

23 February 2021

Georges River Council
Corner of MacMahon and Dora Streets
Hurstville NSW 2220

Ref: E040

Sent via Email: Tom.Heath@georgesriver.nsw.gov.au

Dear Tom,

RE: Interim Audit Advice - Kogarah War Memorial Pool, Carss Park

1 Introduction

As a NSW Environment Protection Authority (EPA) accredited Contaminated Site Auditor, I am conducting an audit in relation to the site known as the Kogarah War Memorial Pool, within the Carss Bush Park located at 78 Carwar Avenue, Carss Park NSW. The site area is approximately 7,500m² and is identified as Part Lot 1 DP125981, Part Lot 376 DP1118749 & Lot 511 DP752056. Part of the site also extends onto unregistered crown land. (Attachment 1 & 2)

Part of Carss Bush Park was reclaimed from Kogarah Bay in the 1940's and 1950's using uncontrolled fill from variable sources. The War Memorial Pool was constructed over part of the reclaimed land in 1965. The pool was closed in 2019 due to severe cracking across major sections and its foundations, due to significant ground subsidence which has occurred over many decades. Council is planning to demolish and remediate the site (due to asbestos in the underlying fill) to allow redevelopment for passive public open space.

1.1 Background

I have previously issued a site audit report and site audit statement (JE081A) documenting my review of the following documents:

- 'Summary of Site Contamination, Carss Park Pool, 76 Carwar Avenue, Carss Park, NSW 2221', 15 November 2019. Construction Sciences.
- 'Report on Detailed Site (Contamination) Investigation, Proposed Pool and Park Redevelopment, Kogarah War Memorial Pool, 78 Carwar Avenue, Carss Park. 14 September 2020. Douglas Partners.
- Remediation Action Plan, Proposed Pool and Park Redevelopment, Kogarah War Memorial Pool, 78 Carwar Avenue, Carss Park. 29 September 2020. Douglas Partners.
- Notification of the Site to NSW EPA, Kogarah War Memorial Pool, 78 Carwar Avenue, Carss Park. 18 September 2020. Douglas Partners.
- Review of Erosion Protection Requirements, Proposed Pool and Park Redevelopment, 78 Carwar Avenue, Carss Park. 13 October 2020. Douglas Partners. (Referred to as *Review of Erosion Protection Requirements*)

The audit concluded that the nature and extent of the contamination has been appropriately determined, The RAP is appropriate, and the site can be made suitable for public open space if remediated in accordance with the RAP subject to compliance with the following conditions:

1. Preparation of a Site Audit Statement certifying suitability for the proposed use, at the completion of the remediation and validation.
2. Prior to commencing remediation council must ensure that any relevant approvals from crown land are obtained.

3. The erosion protection elements identified in the Douglas Partners (2020) Review of Erosion Protection Requirements, Proposed Pool and Park Redevelopment, 78 Carwar Avenue, Carss Park. 13 October 2020 must be incorporated into the cap design as specified in section 7.3 of the RAP. The civil drawings included in Appendix B of the RAP do not reflect the approved cap design specification.
4. The RAP requires preparation and implementation of a construction environmental management plan (CEMP). This must include a plan to screen for ASS and a contingency protocol should ASS be encountered during the remediation. The CEMP must be reviewed and approved by the consultant prior to implementation.

It is understood that the JE081A SAR/SAS was submitted to council in support of a development application (DA2020/0405) for demolition and remediation of the site and redevelopment for public open space. Following a merit assessment of the DA, council have requested further information, relating to the RAP as follows:

"The incorporation of erosion protection measures referenced in the Douglas Partners letter of 13 October 2020 as part of remedial works and the RAP, along with updated civil drawings reflecting the cap design specification is required."

Subsequently, a revised version of the RAP has been prepared by Douglas Partners to incorporate the erosion protection elements described in the *Review of Erosion Protection Requirements*.

1.2 Scope

This interim audit advice (IAA) documents review of the revised RAP (listed below) with reference to the previous site audit (JE081A) and provides the auditor's opinion on whether the site can be made suitable for the proposed use subject to implementation of the following revised RAP:

- 'Remediation Action Plan, Proposed Pool and Park Redevelopment, Kogarah War Memorial Pool, 78 Carwar Avenue, Carss Park', 19 February 2021, Douglas Partners.
- 'Site Audit Report, Remediation Action Plan, Kogarah War Memorial Pool, Carss Park NSW and Site Audit Statement SAS JE081A', 15 October 2020, Envirocene Pty Ltd.

2 Remediation Action Plan

A review of the changes to the Revised RAP compared to the RAP reviewed as part of the scope of the JE081A site audit is provided below:

Table 12.1: Review of Changes to Revised RAP Compared to Previous RAP	
RAP Item	Revised RAP
<p>Section 7.3 Capping of Contaminated Fill: This section specified cap design for main the main cap layer (and landscaping mound), tree protection zones (TPZ) and new tree planting (Type 1-5)</p> <p>Review of the erosion potential of the proposed cap design was undertaken by a geotechnical engineer and documented separately to the RAP (<i>Review of Erosion Protection Requirements</i>). The following additional cap design measures were specified to account for storm surge wave run-up and sea level rise:</p> <ul style="list-style-type: none"> - Inclusion of non-dispersive clay behind and below the sandstone 	<p>Section 7.3 of the Revised RAP has been amended to incorporate the design elements identified in the <i>Review of Erosion Protection Requirements</i>. Cap types were referenced to the civil drawings (and included reference to three additional cap types to account for the erosion protection requirements). A summary of the revised RAP cap design specifications is provided below:</p> <p>Type 1: Main Capping layer to comprise high visibility marker layer and minimum 500mm thick capping (consisting of 350mm of well graded and compacted ripped sandstone VENM and 150mm of topsoil and turf). Type 4 specifies thicker capping to accommodate soil mound (landscaping) in north-eastern corner. (no change from RAP).</p> <p>Type 2: TPZ's (except northern TPZ): fill to be excavated by hand to a depth of 100mm, installation of marker layer, 100mm of free draining VENM and 200mm of topsoil or mulch. Within 300mm of the tree capping to consist of 300mm depth of mulch (contained using permanent edging) (no change from RAP).</p>

Table 12.1: Review of Changes to Revised RAP Compared to Previous RAP

RAP Item	Revised RAP
<p>blocks along the eastern site boundary.</p> <ul style="list-style-type: none"> - Capping to consist of non-dispersive clay in areas below 2.5mAHd including within the TPZ. - Maintenance of the engineered foreshore armoury measures to mitigate erosion below the sandstone blocks along the eastern boundary. 	<p>Type 3 TPZ (northern boundary): due to sensitive root system, capping reduced to marker layer and 150mm of topsoil to surface. To assist with erosion protection a polypropylene geogrid will be installed within the topsoil layer. (no change from RAP).</p> <p>Type 5: New tree planting: 1m deep tree pits lined with marker layer and backfilled with growing medium (no change from RAP).</p> <p>Type 6 Areas where the design level surface is <2.5mAHd: cap material placed below the topsoil to consist of non-dispersive clay (previously detailed in Review of Erosion Protection Requirements)</p> <p>Type 7 Eastern Boundary: Sandstone blocks (500mm x 500mm) to be installed (no change from RAP). Inclusion of non-dispersive clay behind and below the sandstone blocks (previously detailed in <i>Review of Erosion Protection Requirements</i>).</p> <p>Type 8: TPZ (along eastern boundary): non-dispersive clay to be included in the capping layer.</p> <p>Maintenance of the engineered foreshore armoury measures to mitigate erosion below the sandstone blocks along the eastern boundary.</p>
<p>Appendix A: Drawings</p>	<p>Drawings and cross-sections provided in the revised RAP are listed below (by reference to the drawing number). Comments are provided in brackets.</p> <ol style="list-style-type: none"> 1. & 2. Site Location and Previous Test Locations (unchanged from RAP) 3. Capping Strategy (unchanged from RAP) 4. Eastern Boundary finished surface <2.5mAHd (new drawing showing non-dispersive clay cap installed in areas <2.5mAHd) 5. Existing TPZ Areas <i>excludes northern TPZ</i>, (unchanged from RAP except for drawing reference no.) 6. Deeper Tree Planting <i>new trees within minimum 1m deep tree pits</i>, (unchanged from RAP except for drawing reference no.) 7. Eastern Boundary <i>main capping layer & sandstone blocks</i>, (amended to show non-dispersive clay behind and below sandstone blocks) 8. Eastern Boundary <i>within TPZ sandstone blocks</i>, (amended to show non-dispersive clay included in the cap) 9. Capping Approach – Eastern Boundary (new drawing showing foreshore armoury) 10. Capping Approach – Eastern Boundary finished surface <2.5mAHd (new drawing showing foreshore armoury) 11. Capping Approach – Eastern Boundary within TPZ (new drawing showing foreshore armoury) 12. Southern Boundary within TPZ (Type 2) (permanent edging installed, no change from RAP except for drawing reference no.) 13. Western Boundary (connection to adjoining carpark, no change from RAP except for drawing reference no.) 14. Northern Boundary within TPZ (Type 3) <i>includes geogrid</i>, (no change except for drawing reference no.)
<p>Appendix B: Civil Drawings</p>	<p>Amended (and new) Civil Drawings provided as follows:</p>

Table 12.1: Review of Changes to Revised RAP Compared to Previous RAP

RAP Item	Revised RAP
	<ul style="list-style-type: none"> - 200060-DA-C04.10 Remediation Plan (amended to show cap design specifications including erosion protection measures) - 200060-DA-C04.20 Remediation Plan Sections (new drawing showing cross sections cap design including erosion protection measures i.e. Type 1-Type 8) <p>The rest of the civil drawings remain unchanged.</p>
Proposed Validation Testing	<p>Proposed validation testing has been updated to include sampling of soils to confirm geotechnical properties of non-dispersive clay. This is to be reviewed and confirmed by a geotechnical engineer.</p> <p>No other changes compared to RAP.</p>
Executive Summary	<p>A summary of the erosion protection measures to be incorporated into the cap design has been included.</p>
Other	<p>Miscellaneous typographical corrections which have no material bearing on the technical content of the RAP.</p>

In summary the design elements detailed in the *Review of Erosion Protection Requirements* (specified to maximise the long-term stability of the cap) have been adequately incorporated into the revised RAP. The remediation methodology presented in the Revised RAP does not differ conceptually from that reviewed as part of the scope of the previous JE081A site audit.

3 Conclusion and Recommendations

On this basis that the previous site audit (JE081A) provides an accurate appraisal of the proposed investigations and remediation methodology, the auditor concludes that the site can be made suitable for the proposed use if remediated in accordance with the following remedial action plan:

- 'Remediation Action Plan, Proposed Pool and Park Redevelopment, Kogarah War Memorial Pool, 78 Carwar Avenue, Carss Park', 19 February 2021, Douglas Partners.

Subject to compliance with the following conditions:

1. Preparation of a Site Audit Statement certifying suitability for the proposed use, at the completion of the remediation and validation.
2. Prior to commencing remediation council must ensure that any relevant approvals from crown land are obtained.
3. The RAP requires preparation and implementation of a construction environmental management plan (CEMP). This must include a plan to screen for ASS and a contingency protocol should ASS be encountered during the remediation. The CEMP must be reviewed and approved by the consultant prior to implementation.

The comments provided at the end of site audit statement SAS JE081A are still relevant and apply to this IAA.

4 Limitations

This IAA letter has been requested by GRC for submission to council in support of a DA for demolition, remediation and redevelopment of the former pool as public open space. This advice may not be suitable for other uses. Douglas included limitations in their reports. This IAA must also be subject to those limitations. The Auditor has prepared this document in good faith but is unable to provide certification outside of areas over which the Auditor had some control or is reasonably able to check.

The Auditor has relied on the documents referenced in this letter in preparing her opinion. If the Auditor is unable to rely on any of those documents, the conclusions of the audit could change.

It is not possible in an IAA letter to present all data which could be of interest to all readers of this IAA letter. Readers are referred to the referenced reports for further data. Users of this document should satisfy themselves concerning its application to, and where necessary seek expert advice in respect to, their situation.

* * *

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

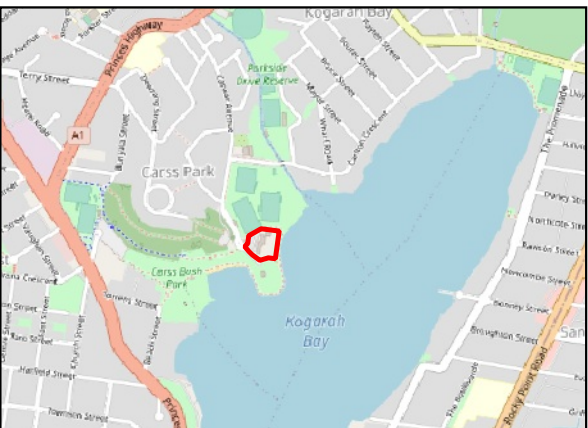
- This advice letter does not constitute a Site Audit Report or Site Audit Statement.
- At the completion of the audit, I will provide a Site Audit Statement and supporting documentation.
- This interim advice will be documented in the Site Audit Report.

Yours faithfully,
Envirocene Pty Ltd



Julie Evans
NSW EPA Accredited Site Auditor 1003

Attached: Site Location Plan and Site Area Identification



LOCALITY MAP

Notes:
1. Basemap from nearmap.com (dated 01/06/2020)

Legend

 Approximate Site Boundary (Remediation Boundary)

