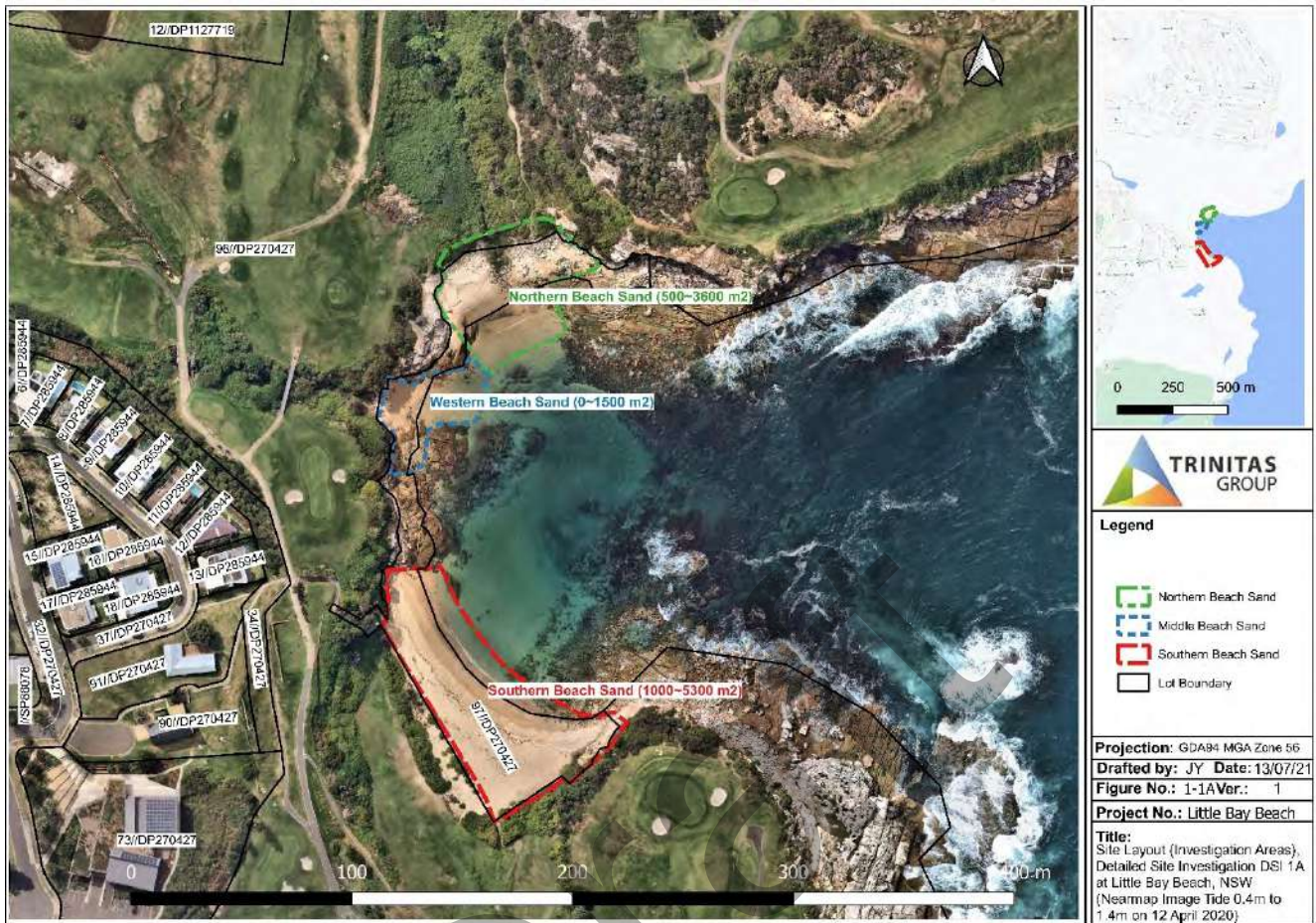
Agree, Trinitas recommends a certified surveyor to define the boundaries for the site, crown land and adjacent lands and properties, which was out of the scope of work in the DSI. The DSI focused on the physical boundaries with a short period of one week (lowest tide 0.3 m, highest tide 1.8 m) whatever the soil was practically accessible during normal work hours, but not for areas under water for such a dynamic environment,

The best practical investigation area as shown in Figure 1-1 (Normally tide height ~0.5m, because it is almost impossible to arrange the sampling at the lowest tide of 0.2 m). The approximate accessible sand area of three beaches could be 10400 m² (Please do not be unrealistic of the numbers, they keep changing all the time).

Tidal effects:



Under severe conditions of tide heights in the range of 1.4 m to 1.8 m, rough swell height and strong to gust wind, the whole Middle Beach, Most of Northern Beach, and ~80% of Southern Beach are either under water or impacted by currents. The total area of sands could be just ~1500 m².



However, under extreme conditions, tides could impact the sand areas up to the Retaining Wall at Southern Beach. For example, with rough swell 3.5 m, 1.8 m tide, strong wind or gust, three beaches are severely impacted by natural elements (ACM fragments at Hotspot, Southern Beach were sighted as expected).







Figure Southern Beach impacted by Rough Swell and High Tide.

However, under extreme conditions, tides could impact the sand areas up to the Tip adjacent to Heritage Wall at Northern Beach. All of the Middle Beach is under water.



Figure. Northern Beach, Middle Beach and Southern Beach impacted by rough swell and high tide.



Figure. Northern Beach impacted by rough swell and high tide.

3. Auditor Comments

The auditor has conducted a review of the DSI and provides the following comments:

3.1 Overall Comments

A1 The site is described by Trinitas in Table 1 of the DSI as comprising the Northern Beach (~3600 m²), Western Beach (1200 m²) and Southern Beach (5300 m²). The total site area is quoted as 11000 m² in Table 1, however the sum of the 3 areas is 10,100 m².

Agree, for such a dynamic environment, the estimated areas could be as little as ~2000 m² (sum of exposed three beaches, when were not impacted by rip, current, tide under high tide and gust wind conditions), or be as much as 12000 m² (sum of exposed three beaches, when were not impacted by rip, current, tide under lowest tide and light wind conditions.). Please keep in mind, these areas keep changing!

Trinitas describes in Section 5.1.22 that 'The temporal boundaries were determined on the basis of the timeline of one week for the current investigation. Especially, this report intentionally selected the lowest tide period of 0.3 m to cover all practical exposed soil/rock/sand areas as much as possible, as Dr Jeffrey Yu proposed that at 2 m highest tide, most of the investigation areas could be under water or impacted by tides, there would be very low possibility to delineate the contamination. Therefore, Trinitas propose that in the boundaries of this Study there could be some "grey areas": Land, water and soil are under the Council or the Crown or both of them, which are out of the scope of this DSI report...'.
A large, faint, diagonal watermark reading 'Draft' is visible across the page.

A precise site boundary and area will need to be established for the purposes of the site audit, especially given the discrepancy between the cadastral boundary in Figure 2 and the boundary shown in Figure 1 above. If the site needs to be surveyed to achieve this then this should be undertaken. The site area and boundary should be checked and confirmed by Trinitas.

Agree, Trinitas recommends a certified surveyor to define the boundaries for the site, crown land and adjacent lands and properties, which was out of the scope of work in the DSI.

The DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach.

A2 The auditor considers the DSI should be streamlined to include only factual observations, data and related interpretation and opinion. The descriptions of the site are only relevant if they relate to the visual and physical elements (aesthetics) which are relevant to the nature, degree and extent of asbestos contamination. The auditor refers Trinitas to the *Schedule B2 – Guideline on Site Characterisation* (NEPM (2013)) and *NSW EPA (April 2020) Consultants Reporting on Contaminated Land Contaminated Land Guidelines*.

Agree. Trinitas recommends that all the documents, including, but not limited to, site investigation reports, images, communications, Remedial Action Plans, Validation Plan, Landfill Cell Design Plan, etc., should be provided to Trinitas for DSI reporting. All those documents listed in the Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be collected and provided by the Client or other stakeholders for Trinitas review.

Only two reports were made available for Trinitas Desktop Review in DSI reporting (All other reports have not been made available so far)

1. Environmental Monitoring Services, Remediation Strategy Report & Future Site Management

Principles, Prince Henry Redevelopment Site – Undevelopable Area (Reference No. EMS 05 4328, in December 2005)

2. ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM)

Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders.

1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999;
2. **Douglas Partners** Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site;
3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 – 2002; and
4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004.

Only factual observations, data and related interpretation and opinion for all possible point sources should be done after additional investigations listed in Trinitas DSI 2021. It was out of the scope of Trinitas DSI 2021 to collect all those reports and to define legal site boundaries.

A3 Trinitas should include a specific section on the dynamic erosional environment at the site and how conditions might change over short or longer periods of time and indeed how representative the DSI is likely to be over any given time period. Trinitas should include a review of erosional mechanisms, tidal regimes, storm and rainfall events which may affect beach geometry? In this regard the auditor considers that any DSI for this site could only provide a spatio-temporal snapshot of the site conditions, and that the reported conditions would probably vary over short periods, possibly within one tidal cycle and would certainly change over longer periods particularly after rainstorm events and/or very high tides or storms. A review of such conditions, particularly over the last two years would be appropriate particularly as these are precisely the conditions when asbestos could be mobilised from the various potential source(s) and then be transported downslope onto the beach area. This apparently occurs largely from off-site areas via a combination of mechanisms including *inter alia* sheet, rill and gully erosion and stream flow. Accordingly, can Trinitas include a discussion of the likely changes in asbestos distribution within (and outside) the site over time, and how this might affect any future remediation strategy?

Agree, this is a long-term mission, which is out of the scope of Trinitas DSI. Trinitas is happy to quote for all these suggestions by the DP Auditor once formally requested and approved by the Client.

A4 The auditor requires the CSM be revised to include a discussion of the suspected source(s) of the asbestos e.g., hinterland, gullies, slopes, reclaimed beach, others, and a pathway for the asbestos – e.g., mass movement, erosion, water runoff etc from the fill slopes adjacent to and above and beyond the beach. The CSM will also need to consider movement of asbestos (vertically and horizontally) once present on the beach i.e., as a result of tidal movement and sand movement both on the sand and rock platforms. A series of stylized or schematic graphic cross sections (beach and hinterland profiles) would be appropriate as part of the CSM and certainly the CSM should be provided in tabular form to enable consideration of these factors. The auditor has attached a suggested format for such a visual CSM (see attached stylised cross-section).

Agree, a comprehensive CSM is desirable. However, it was still premature to prepare a 3D or 4D CSM with so many unknowns during the Trinitas DSI 2021. It is out of the scope of work in the DSI 2021.

Trinitas DSI was just a Stage 1A to delineate the site (immediately surroundings). Once additional Detailed Site Investigations were completed, Trinitas is able to quote for the following DSI once requested by the Client.

A5 Further to A4 and in this regard, the auditor recommends a 4-dimensional CSM which looks at not just the nature, degree and extent of site (and source site) contamination at the time of the DSI but also the way in which the vertical, horizontal and temporal distribution of asbestos in the site might change over time and whether there is likely to be a spike in occurrence after heavy rainfall and / or large tidal events which result in significant discharge onto the beach and or wave erosion at the head of the beach where fill may be exposed (note such phenomena occurred at Wamberal Beach in 2020 as referenced in the DSI). In this regard the shape of asbestos fragments (flat, flaky or elongate see AS 1141.15-1999) and its specific gravity (low density) would likely lend themselves to mobilisation by sheet, rill and gully erosion and water transport through sheet, rill and gully flow on the side slopes which during rainstorms would be quite high velocity. A detailed description of asbestos fragments found during the DSI would be beneficial in this regard. The auditor considers that there are specific geomorphological issues which need to be examined in terms of sediment (including asbestos) transport both within the site and onto the site.

Agree. It is desirable to have a vertical, horizontal and temporal, 4-dimensional CSM, which was out of the scope work in the Trinitas DSI 2021.

Trinitas is happy to quote and prepare all of the fancy 4D CSM once the unknowns were delineated in the following investigations as recommended in the Trinitas DSI.

If the Client formally requests and approves additional Trinitas DSI, these fancy 4D CSM could be prepared.

A6 Can Trinitas provide a discussion on whether the asbestos has been accumulating on the beach for many years or whether this is a recent phenomenon possibly exacerbated by an increase in supply due to the recent weather events, including the storms of June- July 2020 and more recent heavy rainfall. The depth profile of asbestos in the sand is also important in this context as it might be expected that asbestos would have found its way into the deeper sand layers rather than being purely superficial or at relatively shallow depth if accumulation had been occurring for a lengthier period. An appreciation of depth and frequency would therefore be beneficial.

Disagree. Some thoughts are out of the scope of work in Trinitas DSI 2021 (specifically, the site and its immediately surroundings changes under extreme weather conditions in the past 100 years, or after 1999, after 2005, after 2020).

Trinitas DSI 2021 has already delineated the site with depth and frequency, as clearly illustrated in Appendix D: DSI Site Layout, Sampling Locations, Positive Test Pits and Maps, Trinitas DSI 2021.

Especially, Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders.

1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999;
2. **Douglas Partners** Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site;
3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 – 2002; and
4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September

2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004.

Hopefully, those aforementioned PSIs had shed some light on the vertical, horizontal and temporal contamination with a 3 D or 4-dimensional CSM.

3.2 Specific Comments

The checklist – Table 2.3 of NSW EPA *Consultants Reporting on Contaminated Land Contaminated Land Guidelines* April 2020 has been completed for this IAL and the Site Auditor's comments are provided in the following table.

DSI Section	Auditor Comments
Executive Summary	Please add clear Objectives, Scope of works and summary of conclusions and recommendations.
Executive Summary	Please clarify inconsistencies in these statements: '...few highly weathered FC sheeting fragments and/or friable asbestos were collected and recorded...' This suggests that some fibrous asbestos was collected during this period, but the DSI indicates that no AF/FA was recorded during sampling. Following on this statement was noted: '...site inspections and periodical emu-picking indicate that there is no decreasing trend of visible ACM fragments at the time of this report (the DSI) preparation...' '...There are high uncertainties of ACM fragments in other areas of the Site (especially on the Coast Golf Course Exposed soils as several ACM fragments were observed) (outside the scope of this DSI)...', Asbestos Terminology (NEPM or Work Health and Safety Legislation) Friable means when dry, or as the result of a work process, may be crumbled, pulverised or reduced to a powder by hand pressure. Bonded ACM is equivalent to "non-friable" asbestos in Safe Work Australia (2011), which is defined therein as "material containing asbestos that is not friable asbestos, including material containing asbestos fibers reinforced with a bonding compound". Non-friable asbestos may become friable as a result of work

processes over time (for example, degradation due to chemical exposure) or due to other factors (for example, damage by fire).

Asbestos fines (AF) includes free fibres, small fibre bundles and also small fragment of bonded ACM that pass through a 7 mm x 7 mm sieve in NEPM 2013.

Fibrous asbestos (FA) comprises friable asbestos materials and includes severely weathered cement sheet, insulation products and woven asbestos material.

Trinitas confirmed that

1. Most of collected suspected ACM fragments on surficial soil at the site were highly polished as thin as a five cent and are being polished from August 2020 to July 2021.
2. Few Friable Asbestos fragments (frequency: 2 out of 2000 suspected ACM fragments) as WHS Legislation defined were collected during Trinitas's one-year Emu-picking and Clearance from August 2020 to July 2021. As shown in the images below, they can be easily crumbled, but a sort of weathered, polished and bonded forms.

Therefore, as shown in the following images, some fragments could be classified as Friable according to WHS; or Non-friable as NEPM.





3. “DSI indicates that no AF/FA was recorded during **sampling**”.
The statement is based on the DSI sampling period of just a week from 26 April to 30 April, 2021.

Therefore, there is no inconsistency with DSI conclusions.

	The golf course is not only outside the scope of the DSI, but is also external to the defined site boundary. See similar comments later in this IAL. Can Trinitas please discuss? In addition, mention of 3 hotspots in the context of asbestos detections is quite misleading as is the determination of hotspot areas. Can Trinitas clarify how these 'hotspots' were determined or demarcated and how persistent they are likely to be bearing in mind the dynamic nature of the beach environment and likelihood of asbestos movement in any given period. Hotspots or Hotspot Area, where many pieces of ACM in a localized area, or very frequently encountered fragments during one-year period of Emu-picking and clearance inspection. In another word, these areas have been observed ACM fragments almost every time for a one-year Emu-picking. Also, DSI sampling found ACM fragments during sieving or excavation, whatever over HSL criteria or below, as there are uncertainties to sight/sieve wet sands or sands below sea water level. Trinitas observes the pattern that all of the Hotspot Areas are close to the outlets of gullies, while ACM fragments are less likely to be found in the upper northern section of Southern Beach. This site pattern has not changed since August 2020. In addition, it is noted that on the 3 figures showing sampling locations that no surface asbestos (red dots) appears to be present except in the Northern, Middle and Southern Crown Gully which are outside the site boundary. Can Trinitas confirm that no surficial asbestos was observed during the DSI in the defined site area, noting that the photos from page 58 appear to suggest otherwise as does Section 2.2 ('...visible ACM fragments were identified throughout the whole beachsand area....'). Or is there a suggestion that all surficial asbestos (at the time of the DSI) had been removed by emu picking which commenced on 7 August 2020 and has continued twice weekly since then? Surface asbestos fragments are unpredictably widely scattered. Natural elements keep them exposed all the time. Red dots just illustrated where ACM fragments were observed, therefore, based on the site observation, further investigations were recommended. If the Client formally requests and approves the additional investigations, Trinitas will update the DSI 2021. Trinitas keeps "Make-safe" Emu-picking and Clearance from August 2020. These ACM fragments are being exposed all the

	time. Under this dynamic environment, Trinitas “Make-safe” Emu-picking and Clearance ensures that all visible ACM fragments were picked up and cleared at the time of Emu-picking Clearance period only. Maybe, in the following seconds, it could be possible that more ACM fragments appear due to natural elements.
1. Introduction	Figure 1 shows the site layout (which differs from the specified lot (Lot 97 DP270427) and includes areas of environmental concern and areas of potential contamination (presumably asbestos) sources. It is also noted that sampling was undertaken in these areas. It is however noted that the various sources are not labelled on the legend and for the most part appear to be outside the defined siteboundary, which should be clearly acknowledged in the report (although it is noted that Table 1 indicates that the gullies and golf course etc comprise surrounding land uses). Notwithstanding, it is agreed that the identification of these off-site sources (as shown on Figure 1) is important in the wider context of this DSI and it is axiomatic that they are highly relevant to any future remediation strategy. Agree, Should an Asbestos Management Plan be implemented rather than scaping, stockpiling and dumping around the Gully 1 after 2005? These immediate areas are “known” contaminated with asbestos and other chemicals. All surface runoff flows towards the Northern Beach! 



	
2. Background	The auditor considers descriptions of the site should be factual and not subjective. (Please summarise this section and consider removing information which is not relevant to this contamination investigation report). Agree, Trinitas recommends a certified surveyor to define the boundaries for the site, crown land and adjacent lands and properties, which was out of the scope of work in the DSI. But, the DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach. Only two reports were made available for Trinitas Desktop Review in DSI reporting (All other reports have not been made available so far) 1. Environmental Monitoring Services, Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site – Undevelopable Area (Reference No. EMS 05 4328, in December 2005) 2. ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) Especially, Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders. 1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999; 2. Douglas Partners Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 – 2002; and

	4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004.
2. Background	Please include a discussion of whether Trinitas considers it likely that asbestos was present in the site (on the beach and rock shelves) before August 2020 or whether asbestos was only noticed around this time. Could the storms of June/July cause mass migration down gullies slopes etc? See later comments. The DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach. Only two reports were made available for Trinitas Desktop Review in DSI reporting (All other reports have not been made available so far) 1. Environmental Monitoring Services, Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site – Undevelopable Area (Reference No. EMS 05 4328, in December 2005) 2. ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) Especially, Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders. 1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999; 2. Douglas Partners Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 – 2002; and 4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004. All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. Trinitas will be more confidently able to answer the key question: why those sampling activities as Annex A Figures and Photographs, Figure 8, Borehole Location Plan, did not confirm asbestos contamination in any sampling location? To what extent, asbestos fragments on surficial soil in three beaches? Under this dynamic environment, changes are all the time, day and

	night, year after year. Please refer to some videos for a better understanding how dynamic the three beaches in Little Bay are!
2.1 Table 1	See A1 above – please clarify site area and boundary. Agree, Trinitas recommends a certified surveyor to define the boundaries for the site, crown land and adjacent lands and properties, which was out of the scope of work in the DSI. But, the DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach, which were illustrated in Appendix D: DSI Site Layout, Sampling Locations, Positive Test Pits and Maps, Page 52 – 56 in DSI 2021. Once the Client formally requests and approves Trinitas Surveying quote, this will be updated.
2.1 Table 1	Please clarify whether the topographical details are for the specified site i.e., 3 zones specified in Table 1 - Northern Beach, Western Beach and Southern Beach. or for a wider area including the adjacent hinterland. Agree, Trinitas recommends a certified surveyor to define the boundaries for the site, crown land and adjacent lands and properties, which was out of the scope of work in the DSI. But, the DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach with a segment of dumped tip. Once the Client formally requests and approves Trinitas Surveying quote, this will be updated.

Section 2.2	Section 2.2. notes that; ‘...during heavy rain events, the three creeks from the gullies change subsequently in terms of soil disturbance, flow direction and bed depths. Overall, the site is very dynamic...’. This is agreed, however further detail is required and would be best considered as part of the CSM. Agree. But, the DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach. Only two reports were made available for Trinitas Desktop Review in DSI reporting (All other reports have not been made available so far) 1. Environmental Monitoring Services, Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site – Undevelopable Area (Reference No. EMS 05 4328, in December 2005) 2. ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) Especially, Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders. 1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999; 2. Douglas Partners Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 – 2002; and 4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004. All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. Trinitas will be more confidently able to answer the key question: why those sampling activities as Annex A Figures and Photographs, Figure 8, Borehole Location Plan, did not confirm asbestos contamination in any sampling location? To what extent, asbestos fragments on surficial soil in three beaches? Under this dynamic environment, changes happen all the time, day and night, year after year.

Please refer to some videos for a better understanding how dynamic the three beaches in Little Bay are!

1. Storm and extremely dangerous current conditions:
https://www.dropbox.com/s/vppshfpsfvtpim0/IMG_7789.MOV?dl=0
2. Southern Beach (~1000 m² was not impacted by high tide)
https://www.dropbox.com/s/ie4ptgd2rxo81nq/IMG_7766.MOV?dl=0
3. Hotspot at Southern Beach and Crown Gully 3 (Concrete Stormwater Pipe)
https://www.dropbox.com/s/yxl4xe87e3migk7/IMG_7778.MOV?dl=0
4. West Beach or Middle Beach under water and Crown Gully 2
https://www.dropbox.com/s/ugoczwnmaqrbrb/IMG_7808.MOV?dl=0
5. Northern Beach and Crown Gully 1
https://www.dropbox.com/s/lr2jle9cck4cffb/IMG_7843.MOV?dl=0
6. Coastal Erosion from Recent Dumping Stockpile (~150 Tonnes) at immediate surrounding of Northern Beach and Crown Gully 1.



	
Section 2.3	Please add relevant data from BOM or other sources and provide a discussion on rainfall events. In addition, information on creek hydrographs, typical creek flows and high stage events and erosion potential particularly those in the last 18 months including those during the early part of 2021 is also required. It may be that such information is not site specific, but provision of such information would assist in understanding the mechanisms of asbestos release/transport into the site from the source areas. Similarly, please provide tidal hydrographs particularly making reference to the storm events and massive tides experienced on the eastern seaboard in June and July 2020. The DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach. Only two reports were made available for Trinitas Desktop Review in DSI reporting (All other reports have not been made available so far) 1. Environmental Monitoring Services, Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site – Undevelopable Area (Reference No. EMS 05 4328, in December 2005) 2. ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) Especially, Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders. 1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999; 2. Douglas Partners Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and

	comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 – 2002; and 4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004. All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. Trinitas will be more confidently able to answer the key question: why those sampling activities as Annex A Figures and Photographs, Figure 8, Borehole Location Plan, did not confirm asbestos contamination in any sampling location? To what extent, asbestos fragments on surficial soil in three beaches? Under this dynamic environment, changes happen all the time, day and night, year after year. Please refer to some videos for a better understanding how dynamic the three beaches in Little Bay are! Field Investigation regarding Information on creek hydrographs, typical creek flows and high stage events and erosion potential will be conducted only after the Client formally requests and approves a new Trinitas quote, they will be updated in the DSI.
New Section Required	Add new section - Objectives which establishes the objectives of the DSI. Agree. Will do.
New Section Required	Add new section - Scope of Works (including site history, review of previous reports and field work and analysis, reporting etc). The scope and objectives should differentiate between the site (Lot 97 DP270427) and the adjacent sites and note that the DSI focusses on the investigation and assessment of the site. Separate consideration should be given to the apparent source of asbestos on the beach from the adjacent land. Agree. But, the DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach. Only two reports were made available for Trinitas Desktop Review in DSI reporting (All other reports have not been made available so far) 1. Environmental Monitoring Services, Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site – Undevelopable Area (Reference No. EMS 05 4328, in December 2005) 2. ERM, Site Audit Statement (Reference No. PS 53, by Paul

	Steinwede at ERM) Especially, Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders. 1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999; 2. Douglas Partners Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 – 2002; and 4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004. All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. Trinitas will be more confidently able to answer the key question: why those sampling activities as Annex A Figures and Photographs, Figure 8, Borehole Location Plan, did not confirm asbestos contamination in any sampling location? To what extent, asbestos fragments on surficial soil in three beaches?
3 Limited Site History	NEPM states that the site history should contain, as far as practicable, <u>all available</u> information that assists in identifying the potential nature and extent of site contamination. The 'limited' site history in this DSI will need to be expanded including a review of historical aerial photographs of the surrounding sites (see above) since 1900 which may provide additional information relating to the timing and extent of cut and fill operations adjacent to the site, particularly gully filling. A GIPA (RCC), Randwick Library archive search, Trove website and EPA websites should also be completed. The objective the site history search will be to gain additional information on the potential source(s) of the asbestos filling and the approximate extent of the filled areas as well as those areas most likely to be the primary sources of the asbestos which is present on the site. If possible, summarise the information in a table.

	Agree. The DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach. Only two reports were made available for Trinitas Desktop Review in DSI reporting (All other reports have not been made available so far) 1. Environmental Monitoring Services, Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site – Undevelopable Area (Reference No. EMS 05 4328, in December 2005) 2. ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) Especially, Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders. 1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999; 2. Douglas Partners Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 – 2002; and 4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004. All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. If the client formally requests and approves the detailed desktop review, Trinitas will revise it.
3 Limited Site History	Trinitas refers to a review of Nearmap images of the beach since 2008. Has the geometry of the beach changed during this time? Can the photos be presented in an appendix or table showing the changes to the beach and perimeter/surroundingsites from 2008 – 2021, and in particular any changes which occurred following the storms of June-July 2020? Agree. But, the DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach. Only two reports were made available for Trinitas Desktop Review

	in DSI reporting (All other reports have not been made available so far) 1. Environmental Monitoring Services, Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site – Undevelopable Area (Reference No. EMS 05 4328, in December 2005) 2. ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) Especially, Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders. 1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999; 2. Douglas Partners Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 – 2002; and 4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004. All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. Under this dynamic environment, changes happen all the time, day and night, year after year. Please refer to some videos for a better understanding how dynamic the three beaches in Little Bay are!
3 Limited Site History	The auditor requests a specific focus on the location of former landfill sites in the vicinity of Little Bay beach. Agree. But, the DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach. Only two reports were made available for Trinitas Desktop Review in DSI reporting (All other reports have not been made available so far) 1. Environmental Monitoring Services, Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site – Undevelopable Area (Reference No. EMS 05 4328, in December 2005)

	2. ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) Especially, Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders. 1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999; 2. Douglas Partners Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 – 2002; and 4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004. All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. No information regarding the location of landfill cell, surveying report, long term management plan for the cell was proved to Trinitas for review.
Table 2	Please add dates to photographs in Table 2 Agree. Will do.

3.1 Information Services	The auditor agrees that the site history search needs to be expanded and includes surrounding sites. Agree. Once the Client formally requests and approves Trinitas quote, the DSI will be updated.
5.1 Data Quality Objectives	Section 5.1 details DQO – please include details and results from QA/QC samples taken as part of this DSI. Parts of the DQO section which are not relevant to this (asbestos) report should be removed/revised. In section 5.1 the DSI states that: ‘...Some of the structures located in the lot and adjacent properties may have been constructed with asbestos containing materials (ACM). Legacy dumping and layers of fill may (have) happened in the past decades....’. Please advise what structures and legacy dumping was conducted on the site (Lot 97) and what evidence there is to confirm the presence of structures and legacy dumping in Lot 97. As noted earlier this statement is confusing as it combines the probable activities which occurred off-site (with conditions on site) and it seems reasonable to assume that these activities occurred on Lot 98 and that contaminants (asbestos) was transported onto the beach area (i.e. Lot 97) by mass movement mechanisms alluded to elsewhere. Please clarify. All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. No information regarding the location of landfill cell, surveying report, long term management plan for the cell was provided to Trinitas for review. Based on site observation, Landfill locations were identified 1. Tip around Heritage Wall, lower part of the Gully 1 adjacent to the Heritage Wall (~150 Tonnes of scraped waste were observed on July 11, 2011 and smaller volume of dumped waste observed from August 2020 till now), and the whole lower part of Gully 1. 2. Landfill around Gully 2, Middle Beach After the Client formally requests and approves the additional investigations as recommended in the DSI 2021, Trinitas will update the relevant parts. Please also explain/clarify the statement: ‘...ACM fragments are observed extensively throughout the worst Middle Beach, the worse Northern Beach and the slightly contaminated Southern Beach...’. In Section 5.1.2 a series of dot point questions were posed. Please

confirm that the DSI has answered each of these and clarify the meaning of the latter part of the last dot point, viz: '...Will the DSI recommend further site investigation based on limited sampling locations and strict testing numbers....'.

Yes, as recommended in Section 10, DSI 2021.

Regarding S.5.1.2.1, please clarify what hydrogeological data is required to assist the assessment of asbestos contamination in Lot 97 or indeed in Lot 98 should this be further required.

Yes, Three Unknown Areas adjacent to Hotspots were recommended for further investigation.

S.5.1.2.2 defines the spatial site boundary (restricted to Lot 97) and also mentions that the temporal boundary of the investigation is one week from the date of the investigation (see related comments elsewhere). Accordingly, a discussion on the useability of the investigation results needs to be included in an appropriate section of the report, noting that for the purposes of remedial planning (on the site) the results may be deemed to be no longer relevant due to the short period specified above.

Disagree.

Trinitas DSI identified elevated or higher frequency of ACM fragments mostly around the Gully outlets. The point sources from Three gullies were confirmed.

The hotspot area at Southern Beach could be dumped site or buried or accumulated below and around rocks.

All of the three beaches are not the point of sources of contamination. Asbestos contamination could be managed to a certain extent. However, the point sources from gullies should be properly remediated or managed to reduce the long-term burden of Emu-picking and clearance.

Trinitas can provide specific remedial action plan to manage risks both in a short term and long-term period.

	In S.5.1.3 please clarify the reference to statistical parameters in the statement: ‘...The statistical parameters of interest are the COPC and the assessment criteria are presented in Section 0. ...’. In S.5.1.3.1 and S.5.1.3.3 please clarify the applicability of the use of 95% UCL of the mean concentrations in terms of asbestos assessment and confirm if this approach was actually adopted in this DSI. The same applies to the statements in S.5.1.3.7 regarding RPDs and precision. Please advise if and how RPDs were calculated for asbestos. In addition, in S.5.1.3.8 please advise if and how the laboratory undertook control and spike samples for asbestos and confirm what the results were in a section on field and laboratory QA/QC results. In S.5.2 Table 4, please advise how some of the PARCC items were assessed in terms of asbestos sampling and analysis and complete the table accordingly. Also please note that text appears to be missing in the second column (Laboratory Control Sample), confirm what sample extraction was required (for asbestos) and what field equipment required calibration and advise where the records are provided. Agree. Will revise and update accordingly.
Section 6 Site Assessment Criteria	The Auditor considers that the asbestos acceptance criteria presented in the DSI were adequate and generally in accordance with the requirements of NEPM(2013) and WA DOH (2009).
Section 7.3	Please explain the reference to footings in this section. Does this refer to off-site locations? Can not understand the meaning.
7.3.1 Sampling Plan and Methodology (SAQP)	Please advise whether the sampling density accounted for Table 1 of the WA DOH (2009) specified that where asbestos is ‘likely’ 2 x CSMS grid sampling is required. Can Trinitas expand the discussion in this section to reference Table 1? Does Trinitas consider sufficient samples were taken from shallow depth and deeper for the purpose of determining if the asbestos is restricted to the upper sands (say top 100-200mm) or is it found deeper down in the sand profile? Note it is recognised that in places testing has indicated that sand has (presumably) been deposited above fill possibly as a result of slope wash of fill being subsequently being superimposed by sand deposits (e.g., TP09). In addition, in some of the logs the description indicates fill, but the graphical log indicates natural

	sand (i.e., and in situ deposit at the time of sampling). Please indicate whether the materials are natural sand which contains some anthropogenic materials derived from off site or whether they are genuine fill materials. Anthropogenic materials are throughout the three beaches and immediately surroundings.

Draft

7.3.1 Sampling Plan and Methodology	Does the SAQP account for the lateral, vertical and temporal distribution of asbestos, given the asbestos may be deeply entrained in the beach sands or conversely just entrained in the top 100 mm or so? Does Trintias consider enough samples (including bulk sieved samples) were analysed below 1m depth? DSI sampling excavated up to 2.5 m or refusal in the southern beach; DSI sampling excavated up to 1 m or refusal in the middle beach; DSI sampling excavated up to 1 m or refusal in the northern beach. Visual inspection for deep excavation only, rather than grab sampling (500 mL) or sieving due to safety issue. (All fieldnotes and graphic records is available).
Section 7 Table 6	The number of test pits listed in the table are 20 (north), 9 (middle) and 9 (south) i.e., 38. The total is however listed at 45 test pits. Accordingly, these numbers do not seem to correspond. In the text following the table 44 test pits are listed. Please clarify. Note from the logs there are 45 test pits TP1-TP44 including TP37A. Agree, will do. Also, can Trinitas advise if they consider it reasonable to determine hotspots in relation to asbestos, noting that 'hotspots are defined as areas where: 1. The 95% upper confidence limit (UCL) of the arithmetic mean concentration of the contaminant is less than the relevant HIL value. 2. No individual sample concentration exceeds 250% of the HIL value. 3. The standard deviation of the sample concentrations does not exceed 50% of the HIL value. 4. A sufficient number of samples has been collected using a spatially representative sampling design (Schedule B2 provides advice on sampling requirements). Can Trinitas advise if this approach was used to define asbestos hotspots within the site, if not please provide alternative terminology? Hospots or Hot Areas in the DSI 2021: 1. Where ACM pieces were most frequently sighted and picked up (such as every site walkover and clearance inspection finds ACM piece(s) in a localized area) 2. DSI 10 L sieving sampling sighted or collected ACM fragments with gravimetric concentration over 0.02% w/w.

	3. Several ACM fragments were sighted in a localized area (Page 57, WA Guidelines 2009). 4. Or the least weighted, one or two pieces found during DSI sampling on surface. For this specific site, could DP Auditor recommend another approach to delineate these areas? Also, in Table 6 please note which samples were from the specified site (Lot 97) and which were obtained from Lot 98. Disagree. This was out of scope of work in DSI.
7.3.1 Sampling Plan and Methodology	The test pits were reportedly excavated to 2.5m depth, however a review of the test bore logs and the results table has revealed many of the test pits were shallow (0.5m) and it is not clear how many of these involved were bulk samples North – 2 of 20 test pits >1m, 7 = 1m Middle – all 10 test pits <0.5m South – 9 out of 15 test pits >1m Agree. All field notes and photographic records are available. DSI sampling excavated up to 2.5 m or refusal in the southern beach; DSI sampling excavated up to 1 m or refusal in the middle beach; DSI sampling excavated up to 1 m or refusal in the northern beach. Visual inspection for deep excavation only, rather than grab sampling (500 mL) or sieving due to safety issue. All samples labelled as TPXX_YY-ZZFCWW is defined as • Test Pit XX; • Depth from YY m to ZZ m; • Fragment Fibro Cement FC sighted or collected from 10 L sieving process • The nth of fragment: WW In section 7.3.1 the DSI states: <i>a 10 L soil sample collected from each sample location, which will be weighed...</i> Are field notes available for 10L sample sieving and analysis? Can Trintas also confirm which of the samples were tested as grab samples and which were bulk samples obtained for sieving? Please provide a detailed description of the methods employed in each case, including the decontamination procedures applied for the sampling and sieving equipment between each sample and location. Agree, will do. Please also advice what (if any) chemical analysis was undertaken and why glass jars are mentioned when sampling was apparently in >500 gm and 10 L sample size. Viz: ‘...Soil samples collected for chemical analysis will be placed into NATA accredited laboratory supplied glass jars...’. Agree, Will revise.

7.3.4 Air Monitoring	Are air monitoring results available for this DSI – can these be appended to the DSI? Agree. Will do.
8. Conceptual Site Model	See A3 – A6 above. The CSM should identify the known and potential sources of contamination, potentially affected media (soil, sediment, ambient air), human and ecological receptors and potential and complete exposure pathways. Given, the beach itself is unlikely to be a source area the CSM should list possible alternative sources. Agree, once the Client formally requests and approves the additional investigations as listed in the Trinitas Stage 1A, DSI 2021, a 3D CSM with evidence to identify point sources will be prepared after Trinitas RFQ.
CSM	The CSM should state that the DSI assessment was limited to asbestos only. A brief discussion of other COC should, however, perhaps note that other contaminants may be present derived from adjacent source sites. Agree, considering the stained or humus-like dark color of soils.
Table 8	The auditor considers that the risk of contamination on the beach (site) from asbestos is actually high given the results. Please explain the rating of low to medium in Table 8 given that asbestos contamination is known to have occurred previously and was detected by the DSI. The auditor also notes that the risk of contamination is different to the human health risk, which may well be relatively low (as determined by JBS&G (2020) and noting presumably that this issue will be further assessed in the proposed HHRA.
Table 8	Please add a discussion of potential sources of the asbestos contamination – including off site gullies, catchments, golf course land etc. It is noted that the likely sources are outside the specified site area and therefore beyond the scope of the DSI, but it is reasonably likely that contaminants are migrating onto the site from adjacent areas (source sites – apparently within Lot 98 DP270427) and these need to be at least tentatively identified as they will have a bearing on future remediation strategies for Lot 97. Agree. Once the Client formally requests and approves the additional DSI – Stage 1B quote, it will be updated. Once the Client requests and approves the surveying quote, it will be updated.
Table 8 and new section	Please add a discussion on tidal effects and the transient nature of the site characterisation (assessment). See previous

	comments. Disagree. It was out of the scope of work in the Trinitas DSI 2021. Once the Client formally requests and approves the additional data collection for coastal erosion monitoring quote, the related works will be updated.
Table 9	Please explain the phrase '...Importation of potentially contaminated fill under three beaches...'. Does this mean that the beach or part of it is considered to be reclaimed or over tipped with fill, and if so what is the geotechnical / physiographic evidence? Trinitas excavation and observation with photographic evidence identified landfill-like waste (buried, off-site migrated from gullies, or dumped) at 1. Hotspot Area 1, 2 and 3. 2. Dumped waste in Gully 1 and Gully 2; 3. Dumped waste in Golf Course adjacent to Gully 1. However, when and how the dumped waste came from are not certain. Please also clarify the phrase '...Inhalation of mist after ACM fragments polished were flushed into water..'. Presumably this means breathing in fibres rather than ingestion/drinking of fibres? In any event, please advise whether these issues will be covered by the proposed HHRA. It is hard to make a conclusion. Most of the Emu-picked ACM fragments are highly polished. Some are as tiny as a five cent coin. Some are as thin as a five cent coin. Some big fragments are still visible as corrugated Super 6 sheeting fragments. Under The dynamic environment, the polished ACM fragments could deliver fibres into sand, into water, into air. However, Trinitas continuous air monitoring results are all negative.
Section 9 Findings and Conclusions	Given the ACM fragments were/are reported as being washed up and down throughout the three beaches at Little Bay is there any case/evidence to consider classifying all asbestos as friable? It is hard to make a conclusion. Most of the Emu-picked ACM fragments are highly polished. Some are as tiny as a five cent coin. Some are as thin as a five cent coin. Some big fragments are still visible as corrugated Super 6 sheeting fragments. Some fragments could be classified as Friable according to WHS; or Non-friable as NEPM. Under The dynamic environment, the polished ACM fragments could deliver fibres into sand, into water, into air. However, Trinitas continuous air monitoring results are all negative. That is why Auditor opinions are essential.

Section 9	The auditor notes the recommendations in this section as follows: ‘...Trinitas recommends a series of approaches, measures, and strategies including further risk assessment, additional site investigation, Remedial Action Plan and Environmental Management Plan for the site subject to change with the required consultation among the client, community, decision makers and stakeholders...’. These are generally agreed. The auditor also requests that Trinitas adds a section on the relevance of the sampling undertaken in areas of tidal influence – and confirms whether they have considered sampling along the site boundaries in the vicinity of the asbestos positive locations, but outside the tidal influence, the auditor notes that such zones may be within Lot 98? Presumably such sampling might be included in the recommended further investigations. Agree. Tidal influence was out of the scope of work, as Coastal Engineer should be engaged to investigate it. Legal Site Boundaries should be done by the Client, as it was out of the scope of work. From 26 April, 2021 to 30 April, 2021, the site has the time window of lowest tide at 0.3 m and highest tide at 2.0 m. Please be aware that the lowest tide could be 0.2 m in one year period, when most of the outcrops at the Middle Beach is above water level. During the highest tide of 2.0 m, the whole Middle Beach is under water and impacted by tides up to the boulders at the outlet of Gully 2. Trinitas is of the opinion the specifically selected period at the DSI investigation is the most practical one for the contamination investigation and assessment, which was agreed with relevant stakeholders. The sampling points at the DSI already reached the most achievable low tidal lines, if not the lowest tideline. However, Trinitas is of the same opinion that the exact site boundaries of Lot 97, Lot 98, DP270427 should be surveyed and defined by the client, the Crown Land and other stakeholders. Trinitas is aware of the potential legal processes, acknowledging the fact that the site is dynamic and that site boundaries from Sixmaps or copied layouts are not clear enough to guide the DSI. In Appendix G, Photos – Southern Beach – Rock Area or Unknown

	Underwater Area, ACM fragments were already observed under water, as most of the Rock Area was easily accessible via bare feet. The auditor generally concurs with the above recommendations in particularly (at this stage) that additional investigations are required. Accordingly, the auditor requires that Trinitas specify the purpose, nature and location of these investigations and prepares a detailed SAQP prior to undertaking any further sampling. Trinitas DSI is just a Stage 1A – Detailed Site Investigation. Additional investigations can be conducted exactly suggested by the DP site auditor, only after the client approves them. Trinitas, however, need to make a formal statement regarding the findings of the DSI report specifically whether the site is or can be made suitable for the specified land use, in particular whether any or all of the site assessment criteria have been met (viz ACM <0.02% w/w, FA/AF <0.001% w/w and NVA at the surface). As shown in Appendix D: DSI Site Layout, Sampling Locations, Positive Test Pits and Maps, DSI report: Three Hotspots have ACM over 0.02%, <0.02%, ACM fragments observed on the surfaces and ACM fragments sighted during excavation or during 10 L sieving process. All other areas except unknown contamination areas are considered to have diffused sources of contamination. Trinitas is of the opinion that most of the ACM fragments will undergo subsequent processes: stirring, polishing, sieving, washing up and washing all the time. The clearance report and emu picking with photographic records in the past year from August 2020 to July 2021) clearly demonstrated the highly polished ACM fragments could be as thin as a five cent. “whether the site is or can be made suitable for the specified land use” depends on the Human Health Risk Assessment Reports by JBSG. The DSI will be updated accordingly. However, Trinitas is of the opinion that if all of the recommendations listed from Page 42 to Page 45 at Section 10, DSI are implemented, It is possible to make the site suitable for the specified land use. There are still unknown contamination conditions and uncertainties after the Trinitas DSI 2021. Trinitas is happy to consider all ideas and recommendations from the auditor, the council, EPA and all other stakeholders.
Section 10	Following the necessary amendments to the current DSI and recommended further investigations, the auditor concurs that an RAP should be prepared for the site in accordance with <i>Schedule B2 – Guideline on Site Characterisation</i> (NEPM (2013) and NSW EPA (April 2020) <i>Consultants Reporting on Contaminated Land Contaminated Land Guidelines</i>. It is however noted that

	remediation of the beach areas will likely be ineffective without remediation of the source areas (of asbestos). Agree. Trinitas recommends further investigation of Unknown Immediate Surrounding Areas, Point Sources as shown in Appendix D: DSI Site Layout, Sampling Locations, Positive Test Pits and Maps, DSI report, in order to prepare a remediation plan and to address the contamination issues in a short term, medium period and long term period with the consultation and engagement of key stakeholders.
Appendix F Test Pit Logs	Please clarify on the logs if these are Test pits or Boreholes, presumably the former and amend minor typos (shovel for shovel etc), Agree. Will do. Trinitas used Test Pit method by 5-T excavation. Shovels or hand tools were used to collect samples for testing. All logs will be updated accordingly. For USCS – please check that material with building rubble and inclusions is correctly identified as FILL rather than SAND (see earlier comment). Agree. Will be revised. Sands with minor tiles, glasses will not be labelled as Fill. Please define 'legacy tip'. Background Based on limited site historical information, Legacy Tip in Trinitas DSI report could be old rubbish dumps, legacy landfill, old garbage tip, unregistered dumped/buried cells, whatever happened during the 100 years at the site. Especially, the demolition of buildings of Male Lazaret and Female Lazaret or other subsequent buildings were dumped in the gullies or catchments areas. Old rubbish dumps are littered across the state. Some of the illegal waste dumped at the old tips could include asbestos, pesticides and dangerous chemicals. There could be landfills exempt from EPA licences and there may be sites that have not been reported. These closed garbage tips, known as "legacy landfills", pose a major challenge for councils as they struggle to fund a clean-up. The community was concerned some of the old tips were leaching hazardous materials, but that too little work had been done to assess the extent of the problem. In Trinitas Technical Brief, Section 3.2 Interview with a local resident disclosed that: "As part of the Site history review, an interview was held with the representative from the Client on 3 August 2020. The interview revealed no former report of asbestos contamination at Little Bay Beach.

A Trinitas Hygienist met a local resident (Greg Bond) on the beach on 31 August 2020. Greg has around 50 years of knowledge of the Site. Greg indicated that “the legacy dumped tip locates on the northern hill top adjacent to Crown Gully 1 and Northern Beach”, but the demolition of buildings of Male Lazaret and Female Lazaret or other subsequent buildings around the Crown Gully 1 and Crown Gully 2 during a 100 year period could not be reflected.

Fill or dumped waste in the catchments at the upstream of Old Retaining Wall in Crown Gully 1 and other two three gullies could be likely, as some front areas of the Golf Course were used a sand quarry. In the past 100 years, the sewer, the catchment areas and / or the gullies from the old hospital site could deliver all types of solid waste up to the sea as close as 3 KM away (some rubbish were pushed up and down towards the bay).”

As mentioned in EMS report (D00229667 Environmental Monitoring Services - Prince Henry Redevelopment Site - PHLB Undevelopable areas remediation strategy report EMS 211205), a cell or two cells were proposed. However, no reports were provided by the Client for reference.

Especially, the following reports are desirable and crucial.

1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999;
2. Douglas Partners Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site;
3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 – 2002; and
4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004.

Trinitas assumes that all of these previous PSI reports should have already done a good quality desktop review regarding the dumped landfills/tipping locations. However, all of these five reports were not made available for DSI report.

Therefore, DP should resort to its own archive database for old tips related information, but Trinitas was not provided all those documents by the client.

Please confirm if sand with building rubble should be classified as fill? See earlier comment.

TP21 – Please discuss the sand logged over fill in this location in the appropriate part of the report?

	Trinitas Consultant is of the opinion that Middle Beach or Western Beach has fill throughout with abundant glass, tiles and other anthropogenic materials under the top layer of sand. The visually clean sandy layer is just around 10 cm thick or less due to tidal effect from either the wash down of the Gully 2 or washup/deposit from the bay or both of them are the formation mechanisms. Significant volumes of bricks, glasses, rocks, concrete pieces throughout the Middle Beach were observed in the subsurface. (The collapse of a former dam and dumped waste were washed down all the way into the water). Please refer to “Short, A.D.(2012)Coastal Processes and Beaches. Nature Education Knowledge 3(10):15” for a basic idea of sand formation on the top of the beach. Therefore, Trinitas differentiates fill from top sand stratum at Test Pit 21. Actually, all of test pits at Middle Beach or Western Beach Sand Area were illustrated in the same manner to clarify the different strata. Please refer to Page 31, Schedule B1, Guideline on Investigation Levels for Soil and Groundwater, NEPM 2013. Please refer to Appendix E: Representative Photographic Records in Trinitas DSI 2021. 1. Item 9, TP22_1.0, Fill with Brick, glass, sand, tile, shell, concrete under top sand. In Photos - Middle Beach, from Photos - Middle Beach (Western Beach) – Hotspot as the Whole Sand Area 2. Page 67, Photos - Middle Beach (Western Beach) – Crown Gully 2, Appendix E: Representative Photographic Records 3. During a certain period, the top sand is visually clean. https://www.dropbox.com/s/ugoczwnmaqrbrb/IMG_7808.MOV?dl=0 The video showed that the Middle Beach was almost completely under water and impacted by strong currents and tides.

Appendix G Data Summary	Reference Eurofins Report 791709-AID Can Trinitas explain the analysis/results from sample TP28_0.5 and TP28_0.5FC01 Not sure what DP question means? Is it a question about NATA lab testing explanation? Or are you asking about the difference between NEPM testing (for TP28_0.5 was collected (500 mL) from the test pit using shovel, asbestos in soil NEPM) and Asbestos Testing as WA DOH (Fragments over 7x7mm collected during 10L soil sieving, TP28_0.5FC01 over 7mmx7mm dimension was collected from the sieve)? Or why Trinitas took two testing approaches? Please refer to Eurofins Report 791709-AID, Page 10, TERMS.
Appendix G Data Summary	Field notes for 10L sieved samples need to be added to the DSI. Agree. Will do. Asbestos in soil concentration by gravimetric approach as NEPM 2013, Schedule B1 – Guideline on Investigation Levels for Soil and Groundwater (page 31), WA DoH guideline, 2009 On page 132, DSI V1 Draft; Also, on page 132, DSI V1 Draft, P32, “deleted cement Brown fine-grained sandy soil” at left hand corner.

4. Conclusion

In summary, the auditor considers that the DSI report is quite poorly drafted and lacks attention to detail and reporting precision throughout.

In general, the auditor is of the view that the report should be carefully rewritten to record what was actually done and how this was achieved (i.e. written in the past tense), and not what will be done (future tense), as it is in parts, and should reflect the actual works/sampling undertaken (asbestos only) rather than describing extraneous details relevant to chemical contaminants which were not addressed as part of the DSI as these were beyond the agreed scope. The auditor assumes that in part this may be a cut and paste issue with insufficient editorial checking.

The site area and boundary must be accurately defined, such that the site and the adjacent lands are clearly defined and articulated as separate sites. It is noted that sampling was undertaken beyond the specified lot boundary, and this should be acknowledged. Descriptions of the site and adjacent lands should also be separated and not merged as this makes comprehension of the report quite difficult. In addition, it should be acknowledged that where observations and/ or sampling was undertaken beyond the specified site/lot boundary that these are reported as being off-site.

In general, there are numerous technical issues associated with the DSI report that these make a comprehensive and detailed review quite difficult, notwithstanding this IAL has attempted to highlight the main technical issues which need to be addressed.

Accordingly, it is considered that the DSI report requires considerable amendment before it can be deemed to meet the requirements set out in the various relevant guidelines made and endorsed under Part 4 of the CLM Act. In addition, the auditor notes that if the DSI is to put on public exhibition on the Council website (similar to previous reports), then it is essential that the report is properly and coherently drafted and is technically robust.

Having said this the auditor does not disagree with the consultant's overall findings and recommendations as set out in Table 10.6 and concurs that further investigations are required (which need to be specified via the preparation of a detailed SAQP). The auditor also agrees that a formal risk assessment should be conducted. It is however recommended that an interim EMP is drafted to formalise the make safe measures for Little Bay Beach, and that significant revision of the DSI is required before it is issued to other parties as mentioned in Items 3 and 4 of the Table 10.6.

The auditor considers that the risk of site contamination is high (i.e., the auditor disagrees with consultant in this regard) and that the risk of beach contamination from asbestos is likely to remain high for the foreseeable future. However, the auditor is currently unable to form an opinion on the risk to human health posed by the asbestos within the subject site or beyond, or indeed the likely changes to these risks over time. In large part this due to the constantly changing (dynamic) environment in both the subject site and in all likelihood the source site(s).

It is however, noted from the laboratory results that for the most part the asbestos detected was in particles of building materials rather than being disseminated throughout the sand (or fill) and that the analysis further suggests that the asbestos detected is in the form of bonded ACM rather than FA/AF (fibrous) asbestos materials.

In this regard the auditor considers that the highly attritional conditions of the beach environment may be a significant factor in reducing the likelihood of FA/AF (fibrous) asbestos materials being present although this situation could change and it is noted in this context that the DSI is time limited viz '*...the temporal boundaries were determined on the basis of the timeline of one week for the current investigation...*' (S.5.1.2.2 of the DSI).

Yours faithfully

Douglas Partners Pty Ltd



J M Nash
Principal

Please note that the above information, interim advice and opinions do not pre-empt the eventual site audit findings nor do they constitute a site audit as defined under Part 4 of the Contaminated Land Management Act, 1997.

Attachment
Stylized Cross Section

ⁱ <https://www.wrl.unsw.edu.au/file/wamberal-coastal-erosion-july-2020>

Draft

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Asbestos / Fill
Deposition Zone &
Exposure Zone

Boach



Tidal Movement Area
Backward & Forward Migration (Asbestos)

Asbestos below water

Mass Movement Erosion / Transport Deposition
Sheet / Rim / Gully Erosion

Storm Tide
High Tide
Low Tide

1

Randwick City Council
30 Frances Street
Randwick NSW 2031

Project 205690.00
9 July 2021
IAA2-205690
JMN:jl

Attention: Stephen Leung

Email: stephen.leung@randwick.nsw.gov.au

Interim Advice Letter 2
Non-Statutory Site Audit DPNS/19
Lot 97 Little Bay Beach, Little Bay Lot 97 DP270427

1. Introduction

This letter provides Randwick City Council (RCC) and their Environmental Consultant - JBS&G Australia (JBS&G) with interim advice (IAL) as part of Non-Statutory Site Audit DPNS/19 being undertaken by Mike Nash, an NSW EPA Site Auditor accredited under the Contaminated Land Management (CLM) Act. The advice concerns the assessment of contamination risks at the site located at Lot 97 Little Bay Beach, Little Bay Lot 97 DP270427 (Figure 1 - the site). The interim advice has been provided in accordance with a proposal issued by DP dated 8 June 2021 and a purchase order PIS20761 provided by RCC dated 18 June 2021, subject to DP terms and conditions.

The report reviewed as part of this IAL includes:

- JBS&G (June 2021), Interim Human Health Risk Assessment for Asbestos Reference 59811-138906 (Revision A) draft.

This IAL does not pre-empt the conclusions which may be drawn at the end of the site audit process and does not represent a Site Audit Statement (SAS) or a site audit report (SAR).

2. The Site

The auditor notes that the extent of the site specified in the HHRA (Figure 2) is the cadastral site boundary. As such, some of the sampling locations from the Trinitas DSI¹ appear to be outside the defined site area. The auditor considers the inclusion of the additional results likely correspond to a higher positive asbestos count than would otherwise be the case, therefore making the HHRA result more conservative. Can JBS&G comment in this regard?

¹ Trinitas Group (June 2021) Detailed Site Investigation of Potential Asbestos Contamination at Little Bay Beach, Little Bay NSW Randwick City Council, Little Bay Beach - 4R Coast Hospital Rd, Little Bay NSW, dated 29/06/2021 Revision 3 ('the DSI report').

3. Auditor Comments

The auditor considers the HHRA to be generally well written and technically sound. The following specific comments are provided for consideration.

3.1 Specific Comments

HHRA Section	Auditor Comments
Executive Summary	Reference is made in this section and throughout to the eastern boundary of the southern beach area. Can JBS&G confirm. Is this the shoreline of the southern beach? Please clarify.
Section 1.11	Can JBS&G confirm that Clearance Inspections and Certificates reviewed in this section are for works undertaken in August and September 2020 and the DSI for works undertaken in April 2021. The auditor understands emu-picking was also undertaken in the intervening and subsequent months respectively. The auditor considers the results from these additional events should be provided to JBS&G for consideration in their assumptions.
Section 1.11	Regarding Trinitas (2021) the auditor considers that an assessment of the integrity of the Trinitas sampling methodology and data on which the HHRA has been based should be included in this section (data integrity assessment), noting that the reliability of the data is paramount to the reliability of this HHRA. Please confirm whether JBS&G considers that additional data/assessment is required as input into the HHRA, or whether they are satisfied with the current data set?
2.2.1 Preliminary Estimate of Asbestos Occurrence	The auditor notes that a number of assumptions were made to estimate the total volume or weight of asbestos collected which was in turn was converted to a concentration of asbestos. Can JBS&G confirm that Trinitas similarly recorded these details, or whether this information was derived solely by JBS&G? See also comment above regarding additional Trinitas emu picking events / clearance reports. All available field data should be included in these calculations. The auditor notes that asbestos concentrations have been converted into the unit 'mg/kg'. Can JBS&G ensure that for the purposes of this NSW EPA audited site, the preference would be to adopt the unit '%w/w' (for comparison with NEPM 2013 HSLs rather than the more recent NZ guidelines).

HHRA Section	Auditor Comments
2.2.3 Summary of Asbestos Occurrence	The auditor notes the reference by JBS&G to bias (targeted sampling) of the locational and depth focus in areas where ACM was expected by Trinitas. Does JBS&G consider additional grid sampling to address data gaps would improve the dataset used for the HHRA, or does the data currently employed likely introduce a more conservative result than would otherwise be the case if genuine grid sampling had been deployed? The auditor notes that as asbestos is an 'isolated, physical contaminant that does not generally fit the normal distribution model', the notion of asbestos hotspots should perhaps be avoided. Can JBS&G comment on?
Section 6 Exposure Assessment	Please confirm whether JBS&G considered extreme weather events which may alter the conclusions of the HHRA - for example king or storm tides and 1 in 100 year flood events. The auditor considers that either of which may cause spikes in the occurrence of asbestos or the redistribution of asbestos in the site, including within the sand body and on rock shelves etc, or by mobilising asbestos from below the low water mark onto the beach. Similarly in the case of heavy rainfall increased occurrence may occur by increasing asbestos supply from the probable source areas onto the beach via erosion and transport? Please comment.
Section 6 Exposure Assessment	Please confirm whether JBS&G considered times of increased public activity at the beach - for example the summer holiday months when the movement of sands due to activities on the beach and possibly at the mouths of gully areas may increase substantially?
6.5.4 Reduced Asbestos Exposure during Rain Days	Please advise whether JBS&G has considered the possibility of higher asbestos fibre emissions during hot and dry conditions and increased dust / wind of summer months? See also comment above regarding increased public use of the beach.
Section 10.1 Recommendations	Can JBS&G provide an opinion based on the findings of the HHRA as to whether the beach should be closed to the public until the recommended management (remedial) plans have been prepared / actioned? Can JBS&G comment on the purpose of an asbestos register for a site which is being routinely remediated by emu picking and is also subject to tidal movements, coastal processes etc, noting that the distribution of asbestos is unlikely to remain static even over fairly short periods?

The auditor will await a response from JBS&G regarding the above comments, including inclusion of all available information in the assumptions and calculations prior to acceptance of the HHRA.

Yours faithfully
Douglas Partners Pty Ltd



J M Nash
Principal

Please note that the above information, interim advice and opinions do not pre-empt the eventual site audit findings nor do they constitute a site audit as defined under Part 4 of the Contaminated Land Management Act, 1997.

Paula Maurici

From: Stephen Leung <Stephen.Leung@randwick.nsw.gov.au>
Sent: Wednesday, July 14, 2021 3:18 PM
To: Mike Nash
Cc: Paula Maurici; Joe Santangelo; Evan Buntoro
Subject: RE: Little Bay IAL2

Categories: Filed by Newforma

OK thank you Mike, much appreciated for your second review of the HHRA and associated returned comments from JBS&G.

We are expecting a response from Trinitas today. They'll have some clarifications they'll need you to confirm prior to finalising their DSI.

Kind regards,

Stephen Leung
Project Manager
Randwick City Council
02 9093 6729
0404 265 870
stephen.leung@randwick.nsw.gov.au
www.randwick.nsw.gov.au



From: Mike Nash <Mike.Nash@douglaspartners.com.au>
Sent: Wednesday, 14 July 2021 2:53 PM
To: Stephen Leung <Stephen.Leung@randwick.nsw.gov.au>
Cc: Paula Maurici <paula.maurici@douglaspartners.com.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>
Subject: RE: Little Bay IAL2

Hi Stephen

I have reviewed the amended HHRA (dated 11 July 2021 ref 59811-138906 (Revision B) and related feedback from JBS&G as below, and consider that they have suitably addressed the issues raised in IAL2, and in general I agree with their conclusions and recommendations with respect to Lot 97 DP270427.

Regarding any other remediation or management options which may be available e.g. along the (landward) site boundary of Lot 97, or beyond, these should be considered and addressed by the DSI consultant.

As yet I have not, however, seen any revision to the DSI, nor any response by Trinitas following on from IAL1 and therefore I am unable to comment further at this time.

Kind regards.

Mike Nash | Principal

Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au

96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685

P: 02 9809 0666 | M: 0414 716 501 | E: Mike.Nash@douglaspartners.com.au



To find information on our COVID-19 measures, please visit douglaspartners.com.au/news/covid-19

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From: Stephen Leung <Stephen.Leung@randwick.nsw.gov.au>

Sent: Monday, 12 July 2021 11:03 AM

To: Mike Nash <Mike.Nash@douglaspartners.com.au>

Cc: Paula Maurici <paula.maurici@douglaspartners.com.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>

Subject: FW: Little Bay IAL2

Hi Mike,

Attached is the updated HHRA and response from JBS&G as seen in their email below for your review / comment.

I am targeting to have the DSI and HHRA finalised by this Wednesday at the latest so I can provide the recommendations from these reports to executive management on the same day.

Kind regards,

Stephen Leung

Project Manager

Randwick City Council

02 9093 6729

0404 265 870

stephen.leung@randwick.nsw.gov.au

www.randwick.nsw.gov.au



From: Matthew Parkinson <Mparkinson@jbsg.com.au>

Sent: Sunday, 11 July 2021 4:18 PM

To: Stephen Leung <Stephen.Leung@randwick.nsw.gov.au>

Cc: Michael Samuel <MSamuel@jbsg.com.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>

Subject: RE: Little Bay IAL2

Stephen, please find attached revised report. Responses to Site Auditor comments following and revised in text where appropriate.

Comment 1 – clarified as south-eastern portion of southern beach throughout text.

Comment 2 – Section 1.11 updated to note review of all reports (now undertaken). Minor edits made throughout document.

Comment 3 – Section 1.11.11 added.

Comment 4 – all of these calculations have been required to be undertaken by JBS&G in absence of this level of assessment in the Trinitas documentation. The report has been revised to report asbestos as %w/w s well as mg/kg.

Comment 5 – JBS&G agrees that ‘data currently employed likely introduces a more conservative result than would otherwise be the case if genuine grid sampling had been deployed’. The conservatism as caused by the biasing of the Trinitas sample locations has been noted through the assessment. The estimated risk levels on this likely conservative data is noted to be well below the acceptable levels. Further grid based sampling may be warranted where risk levels were approaching acceptable levels, and greater confidence was needed that the site did not pose an unacceptable health risk. Otherwise it is most likely that additional grid based sampling will simply result in lower levels of health risk being estimated. No reference to asbestos hot-spots is identified in the text. However an area of greater occurrence has been identified at the south-eastern portion of the southern beach.

The Site Auditor comment with respect to statistical analysis of data is also noted. The decision to fit the data to a distribution to determine a 95% upper confidence limit estimate of the site average is based on a consideration of likely human behaviours on the Beach, other the potential distribution of asbestos. It is agreed that the asbestos is likely to be heterogeneous, but through biasing of sampling locations / depths to target more likely locations of asbestos that has introduced conservatism to the risk assessment process.

Comment 6 – it is considered that the conservatism in the sampling is sufficient to address the extreme weather events as noted by the Site Auditor. This is discussed in a revised Section 9.3.

Comment 7 – the risk assessment has been based on a chronic dose to asbestos. The exposure parameters adopted are considered sufficiently robust to be protective of increased incidence of beach activity during, as offset with inevitable decreased activity during cooler months / poor weather, and further noting that a substantial proportion of beach activity will not comprise the active agitation / disturbance of the site sands that may cause the release of asbestos fibres. The sensitivity of the risk estimates to exposure durations have been discussed in Section 9.4.

Comment 8 – the hot and dry conditions that may occur to cause a potential increase in asbestos fibre emissions are not considered applicable to an intertidal / seaside locations such as Little Bay. It is must be noted that the site is likely to more subject to inundation / higher moisture levels than the construction sites / development sites that have been adopted in the development of the dataset used to estimated potential asbestos fibre emissions. This additional factor, as adopted in the WA guidelines is only applicable for locations where no water ingress / proximity is likely.

Comment 9 – JBS&G are of the opinion that most significant findings of the Trinitas works is that there are no occurrences of asbestos fines / free asbestos / friable asbestos on the site. Put simply, asbestos fibres are not caused to be released from bonded asbestos – and in absence of the release of asbestos fibres there is no health risk. Even by the assumption within the risk assessment that the asbestos on the Beach will spontaneously decompose and be available as free asbestos fibres – an unacceptable health risk cannot be estimated. The recommendations as provided by JBS&G relates only to the maintenance of an aesthetic condition of the Beach that would be expected by the community. They are in no way driven or guided by an unacceptable level of potential cancer risk.

The Asbestos Register is a function of the Work Health and Safety Act 2011 and Work Health and Safety Regulation 2017 which make no provision for potential levels of health risk – are absolute in their application.

Happy to discuss further if required. Thanks, matt



Matthew Parkinson | Senior Principal Environmental Engineer | JBS&G
Sydney | Melbourne | Adelaide | Perth | Brisbane | Canberra | Darwin | Wollongong | Bunbury
Level 1, 50 Margaret Street Sydney NSW 2000

T: 02 8245 0300 | M: 0414 923 375 | E: mparkinson@jbsg.com.au | W: www.jbsg.com.au

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From: Stephen Leung <Stephen.Leung@randwick.nsw.gov.au>
Sent: Friday, 9 July 2021 3:13 PM
To: Matthew Parkinson <Mparkinson@jbsg.com.au>
Cc: Michael Samuel <MSamuel@jbsg.com.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>
Subject: FW: Little Bay IAL2

*****[EXTERNAL EMAIL] Stop and think before opening attachments, clicking or responding.*****

Hi Matthew,

Attached is the independent audit notes from the Site Auditor for the HHRA.

Can you please review the report and provide the appropriate amendments and/or responses to each of the auditor's notes?

We are targeting to have all of our reports finalised by next Wednesday, so can you please provide me with your amended report and/or comments by then?

Kind regards,

Stephen Leung
Project Manager
Randwick City Council

02 9093 6729

0404 265 870

stephen.leung@randwick.nsw.gov.au

www.randwick.nsw.gov.au



From: Mike Nash <Mike.Nash@douglaspartners.com.au>

Sent: Friday, 9 July 2021 11:33 AM

To: Stephen Leung <Stephen.Leung@randwick.nsw.gov.au>

Cc: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>; Paula Maurici <paula.maurici@douglaspartners.com.au>

Subject: Little Bay IAL2

Stephen

Please find attached IAL2 for the HHRA by JBS&G.

Apologies for the slightly late delivery.

Any questions please give me a call.

Regards.

Mike Nash | Principal

Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au

96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685

P: 02 9809 0666 | M: 0414 716 501 | E: Mike.Nash@douglaspartners.com.au



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Randwick City Council
30 Frances Street
Randwick NSW 2031

Project 205690.00
22 July 2021
IAA3-205690
JMN:jl

Attention: Evan Buntoro

Email: Evan.Buntoro@randwick.nsw.gov.au>

Interim Advice Letter 3
Non-Statutory Site Audit DPNS/19
Lot 97 Little Bay Beach, Little Bay Lot 97 DP270427

1. Introduction

This letter provides Randwick City Council (RCC) and their Environmental Consultant - Trinitas Group (Trinitas) with interim advice (IAL) as part of Non-Statutory Site Audit DPNS/19 being undertaken by Mike Nash, an NSW EPA Site Auditor accredited under the Contaminated Land Management (CLM) Act. The advice concerns the assessment of contamination risks at the site located at Lot 97 Little Bay Beach, Little Bay Lot 97, DP270427 (Figure 1 - the site). The interim advice has been provided in accordance with a proposal issued by DP dated 8 June 2021 and a purchase order PIS20761 provided by RCC dated 18 June 2021, subject to DP terms and conditions.

The purpose of the non-statutory audit is to determine whether the Trinitas DSI meets the requirements of, and is compliant with, the guidelines made and endorsed under the Contaminated Land Management Act, 1997. The version of the DSI reviewed by the auditor (subject of IAL1) is:

- Trinitas Group (June 2021) *Detailed Site Investigation of Potential Asbestos Contamination at Little Bay Beach, Little Bay NSW* Randwick City Council, Little Bay Beach - 4R Coast Hospital Rd, Little Bay NSW, dated 29/06/2021 Revision 3 ('the DSI report').

This IAL (IAL3) addresses the following response provided by Trinitas:

- Trinitas Group (20 June 2021) *IAL1 205690 dated 2 July 2021 - Trinitas Response dated 15 July 2021*.

This IAL does not pre-empt the conclusions which may be drawn at the end of the site audit process and does not represent a Site Audit Statement (SAS) or a site audit report (SAR). The attached table (Detailed Comments on Trinitas' Responses to IAL1 dated 15 July 2021) provides individual replies to each response to comments by Trinitas.

2. Auditor's General Comments

2.1 Site Boundary and Previous Reports

The auditor considers the cadastral boundary of the site (Lot 97 DP 270427) should be adopted in the absence of a survey. The auditor notes that the boundary of particular interest / relevance is the boundary which is shared with other land-owners (Prince Henry Centre and Golf Club Centre, the Coast Golf Course, Crown Gully 2, etc).

Previous reports prepared for adjacent sites will likely be owned by the current / previous land-owners or developers. Release, novation, etc. may be required to gain access to these reports. It is not however considered imperative to review these reports as they are outside the Lot 97 site boundary, although they may provide invaluable information on potential asbestos source sites. In addition, a review of any EPA notices / available data (e.g., council records such as Section 10.7 Certificates) relating to these sites is relevant. Additional comments on this issue and related matters are provided in the attached Table.

2.2 Friable Asbestos

The auditor refers to the responses added to pages 23-25 (of 56) of IAL1. The auditor notes that, by definition, AF and FA are also friable. For clarity, the DSI definition for friable asbestos should therefore include AF and FA. For the purpose of this DSI, the auditor considers NEPM definitions should be adopted. In NEPM the following statement is noted:

'From a risk to human health perspective, FA and AF are considered to be equivalent to 'friable' asbestos in SafeWork Australia (2011), which is defined therein as 'material that is in a powder form or that can be crumbled, pulverised or reduced to a powder by hand pressure when dry, and contain asbestos.'

The section added by Trinitas (page 24 of 56) includes the following extract:

'...2. Few Friable Asbestos fragments (frequency: 2 out of 2000 suspected ACM fragments) as WHS Legislation defined were collected during Trinitas's one-year Emu-picking and Clearance from August 2020 to July 2021. [As shown in the images below], they can be easily crumbled, but a sort of weathered, polished and bonded forms. Therefore, as shown in the following images, some fragments could be classified as Friable according to WHS; or Non-friable as NEPM...'

The auditor requires a clear statement regarding the presence / absence of friable asbestos based on observations and laboratory results be included in the updated DSI. In particular it is noted that the DSI report Rev3 indicated that no friable asbestos was present (whereas Rev 2 of the DSI reported that some friable asbestos was present) and subsequently the response as referenced indicates that friable asbestos may be present. Accordingly, can Trinitas please confirm whether friable asbestos was actually present during the DSI and if it is Trinitas's opinion that the asbestos classified as AF / FA (or not) and why and whether Trinitas intend to further change their opinion in Revision 4? Additional comments on this issue and related matters are provided in the attached Table.

Moreover, the conclusion regarding the presence/absence of friable asbestos (AF or FA) as defined in NEPM will have implications for the JBS&G (June 2021), *Interim Human Health Risk Assessment for Asbestos*.

2.3 Conceptual Site Model

The auditor notes that the development of a suitable CRM is a requirement of the guidelines listed below and is an integral component of all reports prepared for contaminated site assessment, including DSIs. Accordingly, the auditor considers that the requested CRM is not beyond the scope of works which should have been included in the preparation of the DSI and therefore should have been included at the outset. Additional comments on the CSM and related matters are provided in the attached Table.

2.4 Internal Review

Based on the response from Trinitas as referenced above and which is further examined in the attached table, which the auditor considers this to be rather repetitive, and it is therefore recommended that Revision 4 of the DSI should be carefully and thoroughly reviewed by Trinitas and that such a review is preferably undertaken by a Certified Environmental Practitioner (CEnvP-SC) prior to finalising and re-submission (we understand that such a person is listed on the Trinitas website). This internal review should particularly address the responses to IAL1 and the related technical requirements of the published guidelines on the preparation of DSI's including *inter alia*:

- *National Environment Protection (Assessment of Site Contamination) Amendment Measure* (NEPM 2013), *Schedule B2 - Guideline on Site Characterisation* (NEPM (2013));
- *NSW EPA Consultants Reporting on Contaminated Land Contaminated Land Guidelines April 2020, Table 2.3 - Detailed Site Investigations; and*
- *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated sites in Western Australia* (WA DOH, 2009), including subsequent additions.

Additional comments on this issue and related matters are provided in the attached Table.

2.5 Further Works

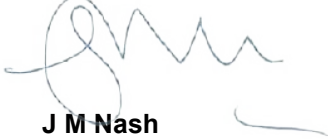
Additional field work is not considered to be required at this stage for the updated DSI, except perhaps further testing within the three defined 'hotspot' areas within Lot 97, although again the purpose of any such additional testing would need to be clearly articulated by Trinitas. Nor does the auditor believe that further investigation is required below the low tide level (Stage 1 B as recommended by Trinitas). Notwithstanding, however make safe measures (including fortnightly emu-picking / clearance inspections, barricades and signage) are supported. Consideration should also be given in the DSI to the preparation of and RAP/AMP, VR and eventually an EMP, although it is noted that such documents will need to deal only with Lot 97, at least initially.

Along with your amended/revised DSI (Rev 4) please also provide any recent asbestos clearance / emu picking reports to the auditor for information.

As with Rev 4 of the DSI, the auditor recommends that all further documents prepared in the next phase of the project including the RAP / AMP should be prepared and / or reviewed by a Certified Environmental Practitioner (CEnvP-SC).

Yours faithfully

Douglas Partners Pty Ltd



J M Nash

Principal

Please note that the above information, interim advice and opinions do not pre-empt the eventual site audit findings nor do they constitute a site audit as defined under Part 4 of the Contaminated Land Management Act, 1997.

Attachment

Detailed Comments on Trinitas' Responses to IAL1 dated 15 July 2021

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
1	This site layout was extracted from Trinitas Brief, rather than from the Trinitas DSI 2021. Refer to Appendix D: DSI Site Layout, Sampling Locations, Positive Test Pits and Maps. The week from 26 April 2021 featured lowest tide 0.3 m, highest tide 1.8 m, light or fresh wind, slight swell. Sampling taken above 0.4 m tide as much as practical, but not for sand areas underwater.	Noted. However, as observed previously, the site needs to be properly defined with the real property boundaries of Lot 97 DP270427 clearly shown. If Trinitas consider that the Lot boundary (image) from Six Maps is insufficient to accurately identify the site, then alternative arrangements should be made to define the boundary. In this regard RCC as the planning authority should have access to accurate lot information, for example via S.10.7 Certificates, etc. including the location of the landward and seaward boundaries, with the latter likely to coincide with the low tide mark, although it is understood that such definitions are complex and may be subject to common law issues, see: https://www.accarnsi.unsw.edu.au/sites/accarnsi/files/uploads/PDF/Discussion/Principles%20and%20Problems%20Of%20Shoreline%20Law.pdf
2	Various inserted versions of Figures	Amendments noted. In relation to Figure 1-3 it is interesting to note that the various asbestos 'hotspots' are focused on the areas of the Northern, Middle and Southern Beaches where the corresponding creeks / gullies debouch onto the corresponding beach, which may perhaps lead to a fairly obvious conclusion regarding the source of contamination.
3	This site layout was copied pasted from Six Maps NSW, https://maps.six.nsw.gov.au/. However, there is no clear definition of the lower tidal line (lowest tide 0.2 m? 1.8 m?; Highest tide 2 m? 1.3 m?). Trinitas recommends a certified surveyor to define the boundaries for the site, crown land and adjacent lands and properties, which was out of the scope of work in the DSI. Under severe conditions of tide heights in the range of 1.4 m to 1.8 m, rough swell height and strong to gust wind, the whole Middle Beach, Most of Northern Beach, and ~80% of Southern Beach are either under water or impacted by currents. The total area of sands could be just ~1500 m².	Noted. See comment #1 above. It does however seem evident that even the normal tidal range experienced at Little Bay probably extends to the boundary of Lot 97 and at times may be significantly beyond the landward Lot boundary as evidenced by the geomorphological features such as the wave cut notch in sandstone at the base of the low cliffs, wave cut platforms etc., plus other features as shown in some of the photographs provided by Trinitas. My recommendation is that the Lot 97 boundary which is available currently is used for this DSI, but that this should be cross checked though suitable real property information which may be readily available from a number of existing sources, including <i>inter alia</i>: • Historical and current title deeds – available for example via Lot Search etc; • NSW EPA Public Registers; • Section 10.7 (2) & (5) planning certificate (assumed to be providable by client in this case); and

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
		Other Council records. Further details can be found in NEPM Schedule B2 etc. See above. From observations made during the auditor's site inspection and from the photographs and tide information provided it seems reasonable to conclude the entire beach and base of the 'cliff line' will from time be subject to wave action and currents. The effects of such an environment would likely cause existing asbestos contamination on the beach / rock platforms to be moved / redistributed within that environment and potentially for further asbestos to be sourced from: (i) the tidal fringe and the hinterland immediately beyond (also depending on other factors such as rainfall), and (ii) to be moved from below the low water mark up onto the beach by wave action.
4	Agree, Trinitas recommends a certified surveyor to define the boundaries for the site, crown land and adjacent lands and properties, which was out of the scope of work in the DSI. The DSI focused on the physical boundaries with a short period of one week (lowest tide 0.3 m, highest tide 1.8 m) whatever the soil was practically accessible during normal work hours, but not for areas under water for such a dynamic environment, The best practical investigation area as shown in Figure 1-1 (Normally tide height ~0.5 m, because it is almost impossible to arrange the sampling at the lowest tide of 0.2 m). The approximate accessible sand area of three beaches could be 10400 m² (Please do not be unrealistic of the numbers, they keep changing all the time).	See above. The investigation area should be as defined by the boundaries of Lot 97. Regarding the low tide mark some discretion is obviously reasonable and is therefore taken into account in terms of both determining the site area related sampling density.
5	However, under extreme conditions, tides could impact the sand areas up to the Retaining Wall at Southern Beach. For example, with rough swell 3.5 m, 1.8 m tide, strong wind or gust, three beaches are severely impacted by natural elements (ACM fragments at Hotspot, Southern Beach were sighted as expected).	Noted, see above. It should therefore be noted that some of these areas may fall outside the defined site area (Lot97). This may similarly be the case for some of the sampling locations.
6	However, under extreme conditions, tides could impact the sand areas up to the Tip adjacent to Heritage Wall at Northern Beach. All of the Middle Beach is under water.	Noted. From the auditor's observations, it seems unlikely that the 'dump' and / or 'tip' mentioned in the response and as shown on the Figures are located on Lot 97 and if present are most likely to be located on Lot 98. Any debris which is present on the beach is considered likely to have been moved / transported by erosive processes over time from source areas which are not within Lot 97. Such materials were observed by the

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
		auditor during the site inspection to include building wastes (bricks, tiles, ceramics as well as pieces of fibrous cement (presumably ACM) along with sub-rounded particles of black material (possibly coal, coke, ash etc), the latter being present in a cone shaped fan at the base of Gully 2 (Middle Gully).
7	Agree, for such a dynamic environment, the estimated areas could be as little as ~2000 m ² (sum of exposed three beaches, when were not impacted by rip, current, tide under high tide and gust wind conditions), or be as much as 12000 m ² (sum of exposed three beaches, when were not impacted by rip, current, tide under lowest tide and light wind conditions.). Please keep in mind, these areas keep changing!	Noted. The DSI should stress that from time to time the entirety of Lot 97 is likely to be below water level and subject to wave action and that as a result asbestos fragments are likely to be transported by wave action / currents, etc. and continually comminuted by erosional attrition within such an environment. The auditor notes that Trinitas has recognised that the backward and forward movement of ACM particles by tidal action has resulted in smoothing.
8	Agree, Trinitas recommends a certified surveyor to define the boundaries for the site, crown land and adjacent lands and properties, which was out of the scope of work in the DSI. The DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach.	See above. If Trinitas consider a survey is warranted then the auditor has no objections, however it is considered that existing Lot information should be sufficient to adequately define the boundaries, in particular the landward boundary of Lot 97 with Lot 98. It is noted that focus on the 3 outlet areas at the base of each gully are likely to comprise the main concentration of asbestos, and that this material will then be further dispersed by tidal action as seems to be particularly the case at the Southern Beach.
9	Agree. Trinitas recommends that all the documents, including, but not limited to, site investigation reports, images, communications, Remedial Action Plans, Validation Plan, Landfill Cell Design Plan, etc., should be provided to Trinitas for DSI reporting. All those documents listed in the Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be collected and provided by the Client or other stakeholders for Trinitas review. Only two reports were made available for Trinitas Desktop Review in DSI reporting (All other reports have not been made available so far) Environmental Monitoring Services, Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site – Undevelopable Area (Reference No. EMS 05 4328, in December 2005) ERM, Site Audit Statement (Reference No. PS 53, by Paul	At present the main issue is what is the source of asbestos on the 3 components of the site (Lot 97)? If review of these reports will assist in determining potential off-site sources, then a detailed review may be worthwhile. However, for the purposes of the current DSI it may simply be appropriate to review the Site Audit Report and Site Audit Statement as referenced. In any event such documents should be provided as supplementary information in the DSI as they have a bearing on the site history. In regard to review of the various documents cited, Trinitas may need to acknowledge that such reports may be commercial in confidence and therefore not be readily available. In addition, it seems axiomatic that the main likely source(s) of asbestos are related to the 3 gullies currently identified in the DSI (i.e., associated with the 3 beaches), accordingly, for the purposes of the current DSI, this information together with an examination of the site audit documentation is probably sufficient.

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
	Steinwede at ERM) Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders. 1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999; 2. Douglas Partners Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 - 2002; and 4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004. Only factual observations, data and related interpretation and opinion for all possible point sources should be done after additional investigations listed in Trinitas DSI 2021. It was out of the scope of Trinitas DSI 2021 to collect all those reports and to define legal site boundaries.	Whilst additional investigations may be necessary to further assess remediation requirements in Lot 98 the main question at present is does Trinitas consider that testing to date in Lot 97 (noting the caveats regarding environmental dynamics) has sufficiently characterised the defined site and such that a definitive statement can be made on site suitability, or if not what measures are required to arrive at that situation?
10	Agree, this is a long-term mission, which is out of the scope of Trinitas DSI. Trinitas is happy to quote for all these suggestions by the DP Auditor once formally requested and approved by the Client.	Noted. This is a matter between the Client (Council) and Trinitas. Generally, it would be anticipated (and it is normal practice) that the consultant would rectify the DSI as necessary following comments by the auditor. If additional sampling is considered to be required in Lot 97, again the cost of this is a matter between Council and Trinitas.
11	Agree a comprehensive CSM is desirable. However, it was still premature to prepare a 3D or 4D CSM with so many unknowns during the Trinitas DSI 2021. It is out of the scope of work in	A comprehensive CSM is a necessary component and requirement of any DSI, the details of which are set out in NEMP and in Consultants Reporting on Contaminated Land, Contaminated Land Guidelines (EPA, 2020) – Tables 2.1-2.3. Provision of a suitable CSM is not regarded as premature and it should be noted that the CSM should be modified as

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
	the DSI 2021. Trinitas DSI was just a Stage 1A to delineate the site (immediately surroundings). Once additional Detailed Site Investigations were completed, Trinitas is able to quote for the following DSI once requested by the Client.	more information comes to light. The Stage 1A DSI should be complete and should be sufficient to characterise the defined site Lot 97. It is agreed that investigation of other areas e.g., Lot 98 and areas beyond the low water mark are indeed beyond the scope of the current investigation, but should not be regarded as a pre-requisite to enable satisfactory completion of the current DSI. Indeed, the auditor considers that the need and advisability of conducting investigations below the low water mark is questionable, i.e., as recommended as Stage 1B by Trinitas (i.e., the 'Diving Investigation') as it is not clear what usable information will be forthcoming, other than perhaps an appreciation of the amount of asbestos in the immediate off-shore environment. Perhaps of more relevance is the identification of mechanisms which may bring asbestos on to the site from both on shore and offshore sources, both of which should be examined in the CSM. The recommended Stage 1C investigation of the 3 Crown Gullies may be necessary depending on what remedial measures are to be adopted at / or beyond the current (Lot 97) site boundary. It should be noted that such investigations will be largely if not entirely within Lot 98 which is understood to be owned by others.
12	Agree. It is desirable to have a vertical, horizontal and temporal, 4-dimensional CSM, which was out of the scope work in the Trinitas DSI 2021. Trinitas is happy to quote and prepare all of the fancy 4D CSM once the unknowns were delineated in the following investigations as recommend in the Trinitas DSI. If the Client formally requests and approves additional Trinitas DSI, these fancy 4D CSM could be prepared. Trinitas DSI was just a Stage 1A to delineate the site (immediately surroundings). Once additional Detailed Site Investigations were completed, Trinitas is able to quote for the following DSI once requested by the Client.	As noted above a suitable CSM is a requirement of NEPM and the various guidelines made and endorsed under Part 4 of the CLM Act and should have been presented in the DSI, accordingly provision of a suitable CSM is not considered to fall outside the scope of the DSI. The auditor refers the consultant to a range of guidelines included in the above guideline, which can be found at: https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/contaminated-land/20p2233-consultants-reporting-on-contaminated-land-guidelines.pdf?la=en&hash=EBB6758A2DE448534B6FDD5057D280523E423CC7.
13	Agree. It is desirable to have a vertical, horizontal and temporal, 4-dimensional CSM, which was out of the scope work in the Trinitas DSI 2021. Trinitas is happy to quote and prepare all of the fancy 4D CSM once the unknowns were delineated in the following investigations as recommend in the Trinitas DSI. If the Client formally requests and approves additional Trinitas DSI, these fancy 4D CSM could be	As noted above the scope of work should have included sufficient review and appreciation of site conditions in order to develop a suitable CSM which would include consideration of the beach environment and the geo-mechanical processes involved in the fate and transport of asbestos onto the beach and within the beach environment. As noted above a CSM is a requirement, there is nothing 'fancy' about it. Because of the beach environment some consideration of the likely temporal changes to the CSM should also be considered in the narrative.

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	prepared.	
14	Disagree. Some thoughts are out of the scope of work in Trinitas DSI 2021 (specifically, the site and its immediately surroundings changes under extreme weather conditions in the past 100 years, or after 1999, after 2005, after 2020). Trinitas DSI 2021 has already delineated the site with depth and frequency, as clearly illustrated in Appendix D: DSI Site Layout, Sampling Locations, Positive Test Pits and Maps, Trinitas DSI 2021. Especially, Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders. 1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999; 2. Douglas Partners Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 – 2002; and 4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004. Hopefully, those aforementioned PSIs had shed some light on the vertical, horizontal and temporal contamination with a 3 D or 4-dimensional CSM.	As noted above the scope of work should have included sufficient review and appreciation of site conditions. The depth, location and frequency of testing is noted. What is required is a clear statement on whether the consultant considers that the site has been sufficiently characterised, along with any limitations, and whether any further investigations are required in Lot 97. This response is repetitive. See above comments above regarding reports pertinent to Lot 98. As noted above a CSM is a requirement, the consideration of changes with time – say over a tidal cycle in the intertidal zone in the beach environment, or during storm events are also considered relevant to the CSM. Repetitive reference to these reports. In addition, it is doubted whether the reports relevant to adjacent sites will shed any light on the distribution of asbestos in Lot 97 other than perhaps identifying the source.

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15	Asbestos Terminology (NEPM or Work Health and Safety Legislation) Friable means when dry, or as the result of a work process, may be crumbled, pulverised or reduced to a powder by hand pressure. Bonded ACM is equivalent to “non-friable” asbestos in Safe Work Australia (2011), which is defined therein as “material containing asbestos that is not friable asbestos, including material containing asbestos fibers reinforced with a bonding compound”. Non-friable asbestos may become friable as a result of work processes over time (for example, degradation due to chemical exposure) or due to other factors (for example, damage by fire). Asbestos fines (AF) includes free fibres, small fibre bundles and also small fragment of bonded ACM that pass through a 7 mm x 7 mm sieve in NEPM 2013. Fibrous asbestos (FA) comprises friable asbestos materials and includes severely weathered cement sheet, insulation products and woven asbestos material. Trinitas confirmed that: 1. Most of collected suspected ACM fragments on surficial soil at the site were highly polished as thin as a five cent and are being polished from August 2020 to July 2021. 2. Few Friable Asbestos fragments (frequency: 2 out of 2000 suspected ACM fragments) as WHS Legislation defined were collected during Trinitas’s one-year Emu-picking and Clearance	Noted, please refer to the equivalency information as outlined in the table below. The important issue is that previously in Rev3 of the Trinitas DSI it was stated that no friable asbestos was present and by association (and testing) that no AF/FA was present. Whereas it is now stated that friable asbestos is/or was present based on observation (and photographs) and on materials collected (but presumably not collected during the DSI). A firm statement is required stating unequivocally whether or not AF / FA or friable asbestos is / or was present, if so what is the evidence, either prior to the DSI or as part of the DSI. Similarly, if friable or AF / FA asbestos was not present during the DSI, some discussion is required on whether asbestos on the beach is likely to degrade to such a form through attrition or any other processes which may potentially occur. Table 6 Equivalency of terms used in the NEPM, WA DoH (2009) and Work Health and Safety legislation and guidelines <table><tr><th>NEPM terminology (based on WA DoH 2009)</th><th>Work Health and Safety terminology</th></tr><tr><td>Bonded asbestos-containing-material or ‘bonded ACM’ (referred to as ACM in WA DoH 2009)</td><td>Bonded asbestos/non-friable asbestos</td></tr><tr><td>Fibrous asbestos, FA</td><td rowspan="2">Non-bonded/friable asbestos</td></tr><tr><td>Asbestos fines, AF</td></tr></table>	NEPM terminology (based on WA DoH 2009)	Work Health and Safety terminology	Bonded asbestos-containing-material or ‘bonded ACM’ (referred to as ACM in WA DoH 2009)	Bonded asbestos/non-friable asbestos	Fibrous asbestos, FA	Non-bonded/friable asbestos	Asbestos fines, AF
NEPM terminology (based on WA DoH 2009)	Work Health and Safety terminology								
Bonded asbestos-containing-material or ‘bonded ACM’ (referred to as ACM in WA DoH 2009)	Bonded asbestos/non-friable asbestos								
Fibrous asbestos, FA	Non-bonded/friable asbestos								
Asbestos fines, AF									

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	from August 2020 to July 2021. As shown in the images below, they can be easily crumbled, but a sort of weathered, polished and bonded forms. Therefore, as shown in the following images, some fragments could be classified as Friable according to WHS; or Non-friable as NEPM. 3. "DSI indicates that no AF / FA was recorded during sampling". The statement is based on the DSI sampling period of just a week from 26 April to 30 April 2021. Therefore, there is no inconsistency with DSI conclusions.	
16	Hotspots or Hotspot Area, where many pieces of ACM in a localized area, or very frequently encountered fragments during one-year period of Emu-picking and clearance inspection. In another word, these areas have been observed ACM fragments almost every time for a one-year Emu-picking. Also, DSI sampling found ACM fragments during sieving or excavation, whatever over HSL criteria or below, as there are uncertainties to sight/sieve wet sands or sands below sea water level. Trinitas observes the pattern that all of the Hotspot Areas are close to the outlets of gullies, while ACM fragments are less likely to be found in the upper northern section of Southern Beach. This site pattern has not changed since August 2020.	The DSI should report what was found during the DSI, including any findings which suggest that there are concentrations of ACM near the gully outlets, which seems to be the case. Review of the findings of emu picking reports throughout the preceding year should also be included in order to characterise the changing beach conditions and to gauge the success of the emu picking programme over time by demonstrating a reducing amount of asbestos from each successive collection, if this is the case. If this is not the case then the value of the process becomes questionable, although it is noted that weather events may cause a renewal of supply.
17	Surface asbestos fragments are unpredictably widely scattered. Natural elements keep them exposed all the time. Red dots just illustrated where ACM fragments were observed, therefore, based on the site observation, further investigations were recommended. If the Client formally requests and approves the additional investigations, Trinitas will update the DSI 2021. Trinitas observes the pattern that all of the Hotspot Areas are close to the outlets of gullies, while ACM fragments are less likely to be found in the upper northern section of Southern Beach. This site pattern has not changed since August 2020.	Noted. Please confirm whether the additional investigations you have in mind are within or outside Lot 97.
18	time. Under this dynamic environment, Trinitas "Make-safe" Emu-	

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	picking and Clearance ensures that all visible ACM fragments were picked up and cleared at the time of Emu-picking Clearance period only. Maybe, in the following seconds, it could be possible that more ACM fragments appear due to natural elements.	
19	Agree, Should an Asbestos Management Plan be implemented rather than scaping, stockpiling and dumping around the Gully 1 after 2005? These immediate areas are "known" contaminated with asbestos and other chemicals. All surface runoff flows towards the Northern Beach! Agree, Trinitas recommends a certified surveyor to define the boundaries for the site, crown land and adjacent lands and properties, which was out of the scope of work in the DSI. But, the DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach. Only two reports were made available for Trinitas Desktop Review in DSI reporting (All other reports have not been made available so far) 1. Environmental Monitoring Services, Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site – Undevelopable Area (Reference No. EMS 05 4328, in December 2005) 2. ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) Especially, Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders. 1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999;	Noted. Repetitive comments.

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
	2. Douglas Partners Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 – 2002; and 4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004.	
20	The DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach. Only two reports were made available for Trinitas Desktop Review in DSI reporting (All other reports have not been made available so far) 1. Environmental Monitoring Services, Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site – Undevelopable Area (Reference No. EMS 05 4328, in December 2005) 2. ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) Especially, Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders. 1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999; 2. Douglas Partners Draft Report on Contamination	Noted, repetitive content.

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	Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 – 2002; and 4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004. All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. Trinitas will be more confidently able to answer the key question: why those sampling activities as Annex A Figures and Photographs, Figure 8, Borehole Location Plan, did not confirm asbestos contamination in any sampling location? To what extent, asbestos fragments on surficial soil in three beaches? Under this dynamic environment, changes are all the time, day and night, year after year.	
21	Please refer to some videos for a better understanding how dynamic the three beaches in Little Bay are!	Noted.
22	Agree, Trinitas recommends a certified surveyor to define the boundaries for the site, crown land and adjacent lands and properties, which was out of the scope of work in the DSI. But, the DSI focused on the physically boundaries from the	Noted, repetitive comment. Please see earlier comments.

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	Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach, which were illustrated in Appendix D: DSI Site Layout, Sampling Locations, Positive Test Pits and Maps, Page 52 – 56 in DSI 2021. Once the Client formally requests and approves Trinitas Surveying quote, this will be updated.	
23	Agree, Trinitas recommends a certified surveyor to define the boundaries for the site, crown land and adjacent lands and properties, which was out of the scope of work in the DSI. But, the DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach with a segment of dumped tip. Once the Client formally requests and approves Trinitas Surveying quote, this will be updated.	Noted, repetitive comment. Please see earlier comments.
24	Agree. But, the DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach. Only two reports were made available for Trinitas Desktop Review in DSI reporting (All other reports have not been made available so far) 1. Environmental Monitoring Services, Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site – Undevelopable Area (Reference No. EMS 05 4328, in December 2005) 2. ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) Especially, Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders.	Noted, repetitive comment. Please see earlier comments.

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
	1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999; 2. Douglas Partners Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 - 2002; and 4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004. All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. Trinitas will be more confidently able to answer the key question: why those sampling activities as Annex A Figures and Photographs, Figure 8, Borehole Location Plan, did not confirm asbestos contamination in any sampling location? To what extent, asbestos fragments on surficial soil in three beaches? Under this dynamic environment, changes happen all the time, day and night, year after year. Please refer to some videos for a better understanding how dynamic the three beaches in Little Bay are!	

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	1. Storm and extremely dangerous current conditions: https://www.dropbox.com/s/vppshfpsfvtpim0/IMG_7789.MOV?dl=0 2. Southern Beach (~1000 m² was not impacted by high tide) https://www.dropbox.com/s/ie4ptgd2rxo81nq/IMG_7766.MOV?dl=0 3. Hotspot at Southern Beach and Crown Gully 3 (Concrete Stormwater Pipe) https://www.dropbox.com/s/yxl4xe87e3migk7/IMG_7778.MOV?dl=0 4. West Beach or Middle Beach under water and Crown Gully 2 https://www.dropbox.com/s/ugoczwnmaqrbrb/IMG_7808.MOV?dl=0 5. Northern Beach and Crown Gully 1 https://www.dropbox.com/s/lr2jle9cqk4cffb/IMG_7843.MOV?dl=0 6. Coastal Erosion from Recent Dumping Stockpile (~150 Tonnes) at immediate surrounding of Northern Beach and Crown Gully 1	
25	The DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach. Only two reports were made available for Trinitas Desktop Review in DSI reporting (All other reports have not been made available so far) 1. Environmental Monitoring Services, Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site – Undevelopable Area (Reference No. EMS	Noted, repetitive comment. Please see earlier comments. Investigations in areas other than Lot 97 are not only outside the scope of the DSI but are also outside the audit scope other than the demonstrable need to identify, if possible, the source of asbestos currently being exposed on the beach areas.

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	05 4328, in December 2005) 2. ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) Especially, Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders. 1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999; 2. Douglas Partners Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 – 2002; and 4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004. All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. Trinitas will be more confidently able to answer the key question:	

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	why those sampling activities as Annex A Figures and Photographs, Figure 8, Borehole Location Plan, did not confirm asbestos contamination in any sampling location? To what extent, asbestos fragments on surficial soil in three beaches? Under this dynamic environment, changes happen all the time, day and night, year after year. Please refer to some videos for a better understanding how dynamic the three beaches in Little Bay are! Field Investigation regarding Information on creek hydrographs, typical creek flows and high stage events and erosion potential will be conducted only after the Client formally requests	
26	Agree. Will do.	Noted.
27	Agree. But, the DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach. Only two reports were made available for Trinitas Desktop Review in DSI reporting (All other reports have not been made available so far) 1. Environmental Monitoring Services, Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site – Undevelopable Area (Reference No. EMS 05 4328, in December 2005) 2. ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM)	
28	Especially, Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders.	Noted, repetitive, see comments above

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	1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999; 2. Douglas Partners Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 - 2002; and 4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004. All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. Trinitas will be more confidently able to answer the key question: why those sampling activities as Annex A Figures and Photographs, Figure 8, Borehole Location Plan, did not confirm asbestos contamination in any sampling location? To what extent, asbestos fragments on surficial soil in three beaches?	
29	Agree. The DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach.	Noted, repetitive, see comments above

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
	Only two reports were made available for Trinitas Desktop Review in DSI reporting (All other reports have not been made available so far) 1. Environmental Monitoring Services, Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site – Undevelopable Area (Reference No. EMS 05 4328, in December 2005) 2. ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) Especially, Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders. 1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999; 2. Douglas Partners Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 – 2002; and 4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004. All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review.	

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	All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. If the client formally requests and approves the detailed desktop review, Trinitas will revise it.	
30	Agree. But, the DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach. Only two reports were made available for Trinitas Desktop Review	Noted, repetitive, see comments above
31	All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. No information regarding the location of landfill cell, surveying report, long term management plan for the cell was provided to Trinitas for review. Based on site observation, Landfill locations were identified 1. Tip around Heritage Wall, lower part of the Gully 1 adjacent to the Heritage Wall (~150 Tonnes of scraped waste were observed on July 11, 2011 and smaller volume of dumped waste observed from August 2020 till now), and the whole lower part of Gully 1. 2. Landfill around Gully 2, Middle Beach After the Client formally requests and approves the additional investigations as recommended in the DSI 2021, Trinitas will update the relevant parts.	Noted, repetitive, see comments above. The objective for the current DSI should be to complete the report appropriately and make any recommendations regarding site management, remediation etc. In addition, if investigations are deemed necessary in Lot 98 or elsewhere then these can also be addressed but should not detract from the appropriate completion of the current DSI.
32	Yes, as recommended in Section 10, DSI 2021.	Noted.

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	Yes, Three Unknown Areas adjacent to Hotspots were recommended for further investigation.	Noted, but please clarify whether these are located in Lot 97 or elsewhere.
33	Agreed. Trinitas DSI identified elevated or higher frequency of ACM fragments mostly around the Gully outlets. The point sources from Three gullies were confirmed. The hotspot area at Southern Beach could be dumped site or buried or accumulated below and around rocks. All of the three beaches are not the point of sources of contamination. Asbestos contamination could be managed to a certain extent. However, the point sources from gullies should be properly remediated or managed to reduce the long-term burden of Emu-picking and clearance. Trinitas can provide specific remedial action plan to manage risks both in a short term and long-term period.	Noted. It however considered unlikely that material was dumped directly on to the beach (Lot 97), historically this possibly occurred on Lot 98 and the material is progressively moving down gradient by various mass movement/transport mechanisms onto the beach. These need to be reflected in the CSM. If any materials have been buried on the beach (Lot 97) then evidence needs to be provided. In this regard it seems quite plausible that geo-mechanical mechanisms may have caused material to accumulate at the toe of the slope and then become covered by sand movement and deposition (wind, wave or gravity). Such anthropogenic material could be classifiable as Fill or as Anthropocene deposits. Please make reference to AS 1726:2017 in this regard. Agreed that management or remediation should be considered.
34	Agree. Will revise and update accordingly.	Noted.
35	Cannot understand the meaning.	There is a reference to footings, are these located within Lot 97 or elsewhere i.e. on adjacent land such as Lot 98?
36	Anthropogenic materials are throughout the three beaches and immediately surroundings	Noted. See above.
	DSI sampling excavated up to 2.5 m or refusal in the southern beach; DSI sampling excavated up to 1 m or refusal in the middle beach; DSI sampling excavated up to 1 m or refusal in the northern beach. Visual inspection for deep excavation only, rather than grab sampling (500 mL) or sieving due to safety issue. (All fieldnotes and graphic records is available).	Please check the logs accordingly and advice whether the test pits/ logs in question were actually within Lot 97. Please provide field notes as an appendix to the DSI.

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37	Agree, will do.	Noted.
38	Hospots or Hot Areas in the DSI 2021: - Where ACM pieces were most frequently sighted and picked up (such as every site walkover and clearance inspection finds ACM piece(s) in a localized area) - DSI 10 L sieving sampling sighted or collected ACM fragments with gravimetric concentration over 0.02% w/w - Several ACM fragments were sighted in a localized area (Page 57, WA Guidelines 2009). - Or the least weighted, one or two pieces found during DSI sampling on surface. For this specific site, could DP Auditor recommend another approach to delineate these areas?	Please advise, if this is the case, that in using the term hotspot you are not employing the definition of a hotspot found in NEPM (viz 250% the SIL, HIL, HSL etc) but rather that you are identifying areas where ACM pieces were more frequent than elsewhere on the site.
39	Disagree. This was out of scope of work in DSI.	It is important to confirm which sampling points if any lie outside the site (Lot 97). It is noted that locations along the boundary may be moot, but clearly from the Figures, some sampling locations are apparently outside the site boundary. Accordingly, the auditor is of the opinion that this issue is very much within the scope of the DSI.
40	Agree. All field notes and photographic records are available. DSI sampling excavated up to 2.5 m or refusal in the southern beach;	
41	DSI sampling excavated up to 1 m or refusal in the middle beach; DSI sampling excavated up to 1 m or refusal in the northern beach. Visual inspection for deep excavation only, rather than grab sampling (500 mL) or sieving due to safety issue. All samples labelled as TPXX_YY-ZZFCWW is defined as - Test Pit XX; - Depth from YY m to ZZ m; - Fragment Fibro Cement FC sighted or collected from 10	Noted. Please check with your logs that this is correct and that the depth of pits in the southern beach (within Lot 97) was 2.5m as noted previously.

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
	L sieving process • The nth of fragment: WW	
42	Agree, will do.	Noted.
43	Agree, Will revise.	Noted.
44	Agree, once the Client formally requests and approves the additional investigations as listed in the Trinitas Stage 1A, DSI 2021, a 3D CSM with evidence to identify point sources will be prepared after Trinitas RFQ	Please confirm whether these additional investigations relate to Lot 97 or adjacent sites. The objective at present is to provide a satisfactory DSI for Lot 97. Additional works outside Lot 97 can form recommendations at this stage but are not necessarily germane to the completion of this DSI.
45	Agree, considering the stained or humus-like dark color of soils	Noted. Please confirm whether these soils were observed within or outside Lot 97. In addition, whilst the investigation was restricted to asbestos, does Trinitas consider that it has a duty to warn in regard to other potential contaminants which may be present in Lot 97 particularly noting the fan of dark material at the outlet of Gully 2 (Middle Beach).
46	Agree. Once the Client formally requests and approves the additional DSI – Stage 1B quote, it will be updated. Once the Client requests and approves the surveying quote, it will be updated.	As noted earlier, surveying of the site and completion the Stage 1B are not considered necessary for the completion of the DSI at Lot 97 at this stage, and are possibly not required at all.
47	Disagree. It was out of the scope of work in the Trinitas DSI 2021. Once the Client formally requests and approves the additional data collection for coastal erosion monitoring quote, the related works will be updated.	Such a discussion is considered to form an integral part of the CSM and therefore is most certainly part of the scope of the DSI and is a requirement as noted above.
48	Trinitas excavation and observation with photographic evidence identified landfill-like waste (buried, off-site migrated from gullies, or dumped) at 1. Hotspot Area 1, 2 and 3. 2. Dumped waste in Gully 1 and Gully 2; 3. Dumped waste in Golf Course adjacent to Gully 1. However, when and how the dumped waste came from are not certain.	See above. The so-called hotspots 1-3 may well be the recipients of migrating contaminants, however it is reasonably clear that Gully 1, 2 and 3 (or at least the majority of these gullies) and the Golf Course are not part of Lot 97 and thus not within the site. It may be reasonable to conclude that these features are contributing as sources of asbestos and that legacy filling of gullies occurred historically. In this context and as noted earlier, it is necessary to review and comment upon the findings of the site audit for adjacent land.

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
49	It is hard to made a conclusion. Most of the Emu-picked ACM fragments are highly polished. Some are as tiny as a five cent coin. Some are as thin as a five cent coin. Some big fragments are still visible as corrugated Super 6 sheeting fragments. Under The dynamic environment, the polished ACM fragments could deliver fibres into sand, into water, into air. However, Trinitas continuous air monitoring results are all negative	Noted.
50	It is hard to made a conclusion. Most of the Emu-picked ACM fragments are highly polished. Some are as tiny as a five cent coin. Some are as thin as a five cent coin. Some big fragments are still visible as corrugated Super 6 sheeting fragments.	Noted.
51	Some fragments could be classified as Friable according to WHS or Non-friable as NEPM.	See above and refer to Table 6 which suggests otherwise. Please clarify and make a definitive statement on whether Friable or AF/FA was found in the DSI and indeed was definitely identified at any stage during the emu picking exercises since mid-2020 to present.
52	Under The dynamic environment, the polished ACM fragments could deliver fibres into sand, into water, into air. However, Trinitas continuous air monitoring results are all negative.	Noted. It would also be relevant to comment on the soil sampling results which were also negative in this regard.
53	That is why Auditor opinions are essential.	Noted.
54	Agree. Tidal influence was out of the scope of work, as Coastal Engineer should be engaged to investigate it. Legal Site Boundaries should be done by the Client, as it was out of the scope of work. From 26 April, 2021 to 30 April, 2021, the site has the time window of lowest tide at 0.3 m and highest tide at 2.0 m. Please be aware that the lowest tide could be 0.2 m in one year period, when most of the outcrops at the Middle Beach is above water level. During the highest tide of 2.0 m, the whole Middle Beach is under water and impacted by tides up to the boulders at the outlet of Gully 2.	Noted. However, tidal influence should be considered as part of the CSM and therefore should have been included in the scope of work for the DSI. It is noted that the tidal regime would have influenced the testing programme and that the DSI was conducted to take into account favourable tidal conditions. It is also acknowledged that the investigations for the most part would have revealed the site condition at the time of sampling, and which could and probably did change even over one tidal cycle particularly in the intertidal zone which appears to extend across the full width of the beach and rock platform areas. Comments on the site boundary are shown above.

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
	Trinitas is of the opinion the specifically selected period at the DSI investigation is the most practical one for the contamination investigation and assessment, which was agreed with relevant stakeholders. The sampling points at the DSI already reached the most achievable low tidal lines, if not the lowest tideline. However, Trinitas is of the same opinion that the exact site boundaries of Lot 97, Lot 98, DP270427 should be surveyed and defined by the client, the Crown Land and other stakeholders. Trinitas is aware of the potential legal processes, acknowledging the fact that the site is dynamic and that site boundaries from Sixmaps or copied layouts are not clear enough to guide the DSI. In Appendix G, Photos – Southern Beach – Rock Area or underwater Area, ACM fragments were already observed under water, as most of the Rock Area was easily accessible via bare feet.	
55	Trinitas DSI is just a Stage 1A – Detailed Site Investigation. Additional investigations can be conducted exactly suggested by the DP site auditor, only after the client approves them	See comments above.
56	As shown in Appendix D: DSI Site Layout, Sampling Locations, Positive Test Pits and Maps, DSI report: Three Hotspots have ACM over 0.02%, <0.02%, ACM fragments observed on the surfaces and ACM fragments sighted during excavation or during 10 L sieving process. All other areas except unknown contamination areas are considered to have diffused sources of contamination. Trinitas is of the opinion that most of the ACM fragments will undergo subsequent processes: stirring, polishing, sieving, washing up and washing all the time. The clearance report and emu picking with photographic records in the past year from August 2020 to July 2021) clearly demonstrated the highly polished ACM fragments could be as	Is Trinitas suggesting that these hotspots require further investigations? Also please confirm whether the site and or these areas meets NSW EPA and or NEPM requirements in regard to the published HSL which include no asbestos at the surface? It is a requirement that the DSI makes an unequivocal (clear cut) statement regarding site suitability and any related limitations, see Table 2.3 in the guidelines noted above. If the consultant is unable to make this statement, please state the reasons. It is not acceptable to simply rely on the HHRA in this regard, although the related opinion from JBS&G can of course be referenced.

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
	thin as a five cent. “whether the site is or can be made suitable for the specified land use” depends on the Human Health Risk Assessment Reports by JBSG. The DSI will be updated accordingly. However, Trinitas is of the opinion that if all of the recommendations listed from Page 42 to Page 45 at Section 10, DSI are implemented, It is possible to make the site suitable for the specified land use. There are still unknown contamination conditions and uncertainties after the Trinitas DSI 2021. Trinitas is happy to consider all ideas and recommendations from the auditor, the council, EPA and all other stakeholders.	
57	Agree. Trinitas recommends further investigation of Unknown Immediate Surrounding Areas, Point Sources as shown in Appendix D: DSI Site Layout, Sampling Locations, Positive Test Pits and Maps, DSI report, in order to prepare a remediation plan and to address the contamination issues in a short term, medium period and long term period with the consultation and engagement of key stakeholders.	Noted. See comments above. Can Trinitas confirm that they are recommending and EMP for Lot 97 as well as an RAP and if so, what is the nature of the proposed remediation in broad terms (and of course subject to the eventual RAP/AMP being prepared).
58	Agree. Will do. Trinitas used Test Pit method by 5-T excavation. Shovels or hand tools were used to collect samples for testing. All logs will be updated accordingly	Noted.
59	Agree. Will be revised. Sands with minor tiles, glasses will not be labelled as Fill	Noted. See earlier comments and refer specifically to AS1726, for logging and descriptive advice on stratigraphic matters. In this regard it is noted that: AS 17626 defines fill as follows:

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
		• ‘... a volume of material which has been placed by anthropogenic processes...’ in situ is defined as follows: • ‘...in the place and situation in which it exists naturally...’ Also please note that the AS requires that the identification of the geological origin of soil is now mandatory (refer to clause 6.1). In this regard it is a moot point whether any filling at the base of the gullies, or elsewhere has been placed, or whether it is in situ, although its derivation is certainly anthropogenic and in all probability, it has been deposited by natural processes.
60	Background Based on limited site historical information, Legacy Tip in Trinitas DSI report could be old rubbish dumps, legacy landfill, old garbage tip, unregistered dumped/buried cells, whatever happened during the 100 years at the site. Especially, the demolition of buildings of Male Lazaret and Female Lazaret or other subsequent buildings were dumped in the gullies or catchments areas. Old rubbish dumps are littered across the state. Some of the illegal waste dumped at the old tips could include asbestos, pesticides and dangerous chemicals. There could be landfills exempt from EPA licences and there may be sites that have not been reported. These closed garbage tips, known as "legacy landfills", pose a major challenge for councils as they struggle to fund a clean-up. The community was concerned some of the old tips were leaching hazardous materials, but that too little work had been done to assess the extent of the problem. In Trinitas Technical Brief, Section 3.2 Interview with a local resident disclosed that: “As part of the Site history review, an interview was held with the representative from the Client on 3 August 2020. The interview revealed no former report of asbestos contamination at Little Bay	Agreed, these comments are noted, and largely agreed, but these features are almost certainly not on Lot 97 and appear to be located wholly on Lot 98. In this regard there appears to be some evidence at least to suggest that materials from these locations (or at least from within the 3 gullies in question) are migrating down gradient from time to time and resulting in contamination of the 3 beach areas. Any remedial effort would need to consider what mechanisms may be available to prevent such materials being transported into Lot 97.

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
	Beach	
61	A Trinitas Hygienist met a local resident (Greg Bond) on the beach on 31 August 2020. Greg has around 50 years of knowledge of the Site. Greg indicated that “the legacy dumped tip locates on the northern hill top adjacent to Crown Gully 1 and Northern Beach”, but the demolition of buildings of Male Lazaret and Female Lazaret or other subsequent buildings around the Crown Gully 1 and Crown Gully 2 during a 100 year period could not be reflected. Fill or dumped waste in the catchments at the upstream of Old Retaining Wall in Crown Gully 1 and other two three gullies could be likely, as some front areas of the Golf Course were used a sand quarry. In the past 100 years, the sewer, the catchment areas and / or the gullies from the old hospital site could deliver all types of solid waste up to the sea as close as 3 KM away (some rubbish were pushed up and down towards the bay).” As mentioned in EMS report (D00229667 Environmental Monitoring Services - Prince Henry Redevelopment Site - PHLB Undevelopable areas remediation strategy report EMS 211205), a cell or two cells were proposed. However, no reports were provided by the Client for reference. As mentioned in EMS report (D00229667 Environmental Monitoring Services - Prince Henry Redevelopment Site - PHLB Undevelopable areas remediation strategy report EMS 211205), a cell or two cells were proposed. However, no reports were provided by the Client for reference. Especially, the following reports are desirable and crucial. List of reports not repeated. Trinitas assumes that all of these previous PSI reports should have already done a good quality desktop review regarding the dumped lanfills/tipping locations. However, all of these five reports were not made available for DSI report.	Anecdotal information is noted which tends to agree that material was not dumped or tipped onto the beach but may be located in Lot 98. Certainly, if any remedial measures (barriers, collection devices etc) are proposed along the boundary of Lot 97 then such reports would need to be obtained and consulted.

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
	Therefore, DP should resort to its own archive database for old tips related information, but Trinitas was not provided all those documents by the client.	
62	Trinitas Consultant is of the opinion that Middle Beach or Western Beach has fill throughout with abundant glass, tiles and other anthropogenic materials under the top layer of sand. The visually clean sandy layer is just around 10 cm thick or less due to tidal effect from either the wash down of the Gully 2 or washup/deposit from the bay or both of them are the formation mechanisms. Significant volumes of bricks, glasses, rocks, concrete pieces throughout the Middle Beach were observed in the subsurface. (The collapse of a former dam and dumped waste were washed down all the way into the water). Please refer to "Short, A.D.(2012)Coastal Processes and Beaches. Nature Education Knowledge 3(10):15" for a basic idea of sand formation on the top of the beach. Therefore, Trinitas differentiates fill from top sand stratum at Test Pit 21. Actually, all of test pits at Middle Beach or Western Breach Sand Area were illustrated in the same manner to clarify the different strata. Please refer to Page 31, Schedule B1, Guideline on Investigation Levels for Soil and Groundwater, NEPM 2013. Please refer to Appendix E: Representative Photographic Records in Trinitas DSI 2021. 1. Item 9, TP22_1.0, Fill with Brick, glass, sand, tile, shell, concrete under top sand. In Photos - Middle Beach, from Photos - Middle Beach (Western Beach) – Hotspot as the Whole Sand Area 2. Page 67, Photos - Middle Beach (Western Beach) – Crown Gully 2, Appendix E: Representative Photographic Records	On the beach areas actively affected by erosion and sand movement (i.e. almost all of Lot 97) this is considered to be unlikely, although it is acknowledged that the sand on this beach is likely to contain anthropogenic materials such as building wastes including asbestos which has been washed down the gullies and redeposited, whether this material comprises a volume of material which has been placed by anthropogenic processes is a moot point. It is agreed that at the foot of the gullies and adjacent fill slopes there is likely to be a translational area where fill materials could be redeposited and over filled by naturally placed sand moved by wind and tide, (although it is noted that there is virtually no dune development at this site). For the most part such areas are however, considered likely to be outside the curtilage of Lot 97. Notwithstanding, the erosional and depositional mechanisms at work on the beach (the site) should be examined in the CSM. The description shown in Column 2 (here) could be used to good effect in the CSM.

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
	3. During a certain period, the top sand is visually clean. https://www.dropbox.com/s/ugoczwnmaqrbrb/IMG_7808.MOV?dl=0	
63	Reference Eurofins Report 791709-AID Can Trinitas explain the analysis/results from sample TP28_0.5 and TP28_0.5FC01 Not sure what DP question means? Is it a question about NATA lab testing explanation? Or are you asking about the difference between NEPM testing (for TP28_0.5 was collected (500 mL) from the test pit using shovel, asbestos in soil NEPM) and Asbestos Testing as WA DOH (Fragments over 7x7mm collected during 10L soil sieving, TP28_0.5FC01 over 7mmx7mm dimension was collected from the sieve)? Or why Trinitas took two testing approaches? Please refer to Eurofins Report 791709-AID, Page 10, TERMS.	Can Trinitas provide an interpretation of this result (0.013% w/w) in the discussion of the report?
64	Asbestos in soil concentration by gravimetric approach as NEPM 2013, Schedule B1 – Guideline on Investigation Levels for Soil and Groundwater (page 31), WA DoH guideline, 2009 On page 132, DSI V1 Draft; Also, on page 132, DSI V1 Draft, P32, “deleted cement Brown fine-grained sandy soil” at left hand corner	Noted.

Randwick City Council
30 Frances Street
Randwick NSW 2031

Project 205690.00
22 July 2021
IAA3-205690
JMN:jl

Attention: Evan Buntoro

Email: Evan.Buntoro@randwick.nsw.gov.au>

Interim Advice Letter 3
Non-Statutory Site Audit DPNS/19
Lot 97 Little Bay Beach, Little Bay Lot 97 DP270427

1. Introduction

This letter provides Randwick City Council (RCC) and their Environmental Consultant - Trinitas Group (Trinitas) with interim advice (IAL) as part of Non-Statutory Site Audit DPNS/19 being undertaken by Mike Nash, an NSW EPA Site Auditor accredited under the Contaminated Land Management (CLM) Act. The advice concerns the assessment of contamination risks at the site located at Lot 97 Little Bay Beach, Little Bay Lot 97, DP270427 (Figure 1 - the site). The interim advice has been provided in accordance with a proposal issued by DP dated 8 June 2021 and a purchase order PIS20761 provided by RCC dated 18 June 2021, subject to DP terms and conditions.

The purpose of the non-statutory audit is to determine whether the Trinitas DSI meets the requirements of, and is compliant with, the guidelines made and endorsed under the Contaminated Land Management Act, 1997. The version of the DSI reviewed by the auditor (subject of IAL1) is:

- Trinitas Group (June 2021) *Detailed Site Investigation of Potential Asbestos Contamination at Little Bay Beach, Little Bay NSW* Randwick City Council, Little Bay Beach - 4R Coast Hospital Rd, Little Bay NSW, dated 29/06/2021 Revision 3 ('the DSI report').

This IAL (IAL3) addresses the following response provided by Trinitas:

- Trinitas Group (20 June 2021) *IAL1 205690 dated 2 July 2021 - Trinitas Response dated 15 July 2021*.

This IAL does not pre-empt the conclusions which may be drawn at the end of the site audit process and does not represent a Site Audit Statement (SAS) or a site audit report (SAR). The attached table (Detailed Comments on Trinitas' Responses to IAL1 dated 15 July 2021) provides individual replies to each response to comments by Trinitas.

2. Auditor's General Comments

2.1 Site Boundary and Previous Reports

The auditor considers the cadastral boundary of the site (Lot 97 DP 270427) should be adopted in the absence of a survey. The auditor notes that the boundary of particular interest / relevance is the boundary which is shared with other land-owners (Prince Henry Centre and Golf Club Centre, the Coast Golf Course, Crown Gully 2, etc).

Previous reports prepared for adjacent sites will likely be owned by the current / previous land-owners or developers. Release, novation, etc. may be required to gain access to these reports. It is not however considered imperative to review these reports as they are outside the Lot 97 site boundary, although they may provide invaluable information on potential asbestos source sites. In addition, a review of any EPA notices / available data (e.g., council records such as Section 10.7 Certificates) relating to these sites is relevant. Additional comments on this issue and related matters are provided in the attached Table.

2.2 Friable Asbestos

The auditor refers to the responses added to pages 23-25 (of 56) of IAL1. The auditor notes that, by definition, AF and FA are also friable. For clarity, the DSI definition for friable asbestos should therefore include AF and FA. For the purpose of this DSI, the auditor considers NEPM definitions should be adopted. In NEPM the following statement is noted:

'From a risk to human health perspective, FA and AF are considered to be equivalent to 'friable' asbestos in SafeWork Australia (2011), which is defined therein as 'material that is in a powder form or that can be crumbled, pulverised or reduced to a powder by hand pressure when dry, and contain asbestos.' The section added by Trinitas (page 24 of 56) includes the following extract:

'...2. Few Friable Asbestos fragments (frequency: 2 out of 2000 suspected ACM fragments) as WHS Legislation defined were collected during Trinitas's one-year Emu-picking and Clearance from August 2020 to July 2021. [As shown in the images below], they can be easily crumbled, but a sort of weathered, polished and bonded forms. Therefore, as shown in the following images, some fragments could be classified as Friable according to WHS; or Non-friable as NEPM...'

The auditor requires a clear statement regarding the presence / absence of friable asbestos based on observations and laboratory results be included in the updated DSI. In particular it is noted that the DSI report Rev3 indicated that no friable asbestos was present (whereas Rev 2 of the DSI reported that some friable asbestos was present) and subsequently the response as referenced indicates that friable asbestos may be present. Accordingly, can Trinitas please confirm whether friable asbestos was actually present during the DSI and if it is Trinitas's opinion that the asbestos classified as AF / FA (or not) and why and whether Trinitas intend to further change their opinion in Revision 4? Additional comments on this issue and related matters are provided in the attached Table.

Moreover, the conclusion regarding the presence/absence of friable asbestos (AF or FA) as defined in NEPM will have implications for the JBS&G (June 2021), *Interim Human Health Risk Assessment for Asbestos*.

2.3 Conceptual Site Model

The auditor notes that the development of a suitable CRM is a requirement of the guidelines listed below and is an integral component of all reports prepared for contaminated site assessment, including DSIs. Accordingly, the auditor considers that the requested CRM is not beyond the scope of works which should have been included in the preparation of the DSI and therefore should have been included at the outset. Additional comments on the CSM and related matters are provided in the attached Table.

2.4 Internal Review

Based on the response from Trinitas as referenced above and which is further examined in the attached table, which the auditor considers this to be rather repetitive, and it is therefore recommended that Revision 4 of the DSI should be carefully and thoroughly reviewed by Trinitas and that such a review is preferably undertaken by a Certified Environmental Practitioner (CEnvP-SC) prior to finalising and re-submission (we understand that such a person is listed on the Trinitas website). This internal review should particularly address the responses to IAL1 and the related technical requirements of the published guidelines on the preparation of DSI's including *inter alia*:

- *National Environment Protection (Assessment of Site Contamination) Amendment Measure* (NEPM 2013), *Schedule B2 - Guideline on Site Characterisation* (NEPM (2013);
- *NSW EPA Consultants Reporting on Contaminated Land Contaminated Land Guidelines April 2020, Table 2.3 - Detailed Site Investigations; and*
- *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated sites in Western Australia* (WA DOH, 2009), including subsequent additions.

Additional comments on this issue and related matters are provided in the attached Table.

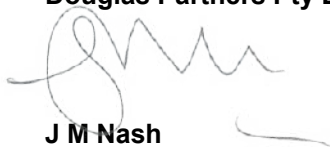
2.5 Further Works

Additional field work is not considered to be required at this stage for the updated DSI, except perhaps further testing within the three defined 'hotspot' areas within Lot 97, although again the purpose of any such additional testing would need to be clearly articulated by Trinitas. Nor does the auditor believe that further investigation is required below the low tide level (Stage 1 B as recommended by Trinitas). Notwithstanding, however make safe measures (including fortnightly emu-picking / clearance inspections, barricades and signage) are supported. Consideration should also be given in the DSI to the preparation of and RAP/AMP, VR and eventually an EMP, although it is noted that such documents will need to deal only with Lot 97, at least initially.

Along with your amended/revised DSI (Rev 4) please also provide any recent asbestos clearance / emu picking reports to the auditor for information.

As with Rev 4 of the DSI, the auditor recommends that all further documents prepared in the next phase of the project including the RAP / AMP should be prepared and / or reviewed by a Certified Environmental Practitioner (CEnvP-SC).

Yours faithfully
Douglas Partners Pty Ltd



J M Nash
Principal

Please note that the above information, interim advice and opinions do not pre-empt the eventual site audit findings nor do they constitute a site audit as defined under Part 4 of the Contaminated Land Management Act, 1997.

Attachment

Detailed Comments on Trinitas' Responses to IAL1 dated 15 July 2021

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
1	This site layout was extracted from Trinitas Brief, rather than from the Trinitas DSI 2021. Refer to Appendix D: DSI Site Layout, Sampling Locations, Positive Test Pits and Maps. The week from 26 April 2021 featured lowest tide 0.3 m, highest tide 1.8 m, light or fresh wind, slight swell. Sampling taken above 0.4 m tide as much as practical, but not for sand areas underwater.	Noted. However, as observed previously, the site needs to be properly defined with the real property boundaries of Lot 97 DP270427 clearly shown. If Trinitas consider that the Lot boundary (image) from Six Maps is insufficient to accurately identify the site, then alternative arrangements should be made to define the boundary. In this regard RCC as the planning authority should have access to accurate lot information, for example via S.10.7 Certificates, etc. including the location of the landward and seaward boundaries, with the latter likely to coincide with the low tide mark, although it is understood that such definitions are complex and may be subject to common law issues, see: Complete https://www.accarnsi.unsw.edu.au/sites/accarnsi/files/uploads/PDF/Discussion/Principles%20and%20Problems%20Of%20Shoreline%20Law.pdf
2	Various inserted versions of Figures	Amendments noted. In relation to Figure 1-3 it is interesting to note that the various asbestos 'hotspots' are focused on the areas of the Northern, Middle and Southern Beaches where the corresponding creeks / gullies debouch onto the corresponding beach, which may perhaps lead to a fairly obvious conclusion regarding the source of contamination. Noted
3	This site layout was copied pasted from Six Maps NSW, https://maps.six.nsw.gov.au/. However, there is no clear definition of the lower tidal line (lowest tide 0.2 m? 1.8 m?; Highest tide 2 m? 1.3 m?). Trinitas recommends a certified surveyor to define the boundaries for the site, crown land and adjacent lands and properties, which was out of the scope of work in the DSI. Under severe conditions of tide heights in the range of 1.4 m to 1.8 m, rough swell height and strong to gust wind, the whole Middle Beach, Most of Northern Beach, and ~80% of Southern Beach are either under water or impacted by currents. The total area of sands could be just ~1500 m².	Noted. See comment #1 above. It does however seem evident that even the normal tidal range experienced at Little Bay probably extends to the boundary of Lot 97 and at times may be significantly beyond the landward Lot boundary as evidenced by the geomorphological features such as the wave cut notch in sandstone at the base of the low cliffs, wave cut platforms etc., plus other features as shown in some of the photographs provided by Trinitas. My recommendation is that the Lot 97 boundary which is available currently is used for this DSI, but that this should be cross checked though suitable real property information which may be readily available from a number of existing sources, including <i>inter alia</i>: • Historical and current title deeds – available for example via Lot Search etc; • NSW EPA Public Registers; • Section 10.7 (2) & (5) planning certificate (assumed to be providable by client in this case); and

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
		Other Council records. Further details can be found in NEPM Schedule B2 etc. See above. From observations made during the auditor's site inspection and from the photographs and tide information provided it seems reasonable to conclude the entire beach and base of the 'cliff line' will from time be subject to wave action and currents. The effects of such an environment would likely cause existing asbestos contamination on the beach / rock platforms to be moved / redistributed within that environment and potentially for further asbestos to be sourced from: (i) the tidal fringe and the hinterland immediately beyond (also depending on other factors such as rainfall), and (ii) to be moved from below the low water mark up onto the beach by wave action. Complete
4	Agree, Trinitas recommends a certified surveyor to define the boundaries for the site, crown land and adjacent lands and properties, which was out of the scope of work in the DSI. The DSI focused on the physical boundaries with a short period of one week (lowest tide 0.3 m, highest tide 1.8 m) whatever the soil was practically accessible during normal work hours, but not for areas under water for such a dynamic environment, The best practical investigation area as shown in Figure 1-1 (Normally tide height ~0.5 m, because it is almost impossible to arrange the sampling at the lowest tide of 0.2 m). The approximate accessible sand area of three beaches could be 10400 m² (Please do not be unrealistic of the numbers, they keep changing all the time).	See above. The investigation area should be as defined by the boundaries of Lot 97. Regarding the low tide mark some discretion is obviously reasonable and is therefore taken into account in terms of both determining the site area related sampling density Noted and completed
5	However, under extreme conditions, tides could impact the sand areas up to the Retaining Wall at Southern Beach. For example, with rough swell 3.5 m, 1.8 m tide, strong wind or gust, three beaches are severely impacted by natural elements (ACM fragments at Hotspot, Southern Beach were sighted as expected).	Noted, see above. It should therefore be noted that some of these areas may fall outside the defined site area (Lot97). This may similarly be the case for some of the sampling locations. Noted
6	However, under extreme conditions, tides could impact the sand areas up to the Tip adjacent to Heritage Wall at Northern Beach. All of the Middle Beach is under water.	Noted. From the auditor's observations, it seems unlikely that the 'dump' and / or 'tip' mentioned in the response and as shown on the Figures are located on Lot 97 and if present are most likely to be located on Lot 98. Any debris which is present on the beach is considered likely to have been moved / transported by erosive processes over time from source areas which are not within Lot 97. Such materials were observed by the

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
		auditor during the site inspection to include building wastes (bricks, tiles, ceramics as well as pieces of fibrous cement (presumably ACM) along with sub-rounded particles of black material (possibly coal, coke, ash etc), the latter being present in a cone shaped fan at the base of Gully 2 (Middle Gully). Noted and completed
7	Agree, for such a dynamic environment, the estimated areas could be as little as ~2000 m² (sum of exposed three beaches, when were not impacted by rip, current, tide under high tide and gust wind conditions), or be as much as 12000 m² (sum of exposed three beaches, when were not impacted by rip, current, tide under lowest tide and light wind conditions.). Please keep in mind, these areas keep changing!	Noted. The DSI should stress that from time to time the entirety of Lot 97 is likely to be below water level and subject to wave action and that as a result asbestos fragments are likely to be transported by wave action / currents, etc. and continually comminuted by erosional attrition within such an environment. The auditor notes that Trinitas has recognised that the backward and forward movement of ACM particles by tidal action has resulted in smoothing. Noted and completed
8	Agree, Trinitas recommends a certified surveyor to define the boundaries for the site, crown land and adjacent lands and properties, which was out of the scope of work in the DSI. The DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach.	See above. If Trinitas consider a survey is warranted then the auditor has no objections, however it is considered that existing Lot information should be sufficient to adequately define the boundaries, in particular the landward boundary of Lot 97 with Lot 98. It is noted that focus on the 3 outlet areas at the base of each gully are likely to comprise the main concentration of asbestos, and that this material will then be further dispersed by tidal action as seems to be particularly the case at the Southern Beach. Noted
9	Agree. Trinitas recommends that all the documents, including, but not limited to, site investigation reports, images, communications, Remedial Action Plans, Validation Plan, Landfill Cell Design Plan, etc., should be provided to Trinitas for DSI reporting. All those documents listed in the Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be collected and provided by the Client or other stakeholders for Trinitas review. Only two reports were made available for Trinitas Desktop Review in DSI reporting (All other reports have not been made available so far) Environmental Monitoring Services, Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site – Undevelopable Area (Reference No. EMS 05 4328, in December 2005) ERM, Site Audit Statement (Reference No. PS 53, by Paul	At present the main issue is what is the source of asbestos on the 3 components of the site (Lot 97)? If review of these reports will assist in determining potential off-site sources, then a detailed review may be worthwhile. However, for the purposes of the current DSI it may simply be appropriate to review the Site Audit Report and Site Audit Statement as referenced. In any event such documents should be provided as supplementary information in the DSI as they have a bearing on the site history. Noted In regard to review of the various documents cited, Trinitas may need to acknowledge that such reports may be commercial in confidence and therefore not be readily available. Noted and completed In addition, it seems axiomatic that the main likely source(s) of asbestos are related to the 3 gullies currently identified in the DSI (i.e., associated with the 3 beaches), accordingly, for the purposes of the current DSI, this information together with an examination of the site audit documentation is probably sufficient. Noted

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	Steinwede at ERM) Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders. 1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999; 2. Douglas Partners Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 - 2002; and 4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004. Only factual observations, data and related interpretation and opinion for all possible point sources should be done after additional investigations listed in Trinitas DSI 2021. It was out of the scope of Trinitas DSI 2021 to collect all those reports and to define legal site boundaries.	Whilst additional investigations may be necessary to further assess remediation requirements in Lot 98 the main question at present is does Trinitas consider that testing to date in Lot 97 (noting the caveats regarding environmental dynamics) has sufficiently characterised the defined site and such that a definitive statement can be made on site suitability, or if not what measures are required to arrive at that situation?’ It is the opinion of Trinitas that at this stage, it is premature to comment on the suitability of the site for the current land use. Due to the dynamic nature of the contamination, further investigations as recommended in section 10 of the DSI should be conducted.
10	Agree, this is a long-term mission, which is out of the scope of Trinitas DSI. Trinitas is happy to quote for all these suggestions by the DP Auditor once formally requested and approved by the Client.	Noted. This is a matter between the Client (Council) and Trinitas. Generally, it would be anticipated (and it is normal practice) that the consultant would rectify the DSI as necessary following comments by the auditor. If additional sampling is considered to be required in Lot 97, again the cost of this is a matter between Council and Trinitas. Noted and DSI report updated
11	Agree a comprehensive CSM is desirable. However, it was still premature to prepare a 3D or 4D CSM with so many unknowns during the Trinitas DSI 2021. It is out of the scope of work in	A comprehensive CSM is a necessary component and requirement of any DSI, the details of which are set out in NEMP and in Consultants Reporting on Contaminated Land, Contaminated Land Guidelines (EPA, 2020) – Tables 2.1-2.3. Provision of a suitable CSM is not regarded as premature and it should be noted that the CSM should be modified as

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	the DSI 2021. Trinitas DSI was just a Stage 1A to delineate the site (immediately surroundings). Once additional Detailed Site Investigations were completed, Trinitas is able to quote for the following DSI once requested by the Client.	more information comes to light. The Stage 1A DSI should be complete and should be sufficient to characterise the defined site Lot 97. It is agreed that investigation of other areas e.g., Lot 98 and areas beyond the low water mark are indeed beyond the scope of the current investigation, but should not be regarded as a pre-requisite to enable satisfactory completion of the current DSI. Indeed, the auditor considers that the need and advisability of conducting investigations below the low water mark is questionable, i.e., as recommended as Stage 1B by Trinitas (i.e., the 'Diving Investigation') as it is not clear what usable information will be forthcoming, other than perhaps an appreciation of the amount of asbestos in the immediate off-shore environment. Perhaps of more relevance is the identification of mechanisms which may bring asbestos on to the site from both on shore and offshore sources, both of which should be examined in the CSM. The recommended Stage 1C investigation of the 3 Crown Gullies may be necessary depending on what remedial measures are to be adopted at / or beyond the current (Lot 97) site boundary. It should be noted that such investigations will be largely if not entirely within Lot 98 which is understood to be owned by others. Noted and updated DSI
12	Agree. It is desirable to have a vertical, horizontal and temporal, 4-dimensional CSM, which was out of the scope work in the Trinitas DSI 2021. Trinitas is happy to quote and prepare all of the fancy 4D CSM once the unknowns were delineated in the following investigations as recommend in the Trinitas DSI. If the Client formally requests and approves additional Trinitas DSI, these fancy 4D CSM could be prepared. Trinitas DSI was just a Stage 1A to delineate the site (immediately surroundings). Once additional Detailed Site Investigations were completed, Trinitas is able to quote for the following DSI once requested by the Client.	As noted above a suitable CSM is a requirement of NEPM and the various guidelines made and endorsed under Part 4 of the CLM Act and should have been presented in the DSI, accordingly provision of a suitable CSM is not considered to fall outside the scope of the DSI. The auditor refers the consultant to a range of guidelines included in the above guideline, which can be found at: https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/contaminated-land/20p2233-consultants-reporting-on-contaminated-land-guidelines.pdf?la=en&hash=EBB6758A2DE448534B6FDD5057D280523E423CC7. CSM updated within DSI report
13	Agree. It is desirable to have a vertical, horizontal and temporal, 4-dimensional CSM, which was out of the scope work in the Trinitas DSI 2021. Trinitas is happy to quote and prepare all of the fancy 4D CSM once the unknowns were delineated in the following investigations as recommend in the Trinitas DSI. If the Client formally requests and approves additional Trinitas DSI, these fancy 4D CSM could be	As noted above the scope of work should have included sufficient review and appreciation of site conditions in order to develop a suitable CSM which would include consideration of the beach environment and the geo-mechanical processes involved in the fate and transport of asbestos onto the beach and within the beach environment. As noted above a CSM is a requirement, there is nothing 'fancy' about it. Because of the beach environment some consideration of the likely temporal changes to the CSM should also be considered in the narrative. CSM updated within DSI report

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	prepared.	
14	Disagree. Some thoughts are out of the scope of work in Trinitas DSI 2021 (specifically, the site and its immediately surroundings changes under extreme weather conditions in the past 100 years, or after 1999, after 2005, after 2020). Trinitas DSI 2021 has already delineated the site with depth and frequency, as clearly illustrated in Appendix D: DSI Site Layout, Sampling Locations, Positive Test Pits and Maps, Trinitas DSI 2021. Especially, Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders. 1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999; 2. Douglas Partners Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 – 2002; and 4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004. Hopefully, those aforementioned PSIs had shed some light on the vertical, horizontal and temporal contamination with a 3 D or 4-dimensional CSM.	As noted above the scope of work should have included sufficient review and appreciation of site conditions. The depth, location and frequency of testing is noted. What is required is a clear statement on whether the consultant considers that the site has been sufficiently characterised, along with any limitations, and whether any further investigations are required in Lot 97. This response is repetitive. See above comments above regarding reports pertinent to Lot 98. As noted above a CSM is a requirement, the consideration of changes with time – say over a tidal cycle in the intertidal zone in the beach environment, or during storm events are also considered relevant to the CSM. Repetitive reference to these reports. In addition, it is doubted whether the reports relevant to adjacent sites will shed any light on the distribution of asbestos in Lot 97 other than perhaps identifying the source. Noted and CSM updated

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15	Asbestos Terminology (NEPM or Work Health and Safety Legislation) Friable means when dry, or as the result of a work process, may be crumbled, pulverised or reduced to a powder by hand pressure. Bonded ACM is equivalent to “non-friable” asbestos in Safe Work Australia (2011), which is defined therein as “material containing asbestos that is not friable asbestos, including material containing asbestos fibers reinforced with a bonding compound”. Non-friable asbestos may become friable as a result of work processes over time (for example, degradation due to chemical exposure) or due to other factors (for example, damage by fire). Asbestos fines (AF) includes free fibres, small fibre bundles and also small fragment of bonded ACM that pass through a 7 mm x 7 mm sieve in NEPM 2013. Fibrous asbestos (FA) comprises friable asbestos materials and includes severely weathered cement sheet, insulation products and woven asbestos material. Trinitas confirmed that: 1. Most of collected suspected ACM fragments on surficial soil at the site were highly polished as thin as a five cent and are being polished from August 2020 to July 2021. 2. Few Friable Asbestos fragments (frequency: 2 out of 2000 suspected ACM fragments) as WHS Legislation defined were collected during Trinitas’s one-year Emu-picking and Clearance	Noted, please refer to the equivalency information as outlined in the table below. The important issue is that previously in Rev3 of the Trinitas DSI it was stated that no friable asbestos was present and by association (and testing) that no AF/FA was present. Whereas it is now stated that friable asbestos is/or was present based on observation (and photographs) and on materials collected (but presumably not collected during the DSI). A firm statement is required stating unequivocally whether or not AF / FA or friable asbestos is / or was present, if so what is the evidence, either prior to the DSI or as part of the DSI. Similarly, if friable or AF / FA asbestos was not present during the DSI, some discussion is required on whether asbestos on the beach is likely to degrade to such a form through attrition or any other processes which may potentially occur. Table 6 Equivalency of terms used in the NEPM, WA DoH (2009) and Work Health and Safety legislation and guidelines <table><tr><th>NEPM terminology (based on WA DoH 2009)</th><th>Work Health and Safety terminology</th></tr><tr><td>Bonded asbestos-containing-material or ‘bonded ACM’ (referred to as ACM in WA DoH 2009)</td><td>Bonded asbestos/non-friable asbestos</td></tr><tr><td>Fibrous asbestos, FA</td><td rowspan="2">Non-bonded/friable asbestos</td></tr><tr><td>Asbestos fines, AF</td></tr></table> Terminology updated within DSI v4	NEPM terminology (based on WA DoH 2009)	Work Health and Safety terminology	Bonded asbestos-containing-material or ‘bonded ACM’ (referred to as ACM in WA DoH 2009)	Bonded asbestos/non-friable asbestos	Fibrous asbestos, FA	Non-bonded/friable asbestos	Asbestos fines, AF
NEPM terminology (based on WA DoH 2009)	Work Health and Safety terminology								
Bonded asbestos-containing-material or ‘bonded ACM’ (referred to as ACM in WA DoH 2009)	Bonded asbestos/non-friable asbestos								
Fibrous asbestos, FA	Non-bonded/friable asbestos								
Asbestos fines, AF									

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	from August 2020 to July 2021. As shown in the images below, they can be easily crumbled, but a sort of weathered, polished and bonded forms. Therefore, as shown in the following images, some fragments could be classified as Friable according to WHS; or Non-friable as NEPM. 3. "DSI indicates that no AF / FA was recorded during sampling". The statement is based on the DSI sampling period of just a week from 26 April to 30 April 2021. Therefore, there is no inconsistency with DSI conclusions.	
16	Hotspots or Hotspot Area, where many pieces of ACM in a localized area, or very frequently encountered fragments during one-year period of Emu-picking and clearance inspection. In another word, these areas have been observed ACM fragments almost every time for a one-year Emu-picking. Also, DSI sampling found ACM fragments during sieving or excavation, whatever over HSL criteria or below, as there are uncertainties to sight/sieve wet sands or sands below sea water level. Trinitas observes the pattern that all of the Hotspot Areas are close to the outlets of gullies, while ACM fragments are less likely to be found in the upper northern section of Southern Beach. This site pattern has not changed since August 2020.	The DSI should report what was found during the DSI, including any findings which suggest that there are concentrations of ACM near the gully outlets, which seems to be the case. Completed Review of the findings of emu picking reports throughout the preceding year should also be included in order to characterise the changing beach conditions and to gauge the success of the emu picking programme over time by demonstrating a reducing amount of asbestos from each successive collection, if this is the case. If this is not the case then the value of the process becomes questionable, although it is noted that weather events may cause a renewal of supply. Findings from bi-weekley emu picks summarised within DSI report
17	Surface asbestos fragments are unpredictably widely scattered. Natural elements keep them exposed all the time. Red dots just illustrated where ACM fragments were observed, therefore, based on the site observation, further investigations were recommended. If the Client formally requests and approves the additional investigations, Trinitas will update the DSI 2021. Trinitas observes the pattern that all of the Hotspot Areas are close to the outlets of gullies, while ACM fragments are less likely to be found in the upper northern section of Southern Beach. This site pattern has not changed since August 2020.	Noted. Please confirm whether the additional investigations you have in mind are within or outside Lot 97. Some investigation areas will fall just outside of the boundary but to fully understand the sources and extent of contamination from these sources, Trinitas recommends undertaking these investigations. Even if remediation measures are to be recommended for Lot 97 boundaries, these areas need to be assessed, in order to provide appropriate recommendations.
18	time. Under this dynamic environment, Trinitas "Make-safe" Emu-	

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	picking and Clearance ensures that all visible ACM fragments were picked up and cleared at the time of Emu-picking Clearance period only. Maybe, in the following seconds, it could be possible that more ACM fragments appear due to natural elements.	
19	Agree, Should an Asbestos Management Plan be implemented rather than scaping, stockpiling and dumping around the Gully 1 after 2005? These immediate areas are "known" contaminated with asbestos and other chemicals. All surface runoff flows towards the Northern Beach! Agree, Trinitas recommends a certified surveyor to define the boundaries for the site, crown land and adjacent lands and properties, which was out of the scope of work in the DSI. But, the DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach. Only two reports were made available for Trinitas Desktop Review in DSI reporting (All other reports have not been made available so far) 1. Environmental Monitoring Services, Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site – Undevelopable Area (Reference No. EMS 05 4328, in December 2005) 2. ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) Especially, Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders. 1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999;	Noted. Repetitive comments. Noted

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	2. Douglas Partners Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 – 2002; and 4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004.	
20	The DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach. Only two reports were made available for Trinitas Desktop Review in DSI reporting (All other reports have not been made available so far) 1. Environmental Monitoring Services, Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site – Undevelopable Area (Reference No. EMS 05 4328, in December 2005) 2. ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) Especially, Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders. 1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999; 2. Douglas Partners Draft Report on Contamination	Noted, repetitive content. Noted

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	Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 – 2002; and 4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004. All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. Trinitas will be more confidently able to answer the key question: why those sampling activities as Annex A Figures and Photographs, Figure 8, Borehole Location Plan, did not confirm asbestos contamination in any sampling location? To what extent, asbestos fragments on surficial soil in three beaches? Under this dynamic environment, changes are all the time, day and night, year after year.	
21	Please refer to some videos for a better understanding how dynamic the three beaches in Little Bay are!	Noted. Noted
22	Agree, Trinitas recommends a certified surveyor to define the boundaries for the site, crown land and adjacent lands and properties, which was out of the scope of work in the DSI. But, the DSI focused on the physically boundaries from the	Noted, repetitive comment. Please see earlier comments. Noted

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	Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach, which were illustrated in Appendix D: DSI Site Layout, Sampling Locations, Positive Test Pits and Maps, Page 52 – 56 in DSI 2021. Once the Client formally requests and approves Trinitas Surveying quote, this will be updated.	
23	Agree, Trinitas recommends a certified surveyor to define the boundaries for the site, crown land and adjacent lands and properties, which was out of the scope of work in the DSI. But, the DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach with a segment of dumped tip. Once the Client formally requests and approves Trinitas Surveying quote, this will be updated.	Noted, repetitive comment. Please see earlier comments. Noted
24	Agree. But, the DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach. Only two reports were made available for Trinitas Desktop Review in DSI reporting (All other reports have not been made available so far) 1. Environmental Monitoring Services, Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site – Undevelopable Area (Reference No. EMS 05 4328, in December 2005) 2. ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) Especially, Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders.	Noted, repetitive comment. Please see earlier comments. Noted

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	1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999; 2. Douglas Partners Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 - 2002; and 4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004. All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. Trinitas will be more confidently able to answer the key question: why those sampling activities as Annex A Figures and Photographs, Figure 8, Borehole Location Plan, did not confirm asbestos contamination in any sampling location? To what extent, asbestos fragments on surficial soil in three beaches? Under this dynamic environment, changes happen all the time, day and night, year after year. Please refer to some videos for a better understanding how dynamic the three beaches in Little Bay are!	

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	1. Storm and extremely dangerous current conditions: https://www.dropbox.com/s/vppshfsvfvtvim0/IMG_7789.MOV?dl=0 2. Southern Beach (~1000 m² was not impacted by high tide) https://www.dropbox.com/s/ie4ptgd2rxo81nq/IMG_7766.MOV?dl=0 3. Hotspot at Southern Beach and Crown Gully 3 (Concrete Stormwater Pipe) https://www.dropbox.com/s/yxl4xe87e3migk7/IMG_7778.MOV?dl=0 4. West Beach or Middle Beach under water and Crown Gully 2 https://www.dropbox.com/s/ugoczwnmaqrbrb/IMG_7808.MOV?dl=0 5. Northern Beach and Crown Gully 1 https://www.dropbox.com/s/lr2jle9cqk4cffb/IMG_7843.MOV?dl=0 6. Coastal Erosion from Recent Dumping Stockpile (~150 Tonnes) at immediate surrounding of Northern Beach and Crown Gully 1	
25	The DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach. Only two reports were made available for Trinitas Desktop Review in DSI reporting (All other reports have not been made available so far) 1. Environmental Monitoring Services, Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site – Undevelopable Area (Reference No. EMS	Noted, repetitive comment. Please see earlier comments. Investigations in areas other than Lot 97 are not only outside the scope of the DSI but are also outside the audit scope other than the demonstrable need to identify, if possible, the source of asbestos currently being exposed on the beach areas. Noted

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	05 4328, in December 2005) 2. ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) Especially, Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders. 1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999; 2. Douglas Partners Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 – 2002; and 4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004. All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. Trinitas will be more confidently able to answer the key question:	

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	why those sampling activities as Annex A Figures and Photographs, Figure 8, Borehole Location Plan, did not confirm asbestos contamination in any sampling location? To what extent, asbestos fragments on surficial soil in three beaches? Under this dynamic environment, changes happen all the time, day and night, year after year. Please refer to some videos for a better understanding how dynamic the three beaches in Little Bay are! Field Investigation regarding Information on creek hydrographs, typical creek flows and high stage events and erosion potential will be conducted only after the Client formally requests	
26	Agree. Will do.	Noted. Noted
27	Agree. But, the DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach. Only two reports were made available for Trinitas Desktop Review in DSI reporting (All other reports have not been made available so far) 1. Environmental Monitoring Services, Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site – Undevelopable Area (Reference No. EMS 05 4328, in December 2005) 2. ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM)	
28	Especially, Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders.	Noted, repetitive, see comments above Noted

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	1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999; 2. Douglas Partners Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 - 2002; and 4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004. All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. Trinitas will be more confidently able to answer the key question: why those sampling activities as Annex A Figures and Photographs, Figure 8, Borehole Location Plan, did not confirm asbestos contamination in any sampling location? To what extent, asbestos fragments on surficial soil in three beaches?	
29	Agree. The DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach.	Noted, repetitive, see comments above Noted

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
	Only two reports were made available for Trinitas Desktop Review in DSI reporting (All other reports have not been made available so far) 1. Environmental Monitoring Services, Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site – Undevelopable Area (Reference No. EMS 05 4328, in December 2005) 2. ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) Especially, Trinitas recommends that the following relevant investigation reports should be provided by the Client or from Douglas Partners or from other Stakeholders. 1. Preliminary Site Contamination Assessment prepared by Woodward Clyde, dated October 1999; 2. Douglas Partners Draft Report on Contamination Assessment, Prince Henry Hospital redevelopment, Little Bay, prepared for Landcom, dated March 2000, comprising the collection of fill and soil samples collected at 22 locations across the whole of the Site; 3. Douglas Partners Report on Contamination Assessment, Prince Henry Hospital Undevelopable Area, Anzac Parade, Little Bay February 2003. The report was prepared for Landcom and comprised the collection of fill, soil and surface water samples collected at 111 locations in 2001 – 2002; and 4. Douglas Partners Draft Report on Supplementary Contamination Assessment, Prince Henry at Little Bay, Undevelopable Area, Anzac Parade, Little Bay (September 2004). This report was prepared for Landcom and included the collection of soil and fill samples from 125 test pits excavated in 2004. All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review.	

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
	All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. If the client formally requests and approves the detailed desktop review, Trinitas will revise it.	
30	Agree. But, the DSI focused on the physically boundaries from the Retaining Walls in Southern Beach, Outlet in the Western or Middle Beach, Heritage Wall in the Northern Beach. Only two reports were made available for Trinitas Desktop Review	Noted, repetitive, see comments above v
31	All documents listed in Table 2.1, ERM, Site Audit Statement (Reference No. PS 53, by Paul Steinwede at ERM) should be provided to Trinitas for review. No information regarding the location of landfill cell, surveying report, long term management plan for the cell was provided to Trinitas for review. Based on site observation, Landfill locations were identified 1. Tip around Heritage Wall, lower part of the Gully 1 adjacent to the Heritage Wall (~150 Tonnes of scraped waste were observed on July 11, 2011 and smaller volume of dumped waste observed from August 2020 till now), and the whole lower part of Gully 1. 2. Landfill around Gully 2, Middle Beach After the Client formally requests and approves the additional investigations as recommended in the DSI 2021, Trinitas will update the relevant parts.	Noted, repetitive, see comments above. The objective for the current DSI should be to complete the report appropriately and make any recommendations regarding site management, remediation etc. In addition, if investigations are deemed necessary in Lot 98 or elsewhere then these can also be addressed but should not detract from the appropriate completion of the current DSI. Noted
32	Yes, as recommended in Section 10, DSI 2021.	Noted. Noted

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
	Yes, Three Unknown Areas adjacent to Hotspots were recommended for further investigation.	Noted, but please clarify whether these are located in Lot 97 or elsewhere. Noted and updated within DSI
33	Agreed. Trinitas DSI identified elevated or higher frequency of ACM fragments mostly around the Gully outlets. The point sources from Three gullies were confirmed. The hotspot area at Southern Beach could be dumped site or buried or accumulated below and around rocks. All of the three beaches are not the point of sources of contamination. Asbestos contamination could be managed to a certain extent. However, the point sources from gullies should be properly remediated or managed to reduce the long-term burden of Emu-picking and clearance. Trinitas can provide specific remedial action plan to manage risks both in a short term and long-term period.	Noted. It however considered unlikely that material was dumped directly on to the beach (Lot 97), historically this possibly occurred on Lot 98 and the material is progressively moving down gradient by various mass movement/transport mechanisms onto the beach. These need to be reflected in the CSM. Noted and updated If any materials have been buried on the beach (Lot 97) then evidence needs to be provided. In this regard it seems quite plausible that geo-mechanical mechanisms may have caused material to accumulate at the toe of the slope and then become covered by sand movement and deposition (wind, wave or gravity). Such anthropogenic material could be classifiable as Fill or as Anthropocene deposits. Please make reference to AS 1726:2017 in this regard. Agreed that management or remediation should be considered. Noted
34	Agree. Will revise and update accordingly.	Noted. Noted
35	Cannot understand the meaning.	There is a reference to footings, are these located within Lot 97 or elsewhere i.e. on adjacent land such as Lot 98? Noted and updated
36	Anthropogenic materials are throughout the three beaches and immediately surroundings	Noted. See above. Noted
	DSI sampling excavated up to 2.5 m or refusal in the southern beach; DSI sampling excavated up to 1 m or refusal in the middle beach; DSI sampling excavated up to 1 m or refusal in the northern beach. Visual inspection for deep excavation only, rather than grab sampling (500 mL) or sieving due to safety issue. (All fieldnotes and graphic records is available).	Please check the logs accordingly and advice whether the test pits/ logs in question were actually within Lot 97. Noted and checked Please provide field notes as an appendix to the DSI. Field notes are collected on Trinitas Groups HAZMAT App. The App generates COC reports, site photos reports etc Logs updated

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
37	Agree, will do.	Noted.
38	Hospots or Hot Areas in the DSI 2021: - Where ACM pieces were most frequently sighted and picked up (such as every site walkover and clearance inspection finds ACM piece(s) in a localized area) - DSI 10 L sieving sampling sighted or collected ACM fragments with gravimetric concentration over 0.02% w/w - Several ACM fragments were sighted in a localized area (Page 57, WA Guidelines 2009). - Or the least weighted, one or two pieces found during DSI sampling on surface. For this specific site, could DP Auditor recommend another approach to delineate these areas?	Please advise, if this is the case, that in using the term hotspot you are not employing the definition of a hotspot found in NEPM (viz 250% the SIL, HIL, HSL etc) but rather that you are identifying areas where ACM pieces were more frequent than elsewhere on the site. In the DSI, hotspots are defined as areas that can be delineated as having much greater risk of widespread contamination compared to other areas.
39	Disagree. This was out of scope of work in DSI.	It is important to confirm which sampling points if any lie outside the site (Lot 97). It is noted that locations along the boundary may be moot, but clearly from the Figures, some sampling locations are apparently outside the site boundary. Accordingly, the auditor is of the opinion that this issue is very much within the scope of the DSI. Noted.
40	Agree. All field notes and photographic records are available. DSI sampling excavated up to 2.5 m or refusal in the southern beach;	
41	DSI sampling excavated up to 1 m or refusal in the middle beach; DSI sampling excavated up to 1 m or refusal in the northern beach. Visual inspection for deep excavation only, rather than grab sampling (500 mL) or sieving due to safety issue. All samples labelled as TPXX_YY-ZZFCWW is defined as - Test Pit XX; - Depth from YY m to ZZ m; - Fragment Fibro Cement FC sighted or collected from 10	Noted. Please check with your logs that this is correct and that the depth of pits in the southern beach (within Lot 97) was 2.5m as noted previously. TP Logs updated

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
	L sieving process • The nth of fragment: WW	
42	Agree, will do.	Noted.
43	Agree, Will revise.	Noted.
44	Agree, once the Client formally requests and approves the additional investigations as listed in the Trinitas Stage 1A, DSI 2021, a 3D CSM with evidence to identify point sources will be prepared after Trinitas RFQ	Please confirm whether these additional investigations relate to Lot 97 or adjacent sites. The objective at present is to provide a satisfactory DSI for Lot 97. Additional works outside Lot 97 can form recommendations at this stage but are not necessarily germane to the completion of this DSI. The DSI is complete in identifying the extent of contamination at the three beaches. However, the ultimate goal is to remediate the site so that it is suitable for the current use. Trinitas considers that this is not possible without fully investigating all the sources of contamination which may or may not lie within the Site boundary.
45	Agree, considering the stained or humus-like dark color of soils	Noted. Please confirm whether these soils were observed within or outside Lot 97. In addition, whilst the investigation was restricted to asbestos, does Trinitas consider that it has a duty to warn in regard to other potential contaminants which may be present in Lot 97 particularly noting the fan of dark material at the outlet of Gully 2 (Middle Beach). These soils were observed adjacent to the site boundary. When further investigations in these areas are approved as recommended, Trinitas will definitely report any contamination risks, whether chemical or asbestos, that could pose a risk to users of the site.,
46	Agree. Once the Client formally requests and approves the additional DSI – Stage 1B quote, it will be updated. Once the Client requests and approves the surveying quote, it will be updated.	As noted earlier, surveying of the site and completion the Stage 1B are not considered necessary for the completion of the DSI at Lot 97 at this stage, and are possibly not required at all. Noted
47	Disagree. It was out of the scope of work in the Trinitas DSI 2021. Once the Client formally requests and approves the additional data collection for coastal erosion monitoring quote, the related works will be updated.	Such a discussion is considered to form an integral part of the CSM and therefore is most certainly part of the scope of the DSI and is a requirement as noted above. Noted. CSM has been updated and additional monitoring works can be undertaken as approved by the Client.

48	Trinitas excavation and observation with photographic evidence identified landfill-like waste (buried, off-site migrated from gullies, or dumped) at 1. Hotspot Area 1, 2 and 3. 2. Dumped waste in Gully 1 and Gully 2; 3. Dumped waste in Golf Course adjacent to Gully 1. However, when and how the dumped waste came from are not certain.	See above. The so-called hotspots 1-3 may well be the recipients of migrating contaminants, however it is reasonably clear that Gully 1, 2 and 3 (or at least the majority of these gullies) and the Golf Course are not part of Lot 97 and thus not within the site. It may be reasonable to conclude that these features are contributing as sources of asbestos and that legacy filling of gullies occurred historically. In this context and as noted earlier, it is necessary to review and comment upon the findings of the site audit for adjacent land. Noted. Site Audit Statement not provided to Trinitas

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
49	It is hard to made a conclusion. Most of the Emu-picked ACM fragments are highly polished. Some are as tiny as a five cent coin. Some are as thin as a five cent coin. Some big fragments are still visible as corrugated Super 6 sheeting fragments. Under The dynamic environment, the polished ACM fragments could deliver fibres into sand, into water, into air. However, Trinitas continuous air monitoring results are all negative	Noted.
50	It is hard to made a conclusion. Most of the Emu-picked ACM fragments are highly polished. Some are as tiny as a five cent coin. Some are as thin as a five cent coin. Some big fragments are still visible as corrugated Super 6 sheeting fragments.	Noted.
51	Some fragments could be classified as Friable according to WHS or Non-friable as NEPM.	See above and refer to Table 6 which suggests otherwise. Please clarify and make a definitive statement on whether Friable or AF/FA was found in the DSI and indeed was definitely identified at any stage during the emu picking exercises since mid-2020 to present. Updated in DSI. No AF/FA identified within any samples.
52	Under The dynamic environment, the polished ACM fragments could deliver fibres into sand, into water, into air. However, Trinitas continuous air monitoring results are all negative.	Noted. It would also be relevant to comment on the soil sampling results which were also negative in this regard. Noted. Updated in DSI
53	That is why Auditor opinions are essential.	Noted.
54	Agree. Tidal influence was out of the scope of work, as Coastal Engineer should be engaged to investigate it. Legal Site Boundaries should be done by the Client, as it was out of the scope of work. From 26 April, 2021 to 30 April, 2021, the site has the time window of lowest tide at 0.3 m and highest tide at 2.0 m. Please be aware that the lowest tide could be 0.2 m in one year period, when most of the outcrops at the Middle Beach is above water level. During the highest tide of 2.0 m, the whole Middle Beach is under water and impacted by tides up to the boulders at the outlet of Gully 2.	Noted. However, tidal influence should be considered as part of the CSM and therefore should have been included in the scope of work for the DSI. It is noted that the tidal regime would have influenced the testing programme and that the DSI was conducted to take into account favourable tidal conditions. It is also acknowledged that the investigations for the most part would have revealed the site condition at the time of sampling, and which could and probably did change even over one tidal cycle particularly in the intertidal zone which appears to extend across the full width of the beach and rock platform areas. Comments on the site boundary are shown above. Noted

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
	Trinitas is of the opinion the specifically selected period at the DSI investigation is the most practical one for the contamination investigation and assessment, which was agreed with relevant stakeholders. The sampling points at the DSI already reached the most achievable low tidal lines, if not the lowest tideline. However, Trinitas is of the same opinion that the exact site boundaries of Lot 97, Lot 98, DP270427 should be surveyed and defined by the client, the Crown Land and other stakeholders. Trinitas is aware of the potential legal processes, acknowledging the fact that the site is dynamic and that site boundaries from Sixmaps or copied layouts are not clear enough to guide the DSI. In Appendix G, Photos – Southern Beach – Rock Area or underwater Area, ACM fragments were already observed under water, as most of the Rock Area was easily accessible via bare feet.	
55	Trinitas DSI is just a Stage 1A – Detailed Site Investigation. Additional investigations can be conducted exactly suggested by the DP site auditor, only after the client approves them	See comments above.
56	As shown in Appendix D: DSI Site Layout, Sampling Locations, Positive Test Pits and Maps, DSI report: Three Hotspots have ACM over 0.02%, <0.02%, ACM fragments observed on the surfaces and ACM fragments sighted during excavation or during 10 L sieving process. All other areas except unknown contamination areas are considered to have diffused sources of contamination. Trinitas is of the opinion that most of the ACM fragments will undergo subsequent processes: stirring, polishing, sieving, washing up and washing all the time. The clearance report and emu picking with photographic records in the past year from August 2020 to July 2021) clearly demonstrated the highly polished ACM fragments could be as	Is Trinitas suggesting that these hotspots require further investigations? Also please confirm whether the site and or these areas meets NSW EPA and or NEPM requirements in regard to the published HSL which include no asbestos at the surface? It is a requirement that the DSI makes an unequivocal (clear cut) statement regarding site suitability and any related limitations, see Table 2.3 in the guidelines noted above. If the consultant is unable to make this statement, please state the reasons. It is not acceptable to simply rely on the HHRA in this regard, although the related opinion from JBS&G can of course be referenced. Noted. The DSI states that 4/45 test pits were confirmed as containing Asbestos contamination over the site assessment criteria (HIL/HSL C). In the current state, these areas require remediation to be considered suitable for site use which is exactly what Trinitas has recommended.

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
	thin as a five cent. “whether the site is or can be made suitable for the specified land use” depends on the Human Health Risk Assessment Reports by JBSG. The DSI will be updated accordingly. However, Trinitas is of the opinion that if all of the recommendations listed from Page 42 to Page 45 at Section 10, DSI are implemented, It is possible to make the site suitable for the specified land use. There are still unknown contamination conditions and uncertainties after the Trinitas DSI 2021. Trinitas is happy to consider all ideas and recommendations from the auditor, the council, EPA and all other stakeholders.	
57	Agree. Trinitas recommends further investigation of Unknown Immediate Surrounding Areas, Point Sources as shown in Appendix D: DSI Site Layout, Sampling Locations, Positive Test Pits and Maps, DSI report, in order to prepare a remediation plan and to address the contamination issues in a short term, medium period and long term period with the consultation and engagement of key stakeholders.	Noted. See comments above. Can Trinitas confirm that they are recommending and EMP for Lot 97 as well as an RAP and if so, what is the nature of the proposed remediation in broad terms (and of course subject to the eventual RAP/AMP being prepared). As discussed earlier, it is premature to make a definitive statement regarding the remediation strategy which is why Trinitas has recommended additional investigation of all sources of contamination prior to the development of a RAP and AMP
58	Agree. Will do. Trinitas used Test Pit method by 5-T excavation. Shovels or hand tools were used to collect samples for testing. All logs will be updated accordingly	Noted.
59	Agree. Will be revised. Sands with minor tiles, glasses will not be labelled as Fill	Noted. See earlier comments and refer specifically to AS1726, for logging and descriptive advice on stratigraphic matters. In this regard it is noted that: AS 17626 defines fill as follows:

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
		• ‘... a volume of material which has been placed by anthropogenic processes...’ in situ is defined as follows: • ‘...in the place and situation in which it exists naturally...’ Also please note that the AS requires that the identification of the geological origin of soil is now mandatory (refer to clause 6.1). In this regard it is a moot point whether any filling at the base of the gullies, or elsewhere has been placed, or whether it is in situ, although its derivation is certainly anthropogenic and in all probability, it has been deposited by natural processes. Noted
60	Background Based on limited site historical information, Legacy Tip in Trinitas DSI report could be old rubbish dumps, legacy landfill, old garbage tip, unregistered dumped/buried cells, whatever happened during the 100 years at the site. Especially, the demolition of buildings of Male Lazaret and Female Lazaret or other subsequent buildings were dumped in the gullies or catchments areas. Old rubbish dumps are littered across the state. Some of the illegal waste dumped at the old tips could include asbestos, pesticides and dangerous chemicals. There could be landfills exempt from EPA licences and there may be sites that have not been reported. These closed garbage tips, known as "legacy landfills", pose a major challenge for councils as they struggle to fund a clean-up. The community was concerned some of the old tips were leaching hazardous materials, but that too little work had been done to assess the extent of the problem. In Trinitas Technical Brief, Section 3.2 Interview with a local resident disclosed that: “As part of the Site history review, an interview was held with the representative from the Client on 3 August 2020. The interview revealed no former report of asbestos contamination at Little Bay	Agreed, these comments are noted, and largely agreed, but these features are almost certainly not on Lot 97 and appear to be located wholly on Lot 98. In this regard there appears to be some evidence at least to suggest that materials from these locations (or at least from within the 3 gullies in question) are migrating down gradient from time to time and resulting in contamination of the 3 beach areas. Any remedial effort would need to consider what mechanisms may be available to prevent such materials being transported into Lot 97. Noted. This is the reason Trinitas recommends full investigation of these point sources. No remediation strategy would be complete without taking these areas into account.

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
	Beach	
61	A Trinitas Hygienist met a local resident (Greg Bond) on the beach on 31 August 2020. Greg has around 50 years of knowledge of the Site. Greg indicated that "the legacy dumped tip locates on the northern hill top adjacent to Crown Gully 1 and Northern Beach", but the demolition of buildings of Male Lazaret and Female Lazaret or other subsequent buildings around the Crown Gully 1 and Crown Gully 2 during a 100 year period could not be reflected. Fill or dumped waste in the catchments at the upstream of Old Retaining Wall in Crown Gully 1 and other two three gullies could be likely, as some front areas of the Golf Course were used a sand quarry. In the past 100 years, the sewer, the catchment areas and / or the gullies from the old hospital site could deliver all types of solid waste up to the sea as close as 3 KM away (some rubbish were pushed up and down towards the bay)." As mentioned in EMS report (D00229667 Environmental Monitoring Services - Prince Henry Redevelopment Site - PHLB Undevelopable areas remediation strategy report EMS 211205), a cell or two cells were proposed. However, no reports were provided by the Client for reference. As mentioned in EMS report (D00229667 Environmental Monitoring Services - Prince Henry Redevelopment Site - PHLB Undevelopable areas remediation strategy report EMS 211205), a cell or two cells were proposed. However, no reports were provided by the Client for reference. Especially, the following reports are desirable and crucial. List of reports not repeated. Trinitas assumes that all of these previous PSI reports should have already done a good quality desktop review regarding the dumped landfills/tipping locations. However, all of these five reports were not made available for DSI report.	Anecdotal information is noted which tends to agree that material was not dumped or tipped onto the beach but may be located in Lot 98. Certainly, if any remedial measures (barriers, collection devices etc) are proposed along the boundary of Lot 97 then such reports would need to be obtained and consulted. Agreed

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
	Therefore, DP should resort to its own archive database for old tips related information, but Trinitas was not provided all those documents by the client.	
62	Trinitas Consultant is of the opinion that Middle Beach or Western Beach has fill throughout with abundant glass, tiles and other anthropogenic materials under the top layer of sand. The visually clean sandy layer is just around 10 cm thick or less due to tidal effect from either the wash down of the Gully 2 or washup/deposit from the bay or both of them are the formation mechanisms. Significant volumes of bricks, glasses, rocks, concrete pieces throughout the Middle Beach were observed in the subsurface. (The collapse of a former dam and dumped waste were washed down all the way into the water). Please refer to "Short, A.D.(2012)Coastal Processes and Beaches. Nature Education Knowledge 3(10):15" for a basic idea of sand formation on the top of the beach. Therefore, Trinitas differentiates fill from top sand stratum at Test Pit 21. Actually, all of test pits at Middle Beach or Western Breach Sand Area were illustrated in the same manner to clarify the different strata. Please refer to Page 31, Schedule B1, Guideline on Investigation Levels for Soil and Groundwater, NEPM 2013. Please refer to Appendix E: Representative Photographic Records in Trinitas DSI 2021. 1. Item 9, TP22_1.0, Fill with Brick, glass, sand, tile, shell, concrete under top sand. In Photos - Middle Beach, from Photos - Middle Beach (Western Beach) – Hotspot as the Whole Sand Area 2. Page 67, Photos - Middle Beach (Western Beach) – Crown Gully 2, Appendix E: Representative Photographic Records	On the beach areas actively affected by erosion and sand movement (i.e. almost all of Lot 97) this is considered to be unlikely, although it is acknowledged that the sand on this beach is likely to contain anthropogenic materials such as building wastes including asbestos which has been washed down the gullies and redeposited, whether this material comprises a volume of material which has been placed by anthropogenic processes is a moot point. It is agreed that at the foot of the gullies and adjacent fill slopes there is likely to be a translational area where fill materials could be redeposited and over filled by naturally placed sand moved by wind and tide, (although it is noted that there is virtually no dune development at this site). For the most part such areas are however, considered likely to be outside the curtilage of Lot 97. Notwithstanding, the erosional and depositional mechanisms at work on the beach (the site) should be examined in the CSM. The description shown in Column 2 (here) could be used to good effect in the CSM. Noted.

Comment #	Trinitas Response Comment (Red insertions onto original IAL1 dated 2 July 2021)	Auditor Response
	3. During a certain period, the top sand is visually clean. https://www.dropbox.com/s/ugoczwnmagbrb/IMG_7808.MOV?dl=0	
63	Reference Eurofins Report 791709-AID Can Trinitas explain the analysis/results from sample TP28_0.5 and TP28_0.5FC01 Not sure what DP question means? Is it a question about NATA lab testing explanation? Or are you asking about the difference between NEPM testing (for TP28_0.5 was collected (500 mL) from the test pit using shovel, asbestos in soil NEPM) and Asbestos Testing as WA DOH (Fragments over 7x7mm collected during 10L soil sieving, TP28_0.5FC01 over 7mmx7mm dimension was collected from the sieve)? Or why Trinitas took two testing approaches? Please refer to Eurofins Report 791709-AID, Page 10, TERMS.	Can Trinitas provide an interpretation of this result (0.013% w/w) in the discussion of the report? It has been discussed in section 9.3 of the DSI. It is stated that 15/45 test pits confirmed asbestos contamination. This is one of those test pits. However, it satisfies the site assessment criteria of 0.02%. In the next sentence, the number of test pits exceeding the SAC has been mentioned.
64	Asbestos in soil concentration by gravimetric approach as NEPM 2013, Schedule B1 – Guideline on Investigation Levels for Soil and Groundwater (page 31), WA DoH guideline, 2009 On page 132, DSI V1 Draft; Also, on page 132, DSI V1 Draft, P32, “deleted cement Brown fine-grained sandy soil” at left hand corner	Noted.

Randwick City Council
30 Frances Street
Randwick NSW 2031

Project 205690.00
5 August 2021
IAL4-205690
JMN:jl

Attention: Evan Buntoro

Email: Evan.Buntoro@randwick.nsw.gov.au>

Interim Advice Letter 4
Non-Statutory Site Audit DPNS/19
Lot 97 Little Bay Beach, Little Bay - Lot 97, DP270427

1. Introduction

This letter provides Randwick City Council (RCC) and their Environmental Consultant - Trinitas Group (Trinitas) with interim advice (IAL) as part of Non-Statutory Site Audit DPNS/19 being undertaken by Mike Nash, an NSW EPA Site Auditor accredited under the Contaminated Land Management (CLM) Act. The advice concerns the assessment of contamination risks at the site located at Lot 97 Little Bay Beach, Little Bay Lot 97, DP270427 (Figure 1 - the site). The interim advice has been provided in accordance with a proposal issued by DP dated 8 June 2021 and a purchase order PIS20761 provided by RCC dated 18 June 2021, subject to DP terms and conditions.

The purpose of the non-statutory audit is to determine whether the Trinitas DSI meets the requirements of, and is compliant with, the guidelines made and endorsed under the Contaminated Land Management Act, 1997. The version of the DSI reviewed by the auditor (subject of IAL1) is:

- Trinitas Group (July 2021) *Detailed Site Investigation of Potential Asbestos Contamination at Little Bay Beach, Little Bay NSW* Randwick City Council, Little Bay Beach - 4R Coast Hospital Rd, Little Bay NSW, dated 30/7/2021 Draft (Revision) 4 ('the DSI report').

This IAL (IAL3) addresses the following response provided by Trinitas:

- Trinitas Group (30 July 2021) *IAL1 205690 dated 2 July 2021 - Trinitas Response dated 15 July 2021*.

This IAL does not pre-empt the conclusions which may be drawn at the end of the site audit process and does not represent a Site Audit Statement (SAS) or a site audit report (SAR). The attached table (Attachment A) provides a detailed review of the revised DSI.

2. Auditor's General Comments

2.1 Site Boundary and Previous Reports

As previously stated, the auditor considers the cadastral boundary of the site (Lot 97 DP 270427) should be adopted in the absence of a survey. The requirement for this defined boundary is integral to the audit process and documentation. Sampling on land owned by others without permission could present issues (for example Lot 98). See comments in the table attached.

2.2 Internal Review

The auditor notes that Trinitas has not organised a review of the document by a Certified Environmental Practitioner (CEnvP-SC) and have stated this is outside the scope of the work.

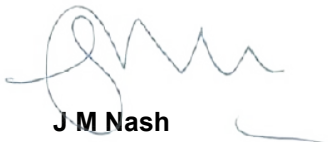
The auditor recommends that all further documents prepared in the next phase of the project including the RAP / AMP/EMP (assuming these are completed) should be prepared and / or reviewed by a Certified Environmental Practitioner (CEnvP-SC).

2.3 Additional Reports

Please provide all fortnightly asbestos clearance / emu picking reports to the auditor for information purposes.

Yours faithfully

Douglas Partners Pty Ltd



J-M Nash
Principal

Please note that the above information, interim advice and opinions do not pre-empt the eventual site audit findings nor do they constitute a site audit as defined under Part 4 of the Contaminated Land Management Act, 1997.

Attachment A - Table of Additional Comments on Rev 4 DSI

Attachment A

Table of Additional comments on Rev 4 DSI

Rev 4 DSI Section	Relevant Extracts from Rev 4 and Additional Issues	Auditor Comment
Nomenclature and distribution list	The nomenclatures used in the report titles is inconsistent - Rev 4 followed Draft, Final Draft and Final DSI. The references in the new DSI have all been changed. The new report is a Draft Rev 4 and previous versions have been renamed Draft Revs 1-3.	Please ensure accuracy and consistency in the nomenclature.
Exec Summary	Trinitas have indicated that: <i>All air monitoring testings for the duration of asbestos in/on soil investigation were performed by a NATA accredited laboratory-Eurofins. Laboratory certificates were provided in Appendix K. All control air monitoring results were below the detection limit of 0.01 fibres/mL of air, the lowest detectable limit for the method used. Therefore, results were also below the National Exposure Standard (NES) for asbestos which is 0.1 f/mL.</i> <i>Visual clearance certificates were issued to ensure that no ACM fragments were on the soil surface after test pit excavation and backfill with spoils.</i> <i>Well over 2000 fragments were collected during this timeframe between August 2020 to June 2021 at Little Bay Beach. There was no conclusive or scientific evidence to demonstrate a decreasing trend in terms of ACM fragment quantity or numbers identified and removed from the site during the bi-weekly site inspections and emu-picking being completed by Trinitas Licensed Asbestos Assessors.</i>	The air monitoring exercises were not strictly associated with the DSI, although the data / reports are relevant and should be supplied to the auditor. Regarding the test pits I don't recall seeing any visual clearance certificates in the DSI which ensure that there was no surficial ACM. Who were these VCCs issued to and can they be included in the report? Again, it should be stated in the DSI that these fragments were largely collected prior to the DSI which commenced in late April 2021, with reporting of this exercise up to the date of the Rev 4 DSI.

Rev 4 DSI Section	Relevant Extracts from Rev 4 and Additional Issues	Auditor Comment
	<i>Crown Gully 1 and Gully 2 have been eroding for decades up to 1 or 2 m.</i> <i>Immediate surroundings were also observed with suspected ACM fragments. Especially, areas of potential environmental concern included, but not limited to:</i> <i>o Stockpiles, Exposed Soils at Golf Course adjacent to the catchment, Crown Gully 1;</i> <i>o Dumped waste adjacent to Heritage Wall at Northern Beach;</i> <i>o Dumped waste in Crown Gully 2;</i> <i>o Cleared land at the upstream of Crown Gully 3</i> <i>o Sand Area under open water in the bay.</i> Trinitas have added: <i>Due to the nature of site contamination by bonded, highly polished asbestos in soil and on surfaces in a widely spread sand areas in this DSI, it was considered that asbestos contamination would pose a potentially low health risk to site users subject to change with a professional human health risk assessment report.</i>	What evidence do Trinitas have to state that the gullies have been eroding for decades? A review of historical aerial photographs of the adjacent site (Lot 98) would be necessary to determine this. In addition, it should be noted that Gully 3 at least is culverted up to the point of discharge onto the beach. Gully 2 is highly incised and is several metres deep within Lot 97 and clearly carries significant, and probably high velocity flow on occasions, and it is possible that the demolition waste within the gully (inland from the beach) was placed historically to reduce erosion. Only one of these areas is actually in the site (Lot 97), viz <i>Dumped waste in Crown Gully 2</i>. The extent of Lot 97 up the gully from the beach area should be shown on the relevant figure as it appears to form part of the site. From the Lot boundary information which is readily available it seems that the boundary extends at least part way up the gully towards the footbridge. The auditor notes that the risk will be determined by the HHRA, however the risk is not subject to change due to the HHRA.

Rev 4 DSI Section	Relevant Extracts from Rev 4 and Additional Issues	Auditor Comment
Section 1 Introduction	<i>In response to the urgent request for a site investigation at Little Bay Beach on 3 August 2020 from Randwick City Council ("The Client"), Trinitas Group Pty Ltd ("Trinitas") conducted a visual inspection within suspected asbestos contaminated area on the Northern Beach, also known as the Northern Sand Area of Little Bay Beach ("The Site") (See Figure 1) and Emu-picking of suspected asbestos fragments in conjunction with RMA Group ("Class A Licensed Asbestos Removal Contractor").</i> <i>At the end of 21 August 2020, there were over two hundred (200) suspected visible ACM fragments.</i> <i>Site inspections and periodical emu-picking indicated that there was no decreasing trend of visible ACM fragments at the time of this report preparation.</i> <i>It was understood that the Client required a Detailed Site Investigation (DSI) for Sand Areas as practically as possible with the findings, analytical results, limited literature review, site history, preliminary risk assessment and recommendations.</i>	It is noted that the investigation (DSI) commenced in late April 2021. Previous works involving collection of ACM on the beach and air monitoring commenced in August 2020. It is also noted here that Trinitas define the site as Little Bay Beach. See other comments on definition of the site as Lot 97 in DP270427. To demonstrate that there is no decreasing trend in visible ACM on the beach it would be necessary to plot the number of fragments collected at each emu-pick over the current collection period. Specifically, if no reduction in ACM fragments has been observed over this 12-month period it would be expected that the number of ACM pieces collected over one month at present would be approximately the same as in August 2020. Please confirm and demonstrate via a table or graphic. As noted elsewhere the area of investigation for the DSI was the Sand Areas (of the beach) i.e., Lot 97. Consideration of the condition and history of the adjacent lot (Lot 98) is of course an important component of the DSI, but Lot 98 does not form part of the site under investigation or under audit. The auditor recommends that references to Lot 98 are assembled under a separate section of the report (Adjacent Areas or similar) which deals with the known or suspected condition of Lot 98.

Rev 4 DSI Section	Relevant Extracts from Rev 4 and Additional Issues	Auditor Comment
	<i>This DSI was prepared as far as reasonably practical within the current scope of work with limited non-commercial information. Where available this limited site history assessment utilised open sources of information issued by NSW EPA, and NSW Land & Property Information (data sources from local government and SafeWork were not made available for Trinitas at the time of this reporting). These commercial sources should be supplemented by information provided by the client, landowner and/or other stakeholders. Review of the available site history summary demonstrated a non-consistent timeline of land use activities and layout with significant data gaps or inconsistencies which triggered the need for further historical record review.</i>	Much of this information forms a necessary component of any DSI for the report to be compliant with NSW EPA and NEMP guidelines (as referred to in previous IALs. Inclusion of this information in the DSI is not optional and should have formed part of the scope of works whether, or not, the information is available from commercial or non-commercial sources. Of course, some information may not be available, as it may be commercial in confidence, however open sources such as Section 10.7 certificates, and other available information from the LGA, SafeWork etc as well as the previous SAS for Lot 98 should have been investigated and the findings included in the DSI. Similarly, a proper review of available historical aerial photographs and a title deed search should have been conducted as part of the DSI. The site history information relevant to the site and which should be included in the DSI should be sufficiently comprehensive for the consultant to form a view on the site conditions and relevant conditions in adjacent land and which may impact on the subject site. Any data gaps should be identified, but basic information which is readily available should have been included in the scope for the DSI and should not have been regarded as outside the scope.
Section 2. Background 2.1 Site Location and Identification	<i>Table 1</i> <i>As shown in Figure 1, the Site with three Sand Areas (Southern Beach, Middle Beach, Northern Beach), mainly was located at Lot 97, DP 270427 (Previous Lot 33, DP 270427 in 2005) and partially at Lot 98, DP 270427 (whatever practically accessible sands for beachgoers from low tideline at low tide ~0.3 m up, up to the cliff & Heritage Wall at Northern Beach, Outcrops/Brick Stockpile at Middle Beach, Retaining Walls & Outcrops/cliff at Southern Beach).</i>	In all previous versions of the DSI made available for review by the auditor as well as the Trinitas Preliminary Technical Brief (the Brief), dated 24 August 2020 Table 1 states that the site is Lot 97 in DP270427. Inclusion of undefined parts of Lot 98 appears to have been introduced following previous auditor comments regarding the definition of the site. For the purposes of the DSI, site audit and HHRA (see JBS&G HHRA Version B) Lot 98 does not comprise part of the site. The auditor concedes that absolute boundary definition may be difficult (perhaps corresponding to the 'grey areas' along the boundary as suggested by Trinitas), however these areas should be marginal to the boundary of Lot 97 and should not extend into an undefined area within the adjacent golf course or other parts of the hinterland within Lot 98. Lot 98 occupies

Rev 4 DSI Section	Relevant Extracts from Rev 4 and Additional Issues	Auditor Comment
		a very large area, probably in excess of 15 ha. As noted elsewhere any incursion into Lot 98 in terms of inclusion in the site (boundary) should be limited to a strip of say 2-3 m, but certainly <5m on the landward side of Lot 97. Notwithstanding, description of the conditions in relevant parts of Lot 98 are certainly germane to the DSI and should be included but as noted above these should be recorded in a section on adjacent/surrounding site conditions (or similar).
Section 2.2 Site Features	<i>Site walkovers and emu-picking of ACM fragments have been carried out by Trinitas Consultants since 3rd August 2020 to current...</i> <i>Sections on Southern, Middle and Northern Beach</i>	This sentence does not appear to relate to site features. Several of the descriptive elements in these sections refer to areas outside Lot 97. In addition, statements such as; <i>'...Hundreds of visible ACM fragments were identified and collected throughout the whole beach sand area...'</i> appears to relate to the condition of the site during the period leading up to the DSI rather than during the DSI itself and are not really site features, but rather conditions or findings during the emu picking campaign and should perhaps be reported in a separate section which summarises these findings.
Section 2.3 Site Topography and Drainage		A short section on the local geology and site geomorphology should be included in this section, which is also relevant to the CSM.
3. Limited Site History Review	<i>With reference to high resolution Aerial Photographs (Nearmap) since October 2009, there is no evidence of major landscape change at Little Bay Beach, while the redevelopment of the adjacent Prince Henry Hospital area has been undertaken for decades. It seems that soil disturbance along the gullies could not be identified in detail.</i>	A more comprehensive review of historical aerial photographs (APs) is required to place the history of Lot 98 into context with the condition of the subject site. Earlier references in the DSI (see above) to gully erosion should be evident in the APs and reported as such. Trinitas may also want to check the start date of the Prince Henry Hospital redevelopment which is believed to have commenced during the mid-2000s. See

Rev 4 DSI Section	Relevant Extracts from Rev 4 and Additional Issues	Auditor Comment
	<i>The demolition waste fate as shown in Image 1 and Image 2 in Table 2 could not be traced, while the landscape of Crown Gully 2 as shown in Image 1 significantly changed by demolition material or fill. The earthworks of the drainage and golf course grass upgrade works could not be summarised, but a number of old brick walls were observed along the Crown Gully 1 and in Crown Gully 2. There is high uncertainty of these gullies used as tips as mentioned by a local resident who reported suspected asbestos contamination on the northern beach. Another resident also mentioned that the top of the northern cliff was used as legacy dumped tip and building materials on the top of the southern hill adjacent to Crown Gully 3 were pushed down to the cliff to fill the aboriginal heritage cave.</i>	https://www.princehenrycommunity.com.au/about-prince-henry/prince-henry-hospital-an-historical-timeline-1881-2003/ As noted above, further evidence of these infilling works may be available from historical APs. APs which predate 2003 may assist in reducing the reported 'high uncertainty' in regard to the nature and timing of such works.
Section 3.1 Information Sources	<i>A further detailed review of the Site history was recommended to be carried out as part of this DSI including:</i> <i>• A historical land titles search for the Site (through commercial provider like Advance Legal Searchers Pty Ltd);</i> <i>• Aerial Imagery Records for the Site from the 2009's backwards (through commercial provider such as Lotsearch Pty Ltd and the Council);</i> <i>• Interviews with people familiar with the Site history;</i> <i>• The NSW EPA register of contaminated sites;</i> <i>• The Coast Golf Club (https://www.coastgolf.com.au/cms/about-us/#history); etc</i>	As noted above all of this work should have been completed as a standard component of the DSI and should not comprise a recommendation for further work.
Section 3.4 Council Section 10.7 (2) and (5) Planning Certificate Search	<i>Section 10.7(2)&(5) Certificate should be conducted through the Council. Once the certificate was provided by the client, the DSI report should be updated.</i>	As noted above this documentation should have been provided in the DSI and should not form a component of any additional scope of works for the DSI. Such documentation is a standard component of PSIs and DSIs (as per the relevant guidelines) and should not comprise a recommendation for further work.

Section 3.5 Council Record Search Available under the GIPA Act 2010	<i>A search of the Council records made available under the GIPA Act should be conducted. The site that could have the potential as a source of contamination were not reviewed.</i>	As noted above this documentation should have been provided in the DSI and should not form a component of any additional scope of works for the DSI.
Section 3.6.1 Trinitas Preliminary Technical Brief	<i>Table 3 Potential sources of contamination and preliminary analysis</i>	Of the three Crown Gullies shown in Table 3 it should be noted that Gullies 1 and 3 are largely, if not entirely, off site. The lower reach of Gully 2 is apparently on site and coincides with an irregular shape in the boundary outline of Lot 97 as shown in the AP below extracted from Six Maps. In addition, the other 5 potential sources of asbestos, noted in the table are all outside the site boundary. In addition, it is further noted that there seems to be no substantive evidence presented to show that encapsulated waste is present on any of the 3 beach areas mentioned, viz: Northern Beach, Middle Beach or Southern Beach. If any encapsulated waste is present evidence of its presence (within the site) needs to be presented. Certainly, from the test pit logs there is no apparent evidence of waste encapsulation. If Trinitas feel that this is not the case and there is substantive evidence of encapsulation, then please provide the relevant information which should be based either on a sound evaluation of site history or be evident from the test pit logs or other site observations.
Section 3.6.2 Trinitas Site Inspections, Emu- picking, Clearance and Air Monitoring Reports	<i>Based on laboratory analytical results and visual inspection from 3 August to 21 August 2020, Trinitas (sic) summarised major findings as follows (Appendix G):</i> <i>Visual inspections and Emu-picking from 3 August 2020 to 2 June 2021 indicated that there was no obvious decreasing trend of visible ACM fragments throughout the three beaches.</i>	Appendix G comprises site photographs not a summary of findings. The above (first point in the adjacent column) relates to the period from 3 -21 August 2020 whereas this dot point relates to 3 August 2020 to 2 June 2021, please clarify. A more consistent approach in this section would be to briefly summarise the results from August 2020 to present (say June/July 2021). In addition, it would be preferable if a graphic or table (see above) could be provided showing the number of recovered pieces of ACM per visit/per month in order to demonstrate that there was indeed no diminution in

		the occurrence of ACM pieces. No observable diminution of occurrence over the monitoring and collection period, would presumably imply that the current method of regular collection is ineffective, whereas a diminution of frequency might infer the opposite.
Section 3.6.3 JBSG Interim Human Health Risk Assessment Report	<i>Interim Human health risk assessment for asbestos, Little Bay Beach by JBSG ("JBSG Report", Report Reference No.: 59811-132997 Revision A) on 7 October 2020 conservatively concluded that:</i>	Please refer to the correct/current version of the HHRA report by JBS&G which is entitled: <i>Randwick City Council Updated Human Health Risk Assessment for Asbestos Little Bay Beach 4R Coast Hospital Road, LITTLE BAY, NSW Dated 11 July 2021 59811-138906 (Revision B) by JBS&G Australia Pty Ltd</i> Please also amend the inserted extracts from the report as applicable.
Section 3.6.4 Previous Site Auditor Statement	<i>3.6.4 Previous Site Auditor Statement</i>	Please provide a copy of the SAS and if possible, the SAR. These should be available from RCC as they are the LGA and all SAS must be provided to the LGA at the time of issue, presumably therefore RCC have a copy.
Section 3.8 Integrity Assessment		See earlier comments regarding Section 3.1
Section 5.1.2.2 Define the Boundaries of the Study	<i>The spatial boundaries of the investigation areas were defined on Figure 1, Appendix A to Appendix D and Table 1. As shown in Appendix E, investigation of all gullies, Golf Course, Underwater Areas and Open Water Sand Area were not included within the boundaries of this DSI, even though in some areas, Trinitas went further into underwater areas up to 0.2 m under water during the lowest tide period (0.3 m).</i>	See earlier comments on site boundaries. The site does not include Gullies 1 and 3 except perhaps where they debouche onto the beach, and except the lower reach of Gully 2 (see above), nor the golf course, not the open water (underwater) sand areas. The site is restricted to Lot 97 and perhaps the immediate landward environs as a buffer zone due to the uncertainty of the boundary as noted above.
Section 5.1.3.3 Specify Acceptable Limits of Decision Errors	<i>An assessment was made as to the likelihood of a decision error being made based on the results of a QA/QC assessment and the closeness of the data to the assessment criteria. The QA/QC assessment included reference these data quality indicators.</i>	Please advise what field QA/QC was undertaken including assessment.

Section 5.2 Data Quality Indicators	<i>Table 4 Data Quality Objectives, Requirements and Indicators</i> <i>Sampling methodology – preservation and samples extracted and analysed within holding times</i>	Please advise what sample preservation methods were employed and how the samples were extracted by the laboratory within holding times, noting that for asbestos samples preservation, extraction and holding times are generally not applicable.
Section 7.3.1	<i>Table 6 Sampling Plan and Site Investigation Summary for Areas of Environmental Concern</i>	It is noted that Crown Gully 2 was not sampled but appears to form part of Lot 97 at least part way up the gully. The auditor notes that the gully is quite inaccessible making sampling difficult. Does Trinitas consider that the absence of sampling in the gully detracts from the overall characterisation of the site as a whole? The auditor also notes that some of the areas listed in Table 6 are outside the curtilage of the site (defined as Lot 97), see also above. Please clarify where footings are located at the site and where this affected the proposed sampling depth.
Section 7.3.4 Air Monitoring	<i>Background air monitoring involves testing the air for respirable fibres prior to work which may disturb known asbestos materials. It is also utilized to determine if other fibres may be present in the air. Background air monitoring shall be implemented as required to gather site air contamination prior to commencement of removal works and maintained until such time that sufficient evidence from the monitoring results demonstrates that the site controls (restrict access, barricade and or even wet spraying) are necessary and effective. Also, the investigation works do not present an unacceptable risk to site users. The air monitoring results will also provide a measurable trigger for upgrading site controls and/or identifying cease work conditions for surrounding training field site users.</i> <i>The collection and analysis of air monitoring samples should be conducted under supervision of a licensed asbestos assessor and in accordance with the National Occupational Health and Safety Commission (NOHSC) "Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Dust [NOHSC: 3003 (2005)].</i> <i>For control air monitoring, calibrated air monitoring pumps were installed at the boundary fences of the exclusion zone for the</i>	It would be appropriate here to: - Amend this section to indicate that this was done previously rather than, as implied here, that it shall be done; and - That the air monitoring was done as part of the asbestos collection exercises during the period August 2020 to present and that no air monitoring was specifically undertaken as part of the DSI. In the auditors view the following amendments would be appropriate to the bolded text: shall be implemented as required – should read; was implemented as required.... The air monitoring results will also provide – should read; The air monitoring results provided.... The collection and analysis of air monitoring samples should be conducted – should read; The collection and

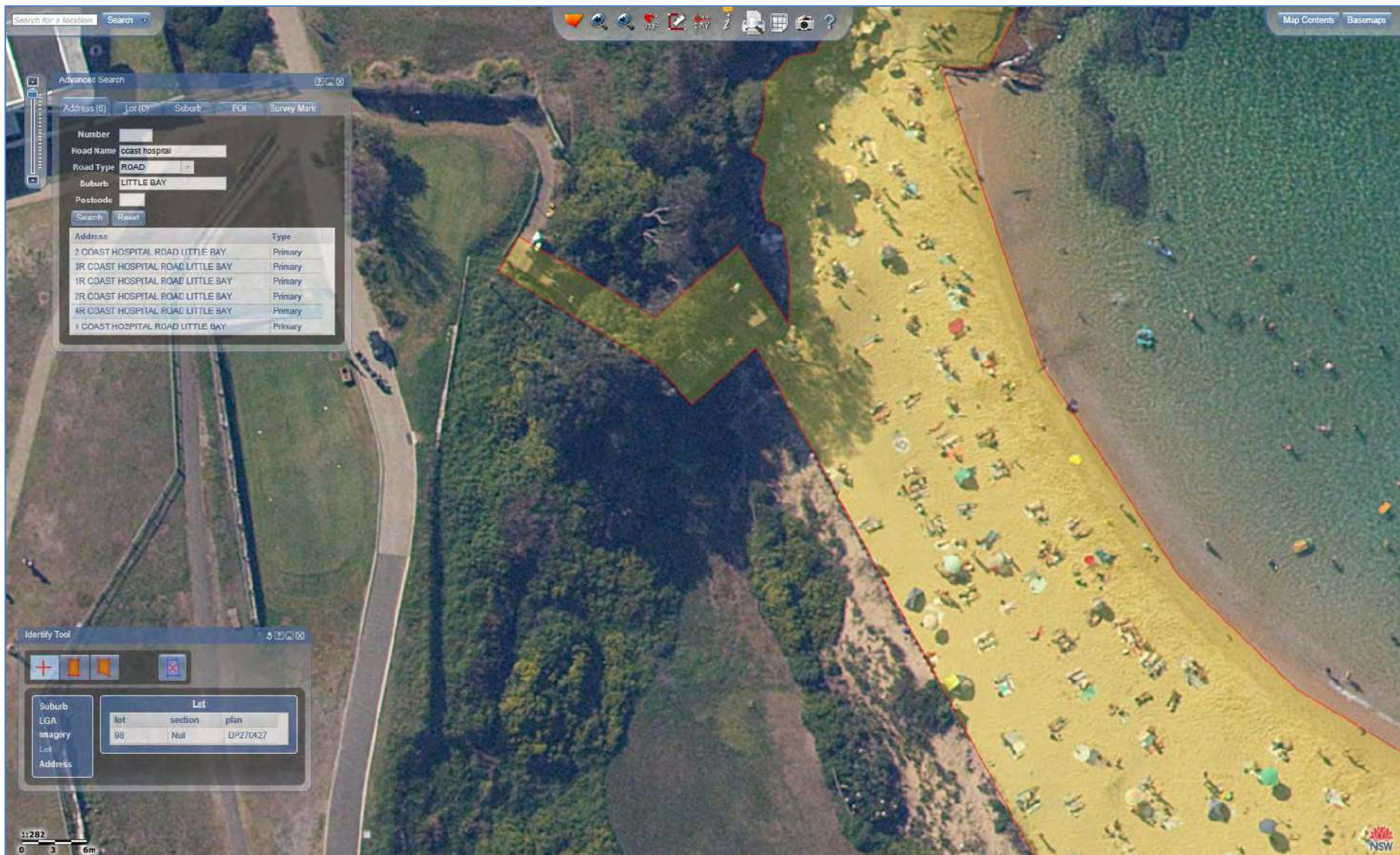
	<i>designated asbestos works area and within the closed cabin of any plant supported by a daily field blank for QA/QC purposes.</i>	<i>analysis of air monitoring samples was conducted....</i>
Section 8.1 Potential Areas and Chemicals of Environmental Concern	<i>Potential Areas and Chemicals of Environmental Concern</i> <i>Based on preliminary findings, visual inspections and laboratory results, risk of asbestos contamination could not be underestimated, even though daily air monitoring data confirmed fibres in the air during the sampling periods have not exceeded the guideline criteria.</i> <i>*All gullies, catchments, underwater sand, golf course land were out of scope of work in this report</i> <i>Footnote to table - *Polished boned (sic) ACM, AF/FA in water were out of scope of work in this report.</i>	What chemicals are involved noting that the assessment only covers asbestos? Please confirm what, if any, air monitoring was undertaken during the sampling period of the DSI. If this air monitoring actually coincides with the emu picking exercises, please state this clearly. Please note that the lower reach of Gully 2 appears to fall within Lot 97 as mentioned above. Can Trinitas please add discussion to support the assumption that AF/FA is not present in beach sediments? This can be added to this section or the CSM?
Section 8.2 Potential Sources, Pathways and Receptors of Contamination	<i>Table 9 Potential Sources, Pathways and Receptors of Contamination</i> <i>Importation of potentially contaminated fill under three beaches</i> <i>Potentially hazardous building materials on ground surface and buried below ground surface</i>	Please identify the evidence which confirms that imported fill is present beneath (under) the 3 beaches. Please identify the evidence which shows that HBMs may be buried below the surface. In this instance the term 'buried' connotes anthropogenic placement rather than burial by natural processes. If Trinitas believes that these materials were buried by were buried/placed by human activity, please provide the evidence. Conversely if Trinitas considers that these materials were buried by natural processes this should be stated, again please provide the evidence.
Section 9.1 Air monitoring and Clearance	<i>All air monitoring testing undertaken for the duration of asbestos in/on soil investigation were performed by a NATA accredited laboratory-Eurofins.</i>	Please confirm that this refers to air monitoring undertaken during the emu picking exercises. If air monitoring was undertaken as part of the DSI, please include the results in the DSI

Section 9.3 Asbestos in/on soil findings	<i>Due to the nature of site in a widely spread sand pose a potentially low health risk to site users subject to change with a professional human health risk assessment report.</i>	Please note that the actual health risk to site users would not be subject to change based on the findings of a human health risk assessment report. The HHRA only serves to determine what the health risk is - it doesn't actually change it.
Section 10 Recommendations	<i>There were high uncertainties of ACM fragments on sand and/or under rocks within underwater area of the bay (outside the scope of this DSI). There were also high uncertainties of ACM fragments in other areas of the Site (especially on the Coast Golf Course Exposed soils and underwater) (outside the scope of this DSI).</i>	Can Trinitas please attempt to clarify the meaning of this section? Does Trinitas mean that despite substantial sampling during the DSI and regular collection of asbestos by emu picking from August 2020 to June/July 2021 there remains some uncertainty regarding the distribution of asbestos in the site and that this is almost certainly due to the continual changes in beach geometry and morphology (tidal action etc) which involves regular redistribution of asbestos both on the surface (sand and rock platforms) and in the sand column (sub-surface) due to the turbation effects of wave action and currents? Please also note that the golf course and underwater domain are not part of the site (Lot 97) and are thus off site (see earlier comments).
Section 10.1 Makesafe Measures	<i>As listed</i> <i>And</i> <i>Barricades erected in place as soon as practicable should be implemented at least in the following sections or hotspots:</i> <i>1) around the canal all the way from Old Concrete Pipe outlet adjacent to Crown Gully 3 all the way to the water in Southern Beach;</i> <i>2) around the canal all the way from Old Heritage Wall adjacent to Crown Gully 1 outlet all the way to the water in Southern Beach;</i> <i>3) all of the sand area at Middle Beach.</i>	The auditor generally agrees with these proposed measures. However, the auditor is of the view that these 3 measures (1-3) would probably be highly impractical and would be at best difficult to implement except perhaps at the point of egress of each gully onto the beach. Similarly, any such measures are unlikely to be easily maintainable and likely to be subject to wave damage, amongst other things.

10.1.1 Stage One 1B: Diving Investigation - Visual Inspection and Contamination Assessment of Underwater Sand in the Bay (if required)		Similarly, the auditor is of the view that the diving investigation would not provide any real benefit because material which is offshore will in all likelihood be (i) either gradually comminuted by continual sand abrasion caused by movement along the sea bed, or (ii) will be brought up onto the beach by wave action enabling subsequent collection by emu picking.
Section 10.1.2 Stage One 1C: Detailed Site Investigation and Contamination Assessment for Three Crown Gullies, Catchments and adjacent Golf Course Hill slopes (if required)		The auditor notes that investigation of Crown Gully 2 (i.e., that part within Lot 97) should have been undertaken as part of the DSI. The remaining gullies are believed to lie mainly, or probably wholly, outside the site. Similarly, the investigation of the adjacent golf course and hill slopes/fill slopes may be required in due course, but these areas comprise Lot 98 which is understood to comprise Crown Land which is currently leased to the golf course operators and as such any investigation of this area would be an entirely separate exercise to that being undertaken currently.
Section 10.2 Human Health Risk Assessment	<i>An updated Human Health risk assessment report should be completed.</i>	The HHRA has been updated (see above). JBS&G should however be consulted once the final version of the DSI is available to determine if any amendments to the HHRA (as referenced above) are warranted.
Section 10.3 Stage Two: Remedial Action Plan (RAP) (if required formally)		The auditor considers that an RAP/ AMP and EMP are warranted. For the purposes of the current exercise such documents should however (at least initially) be restricted to Lot 97 and its immediate environs (see earlier) and include practical options/mechanisms which enable; (i) the collection of asbestos which has found its way onto the beach, particularly after heavy rainfall (current emu picking operations), and (ii) which prevents any asbestos being mobilised from the immediate hinterland and which enables the collection of any asbestos which has migrated down the gullies towards the beach. Provision of an RAP/AMP to document these procedures is recommended. The installation of mitigation devices (as suggested in (i) above)

		may be problematic as these structures would need to cope with excess stream flow from time to time, particularly during heavy rainfall, for example in Gully 2 which appears to carry the largest discharge, but in all probability at the other two gullies as well. To prevent storm damage such mechanisms would also need to be beyond the reach of high tides.
Section 10.4 Stage Three: Validation after Remediation (if required formally)	<i>If required a validation investigation and report after remediation will be prepared. The validation report will clearly identify the areas of the site that are remediated and will be provided in the form of GPS locations and a clear site plan which highlights the remediated areas in red.</i>	Any validation report (VR) is unlikely to comprise a typical VR involving validation sampling, but most likely would include (i) a periodic record of any regular emu picking exercises/air monitoring, and (ii) a record of any asbestos mitigation works, including construction quality assurance (CQA) of any measures installed in the lower reaches of gullies. Such structures would have the aim of collecting and/or preventing asbestos entering the beach areas. Any proposed investigations or remediation works within Lot 98, except perhaps at the immediate boundary with Lot 97, would be far more complex and are beyond the scope of the current work.

Extract from Six Maps Showing Irregular Lot 97 Boundary at Gully 2 Middle Beach



Advanced Search

Address (6) Lot (0) Suburb (0) POI Survey Mark

Number

Road Name

Road Type

Suburb

Postcode

Address	Type
2 COAST HOSPITAL ROAD LITTLE BAY	Primary
3R COAST HOSPITAL ROAD LITTLE BAY	Primary
1R COAST HOSPITAL ROAD LITTLE BAY	Primary
2R COAST HOSPITAL ROAD LITTLE BAY	Primary
4R COAST HOSPITAL ROAD LITTLE BAY	Primary
1 COAST HOSPITAL ROAD LITTLE BAY	Primary

Identify Tool

Lot		
lot	section	plan
88	Null	DP270427

Suburb
LGA
Imagery
Lot
Address

Randwick City Council
30 Frances Street
Randwick NSW 2031

Project 205690.00
16 August 2021
IAL5-205690
JMN:jl

Attention: Evan Buntoro

Email: Evan.Buntoro@randwick.nsw.gov.au>

Interim Advice Letter 5
Non-Statutory Site Audit DPNS/19
Lot 97 Little Bay Beach, Little Bay - Lot 97, DP270427

1. Introduction

This letter provides Randwick City Council (RCC) and their Environmental Consultant - Trinitas Group (Trinitas) with interim advice (IAL) as part of Non-Statutory Site Audit DPNS/19 being undertaken by Mike Nash, an NSW EPA Site Auditor accredited under the Contaminated Land Management (CLM) Act. The advice concerns the assessment of contamination risks at the site located at Lot 97 (DP270427) Little Bay Beach, Little Bay. The interim advice has been provided in accordance with a proposal issued by DP dated 8 June 2021 and a purchase order PIS20761 provided by RCC dated 18 June 2021, subject to DP terms and conditions.

The purpose of the non-statutory audit is to determine whether the Trinitas DSI meets the requirements of, and is compliant with, the guidelines made and endorsed under the CLM Act. The version of the DSI reviewed by the auditor (subject of IAL5) is:

- Trinitas Group (August 2021) *Detailed Site Investigation of Potential Asbestos Contamination at Little Bay Beach, Little Bay NSW* Randwick City Council, Little Bay Beach - 4R Coast Hospital Rd, Little Bay NSW, dated 11/08/2021 Draft (Revision) 5 ('the DSI report').

This IAL does not pre-empt the conclusions which may be drawn at the end of the site audit process and does not represent a Site Audit Statement (SAS) or a site audit report (SAR). The attached table provides a detailed review of the revised DSI.

Reference should also be made to the minutes of the Randwick City Council Meeting Minutes (meeting 5 August 2021) email from Evan Buntoro and response from the auditor dated 11 August 2021.

The issues raised by the auditor and discussed with Trinitas and RCC at the meeting on 5 August 2021 and which were considered integral to the DSI revision include:

- The clearly defined site boundary based on cadastral boundary of Lot 97, DP270427;

- Technical issues including use of correct technical terms (e.g., friable asbestos), consistency in tenses used in the report and inclusion of a conceptual site model in line with the CLM Act and relevant guidelines;
- The requirement for a review of the site history including aerial photographs;
- The claims made in the DSI need to be based on evidence; and
- The Section 10.7 Certificate is to be provided to the auditor.

The auditor also indicated that the audit comments provided in IAL1, IAL3 and IAL4 in respect to the previous versions of the DSI outline the items which need to be considered and actioned by the consultant and that the meeting minutes are supplementary to this requirement.

The additional miscellaneous issues raised by the auditor include the comparison of the number of asbestos fragments collected during the various clearance events (bi-weekly) and discussion of the trend over time. It was agreed that this could be provided following the revision of the preceding version of the DSI.

Also, subsequent to the issue of the DSI, RCC has located and provided a previous Site Audit Report relating to the site (now Lot 97 but previously identified as part of Lot 33, DP 270427), as follows:

- Environmental Resources Management Australia (ERM) (July 2006) Site Audit Statement (SAS) and Report (SAR) - Statutory Site Audit PS3 *Lot 33, Prince Henry at Little Bay for Landcom* (SAS/SAR).

The findings of the SAR report will need to be discussed in the final version of the DSI as it provides a substantial discussion of the site history and other information relating to the site.

2. Auditor's General Comments

The auditor considers that Trinitas has broadly addressed the main issues raised at the meeting (5 August 2021), with the exception of various technical issues and the substantiation of certain claims based on empirical evidence. Specific detail is provided below in the following sections.

For the purposes of expediting the audit process and to assist RCC with their priorities of limiting delays in implementing strategies ahead of the impending Spring/Summer season (with increased volume of beach users), the auditor requests that Trinitas finalise the DSI by providing a version which addresses the 2006 SAR, the auditor's comments (in IAL1, 3 and 4 and the listed items below (IAL5)). To assist this process, Trinitas is requested to provide 2 versions of the DSI, as follows:

- A new version of the DSI (Revision 6) in track changes showing all revisions which have been made to the current DSI Draft (Revision5); and
- A clean formatted final DSI Final (Revision 6), which can be provided once the track change version is agreed.

When this latter version is provided to the auditor the SAR will be prepared.

Additional comments are listed below in the grey box:

1. Section 1 Introduction.

Does Trinitas consider the evaluation of site hydrogeology forms part of the scope of work for the DSI, noting that the investigations only relate to asbestos? The auditor notes that there is seemingly little or no evidence to indicate that the DSI contains an evaluation of site hydrogeology in the scope of works (see final set of dot points), nor that there is any connection, demonstrated or otherwise, between asbestos and groundwater quality. Accordingly, the auditor recommends removing this item from the scope of works.

Trinitas notes in respect to the S10.7 Notice for the site that: '*... Council HAS received a copy of a site audit statement, within the meaning of the Contaminated Land Management Act 1997, for this land...*'.

Accordingly, the auditor requested a copy of the SAS/SAR which has now been provided by RCC and this document should also be reviewed by Trinitas as part of the DSI. It is noted that the previous audit dated July 2006 refers to Lot 33 but includes the beach area which is now Lot 97. The previous SAS concluded that the site is suitable for use as a park, recreational open space or playing field. It is also noted that the previous SAR also documents site remediation in the adjacent land, and along the site boundary, including the access stairway area to the beach (which coincides with a marked irregularity in the western boundary of Lot 97).

2. Section 3 Limited Site History.

The review of aerial photographs (APs) remains inadequate, particularly as it relates to the condition of the adjacent land (Lot 98), both prior to and during redevelopment during the 2000s. References in the introduction to review of aerial photographs should therefore be described as 'limited' based on the level of detail. If Trinitas consider that the asbestos on the beach has been sourced from the Lot 98 area including from diffuse and point sources (see Table 3 and Appendix E of the DSI), including *inter alia* legacy tips, dumped waste, gullies, stockpiles, filled areas, etc. then a thorough review of historical APs should have been undertaken as stated previously - see also previous comments in IAL1 and IAL4 and comments above.

In this regard it is noted that there are various sources of APs which are readily available (some of them free), including historical aerial photos dating back to 1930s (Historical, Aerial and Satellite Imagery - Spatial Services (www.spatial.nsw.gov.au), and from Google Earth, which show the condition of the site back as far as 1986 and include photographs from the early 2000s prior to the current development.

3. Section 3.3 Council Section 10.7 (2) and (5) Planning Certificate Search.

As noted above the previous SAS/SAR [ERM SAS PS53 (20 July 2006)] refers to Lot 33, as reported in Table 1 of the DSI '...Lot 97, DP 270427 (Previous Lot 33, DP 270427 in 2005) ...'. See also S.3.5.4 of the DSI. In this regard, Trinitas should provide substantial documentary evidence of this change in cadastral Lot specification. Accordingly, and as previously requested in IAL3, a thorough search of historical and current title deeds/lot history is warranted.

4. Section 3.4 Council Record Search Available under the GIPA Act 2010.

Further to comments above, RCC planning records should include details of the change of lot specification (from Lot 33 to Lot 97) and as such should have been searched as an integral part of the DSI. This would assist in determining when the current site (Lot 97) boundary was determined, and why, and might also provide insight into any related changes at or near the site boundary with Lot 98.

5. Section 3.5.4 Previous Site Auditor Statement and Preliminary Site Investigation Reports

Please update references to the previous SAS/SAR. Please also note that the DP report referenced in this section on testing in the undeveloped area of Lot 98 and foreshore areas (DP 2003), did not apparently include asbestos analysis / testing, in particular in regard to sampling near the beach area (Lot 97). Testing on the beach by EMS is documented in the previous SAR (2006).

6. Section 3.6 Site Gaps in the Site History.

This section relates to gaps in the history of the adjacent site (Lot 98) and should perhaps be retitled as such. It should also perhaps be stated here that there is very little available site history pertaining to the beach area itself (Lot 97).

7. Section 3.7 Integrity Assessment.

It is noted that there is limited information regarding the site (Lot 97) and that most available information for the general site areas relates to the adjacent land. In addition, it is noted that the DSI states that:

'...Trinitas made several requests to obtain PSI reports from Douglas Partners as these reports could provide crucial information for a better understanding of the site history. Requests for such reports were declined by Douglas Partners. It should be noted that Douglas Partners have been commissioned by the Client as an Independent Site Auditor to review this DSI...'

The auditor was not aware that such requests had been made by Trinitas to DP, or that such requests had been declined, and notes that DP is unable to locate any record of such requests. Accordingly, Trinitas are requested to provide copies of the original requests. Notwithstanding, it is considered that

the documentation contained in the ERM SAR (2006), as referenced above, contains sufficient background information for the purposes of the DSI.

8. Section 5.1.2 Identify the Decision.

Trinitas identify 9 decisions which require to be made under the DQO process as follows:

- i. *Is soil contamination present on-site at concentrations exceeding adopted health screening levels for Recreational C land use setting?*
- ii. *Are the sources of potential contamination from on-site and /or off-site migration?*
- iii. *Is there sufficient soil information to allow a detailed remediation plan to be developed?*
- iv. *Is there any potential migration or impact from soil into water resources inside of the site boundaries?*
- v. *Will the DSI provide a data set that is suitable to assess the risk posed by contamination (if present) to human health, ecological receptors (open water) and potential future liability of material that will remain at the Site?*
- vi. *Do the findings provide a high degree of certainty of the source of identified contamination?*
- vii. *Does the data set provide sufficient information to assess the potential for any off-site migration of contaminant?*
- viii. *Will the DSI recommend further site investigation based on limited sampling?*
- ix. *Does the DSI provide adequate preliminary characterisation to enable an assessment of remedial options, remedial cost estimates and or management of the contamination (if present)?*

Can Trinitas identify where in the DSI each of these decisions is specifically resolved, or remains unresolved, and describe the conclusions that can be drawn and the actions that are required? The auditor notes that for the most part this information may be present in the DSI, but may be better assembled in the form of an appropriate summary checklist / table which identifies the questions / decisions and the solutions.

9. Section 3.5.2 Trinitas Site Inspections, Emu-picking, Clearance and Air Monitoring Reports (also Section 7.1 Visual Inspection & Assessment) and Section 9.2 Site inspection

Additional information added to this section has broadly addressed the auditor's previous comments in respect to the Asbestos Inspection and Clearance Certificates (and Air Monitoring reports) August 2020 - June 2021 (<https://www.randwick.nsw.gov.au/planning-and-building/council-works-and-upgrades/major-projects/little-bay-beach-asbestos-management>). However, could Trinitas please clarify the following:

9.1 Do the number of photos appended to the various 'Asbestos Inspection and Clearance Certificates' represent the count of ACM pieces collected during each inspection? Summaries of counts were provided in reports dated 30 April 2021 (12 pieces) and 4 June 2021 (35 pieces); however corresponding data were not readily found in other reports. Similarly, except in the latter case, there is no record of the weight of the materials collected. If such data has been collected it should be made available (and should have been recorded in each successive Inspection and Clearance report). The

importance of this data relates to the use of the Trinitas data in the JBS&G HHRA calculations/extrapolations provided therein.

9.2 As mentioned in IAL4 and at the joint meeting dated 5 August 2021, this data is required to:

- (i) verify the number of pieces collected during the clean-up period to date, and
- (ii) to demonstrate that there has been no reduction in the number of ACM pieces collected over time (August 2020 to June 2021) as claimed by the consultant and as reported in Rev 4 (and Rev 5) of the DSI. Such claims are required to be substantiated with evidence for incorporation into the DSI and HHRA.

9.3 The absence of such a record would at present seem to make it difficult to provide a reliable trend analysis as requested in IAL4 and during the recent meeting.

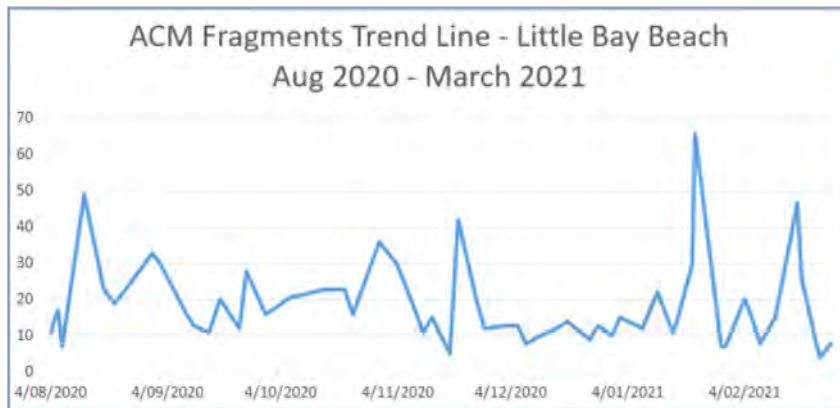
9.4 Similarly, the DSI (Rev 5) indicates that ~2000 pieces of ACM have been collected to date, however without an asbestos count as noted above it may be difficult to accurately substantiate this claim. Accordingly, the consultant is asked to provide the relevant count data for each report to verify the reported frequencies as well as the total number of ACM pieces collected during the clean-up. In this regard it is noted that the DSI indicates:

‘...Prior to the commencement of the DSI works, approximately 2000 fragments were collected during bi-weekly emu picking and clearance inspections undertaken between August 2020 and April 2021 at Little Bay Beach. There was no conclusive or scientific evidence to demonstrate a decreasing trend in terms of ACM fragment quantity or numbers identified and removed from the site during the bi-weekly site inspections and emu-picking being completed by Trinitas Licensed Asbestos Assessors and Occupational Hygienists...’.

and

‘...During the first week of inspections, Trinitas Hygienists collected approximately one hundred (100) ACM fragments across the Northern, Western and Southern section of the Site. By 21 August 2020, over two hundred (200) suspected visible ACM fragments (including over 1 Kg of Super 6 corrugated sheeting chunks, flat fibrous cement sheeting and shell-like ACM fragments) had been collected by Trinitas hygienists...’.

9.5 It is further noted that in Section 3.5.2 of Rev 5 of the DSI Trinitas provides a graphic as shown below, however there is limited evidence of any actual fragment count in the reports (as noted above). Accordingly, Trinitas should provide the raw count data to verify the graphic, presumably this is available in the form of an Excel spreadsheet or similar.



9.6 There is no apparent laboratory analysis of asbestos during the clean-up process other than for 10 samples in the initial report dated 3 August 2020 (chrysotile, amosite and crocidolite asbestos detected). It is noted that the consultant may have considered that this was sufficient to demonstrate that asbestos was present and that subsequently all visually identified FCM material was ACM. The consultant should verify this conclusion (although the auditor notes the subsequent analysis of asbestos in the DSI does tend to confirm this assumption).

9.7 The individual inspection reports (see above) do not clearly define the methodology used in the inspection, whereas the DSI (Rev 5) variously indicates that:

'...Trinitas Consultants conducted the inspections, allowing inspection to be completed on a grid system walking across the surface at 90 degrees to each walk path within the grid. For each grid (5 m x 5 m) for areas of concern in the site, a walkover visual inspection was undertaken to identify suspected ACM in/on the surface to identify damaged and unstable ACM, fragments and debris as applicable ...'.

and

'...Trinitas Consultants conducted the inspections, allowing inspection to be completed on a grid system walking across the surface at 90 degrees to each walk path within the grid. For each grid (5 m x 5 m) for areas of concern in the site, a walkover visual inspection was undertaken to identify suspected ACM in/on the surface to identify damaged and unstable ACM, fragments and debris as applicable.

and

'...Trinitas personnel walked across the surface. The inspection was carried out by means of a visual observation, during a slow traverse across the materials, with the consultant inspecting on a grid pattern at 90 degrees to each walk path. The surfaces were inspected to detect evidence of suspected asbestos containing materials (ACM). Colour, size and shape are used as indicators...'.

Whilst it is noted that most of the above reports predate the audit (and that some of the more recent reports are now included in the DSI), each individual report should contain a brief description of the inspection method (along the lines outlined in the DSI). Accordingly, the consultant is requested to confirm that all 'Asbestos Inspection and Clearance Certificates' listed on the RCC website adopted the same procedures as outlined in the DSI, assuming this is the case.

9.8 The consultant is also requested to provide evidence that (i) all collected asbestos was appropriately disposed to a facility licensed to accept asbestos waste and (ii) to provide the corresponding EPL and disposal details. Such documentation may be held by Trinitas or by RMA Group (the "Class A Licensed Asbestos Removal Contractor" who reportedly assisted Trinitas during inspections and clearance. The auditor notes that RMA's role is not described in further detail, other than that RMA Group undertook the removal of surface ACM on 4 and 5 of August 2020.

9.9 The Air Monitoring reports do not always apparently coincide with the date of inspections for example there is no air monitoring report dated 18/09/2020, whereas the inspection report for that date indicates that monitoring was undertaken on the same date. For completeness, the consultant should provide all corresponding reports for inclusion on the RCC website.

10. Section 7.2 Identification of Materials to Contain Asbestos.

This section indicates that:

'...Materials suspected to contain asbestos were collected and selected based on the likely pattern, morphology and appearance of the materials as well as our professional experience in the visual identification of such materials. The collected representative samples were sent to a NATA accredited laboratory for analysis in accordance with Australian Standard AS4964-2004 Method for the qualitative identification of asbestos in bulk samples...'

Please confirm the appropriate disposal of any samples which were not dispatched to the laboratory for analysis (also see above in relation to ACM collected during the inspection and clearance from August 2020 onwards).

11 Section 7.3.1 Sampling Plan and Methodology.

With reference to the extract from the DSI below, can Trinitas please advise whether the sampling was grid based (systematic) or stratified, or a combination of both, and confirm whether the sampling in the so called 'hotspot areas' was actually judgemental / targeted sampling? Additionally, can Trinitas confirm which design drawings they are referring to in this section?

'...Trinitas undertook systematic grid-based sampling method where stratified sampling can be integrated for localised silty sand / fill, identified in each location around hotspots and from the site history and site observation. According to the provided design drawings, a discrete sample was taken from each sampling location and analysed individually...'

12. Section 8.2 Potential Sources, Pathways and Receptors of Contamination

In Table 9 there is a comment that states that:

'...Inhalation of dust and vapours is a potential pathway...' and '...There is potential for site users and surrounding land users to be exposed to dust and vapours from the subsurface soil, therefore a complete pathway is considered likely...'

Can Trinitas please clarify what vapours are associated with asbestos contamination?

We look forward to receiving the final versions of the DSI at your convenience.

Yours faithfully

Douglas Partners Pty Ltd



J M Nash
Principal

Please note that the above information, interim advice and opinions do not pre-empt the eventual site audit findings nor do they constitute a site audit as defined under Part 4 of the Contaminated Land Management Act, 1997.

Randwick City Council
30 Frances Street
Randwick NSW 2031

Project 205690.00
16 August 2021
IAL5-205690
JMN:jl

Attention: Evan Buntoro

Email: Evan.Buntoro@randwick.nsw.gov.au>

Interim Advice Letter 5
Non-Statutory Site Audit DPNS/19
Lot 97 Little Bay Beach, Little Bay - Lot 97, DP270427

1. Introduction

This letter provides Randwick City Council (RCC) and their Environmental Consultant - Trinitas Group (Trinitas) with interim advice (IAL) as part of Non-Statutory Site Audit DPNS/19 being undertaken by Mike Nash, an NSW EPA Site Auditor accredited under the Contaminated Land Management (CLM) Act. The advice concerns the assessment of contamination risks at the site located at Lot 97 (DP270427) Little Bay Beach, Little Bay. The interim advice has been provided in accordance with a proposal issued by DP dated 8 June 2021 and a purchase order PIS20761 provided by RCC dated 18 June 2021, subject to DP terms and conditions.

The purpose of the non-statutory audit is to determine whether the Trinitas DSI meets the requirements of, and is compliant with, the guidelines made and endorsed under the CLM Act. The version of the DSI reviewed by the auditor (subject of IAL5) is:

- Trinitas Group (August 2021) *Detailed Site Investigation of Potential Asbestos Contamination at Little Bay Beach, Little Bay NSW* Randwick City Council, Little Bay Beach - 4R Coast Hospital Rd, Little Bay NSW, dated 11/08/2021 Draft (Revision) 5 ('the DSI report').

This IAL does not pre-empt the conclusions which may be drawn at the end of the site audit process and does not represent a Site Audit Statement (SAS) or a site audit report (SAR). The attached table provides a detailed review of the revised DSI.

Reference should also be made to the minutes of the Randwick City Council Meeting Minutes (meeting 5 August 2021) email from Evan Buntoro and response from the auditor dated 11 August 2021.

The issues raised by the auditor and discussed with Trinitas and RCC at the meeting on 5 August 2021 and which were considered integral to the DSI revision include:

- The clearly defined site boundary based on cadastral boundary of Lot 97, DP270427;

- Technical issues including use of correct technical terms (e.g., friable asbestos), consistency in tenses used in the report and inclusion of a conceptual site model in line with the CLM Act and relevant guidelines;
- The requirement for a review of the site history including aerial photographs;
- The claims made in the DSI need to be based on evidence; and
- The Section 10.7 Certificate is to be provided to the auditor.

The auditor also indicated that the audit comments provided in IAL1, IAL3 and IAL4 in respect to the previous versions of the DSI outline the items which need to be considered and actioned by the consultant and that the meeting minutes are supplementary to this requirement.

The additional miscellaneous issues raised by the auditor include the comparison of the number of asbestos fragments collected during the various clearance events (bi-weekly) and discussion of the trend over time. It was agreed that this could be provided following the revision of the preceding version of the DSI.

Also, subsequent to the issue of the DSI, RCC has located and provided a previous Site Audit Report relating to the site (now Lot 97 but previously identified as part of Lot 33, DP 270427), as follows:

- Environmental Resources Management Australia (ERM) (July 2006) Site Audit Statement (SAS) and Report (SAR) - Statutory Site Audit PS3 Lot 33, *Prince Henry at Little Bay for Landcom* (SAS/SAR).

The findings of the SAR report will need to be discussed in the final version of the DSI as it provides a substantial discussion of the site history and other information relating to the site.

2. Auditor's General Comments

The auditor considers that Trinitas has broadly addressed the main issues raised at the meeting (5 August 2021), with the exception of various technical issues and the substantiation of certain claims based on empirical evidence. Specific detail is provided below in the following sections.

For the purposes of expediting the audit process and to assist RCC with their priorities of limiting delays in implementing strategies ahead of the impending Spring/Summer season (with increased volume of beach users), the auditor requests that Trinitas finalise the DSI by providing a version which addresses the 2006 SAR, the auditor's comments (in IAL1, 3 and 4 and the listed items below (IAL5)). To assist this process, Trinitas is requested to provide 2 versions of the DSI, as follows:

- A new version of the DSI (Revision 6) in track changes showing all revisions which have been made to the current DSI Draft (Revision5); and
- A clean formatted final DSI Final (Revision 6), which can be provided once the track change version is agreed.

When this latter version is provided to the auditor the SAR will be prepared.

Additional comments are listed below in the grey box:

1. Section 1 Introduction.

Does Trinitas consider the evaluation of site hydrogeology forms part of the scope of work for the DSI, noting that the investigations only relate to asbestos? The auditor notes that there is seemingly little or no evidence to indicate that the DSI contains an evaluation of site hydrogeology in the scope of works (see final set of dot points), nor that there is any connection, demonstrated or otherwise, between asbestos and groundwater quality. Accordingly, the auditor recommends removing this item from the scope of works.

Trinitas notes in respect to the S10.7 Notice for the site that: '*... Council HAS received a copy of a site audit statement, within the meaning of the Contaminated Land Management Act 1997, for this land...*'.

Accordingly, the auditor requested a copy of the SAS/SAR which has now been provided by RCC and this document should also be reviewed by Trinitas as part of the DSI. It is noted that the previous audit dated July 2006 refers to Lot 33 but includes the beach area which is now Lot 97. The previous SAS concluded that the site is suitable for use as a park, recreational open space or playing field. It is also noted that the previous SAR also documents site remediation in the adjacent land, and along the site boundary, including the access stairway area to the beach (which coincides with a marked irregularity in the western boundary of Lot 97).

Hydrogeology deleted from scope of works and review of previous environmental reports mentioned.

2. Section 3 Limited Site History.

The review of aerial photographs (APs) remains inadequate, particularly as it relates to the condition of the adjacent land (Lot 98), both prior to and during redevelopment during the 2000s. References in the introduction to review of aerial photographs should therefore be described as 'limited' based on the level of detail. If Trinitas consider that the asbestos on the beach has been sourced from the Lot 98 area including from diffuse and point sources (see Table 3 and Appendix E of the DSI), including *inter alia* legacy tips, dumped waste, gullies, stockpiles, filled areas, etc. then a thorough review of historical APs should have been undertaken as stated previously - see also previous comments in IAL1 and IAL4 and comments above.

In this regard it is noted that there are various sources of APs which are readily available (some of them free), including historical aerial photos dating back to 1930s (Historical, Aerial and Satellite Imagery - Spatial Services (www.spatial.nsw.gov.au), and from Google Earth, which show the condition of the site back as far as 1986 and include photographs from the early 2000s prior to the current development.

A sentence has been added to mention the insufficient resolution of past aerial photographs to make any conclusions regarding changes such as erosion of gullies or levelling of the golf course. Reference made to previous reports by EMS which frequently mention the use of introduced fill to level the golf course. Reference made to remediation works undertaken to stop erosion and subsequent migration of contamination.

3. Section 3.3 Council Section 10.7 (2) and (5) Planning Certificate Search.

As noted above the previous SAS/SAR [ERM SAS PS53 (20 July 2006)] refers to Lot 33, as reported in Table 1 of the DSI '*...Lot 97, DP 270427 (Previous Lot 33, DP 270427 in 2005) ...*'. See also S.3.5.4 of the DSI. In this regard, Trinitas should provide substantial documentary evidence of this change in cadastral Lot specification. Accordingly, and as previously requested in IAL3, a thorough search of historical and current title deeds/lot history is warranted.

Updated in section 3.4

4. Section 3.4 Council Record Search Available under the GIPA Act 2010.

Further to comments above, RCC planning records should include details of the change of lot specification (from Lot 33 to Lot 97) and as such should have been searched as an integral part of the DSI. This would assist in determining when the current site (Lot 97) boundary was determined, and why, and might also provide insight into any related changes at or near the site boundary with Lot 98.

Updated in section 3.4

5. Section 3.5.4 Previous Site Auditor Statement and Preliminary Site Investigation Reports

Please update references to the previous SAS/SAR. Please also note that the DP report referenced in this section on testing in the undeveloped area of Lot 98 and foreshore areas (DP 2003), did not apparently include asbestos analysis / testing, in particular in regard to sampling near the beach area (Lot 97). Testing on the beach by EMS is documented in the previous SAR (2006).

(DP 2004) did include Asbestos testing

6. Section 3.6 Site Gaps in the Site History.

This section relates to gaps in the history of the adjacent site (Lot 98) and should perhaps be retitled as such. It should also perhaps be stated here that there is very little available site history pertaining to the beach area itself (Lot 97).

Title Updated and sentence about lack of contamination data on foreshore areas added

7. Section 3.7 Integrity Assessment.

It is noted that there is limited information regarding the site (Lot 97) and that most available information for the general site areas relates to the adjacent land. In addition, it is noted that the DSI states that:

'...Trinitas made several requests to obtain PSI reports from Douglas Partners as these reports could provide crucial information for a better understanding of the site history. Requests for such reports were declined by Douglas Partners. It should be noted that Douglas Partners have been commissioned by the Client as an Independent Site Auditor to review this DSI...'

The auditor was not aware that such requests had been made by Trinitas to DP, or that such requests had been declined, and notes that DP is unable to locate any record of such requests. Accordingly, Trinitas are requested to provide copies of the original requests. Notwithstanding, it is considered that the documentation contained in the ERM SAR (2006), as referenced above, contains sufficient background information for the purposes of the DSI.

Sufficient background information has been provided to Trinitas recently to conduct a site history review. Reference to previous requests has been removed.

8. Section 5.1.2 Identify the Decision.

Trinitas identify 9 decisions which require to be made under the DQO process as follows:

- i. *Is soil contamination present on-site at concentrations exceeding adopted health screening levels for Recreational C land use setting? **Yes***
- ii. *Are the sources of potential contamination from on-site and /or off-site migration? **Off site from Lot 98***
- iii. *Is there sufficient soil information to allow a detailed remediation plan to be developed? **No, additional investigation is required within gullies / drainage channels***
- iv. *Is there any potential migration or impact from soil into water resources inside of the site boundaries? **This question has been removed***
- v. *Will the DSI provide a data set that is suitable to assess the risk posed by contamination (if present) to human health, ecological receptors (open water) and potential future liability of material that will remain at the Site? **Yes, DSI results have been used to update JBS&G HHRA***
- vi. *Do the findings provide a high degree of certainty of the source of identified contamination? **Yes, from Lot 98, no sources identified within Lot 97***
- vii. *Does the data set provide sufficient information to assess the potential for any off-site migration of contaminant? **No, only pathway of off site migration is towards underwater area and it can't be determined how much asbestos has migrated there without an underwater investigation***
- viii. *Will the DSI recommend further site investigation based on limited sampling? **Yes, further recommendations have been made***
- ix. *Does the DSI provide adequate preliminary characterisation to enable an assessment of remedial options, remedial cost estimates and or management of the contamination (if present)? **Yes, the DSI has identified that the major source of contamination is surface runoff from Lot 98, remediation options can be assessed based on that.***

Can Trinitas identify where in the DSI each of these decisions is specifically resolved, or remains unresolved, and describe the conclusions that can be drawn and the actions that are required? The auditor notes that for the most part this information may be present in the DSI, but may be better assembled in the form of an appropriate summary checklist / table which identifies the questions / decisions and the solutions.

9. Section 3.5.2 Trinitas Site Inspections, Emu-picking, Clearance and Air Monitoring Reports (also Section 7.1 Visual Inspection & Assessment) and Section 9.2 Site inspection

Additional information added to this section has broadly addressed the auditor's previous comments in respect to the Asbestos Inspection and Clearance Certificates (and Air Monitoring reports) August 2020 - June 2021 (<https://www.randwick.nsw.gov.au/planning-and-building/council-works-and-upgrades/major-projects/little-bay-beach-asbestos-management>). However, could Trinitas please clarify the following:

9.1 Do the number of photos appended to the various 'Asbestos Inspection and Clearance Certificates' represent the count of ACM pieces collected during each inspection? Summaries of counts were provided in reports dated 30 April 2021 (12 pieces) and 4 June 2021 (35 pieces); however corresponding data were not readily found in other reports. Similarly, except in the latter case, there is no record of the weight of the materials collected. If such data has been collected it should be made available (and should have been recorded in each successive Inspection and Clearance report). The importance of this data relates to the use of the Trinitas data in the JBS&G HHRA calculations / extrapolations provided therein.

Trinitas Air monitoring and clearance reports include all relevant data as requested by RCC. A summary of total pieces collected was up to the discretion of the Trinitas consultant to include in the clearance reports.

9.2 As mentioned in IAL4 and at the joint meeting dated 5 August 2021, this data is required to:

- (i) verify the number of pieces collected during the clean-up period to date, and
- (ii) to demonstrate that there has been no reduction in the number of ACM pieces collected over time (August 2020 to June 2021) as claimed by the consultant and as reported in Rev 4 (and Rev 5) of the DSI. Such claims are required to be substantiated with evidence for incorporation into the DSI and HHRA.

9.3 The absence of such a record would at present seem to make it difficult to provide a reliable trend analysis as requested in IAL4 and during the recent meeting.

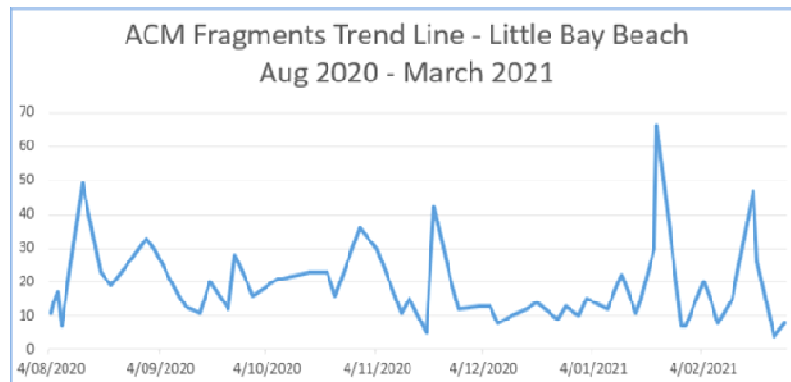
9.4 Similarly, the DSI (Rev 5) indicates that ~2000 pieces of ACM have been collected to date, however without an asbestos count as noted above it may be difficult to accurately substantiate this claim. Accordingly, the consultant is asked to provide the relevant count data for each report to verify the reported frequencies as well as the total number of ACM pieces collected during the clean-up. In this regard it is noted that the DSI indicates:

'...Prior to the commencement of the DSI works, approximately 2000 fragments were collected during bi-weekly emu picking and clearance inspections undertaken between August 2020 and April 2021 at Little Bay Beach. There was no conclusive or scientific evidence to demonstrate a decreasing trend in terms of ACM fragment quantity or numbers identified and removed from the site during the bi-weekly site inspections and emu-picking being completed by Trinitas Licensed Asbestos Assessors and Occupational Hygienists...'

and

'...During the first week of inspections, Trinitas Hygienists collected approximately one hundred (100) ACM fragments across the Northern, Western and Southern section of the Site. By 21 August 2020, over two hundred (200) suspected visible ACM fragments (including over 1 Kg of Super 6 corrugated sheeting chunks, flat fibrous cement sheeting and shell-like ACM fragments) had been collected by Trinitas hygienists...'

9.5 It is further noted that in Section 3.5.2 of Rev 5 of the DSI Trinitas provides a graphic as shown below, however there is limited evidence of any actual fragment count in the reports (as noted above). Accordingly, Trinitas should provide the raw count data to verify the graphic, presumably this is available in the form of an Excel spreadsheet or similar. **Data for the graph was manually obtained from the individual clearance reports.**



9.6 There is no apparent laboratory analysis of asbestos during the clean-up process other than for 10 samples in the initial report dated 3 August 2020 (chrysotile, amosite and crocidolite asbestos detected). It is noted that the consultant may have considered that this was sufficient to demonstrate that asbestos was present and that subsequently all visually identified FCM material was ACM. The consultant should verify this conclusion (although the auditor notes the subsequent analysis of asbestos in the DSI does tend to confirm this assumption). **The materials observed throughout the inspections were similar to initial samples which tested positive and this was later confirmed with DSI results, therefore Trinitas considered it was not necessary to further sample observed fc sheeting material**

9.7 The individual inspection reports (see above) do not clearly define the methodology used in the inspection, whereas the DSI (Rev 5) variously indicates that: **A clearly defined methodology can be included to clearance inspections completed in the future. Methodology is identical to the methodology used during the DSI**

'...Trinitas Consultants conducted the inspections, allowing inspection to be completed on a grid system walking across the surface at 90 degrees to each walk path within the grid. For each grid (5 m x 5 m) for areas of concern in the site, a walkover visual inspection was undertaken to identify suspected ACM in/on the surface to identify damaged and unstable ACM, fragments and debris as applicable ...'

and

'...Trinitas Consultants conducted the inspections, allowing inspection to be completed on a grid system walking across the surface at 90 degrees to each walk path within the grid. For each grid (5 m x 5 m) for areas of concern in the site, a walkover visual inspection was undertaken to identify suspected ACM in/on the surface to identify damaged and unstable ACM, fragments and debris as applicable.'

and

'...Trinitas personnel walked across the surface. The inspection was carried out by means of a visual observation, during a slow traverse across the materials, with the consultant inspecting on a grid pattern at 90 degrees to each walk path. The surfaces were inspected to detect evidence of suspected asbestos containing materials (ACM). Colour, size and shape are used as indicators...'

Whilst it is noted that most of the above reports predate the audit (and that some of the more recent reports are now included in the DSI), each individual report should contain a brief description of the inspection method (along the lines outlined in the DSI). Accordingly, the consultant is requested to confirm that all 'Asbestos Inspection and Clearance Certificates' listed on the RCC website adopted the same procedures as outlined in the DSI, assuming this is the case.

9.8 The consultant is also requested to provide evidence that (i) all collected asbestos was appropriately disposed to a facility licensed to accept asbestos waste and (ii) to provide the corresponding EPL and disposal details. Such documentation may be held by Trinitas or by RMA Group (the "Class A Licensed Asbestos Removal Contractor" who reportedly assisted Trinitas during inspections and clearance. The auditor notes that RMA's role is not described in further detail, other than that RMA Group undertook the removal of surface ACM on 4 and 5 of August 2020.

9.9 The Air Monitoring reports do not always apparently coincide with the date of inspections for example there is no air monitoring report dated 18/09/2020, whereas the inspection report for that date indicates that monitoring was undertaken on the same date. For completeness, the consultant should provide all corresponding reports for inclusion on the RCC website. **All air monitoring and clearance reports are provided to the council, it is up to the council what they upload to the website. Trinitas plays no role in maintaining the council website.**

10. Section 7.2 Identification of Materials to Contain Asbestos.

This section indicates that:

'...Materials suspected to contain asbestos were collected and selected based on the likely pattern, morphology and appearance of the materials as well as our professional experience in the visual identification of such materials. The collected representative samples were sent to a NATA accredited laboratory for analysis in accordance with Australian Standard AS4964-2004 Method for the qualitative identification of asbestos in bulk samples...'

Please confirm the appropriate disposal of any samples which were not dispatched to the laboratory for analysis (also see above in relation to ACM collected during the inspection and clearance from August 2020 onwards).

All presumed positive samples collected during the trinitas clearance inspections are double bagged and stored for off-site disposal.

11 Section 7.3.1 Sampling Plan and Methodology.

With reference to the extract from the DSI below, can Trinitas please advise whether the sampling was grid based (systematic) or stratified, or a combination of both, and confirm whether the sampling in the so called 'hotspot areas' was actually judgemental / targeted sampling? Additionally, can Trinitas confirm which design drawings they are referring to in this section? **Updated**

'...Trinitas undertook systematic grid-based sampling method where stratified sampling can be integrated for localised silty sand / fill, identified in each location around hotspots and from the site history and site observation. According to the provided design drawings, a discrete sample was taken from each sampling location and analysed individually...'

12. Section 8.2 Potential Sources, Pathways and Receptors of Contamination

In Table 9 there is a comment that states that:

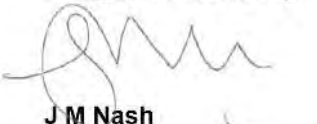
'...Inhalation of dust and vapours is a potential pathway...' and '...There is potential for site users and surrounding land users to be exposed to dust and vapours from the subsurface soil, therefore a complete pathway is considered likely...'

Can Trinitas please clarify what vapours are associated with asbestos contamination? **Updated, reference to vapours removed**

We look forward to receiving the final versions of the DSI at your convenience.

Yours faithfully

Douglas Partners Pty Ltd


J M Nash
Principal

Please note that the above information, interim advice and opinions do not pre-empt the eventual site audit findings nor do they constitute a site audit as defined under Part 4 of the Contaminated Land Management Act, 1997.

Paula Maurici

From: Mike Nash
Sent: Friday, September 10, 2021 4:19 PM
To: Evan Buntoro
Cc: Joe Santangelo; Ryan Zammit; Joanne Brown; Zaman Shamsuz; Clare Baggott; Joshua Hay; Roman Wereszczynski; Denny Bolatti; Paula Maurici
Subject: RE: Little Bay Beach Asbestos Contamination - DSI Rev6 and Response to IAL5

Interim Advice Letter 6 Non-Statutory Site Audit DPNS/19 Lot 97 Little Bay Beach, Little Bay - Lot 97, DP270427

Evan

Thank you for the two documents from Trinitas containing track changes, viz IAL5 and the DSI Rev6 and your time on the phone yesterday afternoon.

The auditor has reviewed these documents and provides the following observations:

- I. The investigation data in the DSI are satisfactory and sufficient to provide a 'snapshot' characterisation of the site (Lot 97) and to form an opinion on the condition of the land at the time of the investigations with respect to asbestos.
- II. Other aspects of the DSI are less satisfactory when compared with the requirements of NSW EPA contaminated land guidance but can be addressed in the site audit report in the form of auditor commentary and opinion.
- III. The sampling and analysis data in the DSI are sufficient to support the human health risk assessment (HHRA), prepared by JBS&G.
- IV. The conclusion of the HHRA is that the risk posed by asbestos on the site is acceptable (see extract from the report below).
- V. The DSI provides a similar conclusion but defers to the HHRA (see extract below).
- VI. The testing results from the DSI fail to meet at least one of the published health screening levels (HSL) in Table 7 of NEPM (2013) Schedule B1 (*no visible asbestos for surface soil*).
- VII. In addition, concentrations of asbestos in certain samples obtained by Trinitas from the site exceeded the NEPM HSL of 0.02% w/w (bonded ACM) for recreational land use, although the average for the site was below the HSL.
- VIII. The HHRA has also indicated that the presence of asbestos is not consistent with aesthetic requirements for a recreational area and that asbestos (ACM) is anticipated to continue to be present at the surface of the beach. In this regard the DSI has indicated that asbestos frequency on the beach has not declined despite implementation of a regular emu picking programme since August 2020.
- IX. Neither the DSI or HHRA is unequivocal regarding site suitability for the current and future recreational land use, and there is no specific statement in either report which indicates that the site is suitable, indeed both reports recommend remediation.
- X. Both the DSI and HHRA have provided recommendations for further works which *inter alia* include the preparation of remediation and management plans.

- XI. The HHRA restricts itself to the remediation and management that may be achieved in Lot 97 whereas the DSI opines that further investigations, remediation and long-term management may *inter alia* extend to the gullies etc beyond the landward boundary of Lot 97 (into Lot 98).
- XII. Trinitas has identified the likely source of asbestos on the beach as being from Lot 98 where extensive remediation took place prior to 2008, including asbestos entombment.
- XIII. The adjacent Lot (Lot 98), previously Lot 79, is the subject of a statutory site audit dated February 2008 which includes a long-term environment management plan (EMP) dated January 2008. The same auditor also provided a statutory site audit for Lot 97 (then Lot 33) dated July 2006.
- XIV. Any future work related to remediation or management of asbestos on the beach (Lot 97), or any investigations, remediation or management related to the probable source of asbestos (assumed) to be in Lot 98 will need to examine the EMP (as above) and determine how effectively the EMP has been implemented.
- XV. In general, the auditor agrees with the findings and conclusions of the DSI and HHRA and concurs with the consultants that remediation and management is required.
- XVI. To be effective in the longer term any remediation and management of asbestos will need to identify, confirm and address the source of the asbestos encountered on Lot 97.
- XVII. In the meantime, interim asbestos mitigation measures should be carefully designed and implemented in Lot 97, including where they intercept the gullies exiting Lot 98, to ensure that they are effective and are not subject to tidal or erosional effects or other forms of damage. It is noted that Trinitas has provided recommendations in regard to 'make safe measures' including barricades. It is further noted that such structures are likely to restrict or prevent beach access.
- XVIII. Accordingly, the auditor recommends that suitably detailed remediation and/or management plans are developed as soon as possible, with the aim of; (i) providing practical interim and longer term asbestos mitigation measures for Lot 97, and (ii) identifying and implementing longer term measures to remove and mitigate the source of asbestos. The auditor notes that review of such plans is beyond the scope of the current audit.

The auditor therefore requests that the DSI Report is completed and issued as per Revision 6 and notes that the final version may include minor amendments to the text, such as those requested by Roman Wereszczynski of RCC (see emails dated 8 September 2021). Provision of the final DSI will precede the preparation of the non-statutory site audit report and statement which will commence once the final DSI has been received.

As always, happy to discuss.

Kind regards.

Notes:

Extract from the Conclusions and Recommendations Section of the HHRA

'...In accordance with the limitations provided as Section 11 (of the HHRA), and subject to a remediation / management response to address high levels of sub-surface asbestos occurrence at the south eastern portion of the southern beach area, levels of asbestos on the site have not been found to pose a potentially unacceptable health risk to current / future users of the site as consistent with a recreational land-use, recreational uses in proximity of the site, nor occupants of residential properties in proximity of the site...'

Extract from the Findings and Conclusions Section of the DSI

'...Due to the nature of site contamination by bonded asbestos fragments in soil and on sand surfaces, it is the opinion of Trinitas that asbestos contamination at the Site poses a potentially low health risk to site users. The final risk ratings are to be determined by the Site Human Health Risk Assessment report...'

Please note that the above information, interim advice and opinions do not pre-empt the eventual site audit findings nor do they constitute a site audit as defined under Part 4 of the Contaminated Land Management Act, 1997.

Mike Nash | Principal

Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au

96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685

P: 02 9809 0666 | M: +61 414 716 501 | E: Mike.Nash@douglaspartners.com.au



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From: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>

Sent: Friday, 10 September 2021 8:25 AM

To: Mike Nash <Mike.Nash@douglaspartners.com.au>

Cc: Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Joanne Brown <Joanne.Brown@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>; Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>; Denny Bolatti <denny.bolatti@trinitasgroup.com.au>; Paula Maurici <paula.maurici@douglaspartners.com.au>

Subject: RE: Little Bay Beach Asbestos Contamination - DSI Rev6 and Response to IAL5

Hi Mike

Following up our phone discussion yesterday afternoon, please proceed with the final IAL leading up to the SAS / SAR i.e. Task 3 as allowed in the submission

Any questions please let me know

Kind regards,

Evan Buntoro

Project Manager

Infrastructure Services

evan.buntoro@randwick.nsw.gov.au

From: Paula Maurici <paula.maurici@douglaspartners.com.au>

Sent: Wednesday, 8 September 2021 12:45

To: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>

Cc: Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Joanne Brown <Joanne.Brown@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Mike Nash <Mike.Nash@douglaspartners.com.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>; Denny Bolatti <denny.bolatti@trinitasgroup.com.au>; Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>

Subject: RE: Little Bay Beach Asbestos Contamination - DSI Rev6 and Response to IAL5

Evan,

On behalf of Mike Nash who is not available today, many thanks for the two documents.

We note that IAL5 contains brief responses to our enquiries and that the DSI (Rev 6) contains minor revisions and amendments from Rev 5. Accordingly, as these responses are relatively succinct we should be able complete our review of Rev 6 by COB tomorrow, this will take the form of a final IAL summarising the audit findings in relation to Task 3 as listed in your email (7 Sept 2021). In this regard we note that future remediation of Lot 97 (or for that matter Lot 98) is beyond the scope of Task 3 of the audit and in due course will need to be provided in the form of an RAP/AMP.

Regarding the comments today from Roman (attached) on alternative or combined interim remedial options, DP has no objection to such recommendations being included in the DSI. However, formal planning of remediation (on Lot 97) will need to be provided in the form of an RAP/AMP, and ultimately any ongoing implementation of such measures will need to be established in a legally enforceable long term EMP, similar to the existing one for Lot 98 (previously Lot 79). We note that the implementation history of the existing EMP for Lot 98 (Lot 79) will also need to be determined as part of any proposed remediation planning or related works either in Lot 97 or in Lot 98, particularly noting that Trinitas has identified the likely source of asbestos on the beach is from within Lot 98 i.e. the land immediately inland of the beach where remediation has previously occurred.

Kind regards,

Paula Maurici | Associate / Environmental Scientist
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 9809 0666 | M: +61 408 314 047 | E: paula.maurici@douglaspartners.com.au



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From: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>
Sent: Tuesday, September 7, 2021 11:42 AM
To: Mike Nash <Mike.Nash@douglaspartners.com.au>; Joanne Brown <Joanne.Brown@randwick.nsw.gov.au>; Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>
Cc: Paula Maurici <paula.maurici@douglaspartners.com.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>; Denny Bolatti <denny.bolatti@trinitasgroup.com.au>
Subject: Little Bay Beach Asbestos Contamination - DSI Rev6 and Response to IAL5

Hi Mike / Joanne / Roman

Please see attached for Trinitas' response to IAL5 **and** DSI Rev6 with "Tracked Changes" for ease of review

Can this DSI Rev6 then be finalised so that we can proceed to the next stage as detailed below?

- Task 3 - Provide site audit statement and site audit report (both are required a following agreement that the DSI and HHRA have been completed satisfactorily and extent of asbestos contamination in the defined site has been properly c related risks identified.

Any questions please let me know

Kind regards,

Evan Buntoro
Project Manager
Infrastructure Services
evan.buntoro@randwick.nsw.gov.au

From: Denny Bolatti <denny.bolatti@trinitasgroup.com.au>
Sent: Tuesday, 7 September 2021 11:01
To: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>
Cc: Asfar Riaz <asfar.riaz@trinitasgroup.com.au>
Subject: RE: Little Ba y Audit DPNS/19

Hi

Find attached DSI v6 in track changes and IAL6 with responses

Let us know if the ISA requires additional information

Regards

Denny Bolatti
Managing Director



A: Level 3, 24 Hunter Street Parramatta NSW 2150
T: 1800 4 TRINITAS **M:** 0412 827 006
E: denny.bolatti@trinitasgroup.com.au
W: www.trinitasgroup.com.au



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Little Bay Beach – Asbestos Contamination

Review of Interim Advice Letter 3 (IAL3) and Detailed Site Investigation (DSI) Rev4

Date: Thursday, 5th of August 2021

Time: 14.00-15.00

Location: Microsoft Teams

ATTENDEES:

Evan Buntoro (EB)	Project Manager	Randwick City Council (RCC)
Joe Santangelo (JS)	Coordinator Projects	Randwick City Council
Ryan Zammit (RZ)	Manager Infrastructure Services	Randwick City Council
Zaman Shamzuz (ZS)	Environmental Engineer	Randwick City Council
Krystal Lim (KL)	Project Administrator	Randwick City Council
Roman Wereszczynski (RW)	Manager Health, Building & Regulatory Services	Randwick City Council
Mike Nash (MN)	Principal	Douglas Partners (DP)
Paula Maurici (PM)		Douglas Partners (DP)
Denny Bolatti (DB)	Managing Director	Trinitas

APOLOGIES:

Joshua Hay	Manager Communications	Randwick City Council
Clare Baggott	Leader Enterprise Risk & Safety	Randwick City Council

1. INTRODUCTION

- 1.01 This meeting is to discuss Little Bay Beach, Asbestos Contamination progress mainly based on IAL3 prepared by DP and DSI Rev4 prepared by Trinitas
- 1.02 DP is the Independent Site Auditor (ISA), Trinitas is the Environmental Consultant and JBS&G (not present in this meeting) is the Human Health Risk Assessor (HHRA)
- 1.03 The objective of this meeting is to determine an agreement so that RCC can make an informed and logical decision for the interest of all parties **and** general public based on the data obtained and recommendations from DP, Trinitas and JBS&G
- 1.04 At the time of the meeting, the project is approximately one month behind original timeline
- 1.05 Spring / summer is coming soon and it is expected that there will be high volume of visitors in the beach hence there is a tight deadline on this process
- 1.06 The final assessment report of this investigation will be released to public hence it is crucial that the information is thorough to avoid heavy scrutiny

2. SITE BOUNDARIES

- 2.01 MN noted that the earlier documents produced by Trinitas defined the site as **DP Lot 97**, however the boundaries between DP Lot 97 and 98 are not made clear in the later documents. This is a major point based on Contaminated Land Management (CLM) Act and other relevant guidelines to be able to assess the site properly
- 2.02 Lot 98 has different occupier (Crown Land, Golf Club etc.) and is located to the West of Lot 97. It is acknowledged by all stakeholders that there are portions of the Lots that might be "grey" zone
- 2.03 DB confirmed that the site is Lot 97. This is acknowledged by all stakeholders in the meeting
- 2.04 JS noted that DB obtained the information about site boundaries at the beginning of the investigation from RCC GIS Integrated Maps
- 2.05 RCC is to assist in obtaining Section 10.7 Certificate

3. TECHNICALITY OF THE DSI

- 3.01 DP noted that technical terms used in the DSI are occasionally inconsistent. The correct use of tense is also necessary so that coherent and logical statements are consistent throughout the whole report
- 3.02 DB acknowledged that different Consultants from Trinitas have worked on this project and they have a subjective understanding on the technical terms. The DSI will be revised to meet the relevant standards and guidelines
- 3.03 RCC is to research aerial photos before 2009 in the Library Collection to assist and obtain more information
- 3.04 MN noted the inconsistent statement in regards to the presence of Friable Asbestos (FA) since this may make a major difference in regard to risk assessment of the site
- 3.05 DB confirmed that there is no Friable Asbestos (FA) on site

4. CLAIM BASED ON EVIDENCE

- 4.01 MN noted that some statements in the DSI may be lack of clear evidence and this might lead to public scrutiny. For example “buried waste” term is used and it is not clear whether this indicates “buried by human” or “buried by nature” such as tidal wave movement
- 4.02 DB confirmed that all claims made in the DSI are based on evidence. This will be discussed between DP and Trinitas to finalise the DSI

5. CONCEPT SITE MODELING (CSM)

- 5.01 EB noted that IAL3 mentioned about no CSM has been completed for the investigation
- 5.02 MN mentioned that this is not a major issue
- 5.03 There are other ways to define the site characteristic and this shall be made available in the final DSI

6. MISCELLANEOUS

- 6.01 RW raised a question that if the number of asbestos fragments is consistent from approximately one year ago, where does these fragments come from?
- 6.02 MN requested to see the emu picking reports to date. This is available on RCC website
- 6.03 MN asked DB to tabulate the number of emu picking found so that a general trend can be easily accessible to everyone

7. CONCLUSION / ACTIONS TO BE TAKEN

- 7.01 The site boundaries is defined as Lot 97
- 7.02 The claims made in the DSI are all based on evidence
- 7.03 No FA is present on site
- 7.04 Historical photographs of the site will be researched, **action: EB**
- 7.05 Section 10.7 Certificate to be obtained, **action: EB**
- 7.06 Revised DSI shall be provided **by Wednesday, 11th of August 2021, action: DB**

8. NEXT MEETING

- 8.01 To be confirmed (if any is required)

Paula Maurici

From: Mike Nash
Sent: Wednesday, July 14, 2021 2:53 PM
To: Stephen Leung
Cc: Paula Maurici; Joe Santangelo; Evan Buntoro
Subject: RE: Little Bay IAL2

Categories: Filed by Newforma

Hi Stephen

I have reviewed the amended HHRA (dated 11 July 2021 ref 59811-138906 (Revision B) and related feedback from JBS&G as below, and consider that they have suitably addressed the issues raised in IAL2, and in general I agree with their conclusions and recommendations with respect to Lot 97 DP270427.

Regarding any other remediation or management options which may be available e.g. along the (landward) site boundary of Lot 97, or beyond, these should be considered and addressed by the DSI consultant.

As yet I have not, however, seen any revision to the DSI, nor any response by Trinitas following on from IAL1 and therefore I am unable to comment further at this time.

Kind regards.

Mike Nash | Principal
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 9809 0666 | M: 0414 716 501 | E: Mike.Nash@douglaspartners.com.au



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From: Stephen Leung <Stephen.Leung@randwick.nsw.gov.au>
Sent: Monday, 12 July 2021 11:03 AM
To: Mike Nash <Mike.Nash@douglaspartners.com.au>
Cc: Paula Maurici <paula.maurici@douglaspartners.com.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>
Subject: FW: Little Bay IAL2

Hi Mike,

Attached is the updated HHRA and response from JBS&G as seen in their email below for your review / comment.

I am targeting to have the DSI and HHRA finalised by this Wednesday at the latest so I can provide the recommendations from these reports to executive management on the same day.

Kind regards,

Stephen Leung
Project Manager
Randwick City Council
02 9093 6729
0404 265 870
stephen.leung@randwick.nsw.gov.au
www.randwick.nsw.gov.au



From: Matthew Parkinson <Mparkinson@jbsg.com.au>
Sent: Sunday, 11 July 2021 4:18 PM
To: Stephen Leung <Stephen.Leung@randwick.nsw.gov.au>
Cc: Michael Samuel <MSamuel@jbsg.com.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>
Subject: RE: Little Bay IAL2

Stephen, please find attached revised report. Responses to Site Auditor comments following and revised in text where appropriate.

Comment 1 – clarified as south-eastern portion of southern beach throughout text.

Comment 2 – Section 1.11 updated to note review of all reports (now undertaken). Minor edits made throughout document.

Comment 3 – Section 1.11.11 added.

Comment 4 – all of these calculations have been required to be undertaken by JBS&G in absence of this level of assessment in the Trinitas documentation. The report has been revised to report asbestos as %w/w s well as mg/kg.

Comment 5 – JBS&G agrees that ‘data currently employed likely introduces a more conservative result than would otherwise be the case if genuine grid sampling had been deployed’. The conservatism as caused by the biasing of the Trinitas sample locations has been noted through the assessment. The estimated risk levels on this likely conservative data is noted to be well below the acceptable levels. Further grid based sampling may be warranted where risk levels were approaching acceptable levels, and greater confidence was needed that the site did not pose an unacceptable health risk. Otherwise it is most likely that additional grid based sampling will simply result in lower levels of health risk being estimated. No reference to asbestos hot-spots is identified in the text. However an area of greater occurrence has been identified at the south-eastern portion of the southern beach.

The Site Auditor comment with respect to statistical analysis of data is also noted. The decision to fit the data to a distribution to determine a 95% upper confidence limit estimate of the site average is based on a consideration of likely human behaviours on the Beach, other the potential distribution of asbestos. It is agreed that the asbestos is likely to be heterogeneous, but through biasing of sampling locations / depths to target more likely locations of asbestos that has introduced conservatism to the risk assessment process.

Comment 6 – it is considered that the conservatism in the sampling is sufficient to address the extreme weather events as noted by the Site Auditor. This is discussed in a revised Section 9.3.

Comment 7 – the risk assessment has been based on a chronic dose to asbestos. The exposure parameters adopted are considered sufficiently robust to be protective of increased incidence of beach activity during, as offset with inevitable decreased activity during cooler months / poor weather, and further noting that a substantial proportion of beach

activity will not comprise the active agitation / disturbance of the site sands that may cause the release of asbestos fibres. The sensitivity of the risk estimates to exposure durations have been discussed in Section 9.4.

Comment 8 – the hot and dry conditions that may occur to cause a potential increase in asbestos fibre emissions are not considered applicable to an intertidal / seaside locations such as Little Bay. It must be noted that the site is likely to more subject to inundation / higher moisture levels than the construction sites / development sites that have been adopted in the development of the dataset used to estimate potential asbestos fibre emissions. This additional factor, as adopted in the WA guidelines is only applicable for locations where no water ingress / proximity is likely.

Comment 9 – JBS&G are of the opinion that most significant findings of the Trinitas works is that there are no occurrences of asbestos fines / free asbestos / friable asbestos on the site. Put simply, asbestos fibres are not caused to be released from bonded asbestos – and in absence of the release of asbestos fibres there is no health risk. Even by the assumption within the risk assessment that the asbestos on the Beach will spontaneously decompose and be available as free asbestos fibres – an unacceptable health risk cannot be estimated. The recommendations as provided by JBS&G relates only to the maintenance of an aesthetic condition of the Beach that would be expected by the community. They are in no way driven or guided by an unacceptable level of potential cancer risk.

The Asbestos Register is a function of the Work Health and Safety Act 2011 and Work Health and Safety Regulation 2017 which make no provision for potential levels of health risk – are absolute in their application.

Happy to discuss further if required. Thanks, matt



Matthew Parkinson | Senior Principal Environmental Engineer | JBS&G
Sydney | Melbourne | Adelaide | Perth | Brisbane | Canberra | Darwin | Wollongong | Bunbury
Level 1, 50 Margaret Street Sydney NSW 2000

T: 02 8245 0300 | M: 0414 923 375 | E: mparkinson@jbsg.com.au | W: www.jbsg.com.au

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JBS&G acknowledges the Traditional Owners and custodians on the land we walk, work and live. We pay respect to their cultures, Elders past and present, and in the spirit of reconciliation, we commit to working together for our shared future.

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From: Stephen Leung <Stephen.Leung@randwick.nsw.gov.au>
Sent: Friday, 9 July 2021 3:13 PM
To: Matthew Parkinson <Mparkinson@jbsg.com.au>
Cc: Michael Samuel <MSamuel@jbsg.com.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>
Subject: FW: Little Bay IAL2

*****[EXTERNAL EMAIL] Stop and think before opening attachments, clicking or responding.*****

Hi Matthew,

Attached is the independent audit notes from the Site Auditor for the HHRA.

Can you please review the report and provide the appropriate amendments and/or responses to each of the auditor's notes?

We are targeting to have all of our reports finalised by next Wednesday, so can you please provide me with your amended report and/or comments by then?

Kind regards,

Stephen Leung
Project Manager
Randwick City Council
02 9093 6729
0404 265 870
stephen.leung@randwick.nsw.gov.au
www.randwick.nsw.gov.au



From: Mike Nash <Mike.Nash@douglaspartners.com.au>
Sent: Friday, 9 July 2021 11:33 AM
To: Stephen Leung <Stephen.Leung@randwick.nsw.gov.au>
Cc: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>; Paula Maurici <paula.maurici@douglaspartners.com.au>
Subject: Little Bay IAL2

Stephen

Please find attached IAL2 for the HHRA by JBS&G.

Apologies for the slightly late delivery.

Any questions please give me a call.

Regards.

Mike Nash | Principal
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 9809 0666 | **M:** 0414 716 501 | **E:** Mike.Nash@douglaspartners.com.au



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Paula Maurici

From: Mike Nash
Sent: Friday, August 6, 2021 10:31 AM
To: Evan Buntoro; Denny Bolatti
Cc: Joe Santangelo; Zaman Shamsuz
Subject: RE: Little Bay Beach Asbestos - Library Photo Collection

Categories: Filed by Newforma

Thanks Evan. Some interesting photos.

The one below in particular, as it shows the buildings behind Gully 1 and presumably the low wall and arch over the gully which is still there.

Also, if I am not very much mistaken, it shows a deep gully extending across the beach from Gully 2 as well as a rock outcrop around the tide level at this location, the photo was either taken at very low tide or there has indeed been a change in sea level since the photo was taken in the 1900s!



Mike Nash | Principal

Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au

96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685

P: 02 9809 0666 | **M:** +61 414 716 501 | **E:** Mike.Nash@douglaspartners.com.au





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From: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>
Sent: Friday, 6 August 2021 9:57 AM
To: Denny Bolatti <denny.bolatti@trinitasgroup.com.au>; Mike Nash <Mike.Nash@douglaspartners.com.au>
Cc: Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>
Subject: Little Bay Beach Asbestos - Library Photo Collection

Hi Denny / Mike

I have scrolled through the Library photo collection of Little Bay Beach as attached

You'll see that the photos are named in the format YYYY MM DD "Description". The timeline for some of the photos is not clear so please keep this in mind

If you are interested in more, please see the links below

https://randwick.ent.sirsidynix.net.au/client/en_AU/randwickcitylibrary/search/results?qu=little+Bay&te=ASSET
[Search Results for little Bay aerial \(sirsidynix.net.au\)](#)

I am trying to find the information about copyright, will get back to you ASAP

Any questions please let me know

Kind regards,

Evan Buntoro
Project Manager
Infrastructure Services
evan.buntoro@randwick.nsw.gov.au

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Paula Maurici

From: Mike Nash
Sent: Wednesday, August 11, 2021 1:22 PM
To: Evan Buntoro
Cc: Paula Maurici; Zaman Shamsuz; Joe Santangelo
Subject: RE: Little Bay Beach - Section 10.7 Certificate

Categories: Filed by Newforma

Hi Evan

Does this mean that there isn't actually an SAS for Lot 97 and that the S10.7 Notice is incorrect, or that Council doesn't have a copy of the SAS, but one exists?

Alternatively, it occurs to me that this issue may be related to the timing of the creation of Lot 97 (from Lot 33) which presumably occurred during or after development in the adjacent Lot 98.

Accordingly, it may be that the SAS actually relates to Lot 33 particularly noting that the consultant reported that '*...the site comprised Lot 33 in DP27042...*' and indicated in the DSI Rev 4 that:

'...D03973784 Paul Steinwede ERM Prince Henry Hospital at Little Bay - Documentation Lot 33 Little Bay Beach Site ~ 1430 Anzac Parade Little Bay(3)...' (see references section).

Therefore it may be that the S10.7 Notice actually refers to this document by Dr Steinwede, which may presumably be the SAS. Also it is possible that reference to the SAS in the S10.7 Notice may have been transferred across perhaps from the old S149 Notice ?

As alluded to previously this information should have been carefully examined and reported by the consultant as part of the DSI's site history.

Accordingly, it may be prudent to determine if there is an SAS for Lot 33 in DP270427 and whether this applies either partly or wholly to Lot 97.

Hope this is helpful.

Cheers.

Mike Nash | Principal
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 9809 0666 | M: +61 414 716 501 | E: Mike.Nash@douglaspartners.com.au



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From: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>
Sent: Wednesday, 11 August 2021 12:37 PM
To: Mike Nash <Mike.Nash@douglaspartners.com.au>
Cc: Paula Maurici <Paula.Maurici@douglaspartners.com.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>
Subject: RE: Little Bay Beach - Section 10.7 Certificate

Hi Mike

I have tried to search for SAS for Lot 97 and there is none

Kind regards,

Evan Buntoro
Project Manager
Infrastructure Services
evan.buntoro@randwick.nsw.gov.au

From: Mike Nash <Mike.Nash@douglaspartners.com.au>
Sent: Wednesday, 11 August 2021 10:38
To: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>
Cc: Paula Maurici <Paula.Maurici@douglaspartners.com.au>
Subject: RE: Little Bay Beach - Section 10.7 Certificate

Hi Evan

Thanks for the S10.7 Notice for Lot 97 DP270427.

Regarding Section 21(e), the Notice states:

'...that the land to which the certificate relates is the subject of a site audit statement within the meaning of that Act—if a copy of such a statement has been provided at any time to the local authority issuing the certificate,

Council HAS received a copy of a site audit statement, within the meaning of the Contaminated Land Management Act 1997, for this land...

Please clarify this statement as I note that the existence of an SAS for Lot 97 has not been advised previously, moreover it also appears that the consultant is not aware of this situation.

Please advise accordingly and provide a copy of the SAS for Lot 97 assuming one is available.

Regards.

Mike Nash | Principal
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 9809 0666 | M: +61 414 716 501 | E: Mike.Nash@douglaspartners.com.au



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From: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>

Sent: Wednesday, 11 August 2021 10:06 AM

To: Mike Nash <Mike.Nash@douglasspartners.com.au>

Subject: Little Bay Beach - Section 10.7 Certificate

Hi Mike

Please see attached for the Section 10.7 Certificate at Little Bay Beach

Any questions please let me know

Kind regards,

Evan Buntoro

Project Manager

Infrastructure Services

evan.buntoro@randwick.nsw.gov.au

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Paula Maurici

From: Mike Nash
Sent: Wednesday, August 11, 2021 9:43 AM
To: Evan Buntoro; Joe Santangelo; Zaman Shamsuz; Ryan Zammit; Clare Baggott; Roman Wereszczynski; Ryan Zammit; Joshua Hay; Denny Bolatti; Paula Maurici
Subject: RE: Little Bay Beach - Asbestos Contamination - Minutes for Meeting on 5 August 2021
Categories: Filed by Newforma

Evan

Thanks for the minutes, these are considered to be a fair and accurate summary of the meeting.

However, with reference to Items 3.02 and 5.02 please note the following:

Item 3.02 – we consider that the various consultants employed by Trinitas should not have a subjective understanding of the (defined) technical terms because this inevitably results in misinterpretation and inaccuracy in reporting. In this regard we consider that the DSI should be revised such that there is a uniform appreciation of technical definitions and moreover that the DSI generally meets the relevant standards and guidelines endorsed under the CLM Act. In this regard it is also necessary that the consultant demonstrates that all field staff as well as report writers and reviewers contributing to the project are appropriately trained, qualified and experienced.

Item 5.02 - we advise that a detailed CSM remains a necessary component of any DSI and must be comprehensive and follow the endorsed guidance. Notwithstanding, the method of presenting the CSM in the DSI can, to a degree, be left to the discretion of the consultant (i.e. it can comprise a schematic cross section, diagram, table, or description or a suitable combination of these methods).

We also note, more generally, that the audit comments provided in IAL1, IAL3 and IAL4 in respect to the previous versions of the DSI outline the items which need to be considered and actioned by the consultant in the forthcoming version of the DSI (Revision 5) and that the meeting minutes are supplementary to this requirement.

Kind regards.

Mike Nash | Principal
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 9809 0666 | **M:** +61 414 716 501 | **E:** Mike.Nash@douglaspartners.com.au



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From: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>
Sent: Saturday, 7 August 2021 12:46 PM

To: Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>; Mike Nash <Mike.Nash@douglaspartners.com.au>; Denny Bolatti <denny.bolatti@trinitasgroup.com.au>; Paula Maurici <paula.maurici@douglaspartners.com.au>
Subject: Little Bay Beach - Asbestos Contamination - Minutes for Meeting on 5 August 2021

Hi all

Please see attached for the minutes of the meeting as per the subject title

Any questions please let me know

Kind regards,

Evan Buntoro
Project Manager
Infrastructure Services
evan.buntoro@randwick.nsw.gov.au

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Paula Maurici

From: Mike Nash
Sent: Monday, August 16, 2021 2:04 PM
To: Evan Buntoro
Cc: Paula Maurici
Subject: Little Bay Audit DPNS/19

Categories: Filed by Newforma

Hi Evan

Further to my earlier email forwarding interim advice letter (IAL5) I should draw your attention to Section 4 of our proposal dated 8 June 2021 which indicated that Task 2 involved only one round of audit comments (IALs) on the consultants' DSI and HHRA reports.

You will recall that the review of the HHRA by JBS&G was completed via IAL2, however successive versions of the DSI by Trinitas Group have required a further three sets of audit comments (IAL3, IAL4 and IAL5) in addition to the original review comprising IAL1.

Additional auditing fees for the IAL3 review were included in our progress claim invoice dated 22 June, however, the latter two items (IAL4 and IAL5) are similarly not included in the agreed scope of work and accordingly will be charged at rates. The additional costs will be itemised in a further progress claim in due course and do not comprise part of the original lump sum fees for the audit as we move onto Task 3.

If you have any questions please let me know.

Kind regards.

Mike Nash | Principal

Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au

96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685

P: 02 9809 0666 | **M:** +61 414 716 501 | **E:** Mike.Nash@douglaspartners.com.au



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Paula Maurici

From: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>
Sent: Monday, August 23, 2021 2:49 PM
To: Denny Bolatti
Cc: Paula Maurici; Zaman Shamsuz; Joe Santangelo; Ryan Zammit; Clare Baggott; Roman Wereszczynski; Joshua Hay; Mike Nash
Subject: RE: HPE CM: Little Bay Audit DPNS19
Categories: Filed by Newforma

Hi Denny

To assist with the finalisation of DIS for Little Bay Beach, we have found the following documents:

1. [“Remediation Action Plan, Prince Henry at Little Bay, Undevelopable Area”, prepared by Douglas Partners, November 2004](#)
2. [“Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site - Undevelopable Area”, prepared by EMS, December 2005](#)
3. [“Site Audit Report - Lot 79 Prince Henry at Little Bay Development”, prepared by EarthTech, February 2007](#)

While these are not exactly the ones requested by Trinitas to be available as part of this investigation, these reports may contain useful information to form the final DSI and eventually, SAS / SAR

Denny, can you please then advise when DSI Rev6 is expected to be issued?

Any questions please let me know

Kind regards,

Evan Buntoro
Project Manager
Infrastructure Services
evan.buntoro@randwick.nsw.gov.au

From: Evan Buntoro
Sent: Tuesday, 17 August 2021 09:21
To: Mike Nash <Mike.Nash@douglaspartners.com.au>; Denny Bolatti <denny.bolatti@trinitasgroup.com.au>
Cc: Paula Maurici <paula.maurici@douglaspartners.com.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>
Subject: RE: HPE CM: Little Bay Audit DPNS19

Hi Mike, Denny

Thanks to Mike for providing IAL5. @Denny Bolatti please download the mentioned SAS [here](#) as per the Section 10.7 Certificate (apologies for not forwarding this earlier). There were confusions about the area of past Lot 33 vs current Lot 97 and it was found out that the current Lot 97 is part of the previously defined Lot 33

One of the major points in IAL5 is the following:

7. Section 3.7 Integrity Assessment.

It is noted that there is limited information regarding the site (Lot 97) and that most available information for the general site areas relates to the adjacent land. In addition, it is noted that the DSI states that:

'...Trinitas made several requests to obtain PSI reports from Douglas Partners as these reports could provide crucial information for a better understanding of the site history. Requests for such reports were declined by Douglas Partners. It should be noted that Douglas Partners have been commissioned by the Client as an Independent Site Auditor to review this DSI...'

The auditor was not aware that such requests had been made by Trinitas to DP, or that such requests had been declined, and notes that DP is unable to locate any record of such requests. Accordingly, Trinitas are requested to provide copies of the original requests. Notwithstanding, it is considered that the documentation contained in the ERM SAR (2006), as referenced above, contains sufficient background information for the purposes of the DSI.

I have previously shared the contact details between you two so can we please solve this past report referencing issue? I noted this was also mentioned in DSI Rev4 Section 3.6.4 and IAL3 Table Point 14 and 61.

[@Denny Bolatti](#), can you please advise the timeline for DSI Rev6 and then we can proceed to final version for the DSI? I noted that IAL5 mentioned 2x versions of the DSI Rev6 is requested:

this process, Trinitas is requested to provide 2 versions of the DSI, as follows:

- A new version of the DSI (Revision 6) in track changes showing all revisions which have been made to the current DSI Draft (Revision5); and
- A clean formatted final DSI Final (Revision 6), which can be provided once the track change version is agreed.

This will then enable us to move forward to Site Audit Report (SAR) as per the statement below from Douglas Partners:

When this latter version is provided to the auditor the SAR will be prepared.

Any questions please let me know and much appreciated for everyone's help

Kind regards,

Evan Buntoro
Project Manager
Infrastructure Services
evan.buntoro@randwick.nsw.gov.au

From: Mike Nash <Mike.Nash@douglaspartners.com.au>

Sent: Monday, 16 August 2021 13:05

To: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>; Denny Bolatti

<denny.bolatti@trinitasgroup.com.au>; Paula Maurici <paula.maurici@douglaspartners.com.au>

Subject: HPE CM: Little Bay Audit DPNS19

Hello Evan

Please find attached IAL 5 in response to Rev 5 of the DSI by Trinitas Group.

Any questions please let me know.

Regards.

Mike Nash | Principal

Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au

96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685

P: 02 9809 0666 | M: +61 414 716 501 | E: Mike.Nash@douglaspartners.com.au



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Paula Maurici

From: Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>
Sent: Tuesday, August 24, 2021 12:04 PM
To: Mike Nash; Evan Buntoro; Denny Bolatti
Cc: Paula Maurici; Zaman Shamsuz; Joe Santangelo; Ryan Zammit; Clare Baggott; Joshua Hay; Joanne Brown
Subject: RE: HPE CM: Little Bay Audit DPNS19
Attachments: D03978155 - Environmental Management Plan - Lot 79 Prince Henry at Little Bay - Landcom - January 2008.pdf

Categories: Filed by Newforma

Hi everyone

I have attached a copy of the EMP for former lot 79, if you don't already have it.

Please advise if you require any other documents from around this time (I am sure Joanne doesn't mind digging them out).

Regards

Roman

Roman Wereszczynski
Manager Health, Building & Regulatory Services
Randwick City Council

02 9093 6947
www.randwick.nsw.gov.au



From: Mike Nash <Mike.Nash@douglaspartners.com.au>
Sent: Tuesday, 24 August 2021 11:33 AM
To: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>; Denny Bolatti <denny.bolatti@trinitasgroup.com.au>
Cc: Paula Maurici <paula.maurici@douglaspartners.com.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>
Subject: RE: HPE CM: Little Bay Audit DPNS19

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Please let me know if you have any questions.

Mike Nash | Principal

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Sent: Monday, 23 August 2021 2:49 PM

To: Denny Bolatti <denny.bolatti@trinitasgroup.com.au>

Cc: Paula Maurici <Paula.maurici@douglaspartners.com.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>; Mike Nash <Mike.Nash@douglaspartners.com.au>

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Infrastructure Services
evan.buntoro@randwick.nsw.gov.au

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Paula Maurici

From: Mike Nash
Sent: Tuesday, August 24, 2021 5:10 PM
To: Joanne Brown; Roman Wereszczynski; Evan Buntoro; Denny Bolatti
Cc: Paula Maurici; Zaman Shamsuz; Joe Santangelo; Ryan Zammit
Subject: RE: Little Bay Audit DPNS19

Categories: Filed by Newforma

Thanks Joanne. Very helpful information.

Mike Nash | Principal
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From: Joanne Brown <Joanne.Brown@randwick.nsw.gov.au>
Sent: Tuesday, 24 August 2021 3:26 PM
To: Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>; Mike Nash <Mike.Nash@douglaspartners.com.au>; Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>; Denny Bolatti <denny.bolatti@trinitasgroup.com.au>
Cc: Paula Maurici <paula.maurici@douglaspartners.com.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>
Subject: RE: Little Bay Audit DPNS19

Hi everyone,

I have been looking through the historical data this afternoon and from what I can determine the beach may have part of the same parcel of land as the golf course at one stage (area referred to as 'undevelopable land') I have summarised some of the details of the land subdivision below and scanned parts of DP270427.

In summary, from what I can determine :

The current Lot 97 DP270427 (was consolidated on 23.12.2010)

↓ from

Lot 33 DP 270427 (15.12.2009)

↓ from

Lot 23 DP270427 (16.03.2005)

↓ from

Lot 1000 DP 1077708

There is more previous history if required though I did not feel it was pertinent to answering your question.

No EMP exists for the beach as far as I am aware. This may be as a result of the conditions imposed on the DA indicating Council would not accept dedication of the land/that being the beach, with the presence of an EMP. I hope this information assists with clarifying questions asked below. Please let me know if you need anything further.

Kind regards
Joanne

Joanne Brown
Senior Environmental Health Officer
Randwick City Council
Direct 9093 6879
Call Centre 1300 722 542
Monday - Thursday

From: Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>
Sent: Tuesday, 24 August 2021 12:04 PM
To: Mike Nash <Mike.Nash@douglaspartners.com.au>; Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>; Denny Bolatti <denny.bolatti@trinitasgroup.com.au>
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Subject: RE: HPE CM: Little Bay Audit DPNS19

Hi everyone

I have attached a copy of the EMP for former lot 79, if you don't already have it.

Please advise if you require any other documents from around this time (I am sure Joanne doesn't mind digging them out).

Regards

Roman

Roman Wereszczynski
Manager Health, Building & Regulatory Services
Randwick City Council

02 9093 6947
www.randwick.nsw.gov.au



From: Mike Nash <Mike.Nash@douglaspartners.com.au>
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Paula Maurici

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Sent: Tuesday, August 24, 2021 11:33 AM
To: Evan Buntoro; Denny Bolatti
Cc: Paula Maurici; Zaman Shamsuz; Joe Santangelo; Ryan Zammit; Clare Baggott; Roman Wereszczynski; Joshua Hay
Subject: RE: HPE CM: Little Bay Audit DPNS19
Categories: Filed by Newforma

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Cc: Paula Maurici <paula.maurici@douglaspartners.com.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>; Mike Nash <Mike.Nash@douglaspartners.com.au>
Subject: RE: HPE CM: Little Bay Audit DPNS19

Hi Denny

To assist with the finalisation of DIS for Little Bay Beach, we have found the following documents:

1. ["Remediation Action Plan, Prince Henry at Little Bay, Undevelopable Area", prepared by Douglas Partners, November 2004](#)
2. ["Remediation Strategy Report & Future Site Management Principles, Prince Henry Redevelopment Site - Undevelopable Area", prepared by EMS, December 2005](#)
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While these are not exactly the ones requested by Trinitas to be available as part of this investigation, these reports may contain useful information to form the final DSI and eventually, SAS / SAR

Denny, can you please then advise when DSI Rev6 is expected to be issued?

Any questions please let me know

Kind regards,

Evan Buntoro
Project Manager
Infrastructure Services
evan.buntoro@randwick.nsw.gov.au

From: Evan Buntoro
Sent: Tuesday, 17 August 2021 09:21
To: Mike Nash <Mike.Nash@douglaspartners.com.au>; Denny Bolatti <denny.bolatti@trinitasgroup.com.au>
Cc: Paula Maurici <paula.maurici@douglaspartners.com.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>
Subject: RE: HPE CM: Little Bay Audit DPNS19

Hi Mike, Denny

Thanks to Mike for providing IAL5. @Denny Bolatti please download the mentioned SAS [here](#) as per the Section 10.7 Certificate (apologies for not forwarding this earlier). There were confusions about the area of past Lot 33 vs current Lot 97 and it was found out that the current Lot 97 is part of the previously defined Lot 33

One of the major points in IAL5 is the following:

7. Section 3.7 Integrity Assessment.

It is noted that there is limited information regarding the site (Lot 97) and that most available information for the general site areas relates to the adjacent land. In addition, it is noted that the DSI states that:

'...Trinitas made several requests to obtain PSI reports from Douglas Partners as these reports could provide crucial information for a better understanding of the site history. Requests for such reports were declined by Douglas Partners. It should be noted that Douglas Partners have been commissioned by the Client as an Independent Site Auditor to review this DSI...'

The auditor was not aware that such requests had been made by Trinitas to DP, or that such requests had been declined, and notes that DP is unable to locate any record of such requests. Accordingly, Trinitas are requested to provide copies of the original requests. Notwithstanding, it is considered that the documentation contained in the ERM SAR (2006), as referenced above, contains sufficient background information for the purposes of the DSI.

I have previously shared the contact details between you two so can we please solve this past report referencing issue? I noted this was also mentioned in DSI Rev4 Section 3.6.4 and IAL3 Table Point 14 and 61.

@Denny Bolatti, can you please advise the timeline for DSI Rev6 and then we can proceed to final version for the DSI? I noted that IAL5 mentioned 2x versions of the DSI Rev6 is requested:

this process, Trinitas is requested to provide 2 versions of the DSI, as follows:

- A new version of the DSI (Revision 6) in track changes showing all revisions which have been made to the current DSI Draft (Revision5); and
- A clean formatted final DSI Final (Revision 6), which can be provided once the track change version is agreed.

This will then enable us to move forward to Site Audit Report (SAR) as per the statement below from Douglas Partners:

When this latter version is provided to the auditor the SAR will be prepared.

Any questions please let me know and much appreciated for everyone's help

Kind regards,

Evan Buntoro
Project Manager
Infrastructure Services
evan.buntoro@randwick.nsw.gov.au

From: Mike Nash <Mike.Nash@douglaspartners.com.au>

Sent: Monday, 16 August 2021 13:05

To: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>; Denny Bolatti <denny.bolatti@trinitasgroup.com.au>; Paula Maurici <paula.maurici@douglaspartners.com.au>

Subject: HPE CM: Little Bay Audit DPNS19

Hello Evan

Please find attached IAL 5 in response to Rev 5 of the DSI by Trinitas Group.

Any questions please let me know.

Regards.

Mike Nash | Principal

Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au

96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685

P: 02 9809 0666 | M: +61 414 716 501 | E: Mike.Nash@douglaspartners.com.au



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Paula Maurici

From: Mike Nash
Sent: Wednesday, August 25, 2021 4:25 PM
To: Denny Bolatti; Evan Buntoro
Cc: Paula Maurici; Zaman Shamsuz; Joe Santangelo; Ryan Zammit; Clare Baggott; Roman Wereszczynski; Joshua Hay
Subject: RE: HPE CM: Little Bay Audit DPNS19

Denny

Thank you for the update.

In consideration of the recent heavy rainfall and high tides at Little Bay I wonder if you have a further inspection/clearance scheduled in the next few days?

In this context and noting previous statements in the DSI regarding the probable source of asbestos on the beach (see Section 3, Table 3 etc), it may be useful to determine if there has been any relative increase in the amount of ACM present on the beach as a result of the recent weather and tidal conditions compared to previous data obtained during more quiescent conditions.

In this context, please note that the EarthTech SAR/SAS (2008) for Lot 79/98, as supplied by RCC, indicates that substantial remediation was undertaken on the land adjacent to the current (subject) site prior to the audit.

Also, and as noted in prior correspondence, the EarthTech SAR/SAS (2008) includes a long term EMP (EMS, 2008) for that area which includes various requirements as set out in Section 7.2 of that document.

Accordingly, in the forthcoming revision of the DSI, you should take these documents into account, as well as the ERM SAS/SAR, (2006) for Lot 33 (Lot 97).

Please let me know if you have any questions.

Regards.

Mike Nash | Principal
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 9809 0666 | **M:** +61 414 716 501 | **E:** Mike.Nash@douglaspartners.com.au



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From: Denny Bolatti <denny.bolatti@trinitasgroup.com.au>
Sent: Tuesday, 24 August 2021 3:30 PM
To: Mike Nash <Mike.Nash@douglaspartners.com.au>; Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>
Cc: Paula Maurici <paula.maurici@douglaspartners.com.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>;

Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>

Subject: RE: HPE CM: Little Bay Audit DPNS19

Thanks Mike

We will review the available material and update the DSI v6 accordingly

Regards



Denny Bolatti

Managing Director

A: Level 3, 24 Hunter Street Parramatta NSW 2150

T: 1800 4 TRINITAS **M:** 0412 827 006

E: denny.bolatti@trinitasgroup.com.au

W: www.trinitasgroup.com.au



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From: Mike Nash <Mike.Nash@douglaspartners.com.au>

Sent: Tuesday, 24 August 2021 11:33 AM

To: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>; Denny Bolatti <denny.bolatti@trinitasgroup.com.au>

Cc: Paula Maurici <Paula.Maurici@douglaspartners.com.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>;

Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Clare

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Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>

Subject: RE: HPE CM: Little Bay Audit DPNS19

Evan

Thanks for these links.

Denny

Presumably the subject site, i.e. Lot 79, of the linked SAR /SAS by EarthTech (Feb 2008) now comprises Lot 98 in DP270427, whereas Lot 33 - the subject site for the other SAR/SAS (July 2006) also by Paul Steinwede (then of ERM) now comprises Lot 97 (i.e. the subject site of the current works). Please confirm if this is the case. In this regard it would be necessary to understand more fully all relevant changes in Lot history and Lot nomenclature which apparently took

place following these two audits and how these directly or indirectly relate to the current subject site (Lot 97). This forms part of the relevant site history and should be included in the DSI.

I also note that both prior audit reports by Dr Steinwede include fairly detailed background and technical information on the two sites in question, not only regarding the site of the current works (Lot 97), but also on the assessment and remediation of the beach hinterland area (the so called 'Undeveloped Area').

In addition, I draw your particular attention to the auditor's findings and recommendations relating to the Long Term Environmental Management Plan (EMP) for Lot 79 /Lot 98 which forms Annexure J of the SAR by EarthTech (Feb 2008).

Accordingly, I recommend that all the reports supplied by RCC, in particular both previous audit reports, are carefully examined by Trinitas and their findings are summarised and analysed as appropriate in forthcoming Rev 6 of the DSI.

Please let me know if you have any questions.

Mike Nash | Principal
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 9809 0666 | M: +61 414 716 501 | E: Mike.Nash@douglaspartners.com.au



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Cc: Paula Maurici <paula.maurici@douglaspartners.com.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>; Mike Nash <Mike.Nash@douglaspartners.com.au>
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evan.buntoro@randwick.nsw.gov.au

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Infrastructure Services
evan.buntoro@randwick.nsw.gov.au

From: Mike Nash <Mike.Nash@douglaspartners.com.au>
Sent: Monday, 16 August 2021 13:05
To: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>; Denny Bolatti <denny.bolatti@trinitasgroup.com.au>; Paula Maurici <paula.maurici@douglaspartners.com.au>
Subject: HPE CM: Little Bay Audit DPNS19

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Any questions please let me know.

Regards.

Mike Nash | Principal
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 9809 0666 | M: +61 414 716 501 | E: Mike.Nash@douglaspartners.com.au



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Paula Maurici

From: Paula Maurici
Sent: Wednesday, September 8, 2021 12:45 PM
To: 'Evan Buntoro'
Cc: Joe Santangelo; Ryan Zammit; Joanne Brown; Zaman Shamsuz; Mike Nash; Clare Baggott; Joshua Hay; Denny Bolatti; Roman Wereszczynski
Subject: RE: Little Bay Beach Asbestos Contamination - DSI Rev6 and Response to IAL5
Attachments: RE: Little Bay Beach Asbestos Contamination - DSI Rev6 and Response to IAL5

Evan,

On behalf of Mike Nash who is not available today, many thanks for the two documents.

We note that IAL5 contains brief responses to our enquiries and that the DSI (Rev 6) contains minor revisions and amendments from Rev 5. Accordingly, as these responses are relatively succinct we should be able complete our review of Rev 6 by COB tomorrow, this will take the form of a final IAL summarising the audit findings in relation to Task 3 as listed in your email (7 Sept 2021). In this regard we note that future remediation of Lot 97 (or for that matter Lot 98) is beyond the scope of Task 3 of the audit and in due course will need to be provided in the form of an RAP/AMP.

Regarding the comments today from Roman (attached) on alternative or combined interim remedial options, DP has no objection to such recommendations being included in the DSI. However, formal planning of remediation (on Lot 97) will need to be provided in the form of an RAP/AMP, and ultimately any ongoing implementation of such measures will need to be established in a legally enforceable long term EMP, similar to the existing one for Lot 98 (previously Lot 79). We note that the implementation history of the existing EMP for Lot 98 (Lot 79) will also need to be determined as part of any proposed remediation planning or related works either in Lot 97 or in Lot 98, particularly noting that Trinitas has identified the likely source of asbestos on the beach is from within Lot 98 i.e. the land immediately inland of the beach where remediation has previously occurred.

Kind regards,

Paula Maurici | Associate / Environmental Scientist
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 9809 0666 | **M:** +61 408 314 047 | **E:** paula.maurici@douglaspartners.com.au



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From: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>
Sent: Tuesday, September 7, 2021 11:42 AM
To: Mike Nash <Mike.Nash@douglaspartners.com.au>; Joanne Brown <Joanne.Brown@randwick.nsw.gov.au>; Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>
Cc: Paula Maurici <paula.maurici@douglaspartners.com.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Clare

Baggott <Clare.Baggott@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>; Denny Bolatti <denny.bolatti@trinitasgroup.com.au>

Subject: Little Bay Beach Asbestos Contamination - DSI Rev6 and Response to IAL5

Hi Mike / Joanne / Roman

Please see attached for Trinitas' response to IAL5 **and** DSI Rev6 with "Tracked Changes" for ease of review

Can this DSI Rev6 then be finalised so that we can proceed to the next stage as detailed below?

- Task 3 - Provide site audit statement and site audit report (both are required a following agreement that the DSI and HHRA have been completed satisfactorily and extent of asbestos contamination in the defined site has been properly related risks identified.

Any questions please let me know

Kind regards,

Evan Buntoro
Project Manager
Infrastructure Services
evan.buntoro@randwick.nsw.gov.au

From: Denny Bolatti <denny.bolatti@trinitasgroup.com.au>
Sent: Tuesday, 7 September 2021 11:01
To: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>
Cc: Asfar Riaz <asfar.riaz@trinitasgroup.com.au>
Subject: RE: Little Bay Audit DPNS/19

Hi

Find attached DSI v6 in track changes and IAL6 with responses

Let us know if the ISA requires additional information

Regards



Denny Bolatti
Managing Director

A: Level 3, 24 Hunter Street Parramatta NSW 2150
T: 1800 4 TRINITAS **M:** 0412 827 006
E: denny.bolatti@trinitasgroup.com.au
W: www.trinitasgroup.com.au



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Paula Maurici

From: Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>
Sent: Wednesday, September 8, 2021 8:38 AM
To: Evan Buntoro; Joe Santangelo
Cc: Paula Maurici; Ryan Zammit; Zaman Shamsuz; Clare Baggott; Joshua Hay; Denny Bolatti; Mike Nash; Joanne Brown
Subject: RE: Little Bay Beach Asbestos Contamination - DSI Rev6 and Response to IAL5
Categories: Filed by Newforma

Hi everyone

Just one query/comment about the recommended actions.

It is recommended that barricades be installed in certain locations immediately, which would in effect require these areas to be closed off to the public.

The table of recommendations recommends that we investigate the installation of a sediment / ACM barrier at or near the gullies, which seems a more feasible option and a positive measure to minimise the amount of ACM coming from the gullies (at least until more effective measures are implemented on the adjoining land).

In either case, we should also be guided by the HHRA in determining which options may be suitable.

If agreed, it may be suitable to slightly modify the following section to provide for alternative or combined interim options, as may be agreed by the parties and having regard to the HHRA.

- Barricades erected in place as soon as practicable in the following sections or hotspots:
 - 1) around the canal all the way from Old Concrete Pipe outlet adjacent to Crown Gully 3 all the way to the water in Southern Beach;
 - 2) around the canal all the way from Old Heritage Wall adjacent to Crown Gully 1 outlet all the way to the water in Southern Beach;
 - 3) all of the sand area at Middle Beach.

Regards

Roman

Roman Wereszczynski
Manager Health, Building & Regulatory Services
Randwick City Council

02 9093 6947
www.randwick.nsw.gov.au



From: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>
Sent: Tuesday, 7 September 2021 11:42 AM
To: Mike Nash <Mike.Nash@douglaspartners.com.au>; Joanne Brown <Joanne.Brown@randwick.nsw.gov.au>; Roman

Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>

Cc: Paula Maurici <paula.maurici@douglaspartners.com.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>; Denny Bolatti <denny.bolatti@trinitasgroup.com.au>

Subject: Little Bay Beach Asbestos Contamination - DSI Rev6 and Response to IAL5

Hi Mike / Joanne / Roman

Please see attached for Trinitas' response to IAL5 **and** DSI Rev6 with "Tracked Changes" for ease of review

Can this DSI Rev6 then be finalised so that we can proceed to the next stage as detailed below?

- Task 3 - Provide site audit statement and site audit report (both are required a following agreement that the DSI and HHRA have been completed satisfactorily and extent of asbestos contamination in the defined site has been properly related risks identified.

Any questions please let me know

Kind regards,

Evan Buntoro
Project Manager
Infrastructure Services
evan.buntoro@randwick.nsw.gov.au

From: Denny Bolatti <denny.bolatti@trinitasgroup.com.au>

Sent: Tuesday, 7 September 2021 11:01

To: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>

Cc: Asfar Riaz <asfar.riaz@trinitasgroup.com.au>

Subject: RE: Little Bay Audit DPNS/19

Hi

Find attached DSI v6 in track changes and IAL6 with responses

Let us know if the ISA requires additional information

Regards

Denny Bolatti
Managing Director



A: Level 3, 24 Hunter Street Parramatta NSW
2150

T: 1800 4 TRINITAS **M:** 0412 827 006

E: denny.bolatti@trinitasgroup.com.au

W: www.trinitasgroup.com.au



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Paula Maurici

From: Mike Nash
Sent: Friday, September 10, 2021 4:19 PM
To: Evan Buntoro
Cc: Joe Santangelo; Ryan Zammit; Joanne Brown; Zaman Shamsuz; Clare Baggott; Joshua Hay; Roman Wereszczynski; Denny Bolatti; Paula Maurici
Subject: RE: Little Bay Beach Asbestos Contamination - DSI Rev6 and Response to IAL5
Categories: Filed by Newforma

Interim Advice Letter 6 Non-Statutory Site Audit DPNS/19 Lot 97 Little Bay Beach, Little Bay - Lot 97, DP270427

Evan

Thank you for the two documents from Trinitas containing track changes, viz IAL5 and the DSI Rev6 and your time on the phone yesterday afternoon.

The auditor has reviewed these documents and provides the following observations:

- I. The investigation data in the DSI are satisfactory and sufficient to provide a 'snapshot' characterisation of the site (Lot 97) and to form an opinion on the condition of the land at the time of the investigations with respect to asbestos.
- II. Other aspects of the DSI are less satisfactory when compared with the requirements of NSW EPA contaminated land guidance but can be addressed in the site audit report in the form of auditor commentary and opinion.
- III. The sampling and analysis data in the DSI are sufficient to support the human health risk assessment (HHRA), prepared by JBS&G.
- IV. The conclusion of the HHRA is that the risk posed by asbestos on the site is acceptable (see extract from the report below).
- V. The DSI provides a similar conclusion but defers to the HHRA (see extract below).
- VI. The testing results from the DSI fail to meet at least one of the published health screening levels (HSL) in Table 7 of NEPM (2013) Schedule B1 (*no visible asbestos for surface soil*).
- VII. In addition, concentrations of asbestos in certain samples obtained by Trinitas from the site exceeded the NEPM HSL of 0.02% w/w (bonded ACM) for recreational land use, although the average for the site was below the HSL.
- VIII. The HHRA has also indicated that the presence of asbestos is not consistent with aesthetic requirements for a recreational area and that asbestos (ACM) is anticipated to continue to be present at the surface of the beach. In this regard the DSI has indicated that asbestos frequency on the beach has not declined despite implementation of a regular emu picking programme since August 2020.
- IX. Neither the DSI or HHRA is unequivocal regarding site suitability for the current and future recreational land use, and there is no specific statement in either report which indicates that the site is suitable, indeed both reports recommend remediation.
- X. Both the DSI and HHRA have provided recommendations for further works which *inter alia* include the preparation of remediation and management plans.

- XI. The HHRA restricts itself to the remediation and management that may be achieved in Lot 97 whereas the DSI opines that further investigations, remediation and long-term management may *inter alia* extend to the gullies etc beyond the landward boundary of Lot 97 (into Lot 98).
- XII. Trinitas has identified the likely source of asbestos on the beach as being from Lot 98 where extensive remediation took place prior to 2008, including asbestos entombment.
- XIII. The adjacent Lot (Lot 98), previously Lot 79, is the subject of a statutory site audit dated February 2008 which includes a long-term environment management plan (EMP) dated January 2008. The same auditor also provided a statutory site audit for Lot 97 (then Lot 33) dated July 2006.
- XIV. Any future work related to remediation or management of asbestos on the beach (Lot 97), or any investigations, remediation or management related to the probable source of asbestos (assumed) to be in Lot 98 will need to examine the EMP (as above) and determine how effectively the EMP has been implemented.
- XV. In general, the auditor agrees with the findings and conclusions of the DSI and HHRA and concurs with the consultants that remediation and management is required.
- XVI. To be effective in the longer term any remediation and management of asbestos will need to identify, confirm and address the source of the asbestos encountered on Lot 97.
- XVII. In the meantime, interim asbestos mitigation measures should be carefully designed and implemented in Lot 97, including where they intercept the gullies exiting Lot 98, to ensure that they are effective and are not subject to tidal or erosional effects or other forms of damage. It is noted that Trinitas has provided recommendations in regard to 'make safe measures' including barricades. It is further noted that such structures are likely to restrict or prevent beach access.
- XVIII. Accordingly, the auditor recommends that suitably detailed remediation and/or management plans are developed as soon as possible, with the aim of; (i) providing practical interim and longer term asbestos mitigation measures for Lot 97, and (ii) identifying and implementing longer term measures to remove and mitigate the source of asbestos. The auditor notes that review of such plans is beyond the scope of the current audit.

The auditor therefore requests that the DSI Report is completed and issued as per Revision 6 and notes that the final version may include minor amendments to the text, such as those requested by Roman Wereszczynski of RCC (see emails dated 8 September 2021). Provision of the final DSI will precede the preparation of the non-statutory site audit report and statement which will commence once the final DSI has been received.

As always, happy to discuss.

Kind regards.

Notes:

Extract from the Conclusions and Recommendations Section of the HHRA

'...In accordance with the limitations provided as Section 11 (of the HHRA), and subject to a remediation / management response to address high levels of sub-surface asbestos occurrence at the south eastern portion of the southern beach area, levels of asbestos on the site have not been found to pose a potentially unacceptable health risk to current / future users of the site as consistent with a recreational land-use, recreational uses in proximity of the site, nor occupants of residential properties in proximity of the site...'

Extract from the Findings and Conclusions Section of the DSI

'...Due to the nature of site contamination by bonded asbestos fragments in soil and on sand surfaces, it is the opinion of Trinitas that asbestos contamination at the Site poses a potentially low health risk to site users. The final risk ratings are to be determined by the Site Human Health Risk Assessment report...'

Please note that the above information, interim advice and opinions do not pre-empt the eventual site audit findings nor do they constitute a site audit as defined under Part 4 of the Contaminated Land Management Act, 1997.

Mike Nash | Principal

Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au

96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685

P: 02 9809 0666 | M: +61 414 716 501 | E: Mike.Nash@douglaspartners.com.au



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From: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>

Sent: Friday, 10 September 2021 8:25 AM

To: Mike Nash <Mike.Nash@douglaspartners.com.au>

Cc: Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Joanne Brown <Joanne.Brown@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>; Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>; Denny Bolatti <denny.bolatti@trinitasgroup.com.au>; Paula Maurici <paula.maurici@douglaspartners.com.au>

Subject: RE: Little Bay Beach Asbestos Contamination - DSI Rev6 and Response to IAL5

Hi Mike

Following up our phone discussion yesterday afternoon, please proceed with the final IAL leading up to the SAS / SAR i.e. Task 3 as allowed in the submission

Any questions please let me know

Kind regards,

Evan Buntoro

Project Manager

Infrastructure Services

evan.buntoro@randwick.nsw.gov.au

From: Paula Maurici <paula.maurici@douglaspartners.com.au>

Sent: Wednesday, 8 September 2021 12:45

To: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>

Cc: Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Joanne Brown <Joanne.Brown@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Mike Nash <Mike.Nash@douglaspartners.com.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>; Denny Bolatti <denny.bolatti@trinitasgroup.com.au>; Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>

Subject: RE: Little Bay Beach Asbestos Contamination - DSI Rev6 and Response to IAL5

Evan,

On behalf of Mike Nash who is not available today, many thanks for the two documents.

We note that IAL5 contains brief responses to our enquiries and that the DSI (Rev 6) contains minor revisions and amendments from Rev 5. Accordingly, as these responses are relatively succinct we should be able complete our review of Rev 6 by COB tomorrow, this will take the form of a final IAL summarising the audit findings in relation to Task 3 as listed in your email (7 Sept 2021). In this regard we note that future remediation of Lot 97 (or for that matter Lot 98) is beyond the scope of Task 3 of the audit and in due course will need to be provided in the form of an RAP/AMP.

Regarding the comments today from Roman (attached) on alternative or combined interim remedial options, DP has no objection to such recommendations being included in the DSI. However, formal planning of remediation (on Lot 97) will need to be provided in the form of an RAP/AMP, and ultimately any ongoing implementation of such measures will need to be established in a legally enforceable long term EMP, similar to the existing one for Lot 98 (previously Lot 79). We note that the implementation history of the existing EMP for Lot 98 (Lot 79) will also need to be determined as part of any proposed remediation planning or related works either in Lot 97 or in Lot 98, particularly noting that Trinitas has identified the likely source of asbestos on the beach is from within Lot 98 i.e. the land immediately inland of the beach where remediation has previously occurred.

Kind regards,

Paula Maurici | Associate / Environmental Scientist
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 9809 0666 | M: +61 408 314 047 | E: paula.maurici@douglaspartners.com.au



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Sent: Tuesday, September 7, 2021 11:42 AM
To: Mike Nash <Mike.Nash@douglaspartners.com.au>; Joanne Brown <Joanne.Brown@randwick.nsw.gov.au>; Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>
Cc: Paula Maurici <paula.maurici@douglaspartners.com.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>; Denny Bolatti <denny.bolatti@trinitasgroup.com.au>
Subject: Little Bay Beach Asbestos Contamination - DSI Rev6 and Response to IAL5

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Please see attached for Trinitas' response to IAL5 and DSI Rev6 with "Tracked Changes" for ease of review

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- Task 3 - Provide site audit statement and site audit report (both are required a following agreement that the DSI and HHRA have been completed satisfactorily and extent of asbestos contamination in the defined site has been properly c related risks identified.

Any questions please let me know

Kind regards,

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Project Manager
Infrastructure Services
evan.buntoro@randwick.nsw.gov.au

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Sent: Tuesday, 7 September 2021 11:01
To: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>
Cc: Asfar Riaz <asfar.riaz@trinitasgroup.com.au>
Subject: RE: Little Ba y Audit DPNS/19

Hi

Find attached DSI v6 in track changes and IAL6 with responses

Let us know if the ISA requires additional information

Regards



Denny Bolatti
Managing Director

A: Level 3, 24 Hunter Street Parramatta NSW 2150
T: 1800 4 TRINITAS **M:** 0412 827 006
E: denny.bolatti@trinitasgroup.com.au
W: www.trinitasgroup.com.au



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Paula Maurici

From: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>
Sent: Tuesday, September 21, 2021 4:49 PM
To: Mike Nash; Paula Maurici
Cc: Joe Santangelo; Ryan Zammit; Zaman Shamsuz
Subject: RE: Little Bay Beach - DSI Rev6 Revised Version

Categories: Filed by Newforma

Hi Mike

JBS&G has been forwarded the latest DSI Report and advised that there are no changes based on the latest DSI Rev6

Any questions please let me know

Kind regards,

Evan Buntoro
Project Manager
Infrastructure Services
02 9093 6890
evan.buntoro@randwick.nsw.gov.au

From: Mike Nash <Mike.Nash@douglaspartners.com.au>
Sent: Tuesday, 21 September 2021 11:22
To: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>; Paula Maurici <paula.maurici@douglaspartners.com.au>
Cc: Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>
Subject: RE: Little Bay Beach - DSI Rev6 Revised Version

Evan

Thankyou. We will check that the final version of the DSI matches the changes set out in the earlier track changed version and then commence preparation of the NS SAR and SAS.

Also please note that as the DSI is now in finalised form it would be appropriate to provide a copy to JBS&G (see also IAL4 - Attachment A - in regard to S10.2 of the DSI) and for them to issue a final version of their HHRA, noting that Revision B 59811-138906 dated 11 July 2021 is in draft form.

Pending delivery of the final version of the HHRA, in which regard it is not anticipated that there will be any material changes (please advise if this is not the case), and agreement of the DSI, the time line for preparation of the NS SAR and SAR should be approximately 5 working days. It is anticipated that these documents will be provided to RCC initially in draft form for the purposes of information and comment, and that the final NS SAR and SAS can be issued within a couple of days of any feedback from RCC.

It is envisaged that the conclusions and recommendations of the audit will be much the same as those indicated in the recent IAL6 *inter alia* that management and remediation are required in Lot 97 and that management and remediation measures may need to extend into Lot 98.

Kind regards.

Mike Nash | Principal

Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au

96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685

P: 02 9809 0666 | M: +61 414 716 501 | E: Mike.Nash@douglaspartners.com.au



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From: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>

Sent: Tuesday, 21 September 2021 9:44 AM

To: Mike Nash <Mike.Nash@douglaspartners.com.au>; Paula Maurici <Paula.Maurici@douglaspartners.com.au>

Cc: Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>;

Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>

Subject: Little Bay Beach - DSI Rev6 Revised Version

Hi Mike / Paula

Please see the link below for the revised version of DSI Rev6

<https://www.dropbox.com/s/j0ngt6jbq6rqzvj/Little%20Bay%20Beach%20-%20DSI%20Rev6%20-%20Trinitas%20-%202021%2009%2021.pdf?dl=0>

Can you please give a timeframe for the expected SAS / SAR based on this DSI?

Any questions please let me know

Kind regards,

Evan Buntoro

Project Manager

Infrastructure Services

02 9093 6890

evan.buntoro@randwick.nsw.gov.au

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Paula Maurici

From: Mike Nash
Sent: Tuesday, September 21, 2021 11:22 AM
To: Evan Buntoro; Paula Maurici
Cc: Joe Santangelo; Ryan Zammit; Zaman Shamsuz
Subject: RE: Little Bay Beach - DSI Rev6 Revised Version

Categories: Filed by Newforma

Evan

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It is envisaged that the conclusions and recommendations of the audit will be much the same as those indicated in the recent IAL6 *inter alia* that management and remediation are required in Lot 97 and that management and remediation measures may need to extend into Lot 98.

Kind regards.

Mike Nash | Principal
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 9809 0666 | M: +61 414 716 501 | E: Mike.Nash@douglaspartners.com.au



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Cc: Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>
Subject: Little Bay Beach - DSI Rev6 Revised Version

Hi Mike / Paula

Please see the link below for the revised version of DSI Rev6

<https://www.dropbox.com/s/j0ngt6jbq6rqzvj/Little%20Bay%20Beach%20-%20DSI%20Rev6%20-%20Trinitas%20-%202021%2009%2021.pdf?dl=0>

Can you please give a timeframe for the expected SAS / SAR based on this DSI?

Any questions please let me know

Kind regards,

Evan Buntoro
Project Manager
Infrastructure Services
02 9093 6890
evan.buntoro@randwick.nsw.gov.au

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Paula Maurici

From: Mike Nash
Sent: Monday, September 27, 2021 10:34 AM
To: Clare Baggott; Roman Wereszczynski
Cc: Paula Maurici; Joe Santangelo; Ryan Zammit; Zaman Shamsuz; Joanne Brown; Joshua Hay; Evan Buntoro
Subject: RE: Little Bay Beach, Asbestos Investigation - Final HHRA Report
Categories: Filed by Newforma

Hello Everyone

I note the comments in the emails below and excerpt from the HHRA.

In this regard please be advised that the anticipated conclusions in the forthcoming NS SAS/SAR will be that in the interim the current regime of asbestos inspection, clearance, certification and air monitoring should continue, this will take place under an interim EMP.

The Interim EMP will initially take the form of a brief inclusion on the SAS (which will essentially replace the unexpected finds protocol included in the ERM (2006) audit by Paul Steinwede) and which will in due course require to be replaced by formalised arrangements for future management and remediation of Lot 97 and if necessary beyond.

The anticipated wording of the 'Interim EMP' for inclusion on the SAS is as follows:

'... In order to maintain the status quo whereby the human health risk from asbestos (asbestos containing materials) in Lot 97 remains acceptable (as determined in the Human Health Risk Assessment), regular emu-picking and removal of asbestos (ACM) should continue, at a biweekly frequency, broadly as it has since its inception in August 2020.

However, inspections and asbestos clearance should also occur at an increased frequency following; (i) periods of heavy rainfall (any day when rainfall has exceeded 7.6 mm per hour), and/or (ii) high tides (tides exceeding 1.75m). Each asbestos inspection, clearance, certification and air monitoring event should be documented and provided to Randwick City Council in the form of a report. Such works and reporting should be undertaken, or supervised, by a suitably qualified person.

Formalised management and remediation measures (plans) require to be developed and implemented as soon as possible which address (i) continued management arrangements for asbestos removal from Lot 97, and (ii) measures to determine the source of asbestos and to remove or mitigate the source of asbestos to prevent it entering Lot 97. These plans should be reviewed by an accredited auditor...'.

I anticipate issuing a draft SAS and SAR for your perusal, probably towards the end of this week.

In the meantime I am happy to discuss, over the phone/Teams, or via email (noting that I am not working today or tomorrow). I will however check emails periodically over the next couple of days.

Kind regards.

Mike Nash | Principal
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 9809 0666 | M: +61 414 716 501 | E: Mike.Nash@douglaspartners.com.au



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From: Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>
Sent: Monday, 27 September 2021 9:24 AM
To: Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>
Cc: Paula Maurici <paula.maurici@douglaspartners.com.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Joanne Brown <Joanne.Brown@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>; Mike Nash <Mike.Nash@douglaspartners.com.au>; Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>
Subject: RE: Little Bay Beach, Asbestos Investigation - Final HHRA Report

Thanks Roman 😊

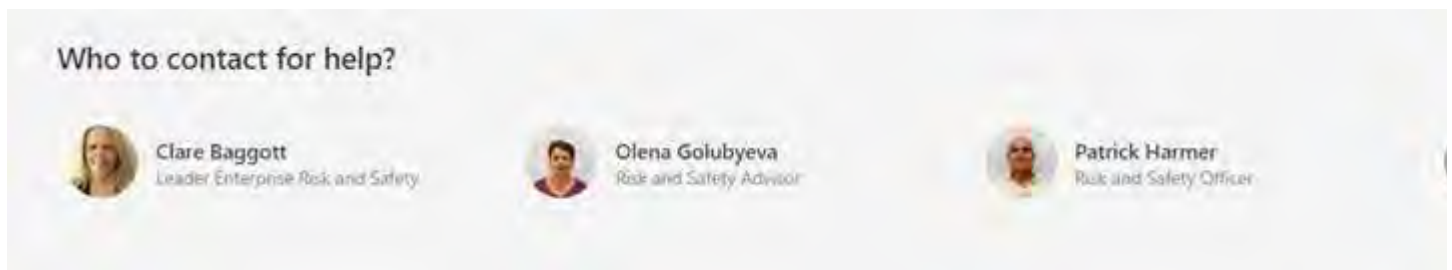
Kind regards

Clare Baggott
Leader Enterprise Risk and Safety
Randwick City Council
02 9093 6598
0447 308 584
clare.baggott@randwick.nsw.gov.au
www.randwick.nsw.gov.au



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Risk and Safety Team



Clare Baggott 0447 308 584
Patrick Harmer 0439 920 536

Olena Golubyeva 0405 654 355
Zee Hesline 0457 129 186

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Regards

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Manager Health, Building & Regulatory Services
Randwick City Council

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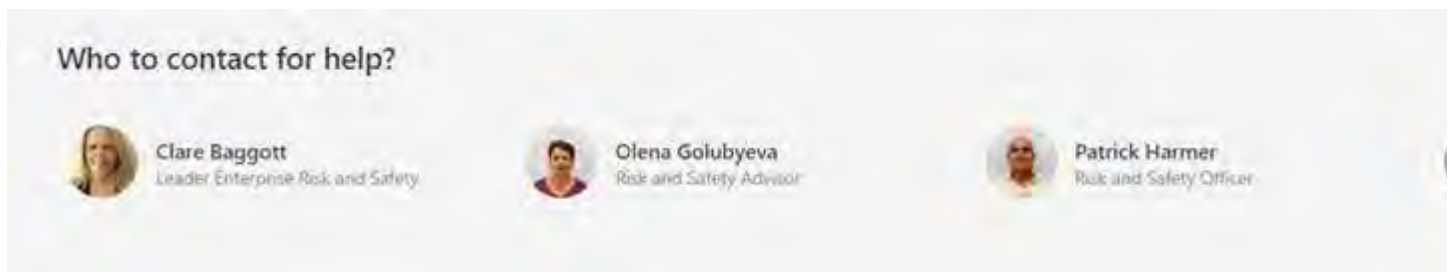
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Subject: RE: Little Bay Beach, Asbestos Investigation - Final HHRA Report

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considered most appropriate that the ongoing response to the asbestos impact be restricted to normal Council maintenance being requested to remove visible ACM at the same time that normal Beach maintenance activities are undertaken. Nominated Council staff should receive asbestos awareness training prior to commencing these works.

Regards

Roman

Roman Wereszczynski
Manager Health, Building & Regulatory Services
Randwick City Council

02 9093 6947

www.randwick.nsw.gov.au



From: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>
Sent: Friday, 24 September 2021 2:09 PM
To: Mike Nash <Mike.Nash@douglaspartners.com.au>
Cc: Paula Maurici <paula.maurici@douglaspartners.com.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>; Joanne Brown <Joanne.Brown@randwick.nsw.gov.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>
Subject: Little Bay Beach, Asbestos Investigation - Final HHRA Report

Hi Mike

Please see attached for the final version of HHRA report as requested

Any questions please let me know. Have a great weekend

Kind regards,

Evan Buntoro
Project Manager
Infrastructure Services
02 9093 6890
evan.buntoro@randwick.nsw.gov.au

Keep up to date with everything happening in Randwick City through [Randwick News](#), a short weekly email about living in our great city.

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Paula Maurici

From: Mike Nash
Sent: Wednesday, September 29, 2021 11:31 AM
To: Roman Wereszczynski
Cc: Oscar Guillen; Joanne Brown; Evan Buntoro; Joe Santangelo; Paula Maurici; Clare Baggott; Zaman Shamsuz; Ryan Zammit; Joshua Hay
Subject: RE: Little Bay Beach, Asbestos Investigation - Final HHRA Report
Categories: Filed by Newforma

Hello Everyone

Further to the email string below regarding the Interim EMP, and pursuant to Section 3.4.6 of the *Guidelines for the NSW Site Auditor Scheme* (<https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/contaminated-land/17p0269-guidelines-for-the-nsw-site-auditor-scheme-third-edition.pdf?la=en&hash=02150C2CED01AD20373CD82F48B8E4141E99E554>) please be advised that it will be necessary for Council to provide written agreement to the IEMP (see conditions (a)-(d) in S.3.4.6) before a Section A2 NS SAS/SAR can be issued.

Also as noted below subsequent to the short term implementation of an IEMP (say no more than 3 months), more formalised management and remedial plans will need to be developed which will also require Council agreement.

I note in this regard that correspondence included in the previous audit for the site (viz: Council to Landcom dated 21 March 2006 - see Environmental Resources Management Australia (ERM, 2006). *Lot 33, Prince Henry at Little Bay, Summary Site Audit Report, PS53 - Lot 33*, dated 20 July 2006, by Paul Steinwede) implies that at that time Council was not willing to agree to an EMP; and indeed no EMP was imposed on Lot 97 via ERM (2006). However, subsequent reporting by Trinitas and JBS&G and correspondence with Council tends to suggest that this is no longer the case.

Accordingly, please confirm that Council agrees to an IEMP and its implementation (broadly as outlined below) and that subsequent management and remedial measures are also supported by Council, and in particular that Council agrees with the requirements set out in S.3.4.6 of the auditor guidelines in particular conditions (b) and (c) in both cases.

As noted below, I would be happy to discuss.

Mike Nash | Principal
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 9809 0666 | **M:** +61 414 716 501 | **E:** Mike.Nash@douglaspartners.com.au



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From: Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>
Sent: Monday, 27 September 2021 12:52 PM
To: Mike Nash <Mike.Nash@douglaspartners.com.au>

Cc: Oscar Guillen <Oscar.Guillen@randwick.nsw.gov.au>; Joanne Brown <Joanne.Brown@randwick.nsw.gov.au>

Subject: RE: Little Bay Beach, Asbestos Investigation - Final HHRA Report

Thanks Mike !

We appreciate your help and advice.

Regards

Roman

Roman Wereszczynski
Manager Health, Building & Regulatory Services
Randwick City Council

02 9093 6947

www.randwick.nsw.gov.au



From: Mike Nash <Mike.Nash@douglaspartners.com.au>

Sent: Monday, 27 September 2021 10:34 AM

To: Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Roman Wereszczynski
<Roman.Wereszczynski@randwick.nsw.gov.au>

Cc: Paula Maurici <Paula.maurici@douglaspartners.com.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>;
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<Evan.Buntoro@randwick.nsw.gov.au>

Subject: RE: Little Bay Beach, Asbestos Investigation - Final HHRA Report

Hello Everyone

I note the comments in the emails below and excerpt from the HHRA.

In this regard please be advised that the anticipated conclusions in the forthcoming NS SAS/SAR will be that in the interim the current regime of asbestos inspection, clearance, certification and air monitoring should continue, this will take place under an interim EMP.

The Interim EMP will initially take the form of a brief inclusion on the SAS (which will essentially replace the unexpected finds protocol included in the ERM (2006) audit by Paul Steinwede) and which will in due course require to be replaced by formalised arrangements for future management and remediation of Lot 97 and if necessary beyond.

The anticipated wording of the 'Interim EMP' for inclusion on the SAS is as follows:

'... In order to maintain the status quo whereby the human health risk from asbestos (asbestos containing materials) in Lot 97 remains acceptable (as determined in the Human Health Risk Assessment), regular emu-picking and removal of asbestos (ACM) should continue, at a biweekly frequency, broadly as it has since its inception in August 2020.

However, inspections and asbestos clearance should also occur at an increased frequency following; (i) periods of heavy rainfall (any day when rainfall has exceeded 7.6 mm per hour), and/or (ii) high tides (tides exceeding 1.75m). Each asbestos inspection, clearance, certification and air monitoring event should be documented and provided to Randwick City Council in the form of a report. Such works and reporting should be undertaken, or supervised, by a suitably qualified person.

Formalised management and remediation measures (plans) require to be developed and implemented as soon as possible which address (i) continued management arrangements for asbestos removal from Lot 97, and (ii) measures to determine the source of asbestos and to remove or mitigate the source of asbestos to prevent it entering Lot 97. These plans should be reviewed by an accredited auditor...'.

I anticipate issuing a draft SAS and SAR for your perusal, probably towards the end of this week.

In the meantime I am happy to discuss, over the phone/Teams, or via email (noting that I am not working today or tomorrow). I will however check emails periodically over the next couple of days.

Kind regards.

Mike Nash | Principal
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
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Subject: RE: Little Bay Beach, Asbestos Investigation - Final HHRA Report

Thanks Roman 😊

Kind regards

Clare Baggott
Leader Enterprise Risk and Safety
Randwick City Council
02 9093 6598
0447 308 584
clare.baggott@randwick.nsw.gov.au
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Risk and Safety Team

Who to contact for help?



Clare Baggott
Leader Enterprise Risk and Safety



Olena Golubyeva
Risk and Safety Advisor



Patrick Harmer
Risk and Safety Officer

Clare Baggott 0447 308 584
Patrick Harmer 0439 920 536
Olena Golubyeva 0405 654 355
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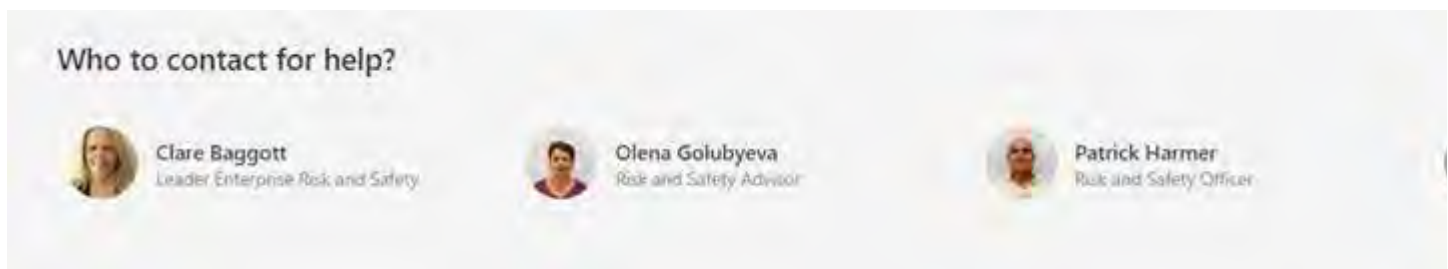
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Subject: Little Bay Beach, Asbestos Investigation - Final HHRA Report

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Any questions please let me know. Have a great weekend

Kind regards,

Evan Buntoro
Project Manager

Infrastructure Services
02 9093 6890
evan.buntoro@randwick.nsw.gov.au

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Paula Maurici

From: Mike Nash
Sent: Friday, October 1, 2021 10:11 AM
To: Roman Wereszczynski
Subject: RE: Little Bay Beach, Asbestos Investigation - Final HHRA Report

Hi Roman

I note your preference for a longer period to develop more detailed plans etc.

Under the circumstances and as mentioned below it seems reasonable to extend the IEMP validity to a period of say no more than six months in order to accommodate the necessary consultation etc.

However, it is envisaged that the consultant engaged by Council to do this work might consider developing the plans in two stages as suggested previously, viz:

- (i) *continued management arrangements for asbestos removal from Lot 97, and (ii) measures to determine the source of asbestos and to remove or mitigate the source of asbestos to prevent it entering Lot 97.*

In this regard the first stage would be to formalise the existing measures with some modifications as alluded to earlier (and which should be a relatively simple task and could probably be completed much sooner than six months) and the second stage would deal with source mitigation and prevention of asbestos migration etc (which is doubtless a much more complex task). Notwithstanding, the staging of these arrangements would be within in the purview of the appointed consultant in discussion with RCC and in due course with the appointed auditor.

Accordingly, I am happy to amend the wording of the IEMP to state *inter alia* that: '*... Formalised and more detailed management and remediation measures (plans) require to be developed and implemented as soon as possible (ideally within 6 months of the date of this SAS, noting the need for consultation with internal and external stakeholders) ...*'.

I tried to call you earlier to discuss, but the number rang out. Do you have an alternate contact number and can you suggest a convenient time for a brief chat?

Kind regards.

Mike Nash | Principal
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 9809 0666 | **M:** +61 414 716 501 | **E:** Mike.Nash@douglaspartners.com.au



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From: Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>

Sent: Friday, 1 October 2021 9:18 AM

To: Mike Nash <Mike.Nash@douglaspartners.com.au>; Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>; Joe

Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Paula Maurici <paula.maurici@douglaspartners.com.au>; Joanne Brown <Joanne.Brown@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>

Cc: Oscar Guillen <Oscar.Guillen@randwick.nsw.gov.au>; Stella Agagiotis <Stella.Agagiotis@randwick.nsw.gov.au>

Subject: RE: Little Bay Beach, Asbestos Investigation - Final HHRA Report

Hi Mike and everyone

I have no objections to the draft IEMP. My only comment is that it would be preferable if the IEMP provided a period of 6 months to develop more detailed plans, investigation of sources and measures for the site (as mentioned in the last paragraph), as these are significant tasks and will require a lot of consultation with internal and external stakeholders.

Regards

Roman

Roman Wereszczynski
Manager Health, Building & Regulatory Services
Randwick City Council

02 9093 6947

www.randwick.nsw.gov.au



From: Mike Nash <Mike.Nash@douglaspartners.com.au>

Sent: Thursday, 30 September 2021 2:45 PM

To: Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>; Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Paula Maurici <paula.maurici@douglaspartners.com.au>; Joanne Brown <Joanne.Brown@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>

Cc: Oscar Guillen <Oscar.Guillen@randwick.nsw.gov.au>; Stella Agagiotis <Stella.Agagiotis@randwick.nsw.gov.au>

Subject: RE: Little Bay Beach, Asbestos Investigation - Final HHRA Report

Roman et al

Noted and agreed.

All that is required is for RCC to indicate that items b) and c) as noted below are agreed and will be undertaken i.e. that the IEMP and any subsequent EMP (management and remediation plans) can 'reasonably be made to be legally enforceable' (which in effect Council is already doing) and that there will be 'appropriate public notification such that interested individuals are aware of the restrictions imposed by the plans'. Notification under S10.7 as suggested below would seem be appropriate.

Ahead of the SAS/SAR which I am hoping to issue shortly, please find attached the proposed draft IEMP which will be attached to the NS SAS.

If you have any comments or wish to discuss please let me know.

Kind regards.

Mike Nash | Principal

Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au

96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685

P: 02 9809 0666 | M: +61 414 716 501 | E: Mike.Nash@douglaspartners.com.au



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From: Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>

Sent: Thursday, 30 September 2021 11:52 AM

To: Mike Nash <Mike.Nash@douglaspartners.com.au>; Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Paula Maurici <paula.maurici@douglaspartners.com.au>; Joanne Brown <Joanne.Brown@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>

Cc: Oscar Guillen <Oscar.Guillen@randwick.nsw.gov.au>; Stella Agagiotis <Stella.Agagiotis@randwick.nsw.gov.au>

Subject: RE: Little Bay Beach, Asbestos Investigation - Final HHRA Report

Hi everyone

Thanks for the information Mike!

To assist everyone with this query, I have copied the relevant clauses below:

Implementation of an EMP must not be included by a site auditor as a condition on a site audit statement nor accepted by the auditor as a means of managing contamination of a site unless the following conditions have been met.

- a) The EMP has been reviewed by the auditor.
- b) The EMP can reasonably be made to be legally enforceable, for example because compliance with it is a requirement of a notice under the CLM Act or of development consent conditions issued by the relevant consent authority. The relevant authority (the EPA or the local authority in these cases, respectively) should be asked their view on the legality of the draft EMP. How implementation of an EMP can reasonably be made to be legally enforceable should take into account exempt and complying development which may occur at the site.
- c) There will be appropriate public notification of any restrictions applying to the land to ensure that potential purchasers or other interested individuals are aware of the restrictions, for example appropriate notations on a planning certificate issued under s.149(2) of the Environmental Planning and Assessment Act or a covenant registered on the title to land under s.88B of the Conveyancing Act 1919.
- d) There is no off-site migration of contamination from the site which is the subject of the site audit, or where there is off-site migration or its potential, that contamination within the site is managed or monitored so it does not present an unacceptable risk to either the on-site or off-site environments.

If an auditor includes a condition on a site audit statement requiring the implementation of an EMP, the auditor must state on the site audit statement form whether the EMP requires Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme 23 operation and/or maintenance of active management systems or requires maintenance of passive management systems only.

In my view, the implementation of an IEMP or EMP for the beach area would be appropriate.

In relation to the b) & c), I understand that upon the issue of the SAS, a notation can be included in the conditions on a Planning Certificate under 10.7 (2) and further details may be included under 10.7 (5). The SAS will in turn refer to the IEMP or EMP.

Regards

Roman Wereszczynski
Manager Health, Building & Regulatory Services
Randwick City Council

02 9093 6947

www.randwick.nsw.gov.au



From: Mike Nash <Mike.Nash@douglaspartners.com.au>

Sent: Wednesday, 29 September 2021 11:31 AM

To: Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>

Cc: Oscar Guillen <Oscar.Guillen@randwick.nsw.gov.au>; Joanne Brown <Joanne.Brown@randwick.nsw.gov.au>; Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Paula Maurici <Paula.Maurici@douglaspartners.com.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>

Subject: RE: Little Bay Beach, Asbestos Investigation - Final HHRA Report

Hello Everyone

Further to the email string below regarding the Interim EMP, and pursuant to Section 3.4.6 of the *Guidelines for the NSW Site Auditor Scheme* (<https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/contaminated-land/17p0269-guidelines-for-the-nsw-site-auditor-scheme-third-edition.pdf?la=en&hash=02150C2CED01AD20373CD82F48B8E4141E99E554>) please be advised that it will be necessary for Council to provide written agreement to the IEMP (see conditions (a)-(d) in S.3.4.6) before a Section A2 NS SAS/SAR can be issued.

Also as noted below subsequent to the short term implementation of an IEMP (say no more than 3 months), more formalised management and remedial plans will need to be developed which will also require Council agreement.

I note in this regard that correspondence included in the previous audit for the site (viz: Council to Landcom dated 21 March 2006 - see Environmental Resources Management Australia (ERM, 2006). *Lot 33, Prince Henry at Little Bay, Summary Site Audit Report, PS53 - Lot 33*, dated 20 July 2006, by Paul Steinwede) implies that at that time Council was not willing to agree to an EMP; and indeed no EMP was imposed on Lot 97 via ERM (2006). However, subsequent reporting by Trinitas and JBS&G and correspondence with Council tends to suggest that this is no longer the case.

Accordingly, please confirm that Council agrees to an IEMP and its implementation (broadly as outlined below) and that subsequent management and remedial measures are also supported by Council, and in particular that Council agrees with the requirements set out in S.3.4.6 of the auditor guidelines in particular conditions (b) and (c) in both cases.

As noted below, I would be happy to discuss.

Mike Nash | Principal
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 9809 0666 | M: +61 414 716 501 | E: Mike.Nash@douglaspartners.com.au



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From: Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>
Sent: Monday, 27 September 2021 12:52 PM
To: Mike Nash <Mike.Nash@douglaspartners.com.au>
Cc: Oscar Guillen <Oscar.Guillen@randwick.nsw.gov.au>; Joanne Brown <Joanne.Brown@randwick.nsw.gov.au>
Subject: RE: Little Bay Beach, Asbestos Investigation - Final HHRA Report

Thanks Mike !

We appreciate your help and advice.

Regards

Roman

Roman Wereszczynski
Manager Health, Building & Regulatory Services
Randwick City Council

02 9093 6947

www.randwick.nsw.gov.au



From: Mike Nash <Mike.Nash@douglaspartners.com.au>
Sent: Monday, 27 September 2021 10:34 AM
To: Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>
Cc: Paula Maurici <Paula.Maurici@douglaspartners.com.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Joanne Brown <Joanne.Brown@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>; Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>
Subject: RE: Little Bay Beach, Asbestos Investigation - Final HHRA Report

Hello Everyone

I note the comments in the emails below and excerpt from the HHRA.

In this regard please be advised that the anticipated conclusions in the forthcoming NS SAS/SAR will be that in the interim the current regime of asbestos inspection, clearance, certification and air monitoring should continue, this will take place under an interim EMP.

The Interim EMP will initially take the form of a brief inclusion on the SAS (which will essentially replace the unexpected finds protocol included in the ERM (2006) audit by Paul Steinwede) and which will in due course require to be replaced by formalised arrangements for future management and remediation of Lot 97 and if necessary beyond.

The anticipated wording of the 'Interim EMP' for inclusion on the SAS is as follows:

'... In order to maintain the status quo whereby the human health risk from asbestos (asbestos containing materials) in Lot 97 remains acceptable (as determined in the Human Health Risk Assessment), regular emu-picking and removal of asbestos (ACM) should continue, at a biweekly frequency, broadly as it has since its inception in August 2020.

However, inspections and asbestos clearance should also occur at an increased frequency following; (i) periods of heavy rainfall (any day when rainfall has exceeded 7.6 mm per hour), and/or (ii) high tides (tides exceeding 1.75m). Each asbestos inspection, clearance, certification and air monitoring event should be documented and provided to Randwick City Council in the form of a report. Such works and reporting should be undertaken, or supervised, by a suitably qualified person.

Formalised management and remediation measures (plans) require to be developed and implemented as soon as possible which address (i) continued management arrangements for asbestos removal from Lot 97, and (ii) measures to determine the source of asbestos and to remove or mitigate the source of asbestos to prevent it entering Lot 97. These plans should be reviewed by an accredited auditor...'

I anticipate issuing a draft SAS and SAR for your perusal, probably towards the end of this week.

In the meantime I am happy to discuss, over the phone/Teams, or via email (noting that I am not working today or tomorrow). I will however check emails periodically over the next couple of days.

Kind regards.

Mike Nash | Principal

Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au

96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685

P: 02 9809 0666 | M: +61 414 716 501 | E: Mike.Nash@douglaspartners.com.au



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From: Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>

Sent: Monday, 27 September 2021 9:24 AM

To: Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>

Cc: Paula Maurici <Paula.maurici@douglaspartners.com.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Joanne Brown <Joanne.Brown@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>; Mike Nash <Mike.Nash@douglaspartners.com.au>; Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>

Subject: RE: Little Bay Beach, Asbestos Investigation - Final HHRA Report

Thanks Roman 😊

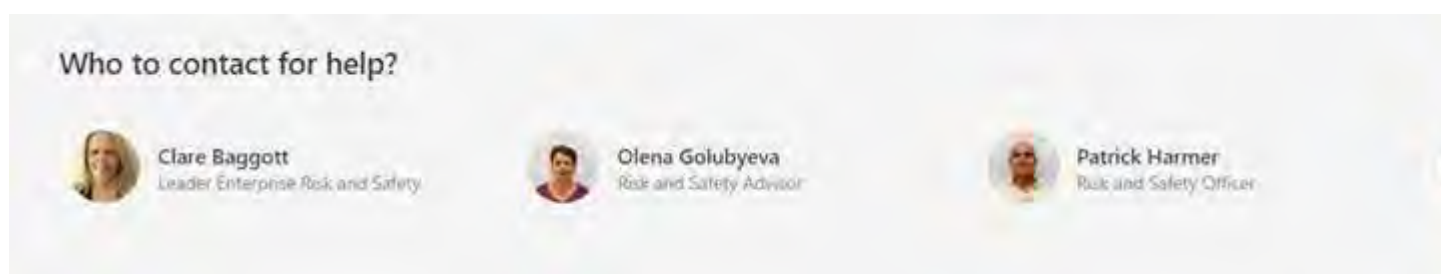
Kind regards

Clare Baggott
Leader Enterprise Risk and Safety
Randwick City Council
02 9093 6598
0447 308 584
clare.baggott@randwick.nsw.gov.au
www.randwick.nsw.gov.au



Don't forget the resources provided in our [safety section](#) of the intranet, including [COVID-19 info and resources](#)

Risk and Safety Team



Clare Baggott	0447 308 584
Patrick Harmer	0439 920 536
Olena Golubyeva	0405 654 355
Zee Hesline	0457 129 186

From: Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>
Sent: Monday, 27 September 2021 9:23 AM
To: Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>
Cc: Paula Maurici <Paula.Maurici@douglaspartners.com.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Joanne Brown <Joanne.Brown@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>; Mike Nash <Mike.Nash@douglaspartners.com.au>; Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>
Subject: RE: Little Bay Beach, Asbestos Investigation - Final HHRA Report

Hi Clare

I agree. It would probably be inconsistent with our Asbestos Policy anyway.

I didn't comment on that part of the recommendation as I thought that that was something that we can manage in the organisation and engage suitably qualified contractors to undertake that work, rather than Council staff. It doesn't change the action or outcome, only the people doing the work.

Regards

Roman

Roman Wereszczynski
Manager Health, Building & Regulatory Services
Randwick City Council

02 9093 6947

www.randwick.nsw.gov.au



From: Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>
Sent: Monday, 27 September 2021 9:18 AM
To: Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>; Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>
Cc: Paula Maurici <Paula.Maurici@douglaspartners.com.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Joanne Brown <Joanne.Brown@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>; Mike Nash <Mike.Nash@douglaspartners.com.au>
Subject: RE: Little Bay Beach, Asbestos Investigation - Final HHRA Report

Thanks Roman.

I am confused too as I thought that we were continuing with Trinitas for the emu picks as our current Council Asbestos Management Policy does not allow for internal staff to undertake the picks?

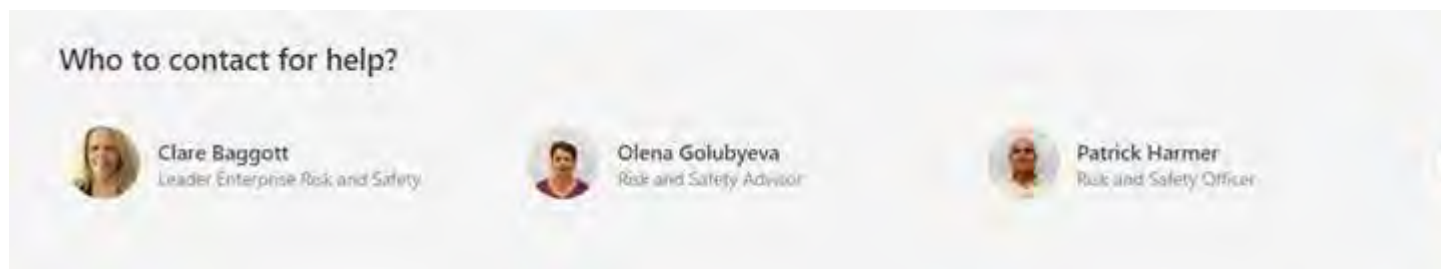
Kind regards

Clare Baggott
Leader Enterprise Risk and Safety
Randwick City Council
02 9093 6598
0447 308 584
clare.baggott@randwick.nsw.gov.au
www.randwick.nsw.gov.au



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Risk and Safety Team



Clare Baggott **0447 308 584**
Patrick Harmer **0439 920 536**
Olena Golubyeva **0405 654 355**
Zee Hesline **0457 129 186**

From: Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>
Sent: Monday, 27 September 2021 9:03 AM
To: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>
Cc: Paula Maurici <Paula.Maurici@douglaspartners.com.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Joanne Brown <Joanne.Brown@randwick.nsw.gov.au>; Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>; Mike Nash <Mike.Nash@douglaspartners.com.au>
Subject: RE: Little Bay Beach, Asbestos Investigation - Final HHRA Report

Hi Everyone

It may just be me, but I was wondering if we should clarify the following recommendation.

Does it mean that it is considered appropriate to continue with our current regular monitoring and emu picking program or does it mean that the use of the areas should be restricted for maintenance purposes (which I assume was not the intent)?

The ongoing occurrence of ACM at the Beach surface is not consistent with the aesthetic requirements for a recreational area. Based on the consultant observations, small quantities of ACM are anticipated to continue to be present at the surface of the Beach. On the basis of the occurrence of asbestos as bonded forms only, and small quantities being present, it is considered most appropriate that the ongoing response to the asbestos impact be restricted to normal Council maintenance being requested to remove visible ACM at the same time that normal Beach maintenance activities are undertaken. Nominated Council staff should receive asbestos awareness training prior to commencing these works.

Regards

Roman

Roman Wereszczynski
Manager Health, Building & Regulatory Services
Randwick City Council

02 9093 6947

www.randwick.nsw.gov.au



From: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>
Sent: Friday, 24 September 2021 2:09 PM
To: Mike Nash <Mike.Nash@douglaspartners.com.au>
Cc: Paula Maurici <Paula.Maurici@douglaspartners.com.au>; Joe Santangelo <Joe.Santangelo@randwick.nsw.gov.au>; Ryan Zammit <Ryan.Zammit@randwick.nsw.gov.au>; Zaman Shamsuz <Zaman.Shamsuz@randwick.nsw.gov.au>; Roman Wereszczynski <Roman.Wereszczynski@randwick.nsw.gov.au>; Joanne Brown <Joanne.Brown@randwick.nsw.gov.au>;

Clare Baggott <Clare.Baggott@randwick.nsw.gov.au>; Joshua Hay <Joshua.Hay@randwick.nsw.gov.au>

Subject: Little Bay Beach, Asbestos Investigation - Final HHRA Report

Hi Mike

Please see attached for the final version of HHRA report as requested

Any questions please let me know. Have a great weekend

Kind regards,

Evan Buntoro

Project Manager

Infrastructure Services

02 9093 6890

evan.buntoro@randwick.nsw.gov.au

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Paula Maurici

From: Evan Buntoro <Evan.Buntoro@randwick.nsw.gov.au>
Sent: Thursday, November 25, 2021 3:20 PM
To: Mike Nash
Cc: Paula Maurici; Joe Santangelo; Ryan Zammit; Zaman Shamsuz; Clare Baggott; Joshua Hay; Roman Wereszczynski; Joanne Brown
Subject: Little Bay Beach Asbestos Contamination - Council Formal Agreement to SAS / SAR

Hi Mike

Hope this email finds you well

Apologies for not responding earlier to Little Bay Beach SAS / SAR, draft version:

1. Council has no concerns or objections to the SAS / SAR
2. The implementation of an IEMP or EMP for the beach area is deemed appropriate, within 6 (six) month timeframe because it will require a lot of consultations with external and internal stakeholder
3. In regards to (b) and (c) of Section 3.4.6 of the auditor guidelines:
 - b) The EMP can reasonably be made to be legally enforceable, for example because compliance with it is a requirement of a notice under the CLM Act or of development consent conditions issued by the relevant consent authority. The relevant authority (the EPA or the local authority in these cases, respectively) should be asked their view on the legality of the draft EMP. How implementation of an EMP can reasonably be made to be legally enforceable should take into account exempt and complying development which may occur at the site. [See above, 6-month timeframe is acceptable](#)
 - c) There will be appropriate public notification of any restrictions applying to the land to ensure that potential purchasers or other interested individuals are aware of the restrictions, for example appropriate notations on a planning certificate issued under s.149(2) of the Environmental Planning and Assessment Act or a covenant registered on the title to land under s.88B of the Conveyancing Act 1919. [This can be done via a notation in the condition on a Planning Certificate under 10.7 \(2\) and further details may be included under 10.7 \(5\)](#)

Can you please then advise what the process is going to be from here since Council have agreed with the drafted SAS / SAR?

Kind regards,

Evan Buntoro
Project Manager
Infrastructure Services
02 9093 6890
evan.buntoro@randwick.nsw.gov.au

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