Douglas PARTNERS

GROUNDED EXPERTISE

Report on Remediation Action Plan

Gosford Regional Library

123A Donnison Street, Gosford NSW

Prepared for North Construction & Building Pty Ltd

Project 83343.04

12 January 2024

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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		12 January 2024
Reviewer	For Glyn Eade	12 January 2024

Site/RAP Auditor

FS604853

Douglas Partners acknowledges Australia's First Peoples as the Traditional Owners of the Land and Sea on which we operate. We pay our respects to Elders past and present and to all Aboriginal and Torres Strait Islander peoples across the many communities in which we live, visit and work. We recognise and respect their ongoing cultural and spiritual connection to Country.

Executive Summary

Douglas Partners Pty Ltd (DP) has prepared this remediation action plan (RAP) conducted for the proposed Gosford Regional Library development at 123A Donnison Street, Gosford NSW.

It is understood that the proposed Gosford Regional Library Building will have a similar floor level to the existing building and that no basement levels are proposed. DP has been advised, however, that some excavation beneath the existing ground floor slab is proposed (full details of this are provided in Section 2).

Based on the results of previous investigation works DP(2021) and DP (2023b), no formal remediation work is required. Any remediation works undertaken at the site would be triggered by an unexpected find during the proposed excavation works.

The general sequence of excavation works shall be determined by the appointed Contractor with the aim of minimising the potential for cross contamination of 'clean' areas/soils (i.e. natural soils) with potentially contaminated soils (i.e. fill materials with trace anthropogenic inclusions). This should include avoiding, wherever possible, transporting or placing contaminated soil over 'clean' areas, separating stockpiles of different origin/contamination profile, and validating the complete removal of any potentially contaminated material placed/ potentially impacting 'clean' areas.

The general order of excavation works should consider the following recommended sequence:

- Task 1: Where required for the construction works, excavation and off-site disposal of potentially contaminated soils (i.e. fill materials with trace anthropogenic inclusions) under the assigned waste classification (DP, 2023a);
- Task 2: Verification of the excavation surfaces to confirm the presence of 'clean' areas/ soils (i.e. natural soils); and
- Task 3: Complete excavation and off-site transport of any 'clean' areas/ soils (i.e. natural soils) to the nominated design levels.

Formal validation reporting is not considered necessary; however, the documents listed in Section 16.1 will need to be collated and then reviewed by the Environmental Consultant and Site Auditor as part of a close-out summary report.

The close-out summary report shall describe the excavation approach adopted, methodology, results and conclusion of the assessment and make a statement regarding the suitability of the site for the proposed Gosford Regional Library development.

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Report on Remediation Action Plan
Gosford Regional Library
123A Donnison Street, Gosford NSW

1. Introduction

Douglas Partners Pty Ltd (DP) has prepared this remediation action plan (RAP) conducted for the proposed Gosford Regional Library development at 123A Donnison Street, Gosford NSW (hereinafter referred to a 'the site'). The investigation was commissioned by Jared Savage of North Construction & Building Pty Ltd and was completed with reference to Douglas Partners Pty Ltd (Douglas) email proposal dated 13 November 2023.

The following key guidelines were consulted in the preparation of this report:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [the 'NEPM']* (NEPC, 2013);
- NSW EPA *Guidelines for Consultants Reporting on Contaminated Land* (NSW EPA, 2020); and
- CRC CARE *Remediation Action Plan: Development - Guideline on Establishing Remediation Objectives* (CRC CARE, 2019a).

The remediation objectives, devised in accordance with CRC (2019a), are to:

- Address potentially unacceptable risks to relevant environmental values from contamination; and
- Render the site suitable, from a contamination perspective, for the proposed development / land use.

This RAP provides details of the work that will be required at the site to meet the stated remediation objectives.

It is understood that the proposed Gosford Regional Library Building will have a similar floor level to the existing building and that no basement levels are proposed. DP has been advised, however, that some excavation beneath the existing ground floor slab is proposed (full details of this are provided in Section 2).

Based on available information, it is considered that the remediation works outlined in this report constitute Category 2 Remediation under Clause 4.13 of *SEPP (Resilience and Hazards) 2021*. However, it is understood that the RAP is required to be reviewed and approved by a NSW EPA accredited site auditor as a condition of development consent.

North Construction & Building Pty Ltd has engaged NSW EPA accredited site auditor Stephan Pawelczyk of Environmental Earth Sciences International Pty Ltd to complete a site audit under the *Contaminated Land Management Act 1997* (NSW), which involves a review of this RAP and associated reports.

It should be noted that this RAP does not form a detailed specification for the proposed site remediation works, but rather represents a planning document which outlines the means by which site remediation can be achieved.

The site locality and layout are shown on Drawing 1, Appendix A. This report must be read in conjunction with all appendices including the notes provided in Appendix A.

2. Site Description

It is understood that the proposed building would comprise of four-storeys, with the ground floor level at approximately RL 8 m Australian Height Datum (AHD) and that this is consistent with the existing ground floor level. North has confirmed that most of the existing ground floor concrete slab will remain in place. However, in some areas the concrete slab is proposed to be demolished and removed, and then the underlying soils excavated to facilitate the construction of new ground floor levels, building foundations and the installation of new facilities and services.

Excavations in these areas would typically be limited to maximum depths of 2.5 m, however, it is understood that bored foundations may extend to maximum depths of approximately 15 m (socketing into weathered rock).

Figure 1 (below) shows the proposed demolition plan for the ground floor level.

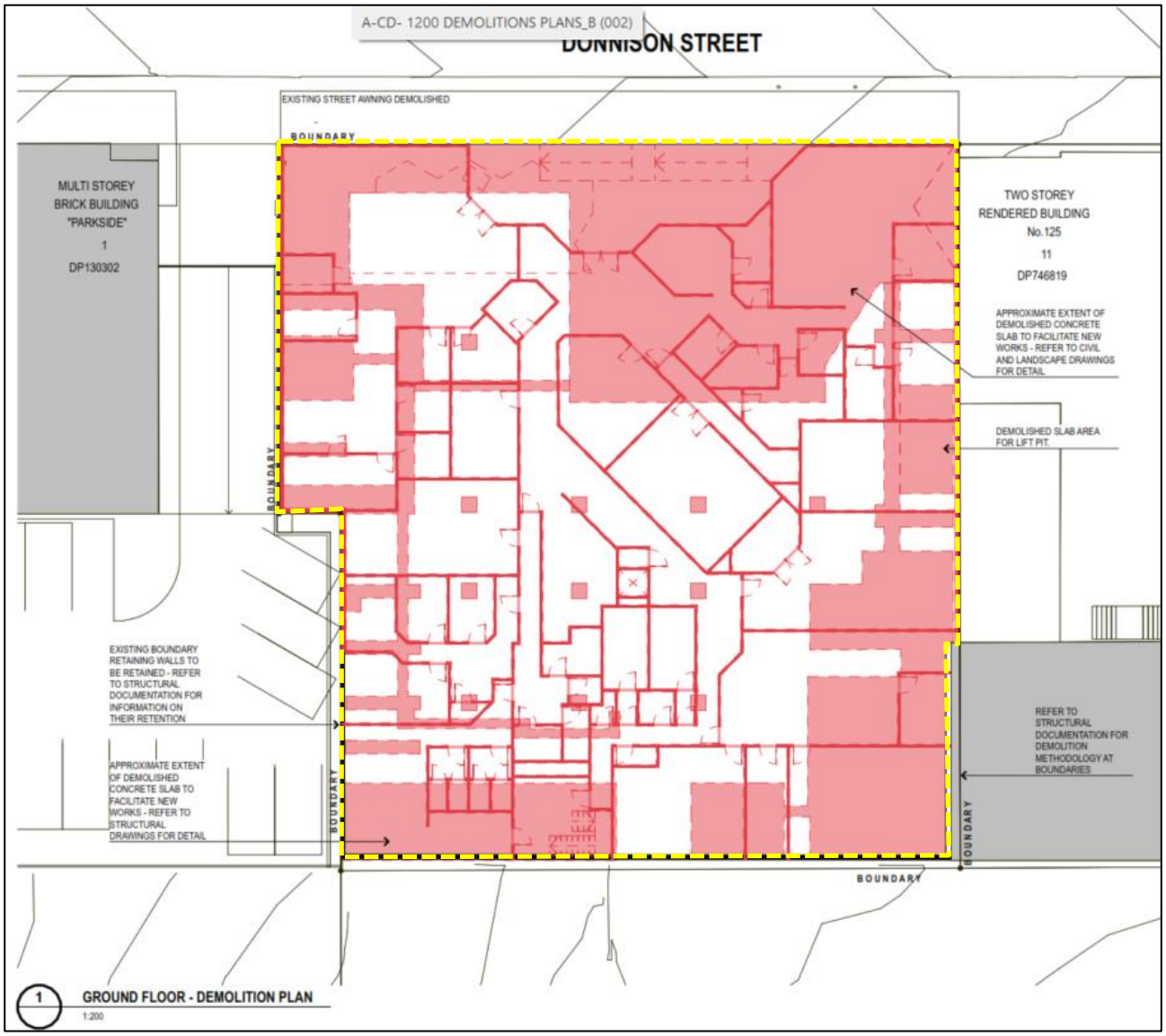

Figure 1: Ground Floor – Demolition Plan (red lines are existing walls to be demolished, pink shading is areas where the existing concrete slab is to be removed and yellow dashed line is the approximate site boundary.

3. Scope of Work

The scope of works to achieve the objectives stated in Section 1 is as follows:

- Summarise the findings of previous investigations used to inform the status of contamination and contamination risk at the site;
- Prepare and present a conceptual site model (CSM) to list potential and likely contamination source, pathway and receptor linkages to address potentially unacceptable risks to human health and relevant environmental values from contamination;
- Define the anticipated extent of remediation;

- Assess, select and justify a preferred approach to management and/or remediation to render the site suitable for its proposed use, and which will minimise potentially unacceptable risk to human health and/or the environment and which includes the consideration of the principles of ecologically sustainable development;
- Establish the site acceptance criteria (SAC) to be adopted for validation of remediation;
- Identify how successful implementation of the RAP will be demonstrated / validated;
- Outline waste classification, handling and tracking requirements;
- Outline environmental safeguards required to complete the remediation works;
- Include a contingency plan and an unexpected finds protocol (UFP); and
- Identify the need for, and nature of, any long-term management and/or monitoring following the completion of management / remediation.

4. Site Information

Legal Description	Lot 100 in Deposited Plan 711850
Street Address	123A Donnison Street
Locality	Gosford, NSW
Site Area	1,400 m^2
Local Government Area	Central Coast Council (CCC)
Zoning	Current zoning as B3 – Commercial Core
Recent Previous Land Use	Commercial (Private Educational Business) - low rise
Current Owner	Central Coast Council
Surrounding Uses	• North (down slope) – Gosford Library and Kibble Park; • East (across and up slope) – Commercial building and car parking; • South (up slope) – Commercial property (car parking) and Henry Parry Drive; and • West (down slope) – Commercial property (car parking).

The site and test location plan prepared for DP (2023b) is presented in Appendix A.

5. Environmental Setting

Site Topography	Review of the local topographic mapping and site observations indicated that the site surface was relatively flat and level at approximately RL 8 m Australian Height Datum (AHD). The surrounding area slopes down towards the north-west. Previous investigations have indicated that the site's natural topography has been modified by historical construction activities including cut to fill earthworks.
Soil Landscape	Reference to the local soil landscape mapping indicates that the site is generally underlain by the Erina erosional soil landscape. The Erina soil landscape comprises gently undulating rises to rolling hills with limitations including localised steep slopes, localised mass movement hazard, localised foundation hazard, widespread sheet erosion hazard, localised high run-on and localised seasonal waterlogging. Notwithstanding, most of the site, except for the south eastern corner is mapped as being underlain by disturbed terrain.
Geology	The local geological mapping indicates that the site is underlain by the Terrigal Formation belonging to the Gosford Subgroup of the Triassic Aged Narrabeen Group. The Terrigal Formation typically comprises interbedded laminite, shale, fine to coarse grained sandstone, and claystone with residual soils derived from the weathering of these rocks.
Acid Sulfate Soils	The local acid sulfate risk mapping indicates that the site is located in an area mapped as having no known occurrence of acid sulfate soils. It was noted, however, that the soil landscape mapping identified disturbed terrain across most of the site. Disturbed terrain in the local area is known to have a risk of being affected by acid sulfate soils. An acid sulfate soil assessment was completed as part of a previous geotechnical investigation (DP, 2018b) with the assessment concluding that acid sulfate soils are not present within the investigation depth.
Surface Water	The entire site was covered by the existing building, however, surface water (or roof runoff) would generally be expected to drain into the local stormwater system then flow west and then south to eventually discharge into Brisbane Water (Broad Water) located approximately 600 m to the south of the site.
Groundwater	Given the site's topography and geology, it is considered unlikely that a permanent groundwater table is present at relatively shallow depth (i.e. less than 2 m depth). Intermittent seepage may, however, be encountered at localised permeability boundaries such as at the interface of fill and natural soils, sand and clay soils or at the weathered rock interface following periods of wet-weather. It should be noted that groundwater levels are potentially transient and can be affected by factors such as soil permeability and recent weather conditions.

6. Previous Reports and Site History

DP previously prepared the following contamination investigation or waste classification reports pertaining to the site:

- *Preliminary Site Investigation for Contamination (PSI) for a larger property identified as 123A-125B Donnison Street, Gosford* (DP, 2018a), *which incorporates the current site;*
- *Detailed Site Investigation (Contamination) (DSI) for the proposed Gosford Regional Library, 123A Donnison Street, Gosford* (DP, 2021)*;*
- *In Situ Waste Classification, 123A Donnison Street, Gosford* (DP, 2023a)*; and*
- *Supplementary Site Investigation (Contamination), Proposed Gosford Regional Library, 123A Donnison Street Gosford* (DP, 2023b).

6.1 PSI (DP, 2018a)

A review of the previous PSI (DP, 2018a) identified that the investigation was completed on a larger parcel of land (i.e. 123A-125B Donnison Street, Gosford) that included the current site area. Furthermore, whilst the preliminary intrusive investigations were completed as part of the PSI and in conjunction with a Geotechnical Investigation (DP, 2018b) none were completed within the current site area. With respect to the current site area, the previous investigation was limited to the following scope of work:

- A desktop site history review (i.e. regulatory notices search, Council enquires, WorkCover dangerous goods licences, historical title deed information, historical aerial photographs and National Library of Australia archives);
- A site walkover to identify potential contamination sources and receptors; and
- Analysis and preparation of a PSI report for the larger parcel of land.

At the time of investigation (circa 2018), a commercial office building occupied the site. Based on the review of historical information and a site walkover, DP identified potential contamination sources primarily comprising the placement of filling, construction/demolition of past structures and the use/storage of oil/chemicals associated with past site uses.

It was recommended that a DSI be completed at the site prior to redevelopment to effectively characterise and delineate site contamination conditions and then to facilitate the effective remediation and management of any site contamination as part of the redevelopment process.

6.2 DSI (DP, 2021)

A review of the previous DSI (DP, 2021) identified that the investigation was completed on the current site area (i.e. 123A Donnison Street, Gosford). In brief, the following scope of work was completed:

- Review of the previous PSI report (DP, 2018a);
- Walkover of the site to update site conditions;
- Review of the conceptual site model (CSM) for contamination;
- Set-out of seven boreholes targeting the identified potential contamination sources and also providing systematic site coverage. The boreholes were located within the existing building;
- The seven boreholes were drilled to depths of between 0.33 m and 2.8 m using hand tools;
- All replicate field samples were screened with a photo-ionisation detector (PID) to assess the likely presence or absence of volatile organic compounds (VOCs);
- Laboratory analysis of selected soil samples for contaminants of potential concern including, metals, total recoverable hydrocarbons (TRH), benzene, toluene, ethyl-benzene and xylenes (BTEX), phenols, polycyclic aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB), organochlorine pesticides (OCP) and asbestos (500 ml); and
- Analysis and preparation of a DSI report for the site.

The pertinent findings and recommendations of the previous DSI (DP, 2021) are as follows:

- Subsurface conditions typically comprised a concrete slab (to approximately 0.2 m depth) underlain by sand and clay fill materials to depths ranging between 0.3 m (in the south) and 1.7 m (in the north-west) depth underlain by natural sands and clays (residual soils). Brick inclusions within the fill materials were identified in two boreholes and three of the seven boreholes refused on brick or concrete within fill or potentially at the fill-natural soil interface. There were no other apparent records of visual or olfactory evidence (e.g. staining, odours, free phase product) to suggest the presence of contamination within the soils observed in the investigation.
- The analytical results for all contaminants tested were below the adopted site assessment criteria (SAC) with the exception of asbestos which was detected in Sample 101/1.2. Laboratory results indicated that chrysotile asbestos was detected in the form of a fragment of asbestos-containing-material (ACM) (>7 mm) at a depth of 1.2 m within the grey and mottled yellow clayey sand fill which was encountered between depths of 1.0 m and 1.6 m in Bore 101. The asbestos fragment would be considered non-friable, given its size and condition. It is noted that this stratum of fill was only encountered in Bore 101.
- Based on the results of the investigation, the site was considered to be generally compatible with the proposed Gosford Regional Library (from a site contamination standpoint), except for:
    - The presence of asbestos (currently identified as an ACM fragment in fill) which will need to be appropriately managed during demolition and construction works to ensure that site users (i.e. construction workers) and adjacent site users are not inadvertently exposed to asbestos contamination. It was recommended that following removal of the existing building slab, any disturbance of site soils should be completed in accordance with a construction environmental management plan (CEMP); and

- A long-term environmental management plan (LTEMP) will need to be prepared for the site that identifies the presence of ACM impacted soils and then establishes the necessary protocols to manage future potential exposure scenarios (i.e. penetration of the proposed new ground floor level slab). A notation on the property title (including Council's database) identifying the presence of asbestos impacted fill materials will also be required.

6.3 *In Situ Waste Classification* (DP, 2023a)

An in situ waste classification (DP, 2023a) was completed in October 2023 for the current site area. The scope of work completed comprised:

- Review of the previous DSI (DP, 2021) to assess contaminant concentrations encountered for comparison against the *EPA Waste Classification guidelines* (NSW EPA, 2014);
- Review of geological and acid sulfate soil mapping;
- Inspection of the excavated materials to confirm that the materials to be classified are generally commensurate with the materials identified during the previous DSI (DP, 2021);
- Comparison of the previous soil testing results against the *NSW EPA Waste Classification guidelines* (NSW EPA, 2014);
- Preparation of an in situ waste classification report.

In summary, the waste classification report concluded that the in situ materials sampled and tested, described as a mix of brown, orange and grey clayey sand / sand and sandy clay fill with sandstone cobbles, brick, concrete fragments and bonded fibro fragments (ACM) and underlying grey, brown and red natural clayey sand and clay within the site as shown on Drawing 1, are classifiable as General Solid Waste (non-putrescible) with bonded ACM (Special Waste), as defined in NSW EPA (2014).

It was noted that natural soils could be potentially classified as Virgin Excavated Natural Material (VENM), subject to the successful stripping of overlying filling and confirmation testing of the exposed natural soil surface. Appropriate segregation of the overlying filling would be required for the VENM classification to be applicable to the natural soils at the site.

6.4 SSI (DP, 2023b)

A review of the previous DSI (DP, 2021) identified that the investigation was completed on the current site area (i.e. 123A Donnison Street, Gosford). In brief, the following scope of work was completed:

- Review of the previous contamination reports (i.e. DP (2018) and DP (2021));
- A site walkover to update site conditions and identify potential contamination sources and receptors;

- Excavation of 18 test pits to depths of between 0.2 m and 3.05 m using a 4.5 tonne excavator fitted with a 300 mm diameter auger;
- Soil samples were collected from each soil stratum and upon apparent signs of potential contamination;
- Replicate soil samples were collected and screened for the presence of VOC using a calibrated PID;
- Twenty three (23) bulk soil samples were screened for ACM fragments to facilitate the calculation of ACM concentrations (where encountered). Thirteen 500 mL soil samples were also collected and submitted for testing to a National Association of Testing Authorities (NATA) accredited laboratory for asbestos fines/friable asbestos analysis;
- Twenty one (21) soil samples were also dispatched to a NATA accredited laboratory for testing of CoPC, these being metals, TRH, BTEX, PAH, PCB, OCP and per- and polyfluoroalkyl substances (PFAS); and
- Analysis and preparation of a SSI report for the site.

The results of the subsurface investigation and soil laboratory testing for the current investigation indicated the following with respect to contamination:

- General absence of bonded ACM within the fill materials across the site which exceeded health screening levels for commercial land use (HSL D);
- The absence of asbestos fines within the fill materials;
- The presence of trace or singular building materials such as brick, tile, concrete, glass, wire and PVC fragments in the fill was observed in some of the test locations; and
- General absence of other gross contamination within the remaining soils tested at the site.

It was concluded that the results of the SSI (DP, 2023b) were generally consistent with that of the previous DSI (DP, 2021) and the results also indicate that the site is suitable for the on-going commercial use (i.e. Gosford Regional Library Development) from a site contamination standpoint.

The presence of asbestos (currently identified as a single ACM fragment in fill) cannot be ruled-out and on this basis will need to be appropriately managed during demolition and construction works to ensure that site users (i.e. construction workers) and adjacent site users are not inadvertently exposed to asbestos contamination. It is recommended that this is managed using an unexpected finds protocol (UFP) that can be incorporated into the CEMP.

7. Conceptual Site Model

Based on the previous investigation results, fill materials do not appear to be impacted by asbestos (in the form of bonded ACM fragments or AF/FA) at a concentration that would require formal remediation/management. Notwithstanding, the presence of fill materials containing trace anthropogenic inclusions (i.e. brick, tile, concrete, glass, wire and PVC fragments) and the single fragment of ACM identified during the DSI (DP, 2021) indicates that the possibility of encountering trace quantities of ACM fragments during construction works cannot be entirely ruled out.

The potential future exposure pathway (i.e. inhalation of dust and/or asbestos fibres) can be readily managed during site demolition and redevelopment activities using an unexpected finds protocol (UFP) that would aim to ensure that site users (i.e. construction workers) and adjacent site users are not inadvertently exposed to the identified and other encountered asbestos contamination.

A summary of the potentially complete exposure pathways for the proposed land use is shown in Table 1 below.

Table 1: Summary of Potentially Complete Exposure Pathways (Proposed Land Use)

Source and CoPC	Transport Pathway	Receptor
Fill materials containing trace anthropogenic inclusions including ACM fragments	P1: Inhalation of dust and fibres	R1: Construction and maintenance workers. R2: Adjacent site users.

8. Remediation Extent

Based on the results of DP(2021) and DP (2023b) no formal remediation work is required. Any remediation works undertaken at the site would be triggered by an unexpected find during the proposed excavation works to facilitate the construction of new ground floor levels, building foundations and the installation of new facilities and services (refer to Figure 1).

9. Remediation Options Assessment

The objective of the remediation options assessment and evaluation is to establish a preferred remediation strategy. The process involves canvassing various remedial options which may be viable and then ranking each option based on a number of evaluation criteria. The remediation options assessment was conducted with reference to CRC CARE Remediation Action Plan: Development - Guideline on Performing Remediation Options Assessment (CRC CARE, 2019a).

The remediation options assessment is included in Appendix B.

10. Preferred Remediation Strategy

10.1 Rationale

The rationale for the selection of the preferred remediation strategy is outlined in Appendix B. The preferred remediation strategy is "No Action". This option was considered appropriate for the following reasons:

- Based on the results of DP(2021) and DP (2023b) no formal remediation work is required; and
- Leaving trace quantities of ACM fragments in situ would not have impacts to human health and the environment.

The following sequencing (Section 10.2) and alternate rationale (i.e. removal of fill to landfill) applies to areas where excavation is required for the completion of the construction/development works.

10.2 Sequence of Excavation Works

The general sequence of excavation works shall be determined by the appointed Contractor with the aim of minimising the potential for cross contamination of 'clean' areas/soils (i.e. natural soils) with potentially contaminated soils (i.e. fill materials with trace anthropogenic inclusions). This should include avoiding, wherever possible, transporting or placing contaminated soil over 'clean' areas, separating stockpiles of different origin/contamination profile, and validating the complete removal of any potentially contaminated material placed/ potentially impacting 'clean' areas.

The general order of excavation works should consider the following recommended sequence:

- Task 1: Where required for the construction works, excavation and off-site disposal of potentially contaminated soils (i.e. fill materials with trace anthropogenic inclusions) under the assigned waste classification (DP, 2023a);
- Task 2: Verification of the excavation surfaces to confirm the presence of 'clean' areas/ soils (i.e. natural soils); and
- Task 3: Complete excavation and off-site transport of any 'clean' areas/ soils (i.e. natural soils) to the nominated design levels.

11. Assessment Criteria

11.1 Remediation Acceptance Criteria

The overarching remediation acceptance criterion (RAC) to be adopted for the project is for 'no unacceptable risks posed by the relevant media (i.e., soils to human health or the environment)'.

The remediation works are to be validated as meeting the RAC by the Environmental Consultant by means of visual inspection, and where necessary field screening, recovery and analysis of samples and review of any available plans as set out in this report.

In the absence of derivation of Tier 2 site specific target levels (SSTL), the (RAC) for contaminants in soil are the same as the Tier 1 site assessment criteria (SAC) adopted for DP (2023b), protective of human health and ecology. The following table provides a summary of the RAC.

Table 2: Remediation Acceptance Criteria

Item	Remediation Acceptance Criteria
Excavations on site	Fill materials remaining in situ beneath concrete pavement. CoPC = asbestos (ACM fragments). RAC = Refer to Appendix C.

11.2 Site Assessment Criteria

Areas of contamination encountered beyond those outlined in Section 8, during the course of the excavation and construction works will be subject to the contingency plan or UFP (Appendix D) and assessed using the SAC in Appendix D. The SAC are the same as the Tier 1 SAC adopted for DP (2023b). The broader list of contaminants and their SAC are included in Appendix C.

The SAC should also be used as part of the assessment framework for imported soils (i.e., contaminant concentrations in imported soils must comply with the SAC).

The adopted investigation and screening levels comprise levels for a generic commercial / industrial land use scenario. The derivation of the SAC is included in Appendix C.

The SAC are not RAC, and an exceedance of the SAC does not automatically trigger the need for remediation. Exceedances of the SAC will trigger the need for further assessment of risk by DP to establish the need for remediation in accordance with NEPC (2013) and may be the subject of a separate RAP.

12. Validation Plan

12.1 Data Quality Objectives

Areas of contamination encountered beyond those outlined in Section 8, during the course of the excavation and construction works will be subject to the contingency plan or unexpected find protocol (Appendix D) and assessed using the SAC provided in Appendix C. No formal validation plan is required.

12.2 **Recommended Due-Diligence Assessment Requirements**

The following site and waste classification verification work is recommended:

- Field assessment by the Environmental Consultant comprising:
  - Visual inspection, including taking photographs for record purposes;
  - Collecting validation samples from excavations resulting from the removal of contaminated soils, including contaminated soil stockpile footprints (if relevant); and
  - Collecting validation / characterisation samples for materials to be re-used on site (if relevant).

13. **Waste Disposal**

Disposal of waste must be to an appropriately licensed waste facility, as per *Protection of the Environment Operations Act 1997* NSW (the 'POEO Act') and the *Protection of the Environment (Waste) Regulation 2014* NSW.

Any waste disposed off-site must be initially classified by the Environmental Consultant in accordance with:

- NSW EPA Waste Classification Guidelines, Part 1: Classifying Waste (NSW EPA, 2014a);
- NSW EPA Waste Classification Guidelines, Part 2: Immobilisation of Waste (NSW EPA, 2014b);
- NSW EPA Waste Classification Guidelines, Part 4: Acid Sulfate Soils (NSW EPA, 2014c); and
- NSW EPA Addendum to the Waste Classification Guidelines (2014) - Part 1: Classifying Waste (NSW EPA, 2016) [addendum for per- and poly-fluoroalkyl substances (PFAS)].

In situ waste classification has been completed (DP, 2023a). In summary, the waste classification report concluded that the in situ materials sampled and tested, described as a mix of brown, orange and grey clayey sand / sand and sandy clay fill with sandstone cobbles, brick, concrete fragments and bonded fibro fragments (ACM) and underlying grey, brown and red natural clayey sand and clay within the site as shown on Drawing 1, are classifiable as General Solid Waste (non-putrescible) with bonded ACM (Special Waste), as defined in NSW EPA (2014a).

It was noted that natural soils could be potentially classified as Virgin Excavated Natural Material (VENM), subject to the successful stripping of overlying filling and confirmation testing of the exposed natural soil surface. Appropriate segregation of the overlying filling would be required for the VENM classification to be applicable to the natural soils at the site.

All waste must be tracked by the Remediation Contractor from 'cradle to grave'. Copies of all consignment notes / disposal dockets (or similar) and Environment Protection Licences for receipt and disposal of the materials must be maintained by the Contractor as part of the site log and must be provided to the Environmental Consultant.

14. Imported Material

Any soil, aggregate etc. imported for the remediation works must have contaminant concentrations that meet the relevant criteria outlined in Section 11. Imported materials will only be accepted for use at the site if:

- It can legally be accepted onto the site (e.g. classified as VENM, accompanied by a report / certificate prepared by a qualified environmental consultant);
- Visual inspection of the imported soil confirms that the soil has no signs of concern and is consistent with those described in the supporting classification documentation; and
- Have no aesthetic issues of concern, and
- The materials are validated (by inspection / sampling) by the Environmental Consultant as being suitable for use at the site.

The classification report / certificate for all material proposed for import must be reviewed and approved in writing by the Environmental Consultant prior to import. Materials to be imported may need to meet geotechnical requirements which are to be assessed by others, as required.

If permitted by the development consent and approved by the site owner, Remediation Contractor and Environmental Consultant and Site Auditor, material classified under a NSW EPA Resource Recovery Order (RRO) may also be accepted, provided the material can be used on site in accordance with the corresponding Resource Recovery Exemption (RRE). This could include excavated natural material (ENM), classified under NSW EPA *Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014, The excavated natural material order 2014* (NSW EPA, 2014d).

The need for check-sampling of RRO material is to be established by the Environmental Consultant depending on the source of the material, adequacy of the supporting documentation provided and inspection(s) of material. Quarried material / VENM may need little or no check sampling.

Any imported recycled aggregates must be sampled at a frequency of one sample per 25 m^3, with a minimum of three samples per load. The recycled aggregate will not be permitted to be used on site until the results of the inspection and laboratory analysis have been approved in writing by the Environmental Consultant.

15. Management and Responsibilities

15.1 Site Management Plan

A general site management plan for the construction works is to be prepared by the Contractor. The management plan should include soil, noise, dust, work health safety (WHS), excavation/work schedule, hours of operation and incident response actions. The Contractor is to implement their over-arching CEMP for the duration of the works.

15.2 Contingency Plan and Unexpected Finds Protocol

Plans for contingency situations (e.g. encountering asbestos in fill), along with an UFP for dealing with unexpected finds during remediation work / earthworks, are provided in Appendix E.

16. Close-Out Reporting

16.1 Documentation

The following documents will need to be collated and reviewed by the Environmental Consultant as part of the validation assessment (including those items that are prepared by the Environmental Consultant):

- Waste classification report(s) (Environmental Consultant);
- Transportation Record: comprising a record of all truckloads of soil (including aggregate) entering the site, including truck identification (e.g. registration number), date, time, source site, load characteristics (e.g. type of material, i.e. quarried aggregate, etc.), approximate volume, use (e.g., general site raising, service trenches, etc.) (Contractor);
- Disposal dockets: for any soil disposed off-site including transportation records, spoil source, spoil disposal location, receipt provided by the receiving waste facility / site (Contractor). Note: A record of the building materials disposed off-site is also to be kept and provided to the Principal, on request;
- Imported materials records: records for any soil imported onto the site, including source site, classification reports, inspection records of soil upon receipt at site and transportation records (Contractor);
- Records relating to any unexpected finds and contingency plans implemented (Contractor);
- Laboratory certificates and chain-of-custody documentation;
- Inspections records from the Environmental Consultant;
- Photographic records by all contractors and consultants of the works completed within their purview of responsibilities (Contractor); and
- Airborne asbestos monitoring records (in the event that asbestos works are conducted) (Contractor).

16.2 **Reporting**

Formal validation reporting is not considered necessary; however, the documents listed in Section 16.1 will need to be collated and then reviewed by the Environmental Consultant and Site Auditor as part of a close-out summary report.

The close-out summary report shall describe the excavation approach adopted, methodology, results and conclusion of the assessment and make a statement regarding the suitability of the site for the proposed Gosford Regional Library development.

17. **Conclusions**

It is considered that the site is suitable for the on-going commercial use (i.e. Gosford Regional Library Development) from a site contamination standpoint.

The presence of asbestos (currently identified as a single ACM fragment in fill) cannot be ruled-out and on this basis will need to be appropriately managed during demolition and construction works to ensure that site users (i.e. construction workers) and adjacent site users are not inadvertently exposed to asbestos contamination. It is recommended that no formal remediation action is required and that any unexpected contamination issues are managed using an UFP that can be incorporated into the CEMP.

18. **References**

CRC CARE. (2019a). *Remediation Action Plan: Development - Guideline on Establishing Remediation Objectives*. National Remediation Framework: CRC for Contamination Assessment and Remediation of the Environment.

DP. (2018a). *Report on Prelimnary Site Investigation for Contamination, 123A-125B Donnison Street, Gosfrord*. Douglas Partners Pty Ltd.

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DP. (2023b). *Supplementary Site Investigation (Contamination), Proposed Gosford Regional Library, 123A Donnison Street Gosford*. 83343.04.R.002.Rev0: Douglas Partners Pty Ltd.

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]*. Australian Government Publishing Services Canberra: National Environment Protection Council.

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

NSW EPA. (2014a). *Waste Classification Guidelines, Part 1: Classifying Waste*. NSW Environment Protection Authority.

NSW EPA. (2014b). *Waste Classification Guidelines, Part 2: Immobilisation of Waste*. NSW Environment Protection Authority.

NSW EPA. (2014c). *Waste Classification Guidelines, Part 4: Acid Sulfate Soils*. NSW Environment Protection Authority.

NSW EPA. (2014d). *Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014, The excavated natural material order 2014*. NSW Environment Protection Authority.

NSW EPA. (2016). *Addendum to the Waste Classification Guidelines (2014) - Part 1: Classifying Waste*. NSW Environment Protection Authority.

NSW EPA. (2020). *Guidelines for Consultants Reporting on Contaminated Land*. Contaminated Land Guidelines: NSW Environment Protection Authority.

19. **Limitations**

Douglas Partners (DP) has prepared this report for this project at 123A Donnison Street, Gosford NSW with reference to DP's proposal dated 13 November 2023 and acceptance received from Jared Savage of North Construction & Building Pty Ltd dated 13 November 2023. The work was carried out under DP's Engagement Terms. This report is provided for the exclusive use of North Construction & Building Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after Douglas' field testing has been completed.

Douglas' advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by Douglas in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the environmental components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. Douglas cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by Douglas. This is because this report has been written as advice and opinion rather than instructions for construction.

Asbestos has been detected by laboratory analysis in fill materials at a test location sampled and analysed. Building demolition materials, such as brick, tile, concrete, glass, wire and PVC fragments were, however, located in previous below-ground fill and these are considered as indicative of the possible presence of hazardous building materials (HBM), including asbestos.

Although the sampling plan adopted for this investigation is considered appropriate to achieve the stated project objectives, there are necessarily parts of the site that have not been sampled and analysed. This is either due to undetected variations in ground conditions or to parts of the site being inaccessible and not available for inspection/sampling. It is therefore considered possible that HBM, including asbestos, may be present in unobserved or untested parts of the site, between and beyond sampling locations, and hence no warranty can be given that asbestos is not present.

Appendix A

Drawing 1 – Test Location Plan (DP, 2023b)

About this Report

About this Report

November 2023

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

continued next page

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

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Drawing adapted from Metromap Image, dated 12 September 2022

Douglas PARTNERS	CLIENT: North Construction and Building Pty Ltd	TITLE: **Test Location Plan**	PROJECT No: 83343.04
	OFFICE: Central Coast / DRAWN BY: BJK	**Proposed Gosford Regional Library**	DRAWING No: 1
	SCALE: 1:250 @ A3 / DATE: 18.12.23	**123A Donnison Street, Gosford**	REVISION: 0

Appendix B

Remediation Options

Appendix B
Remediation Options Assessment
Gosford Regional Library

B1.0 Introduction

The following key guidelines and technical reports were consulted in the preparation of this remediation options assessment:

- NEPC National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [the 'NEPM']) (NEPC, 2013); and
- CRC CARE Remediation Action Plan: Development - Guideline on Performing Remediation Options Assessment (CRC CARE, 2019a).

The first stage of developing a remediation strategy is to establish clear and measurable remediation objectives and remediation criteria (clean-up levels). These will form the requirements against which remediation options are assessed.

The next stage in the remediation options assessment is to select suitable technology and management options, or combinations of options, that have the potential to reduce contaminant concentrations and/or apply management controls as necessary so that the remediation objectives are achieved and no unacceptable risk is posed by the contamination in the context of the current and proposed site use. Where several viable options have been identified, an assessment of each of the options will be required to establish which option will most adequately and sustainably meet the remediation objectives (CRC CARE, 2019a).

The remediation objectives are to:

- Address potentially unacceptable risks to relevant environmental values from contamination (refer to the CSM in Section 7); and
- Render the site suitable, from a contamination perspective, for the proposed development / land use (refer to Section 2).

B1.0 Hierarchy of Remediation Options

NEPC (2013) stipulates the preferred hierarchy of options for site clean-up (remediation) and/or management which is outlined as follows:

- On-site treatment of the contamination so that it is destroyed, or the associated risk is reduced to an acceptable level; and
- Off-site treatment of excavated soil, so that the contamination is destroyed, or the associated risk is reduced to an acceptable level, after which soil is returned to the site;

or, if these two options are not practicable;

- Consolidation and isolation of the soil on site by containment with a properly designed barrier; and
- Removal of contaminated material to an approved site or facility, followed, where necessary, by replacement with appropriate material;

or,

- Where the assessment indicates remediation would have no net environmental benefit or would have a net adverse environmental effect, implementation of an appropriate management strategy.

B2.0 Remediation Options Assessment

B2.1 Introduction

Based on the results of DP(2021) and DP (2023b) no formal remediation work is required. Any remediation works undertaken at the site would be triggered by an unexpected find during the proposed excavation works to facilitate the construction of new ground floor levels, building foundations and the installation of new facilities and services.

B2.2 Remediation Options

Given the straightforward nature of the contamination issues at the site and the necessary earthworks (final landform) as part of the proposed development, only three options for the soil contamination have been considered, namely:

- No action;
- Removal of contaminated material to landfill; and
- Capping / on-site containment of contaminated materials.

The following key guidelines have therefore been consulted:

- CRC CARE Technology Guide: Soil - Excavation (CRC CARE, 2019b);
- CRC CARE Technology Guide: Soil - Containment (CRC CARE, 2019c);
- WA DoH Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (WA DoH, 2021); and
- WorkCover NSW Managing Asbestos in or on Soil (WorkCover NSW, 2014).

B2.2.1 No Action

The “No Action” option involves no remedial response to the contamination identified at the site. This option was considered appropriate for the following reasons:

- Based on the results of DP(2021) and DP (2023b) no formal remediation work is required; and
- Leaving trace quantities of ACM fragments in situ would not have significant impacts to human health or the environment.

B2.2.2 Removal of Fill Material to Landfill

The construction works will require that in some areas the existing concrete slab is to be demolished and removed, and then the underlying soils excavated to facilitate the construction of new ground floor levels, building foundations and the installation of new facilities and services.

All excavated spoil is considered surplus to the development requirements and off-site disposal of fill materials is considered a suitable option for managing potential human health impacts from the fill materials.

B2.2.3 Capping

For the fill materials, formal on-site capping is not required based on the results of DP(2021) and DP (2023b). In the event that an unexpected find is identified (e.g. asbestos impacted soils) the feasibility of formal on-site capping will be reconsidered, and if selected this RAP would be revised.

B3.0 Summary of Preferred Remediation Strategy

Based on the absence of potential contamination at the site (i.e. based on the results of DP(2021) and DP (2023b)), it is considered that the remediation options with respect to soil contamination at the site will comprise:

- For the in situ fill materials it is considered that the most suitable option would be the “No Action” option;
- For fill materials that are excess to development requirements it is considered that the most suitable option would be excavation and off-site disposal to a licensed waste facility (landfill) under the assigned waste classification (DP, 2023a); and
- For the underlying natural soils that are excess to development requirements it is considered that the most suitable option would be excavation, in situ or ex situ validation/verification assessment and then off-site transport for re-use or disposal to a licensed waste facility (landfill) under an assigned classification (classification report yet to be prepared).

B4.0 References

CRC CARE. (2019a). *Remediation Action Plan: Development - Guideline on Performing Remediation Options Assessment.* National Remediation Framework: CRC for Contamination Assessment and Remediation of the Environment.

CRC CARE. (2019b). *Technology Guide: Soil - Excavation.* National Remediation Framework: CRC for Contamination Assessment and Remediation of the Environment.

CRC CARE. (2019c). *Technology Guide: Soil - Containment.* National Remediation Framework: CRC for Contamination Assessment and Remediation of the Environment.

DP. (2021). *Detailed Site Investigation (Contamination), Proposed Gosford Regional Library, 123A Donnison Street Gosford.* 83343.03.R.001.Rev0: Douglas Partners Pty Ltd.

DP. (2023a). *In Situ Waste Classification, 123A Donnison Street, Gosford.* 83343.04.R.001.Rev0: Douglas Partners Pty Ltd.

DP. (2023b). *Supplementary Site Investigation (Contamination), Proposed Gosford Regional Library, 123A Donnison Street Gosford.* 83343.04.R.002.Rev0: Douglas Partners Pty Ltd.

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

WA DoH. (2021). *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia.* WA Department of Health.

WorkCover NSW. (2014). *Managing Asbestos in or on Soil.* March 2014: WorkCover NSW, NSW Government.

Douglas Partners Pty Ltd

Appendix C

Site Assessment Criteria / Remediation Acceptance Criteria

Appendix C
Site Assessment Criteria
123A Donnison Street, Gosford

C1.0 Introduction

C1.1 Guidelines

The following key guidelines were consulted for deriving the site assessment criteria (SAC):

- NEPC National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [the 'NEPM'] (NEPC, 2013).
- CRC CARE Health screening levels for petroleum hydrocarbons in soil and groundwater (CRC CARE, 2011).
- HEPA PFAS National Environmental Management Plan (NEMP) (HEPA, 2020).

C1.2 General

The SAC applied in the current investigation are informed by the CSM which identified primarily human receptors to potential contamination at the site. Notwithstanding, for completeness environmental receptors to potential contamination at the site are also included. Analytical results are assessed (as a Tier 1 assessment) against the SAC comprising primarily the investigation and screening levels of Schedule B1 of NEPC (2013).

The following inputs are relevant to the selection and/or derivation of the SAC:

- Land use: Commercial / Industrial, Corresponding to land use category 'D', commercial / industrial such as shops, offices, factories and industrial sites; and
- Soil type which is sand.

C2.0 Soils

C2.1 Health Investigation and Screening Levels

The generic health investigation levels (HIL) and health screening levels (HSL) are considered to be appropriate for the assessment of human health risk via all relevant pathways of exposure associated with contamination at the site. The adopted soil HIL and HSL for the contaminants of concern are provided in Tables 1 and 2.

Table 1: Health Investigation Levels (mg/kg)

Contaminant	HIL-D
Metals	
Arsenic	3000
Cadmium	900
Chromium (VI)	3600
Copper	240 000
Lead	1500
Mercury (inorganic)	730
Nickel	6000
Zinc	400 000
PAH	
B(a)P TEQ	40
Total PAH	4000
OCP	
DDT+DDE+DDD	3600
Aldrin and dieldrin	45
Chlordane	530
Endosulfan	2000
Endrin	100
Heptachlor	50
HCB	80
Methoxychlor	2500
PCB	
PCB	7

Table 2: Health Screening Levels (mg/kg)

Contaminant	HSL-D	HSL-D	HSL-D	HSL-D
SAND	**0 m to <1 m**	**1 m to <2 m**	**2 m to <4 m**	**4 m+**
Benzene	3	3	3	3
Toluene	NL	NL	NL	NL
Ethylbenzene	NL	NL	NL	NL
Xylenes	230	NL	NL	NL
Naphthalene	NL	NL	NL	NL
TRH F1	260	370	630	NL
TRH F2	NL	NL	NL	NL

Notes: TRH F1 is TRH C_6-C_{10} minus BTEX

TRH F2 is TRH >C_{10}-C_{16} minus naphthalene

The soil saturation concentration (Csat) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds Csat, a soil vapour source concentration for a petroleum mixture could not exceed a level that would results in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'

The HSL for direct contact derived from CRC CARE (2011) are provided in Table 3.

Table 3: Health Screening Levels for Direct Contact (mg/kg)

Contaminant	DC HSL-D	DC HSL-IMW
Benzene	430	1100
Toluene	99 000	120 000
Ethylbenzene	27 000	85 000
Xylenes	81 000	130 000
Naphthalene	11 000	29 000
TRH F1	26 000	82 000
TRH F2	20 000	62 000
TRH F3	27 000	85 000
TRH F4	38 000	12 000

Notes: TRH F1 is TRH C_6-C_{10} minus BTEX

TRH F2 is TRH >C_{10}-C_{16} minus naphthalene

IMW intrusive maintenance worker

C2.2 Health Investigation Levels for Per- and Poly-Fluoroalkyl Substances in Soil

The laboratory analytical results for per- and poly-fluoroalkyl substances (PFAS) in soil have been assessed against HIL published in HEPA (2020). The HIL represent a nationally-agreed suite that should be used to inform site investigations. The HIL are intentionally conservative, and an exceedance of these criteria may not constitute a risk if other exposure pathways are controlled. An exceedance of the HIL should trigger further investigations, such as a site-specific risk assessment. At the time of this investigation, screening values were available only for perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA) and perfluorohexane sulfonate (PFHxS).

The HIL derived from Table 2 of HEPA (2020) are in provided in Table 4.

Table 4: Health Investigation Levels (mg/kg)

Contaminant	HIL-D
PFOS and PFHxS *	20
PFOA	50

Notes: * Includes PFOS only, PFHxS only and the sum of the two.

C2.3 Asbestos in Soil

The HSL for asbestos in soil are based on likely exposure levels for different scenarios published in NEPC (2013) for the following forms of asbestos:

- Bonded asbestos containing material (ACM); and
- Fibrous asbestos and asbestos fines (FA and AF).

The HSL are in Table 5.

Table 5: Health Screening Levels for Asbestos

Form of Asbestos	HSL-D
ACM	0.05%
FA and AF	0.001%
FA and AF and ACM	No visible asbestos for surface soil *

Notes: Surface soils defined as top 10 cm.
* Based on site observations at the sampling points and the analytical results of surface samples.

C2.4 Ecological Investigation Levels

Ecological investigation levels (EIL) and added contaminant limits (ACL), where appropriate, have been derived in NEPC (2013) for arsenic, copper, chromium (III), nickel, lead, zinc, DDT and naphthalene. The adopted EIL, derived using the interactive (excel) calculation spreadsheet on the NEPM toolbox website are provided in Table 7, with inputs into their derivation provided in Table 6.

Table 6: Inputs to the Derivation of the Ecological Investigation Levels

Variable	Input
Age of contaminants	"Aged" (>2 years)
pH	Assumed 6.0
CEC	Assumed 5.00 $cmol_c/kg$
Clay content	Assumed 10%
Traffic volumes	High
State / Territory	NSW

Table 7: Ecological Investigation Levels (mg/kg)

Contaminant	EIL-D
Metals	
Arsenic	160
Copper	160
Nickel	60
Chromium III	680
Lead	1800
Zinc	480
PAH	
Naphthalene	370
OCP	
DDT	640

C2.5 Ecological Screening Levels

Ecological screening levels (ESL) are used to assess the risk of selected petroleum hydrocarbon compounds, BTEX and benzo(a)pyrene to terrestrial ecosystems. The adopted ESL are provided in Table 8.

Table 8: Ecological Screening Levels (mg/kg)

Contaminant	Soil Type	EIL-D
Benzene	Coarse	75
Toluene	Coarse	135
Ethylbenzene	Coarse	165
Xylenes	Coarse	180
TRH F1	Coarse/ Fine	215*
TRH F2	Coarse/ Fine	170*
TRH F3	Coarse	1700
TRH F4	Coarse	3300
B(a)P	Coarse	1.4
Benzene	Fine	95
Toluene	Fine	135
Ethylbenzene	Fine	185
Xylenes	Fine	95
TRH F1	Coarse/ Fine	215*
TRH F2	Coarse/ Fine	170*
TRH F3	Fine	2500
TRH F4	Fine	6600
B(a)P	Fine	1.4

Notes: ESL are of low reliability except where indicated by * which indicates that the ESL is of moderate reliability
TRH F1 is TRH C_6-C_{10} minus BTEX
TRH F2 is TRH >C_{10}-C_{16} including naphthalene

C2.6 Management Limits

In addition to appropriate consideration and application of the HSL and ESL, there are additional considerations which reflect the nature and properties of petroleum hydrocarbons, including:

- Formation of observable light non-aqueous phase liquids (LNAPL);
- Fire and explosion hazards;

- Effects on buried infrastructure eg: penetration of, or damage to, in-ground services.

The adopted management limits are in provided in Table 9.

Table 9: Management Limits (mg/kg)

Contaminant	Soil Type	ML-D
TRH F1	Coarse	700
TRH F2	Coarse	1000
TRH F3	Coarse	3500
TRH F4	Coarse	10 000
TRH F1	Fine	800
TRH F2	Fine	1000
TRH F3	Fine	5000
TRH F4	Fine	10 000

Notes: TRH F1 is TRH C_6-C_{10} including BTEX
TRH F2 is TRH >C_{10}-C_{16} including naphthalene

C3.0 References

ANZECC. (2000). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Australia and New Zealand Environment and Conservation Council.

ANZG. (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Canberra, ACT: Australian and New Zealand Governments and Australian state and territory governments.

CRC CARE. (2011). *Health screening levels for petroleum hydrocarbons in soil and groundwater.* Parts 1 to 3, Technical Report No. 10: Cooperative Research Centre for Contamination Assessment and Remediation of the Environment.

HEPA. (2020). *PFAS National Environmental Management Plan (NEMP).* Version 2.0: Heads of EPAs Australia and New Zealand and Australian Government Department of the Environment.

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

NHMRC. (2008). *Guidelines for Managing Risks In Recreational Water.*

NHMRC, NRMMC. (2016). *Australian Drinking Water Guidelines 6 2011, Version 3.2.* Canberra: National Health and Medical Research Council, National Resource Management Ministerial Council.

Appendix D

Contingency Plan and Unexpected Finds Protocol

Appendix D
Contingency Plan and Unexpected Finds Protocol
Gosford Regional Library

D1.0 General

Where the site conditions are found to be different than that anticipated during the remediation works, the proposed remediation approach may not be appropriate for the contamination encountered. In such cases the Environmental Consultant is to re-assess the contamination and remediation approach and inform the Site Auditor. Where necessary the Environmental Consultant will prepare an addendum to, or revision of, this RAP. Any addendum or revision is to be reviewed and agreed to by the Site Auditor before its implementation.

D2.0 Contingency Plan

This contingency plan has been developed to provide guidance on processes to follow if contamination (or indicators of potential contamination), other than that included in the remediation strategy, (Section 10) is encountered during the construction works. Any such finds shall be surveyed and the location documented.

Although the site has been subject to previous investigations, there remains a potential for soil contamination to be present between sampled locations. In the event that signs of soil contamination, other than that included in the remediation strategy, are encountered during remediation e.g. evidence of asbestos containing material (ACM), petroleum, or other chemical odours which weren't previously identified the following protocols will apply:

- The Site Manager is to be notified and the affected area closed off by the use of barrier tape and warning signs;
- The Environmental Consultant is to be notified to inspect the area and assess the significance of the potential contamination and establish the extent of remediation works (if deemed necessary) to be conducted. An assessment report and management plan detailing this information will be prepared by the Environmental Consultant and provided to the Principal's Representative;
- The assessment results together with a suitable management plan shall be provided by the Principal's Representative to the Consent Authority (if required by the development consent) and Site Auditor;
- The agreed management / remedial strategy, based on the RAP and relevant guidelines (e.g. WA DoH (2021), for asbestos issues), shall be implemented; and
- All details of the assessment and remedial works are to be included in the site close-out / validation report.

D3.0 Unexpected Finds Protocol

This unexpected finds protocol (UFP) has been developed to provide guidance on processes to follow if any unexpected find is encountered during the remediation or future civil and construction works. Any unexpected finds should be surveyed and the location documented.

All site personnel are to be inducted into their responsibilities under this UFP, which should be included or referenced in the Contractors Environmental Management Plan.

All site personnel are required to report unexpected signs of environmental concern to the Site Manager if observed during the course of their works e.g. presence of potential unexploded ordinance, unnatural staining, potential contamination sources (such as buried drums or tanks) or chemical spills.

Should signs of concern be observed, the Site Manager, as soon as practical, will:

- Stop work in the affected area and ensure the area is barricaded to prevent unauthorised access;
- Notify authorities needed to obtain emergency response for any health or environmental concerns (e.g. the fire brigade);
- Notify the Principal's Representative of the occurrence;
- Notify any of the authorities that the Contractor is legally/contractually required to notify (e.g. EPA, and/or Council); and
- Notify the Environmental Consultant.

The Principal's Representative is to notify any of the authorities which the Principal is legally/ contractually required to notify (e.g. EPA and/or Council). Where appropriate the Principals Representative will also implement appropriate community consultation.

The Environmental Consultant will assess the extent and significance of the find and develop an investigation, remediation or management approach using (where possible) the principles and procedures already outlined in the RAP. The proposed approach will be discussed and agreed to with the Site Auditor prior to implementation.

D4.0 References

WA DoH. (2021). *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia.* WA Department of Health.