



**Transport**  
Roads & Maritime  
Services

# **APPENDIX B8**

## **Construction Contaminated Land Management Plan**

### *Windsor Bridge Replacement Project*

## Document control

File name	WBR_CEMP_ Appendix B8 Construction CLMP_Rev 1
Report name	Windsor Bridge Replacement Contaminated Land Management Plan
Revision number	2

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## Revision history

Revision	Date	Description	Approval
2	7/9/2020	Annual review & Modification	
1	23/10/19	Annual review	
0	14/09/18	For construction	GS
D	31/07/18	DPE & ER review	GS
C	4/07/18	RMS review	GS
B	25/06/18	RMS review	GS
A	28/05/18	For review	GS

## Distribution of controlled copies

Copy no.	Issued to	Version
1	Georgiou	0
2	Roads and Maritime Services	0
3	Environmental Representative	0
4	RMS, ER, DPIE	1

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# Glossary / Abbreviations

Terms and definitions used within this document are provided below.

ACM	Asbestos containing material
CEMP	Construction Environmental Management Plan
COA	Condition of Approval
CLM Act	NSW Contaminated Land Management Act 1997
CCLMP	Construction Contaminated Land Management Plan
Cwth	Commonwealth
DA	Development Application
DECCW	Now OEH
EIL	Ecological Investigation Level (NEPM)
EIS	Environmental Impact Statement
EMS	Environmental Management Systems
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999 (Cwth)
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
EWMS	Environmental Work Methods Statement
HIL	Health Investigation Levels (NEPM)
ISEPP	State Environmental Planning Policy (Infrastructure) 2007 (NSW)
NEPM	National Environmental Protection (Assessment of Site Contamination) Measure 1999
NPW Act	National Parks And Wildlife Act 1974 (NSW)
NSW	New South Wales
OEH	(NSW) Office of Environment and Heritage, formerly Department of Environment, Climate Change and Water
SEPP	State Environmental Planning Policy (NSW)
TfNSW	Transport for New South Wales

# 1 Introduction

## 1.1 Context

This Construction Contaminated Land Management Plan (CCLMP) forms part of the Construction Environmental Management Plan (CEMP) for the Windsor Bridge Replacement Project.

The Windsor Bridge Replacement project team, comprised of the Transport for New South Wales (TfNSW) and Georgiou Group (Georgiou) have partnered together to undertake construction activities for the new road bridge over the Hawkesbury River at Windsor (the Windsor Bridge Replacement Project), on behalf of the New South Wales (NSW) government.

This CCLMP has been prepared to address the requirements of TFNSW standard specification G36 (TFNSWG36) and the mitigation and management measures listed in the Environmental Impact Assessment (EIS), submissions / preferred infrastructure report (SPIR), project CoAs, the Modification Report (submitted to DPIE in September 2019) and all applicable legislation.

## 1.2 Background

The Project has been assessed as State Significant Infrastructure under the former Part 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The *Windsor Bridge Replacement Project Environmental Impact Statement* (EIS) was prepared by Sinclair Knight Merz in November 2012 for TfNSW. The EIS was on public exhibition until 17 December 2012. A Submissions Report (and preferred infrastructure report) was finalised in May 2013 which addressed stakeholder submissions received during the EIS exhibition period. Following this, in December 2013, the Project was approved by the Minister for Planning and Infrastructure.

As part of EIS development, a Stage 1 and Stage 2 contamination assessment was prepared to address the requirements issued by the then Department of Planning. The Stage 2 detailed site investigation was undertaken on 28 May 2012 and only a low risk of contamination was identified. As such, a site audit report and audit statement was not required in accordance with CoA C25 of the project approval.

## 1.3 Environmental Management Systems Overview

The overall Environmental Management System for the Project is described in the Construction Environmental Management Plan (CEMP).

The CCLMP forms part of the Georgiou's environmental management framework for the Project, as described in Section 1.3 of the CEMP. Relevant management measures identified in this Plan will be incorporated into site or activity specific Environmental Work Method Statements (EWMS) where relevant.

Used together, the CEMP, strategies, procedures and relevant EWMS form management guides that clearly identify required environmental management actions for reference by Georgiou personnel and subcontractors. The review and document control processes for this Plan is detailed in Section 1.1 of the CEMP.

## **2 Purpose and Objectives**

### **2.1 Purpose**

The purpose of this Plan is to describe how contaminated materials will be managed during the construction of the Project including unexpected finds and measures for the handling, treatment and management of contaminated materials.

### **2.2 Objectives**

The key objective of this plan is to ensure that the potential impacts from disturbance of contaminated land are minimised. To achieve this objective, the following measures will be undertaken:

- Detail relevant procedures for handling, treatment and management of contaminated materials.
- Detail relevant procedures for the unexpected finds of contaminated materials onsite;
- Prevent any cross contamination of contaminated materials with clean material;
- Reduce the total volume of waste generated by the project;
- Outline management measures to help protect human health and the surrounding environment during the extraction of potentially contaminated materials.
- Ensure appropriate measures are implemented to address safeguards detailed in the EIS, submissions / preferred infrastructure report (SPIR), project CoAs C25, D4 (e) (iv) and RMS's QA Specification G36.

### **2.3 Targets**

The following targets have been established for the management of contaminated soil impacts during the construction of the Project:

- Ensure compliance with the relevant legislative requirements and those contained in the EIS, submissions / preferred infrastructure report (SPIR), project CoAs C25, D4 (e) (iv) and RMS' QA Specification G36.
- Minimise or avoid impacts on known contaminated sites.
- Follow correct procedure and ensure notification of any soil contamination discovered during construction.
- Ensure training is provided in the form of inductions to all Project personnel on potential contamination, protection measures and unexpected contamination procedures before they begin work on site.

## 3 Environmental Requirements

### 3.1 Relevant Legislation and Guidelines

Any Contamination management practices will need to comply with the NSW *Contaminated Land Management Act 1997* (CLM Act) and associated guidelines.

These guidelines include:

- NSW EPA (1994), "Contaminated Sites: Guidelines for Assessing Service Station Sites";
- NSW EPA (1995), "Contaminated Site: Sampling Design Guidelines";
- NSW EPA (2011), "Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites";
- NSW EPA (1999), "Contaminated Sites: Guidelines on Significant Risk of Harm from Contaminated Land and the Duty to Report";
- NEPM (May 2013), "National Environment Protection (Assessment of Site Contamination) Measures", National Environment Protection Council (NEPC);
- NSW DEC (2006), "Contaminated Sites: Guidelines for NSW Site Auditor Scheme, 2nd edition";
- NSW DEC (2007), "Guidelines for the Assessment and Management of Groundwater Contamination";
- NSW DECC (2009), Waste Classification Guidelines Part 1: Classifying Waste;
- NSW EPA (1998), "Managing Land Contamination – Planning Guidelines SEPP 55 – Remediation of Land";
- TFNSW publication "Contaminated Land Management Guideline"

### 3.2 Minister's Conditions of Approval

The CoA relevant to this Plan are listed Table 3-2 below. A cross reference is also included to indicate where the condition is addressed in this Plan or other Project management documents.

**Table 3-1 Conditions of Approval relevant to contamination**

CoA No.	Condition Requirements	Document Reference
C25	<p>Prior to the commencement of site preparation and excavation activities, or as otherwise agreed by the Director-General, in areas identified as having a moderate to high risk of contamination, a site audit shall be carried out by a site auditor. A site audit report is to be prepared by the site auditor detailing the outcomes of Phase 2 contamination investigations within these areas. The site audit report shall detail, where relevant, whether the land is suitable (for the intended land use) or can be made suitable through remediation.</p> <p>A site audit statement(s) must be prepared verifying that the site has been remediated to a standard consistent with the intended land use. The site audit statement(s) shall be submitted to the Director-General prior to operation of the SSI, unless otherwise agreed by the Director-General.</p> <p><i>Note: Terms used in this condition have the same meaning as in the Contaminated Land Management Act 1997.</i></p>	<p>EIS soil, sediments, water and waste working paper section 2.2.2</p> <p>A Stage 2 detailed site investigation was undertaken on 28 May 2012 as part of the EIS and only a low risk of contamination was identified. As such, a site audit report and audit statement was not required in accordance with CoA C25.</p>



CoA No.	Condition Requirements	Document Reference
D4 (e)(iv)	<p>The Applicant shall prepare and (following approval) implement a Construction Environmental Management Plan for the project. The Plan shall outline the environmental management practices and procedures that are to be followed during construction, and shall be prepared in consultation with the relevant agencies and in accordance with the Guideline for the Preparation of Environmental Management Plans (Department of Infrastructure, Planning and Natural Resources, 2004). The Plan shall include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> <li>(e) an environmental risk analysis to identify the key environmental performance issues associated with the construction phase and details of how environmental performance would be monitored and managed to meet acceptable outcomes including what actions will be taken to address identified potential adverse environmental impacts. In particular, the following environmental performance issues shall be addressed in the Plan: <ul style="list-style-type: none"> <li>(iv) measures for the handling, treatment and management of contaminated materials,</li> </ul> </li> </ul>	This plan

## 4 Contamination Status

### 4.1 Extent of Contamination

The EIS for the Windsor Bridge Replacement Project assessed the potential contaminated soil sites in the Project footprint. The historical land use information and historical aerial photography review has indicated that the northern bank for the Hawkesbury River at the project location has primarily been used for agriculture since 1793, and the southern bank for residential and urban development since 1810.

Several small scale industrial activities have also occurred in this area, however they are no longer active. Use of the river for transportation purposes began in 1795 with the construction of a wharf on the southern bank of the Hawkesbury River, and Windsor Bridge, at its present location, was constructed in 1874.

The EIS site investigations were undertaken generally in accordance with the Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites (EPA, 2000). The site investigations included;

- A Stage 1 preliminary site investigation which assessed potential contamination issues at the site that may have arisen from past and/or present activities
- A Stage 2 detailed site investigation was also undertaken which involved soil sampling, and laboratory testing and analysis of soil samples
- Other studies (such as Birch et al, 1998) on heavy metal contamination of river bed sediments at Windsor were also reviewed and assessed for relevance to the project.

Based upon the outcomes of the Stage 1 preliminary site investigation, Stage 2 detailed site investigation and the unexpected finds during archaeological investigations, the sites and potential contaminants of concern have been identified in the table below.

The archaeological investigations over the period August to December 2016 identified asbestos contamination in the archaeological test pits NA2 and SA37 at the locations shown in Appendix A. The test pits were abandoned without any remedial work to remove the asbestos contaminated material.

**Table 4-1 Potential Contaminants of Concern**

Site/ source	Contaminants of concern	Location
Turf farm / agricultural areas	Organochlorine Pesticides (OCP), Organophosphorus Pesticides (OPP), herbicides and heavy metals.	To the north and east of the northern approach of Windsor Bridge. Forms part of the proposed roundabout on the northern bank.
Deterioration of bridge structures underneath Windsor Bridge (i.e. crossbeams, utility pipes and pits, break walls and pylons).	Heavy metals (associated with paints), asbestos, and Total Petroleum Hydrocarbons (TPH), Benzene, Toluene, Ethylbenzene, Xylene (BTEX), Polycyclic Aromatic Hydrocarbons (PAH), Polychlorinated Biphenyls (PCB) (associated with fill material behind the break walls).	Underneath the first span of the bridge on both the northern and southern sides. Utility pipes and pits associated with the bridge.

Site/ source	Contaminants of concern	Location
Deposition of potentially contaminated sediments from upstream during flooding events.	The EIS concluded Cu, Pb, Zn concentrations are below the low range Interim Sediment Quality Guidelines (ANZECC 2000) and indicate that the sediments in the river around Windsor are not contaminated.	Along river banks and sediments throughout the site.
Archaeological test pits NA2 and SA37	Asbestos	See Appendix A. one test pit on the northern side of the river west of the existing road and one on the southern side of the river, east of the existing jetty.
Existing road pavements	Coal tar	There is potential for coal tar to be found in the existing road pavements, although none has been identified in the EIS for the project area.

## 5 Environmental Aspects and Impacts

### 5.1 Construction activities

Key aspects of the Project that could affect contaminated land include:

- Excavation of material
- Stripping of topsoil
- Utility relocations
- Removal of structures
- Landscaping and revegetation.

Refer also to the Aspects and Impacts Register included in Appendix A2 of the CEMP.

### 5.2 Impacts

Exposure to unsuspected and/or known contaminated land is a risk to human health and the environment. This CCLMP has been developed to inform all construction personnel of the management measures to be implemented when working in areas of known contaminated land, and the procedure to follow when unexpected contamination is encountered on site.

## **6 Environmental Mitigation and Management Measures**

A range of environmental requirements and control measures are identified in the various environmental documents, TfNSW specifications and Georgiou's Environmental Management Systems.

Specific measures and requirements to address contaminated sites are outlined in Table 6-1.

**Table 6-1 Contaminated Land Measures**

ID	Mitigation Measure / Requirement	Resource Required	Implementation Stage	Responsibility	Reference
<i>Contaminated land identification</i>					
CLM1	Training will be provided to all project personnel, including relevant subcontractors on potential contamination and asbestos risks and the requirements from this plan through inductions, toolboxes and targeted training.	Induction	Pre-construction Construction	Construction Manager / Environment Manager	G36, Good practice
CLM2	During excavations, soil and fill material will be visually monitored by the plant operator to identify the potential contaminated material or soils. All personnel will be made aware of the potential contaminants of concern for the site and visual identification in the induction prior to commencement of work onsite.		Construction	Construction Manager / Superintendent	G36 Clause 4.2.3 EIS table 10-1 SW11
CLM3	If any suspected or potential contamination exposed or encountered (including but not limited to odorous or visually contaminated materials) during construction all work activities within the vicinity of actual or suspected contaminated land will cease and the Unexpected Finds Procedure (Appendix B) will be implemented.	Appendix B - Unexpected Finds Procedure	Construction	Construction Manager / Contamination land consultant / Superintendent / ESR	G36 Clause 4.2.3 EIS table 10-1 SW11
CLM4	Potentially contaminated materials will be segregated into separate stockpiles that are adequately signposted with the source location of the materials on site recorded. The stockpile will be managed in accordance with the Stockpile Management Protocol (CEMP Appendix B4) and will be placed on strong impermeable plastic sheeting and covered top and sides with securely fitted plastic sheeting.	Appendix F - Stockpile Management Protocol (CEMP Appendix B4)	Construction	Superintendent / ESR	G36 Clause 4.2.3
CLM5	Potentially hazardous and contaminating activities including major equipment maintenance / servicing, mixing of cutting oil and bitumen, wash down of construction plant and concrete washout will be conducted in bunded areas away from watercourses and other environmentally sensitive areas.		Construction	Superintendent	Good practice
CLM6	Any contaminated waste will be handled, separated, contained, managed and disposed of to prevent migration and further contamination. It will be removed from the site will be disposed to a suitably licensed facility and a written copy of such records provided to TfNSW.	Construction Waste Management Plan (CEMP Appendix B7)	Construction	Superintendent / ESR	G36 Clause 4.2.3

ID	Mitigation Measure / Requirement	Resource Required	Implementation Stage	Responsibility	Reference
CLM7	<p><i>If any potential asbestos is found during construction, works will cease in the area and an asbestos assessment will be conducted by suitably qualified environmental consultant.</i></p> <p><i>The removal work will be undertaken in accordance with How to Manage and Control Asbestos in the Workplace and How to Safely Remove Asbestos (Safework Australia 2016) which includes the disposal of the material at an appropriately licensed facility by appropriately licensed personnel. Air monitoring will occur if the risk assessment, indicates the need for it.</i></p>	<p><i>How to Manage and Control Asbestos in the Workplace and How to Safely Remove Asbestos (Safework Australia 2016)</i></p>	Asbestos find	Construction Manager / Contamination land consultant / Superintendent / ESR	G36 Clause 4.2.3

## **7 Compliance Management**

### **7.1 Roles and Responsibilities**

The Project Team's organisational structure and overall roles and responsibilities are outlined in Section 4.2 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Section 6 of this Plan.

### **7.2 Training**

All employees, contractors and sub-contractors working on site will undergo site induction training relating to potential land contamination management issues. The induction training will address elements related to heritage management including:

- Procedure to follow in the event of a contamination find during construction works

If contamination is unexpectedly discovered onsite, all workers involved in the remediation or removal will receive a toolbox informing them of the Site specific controls required for remediation process including:

- Site access restrictions
- Correct use of PPE
- Decontamination procedures
- Use of monitoring equipment
- Waste handling procedures
- Water quality and leachate controls
- Dust control measures and performance measures

Further details regarding staff induction and training are outlined in Section 6 of the CEMP.

### **7.3 Monitoring, inspection and testing**

Informal daily visual monitoring of excavation activities will be carried out by the plant operators and supervisors on a daily basis for any signs of previously unidentified contamination for the duration of the Project. Contaminated land inspections will be undertaken as part of the weekly environmental inspections. Requirements and responsibilities in relation to monitoring and inspections are documented in Sections 8.1 and 8.2 of the CEMP.

### **7.4 Incident Response**

An Incident Reporting Procedure (Section 7 of the CEMP) covers incidents involving pollution events. A Pollution Incident Response Management Plan (CEMP - Appendix B12) has been developed to minimise the impact of spills including details on the requirements for managing, cleaning up and reporting.

### **7.5 Auditing**

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental controls, compliance with this sub plan, CoAs, environmental management measures and other relevant approvals, licenses and guidelines.

Audit requirements are detailed in Section 8.3 of the CEMP.

## **7.6 Reporting**

Reporting requirements and responsibilities are documented in Section 8.5 of the CEMP.

# **8 Review and improvement**

## **8.1 Continuous Improvement**

Continuous improvement of this plan will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement.

The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance
- Determine the cause or causes of non-conformances and deficiencies
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies
- Verify the effectiveness of the corrective and preventative actions
- Document any changes in procedures resulting from process improvement
- Make comparisons with objectives and targets

## **8.2 Plan Update and Amendment**

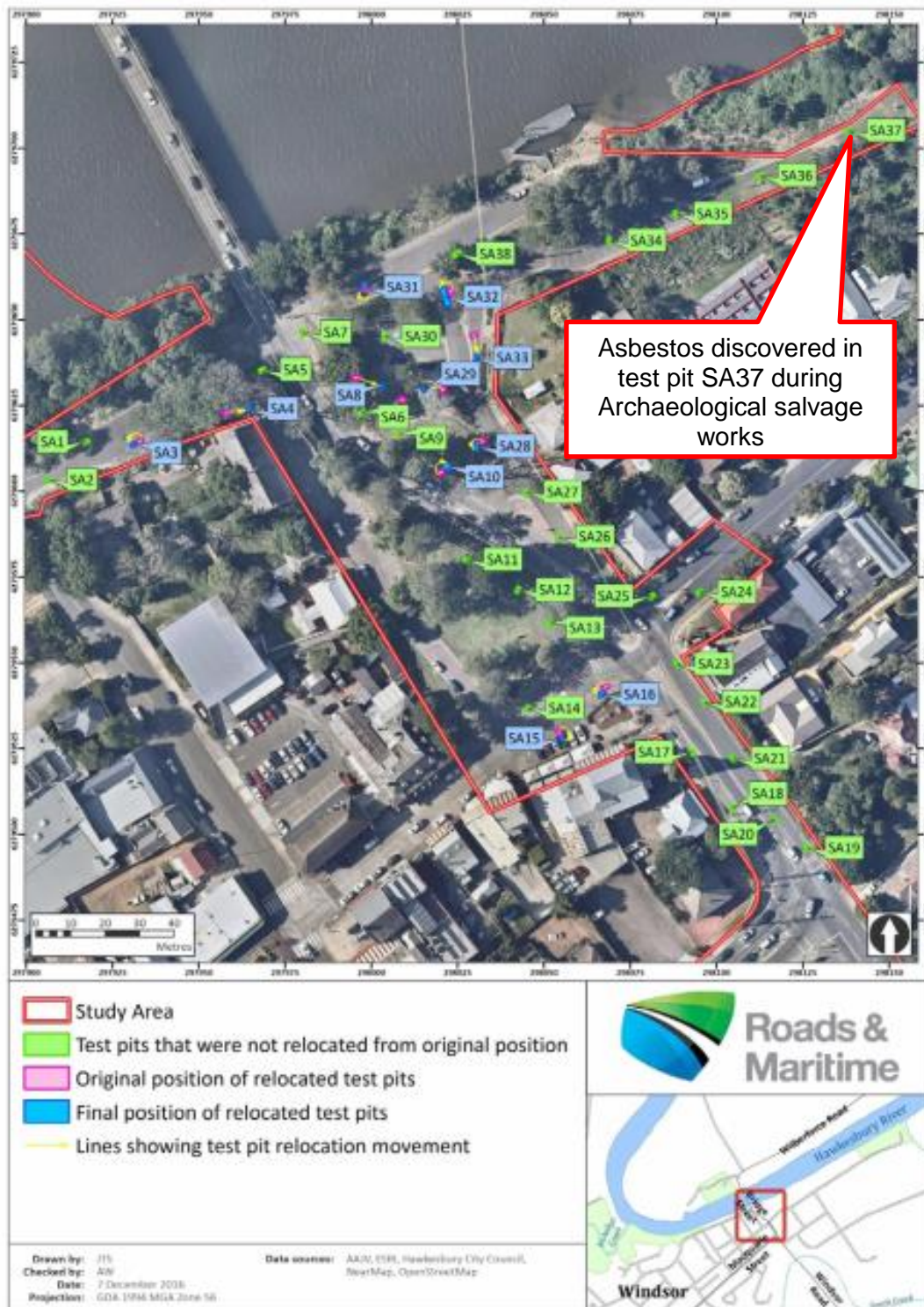
The processes described in Section 9 of the CEMP may result in the need to update or revise this Plan. This will occur as needed.

Any revisions to the CCLMP will be in accordance with the process outlined in Section 9 and 10 of the CEMP, including consultation with TFNSW and relevant stakeholders.



# Appendix A

## Asbestos discovery within archaeological test pits





# Construction Contaminated Land Management Plan

## Appendix B

### Unexpected Finds Procedure

#### Revision history

Revision	Date	Description	Approval
0			
C	31/07/18	DPE & ER review	
B	25/06/18	RMS review	
A	28/05/18	For review	

#### Distribution of controlled copies

Copy no.	Issued to	Version
1	RMS	A
2	RMS	B
3	RMS	C

# Unexpected Finds Procedure

## Purpose

The purpose of this management procedure is to effectively manage any unexpected finds of contaminated material on the Windsor Bridge replacement Project

## Scope

There is potential for previously unidentified contaminants to be uncovered during the works. This might be by observation of any unusual physical/sensory characteristics of the impacted soil, such as changes in colour, changes in texture, visual evidence, or odour. Unexpected finds may include unexpected discovery of hazardous building materials, such as asbestos containing materials, or unexpected discovery of contaminants in addition to the type already identified on-site, such as surface or buried material with visual or olfactory evidence of contamination.

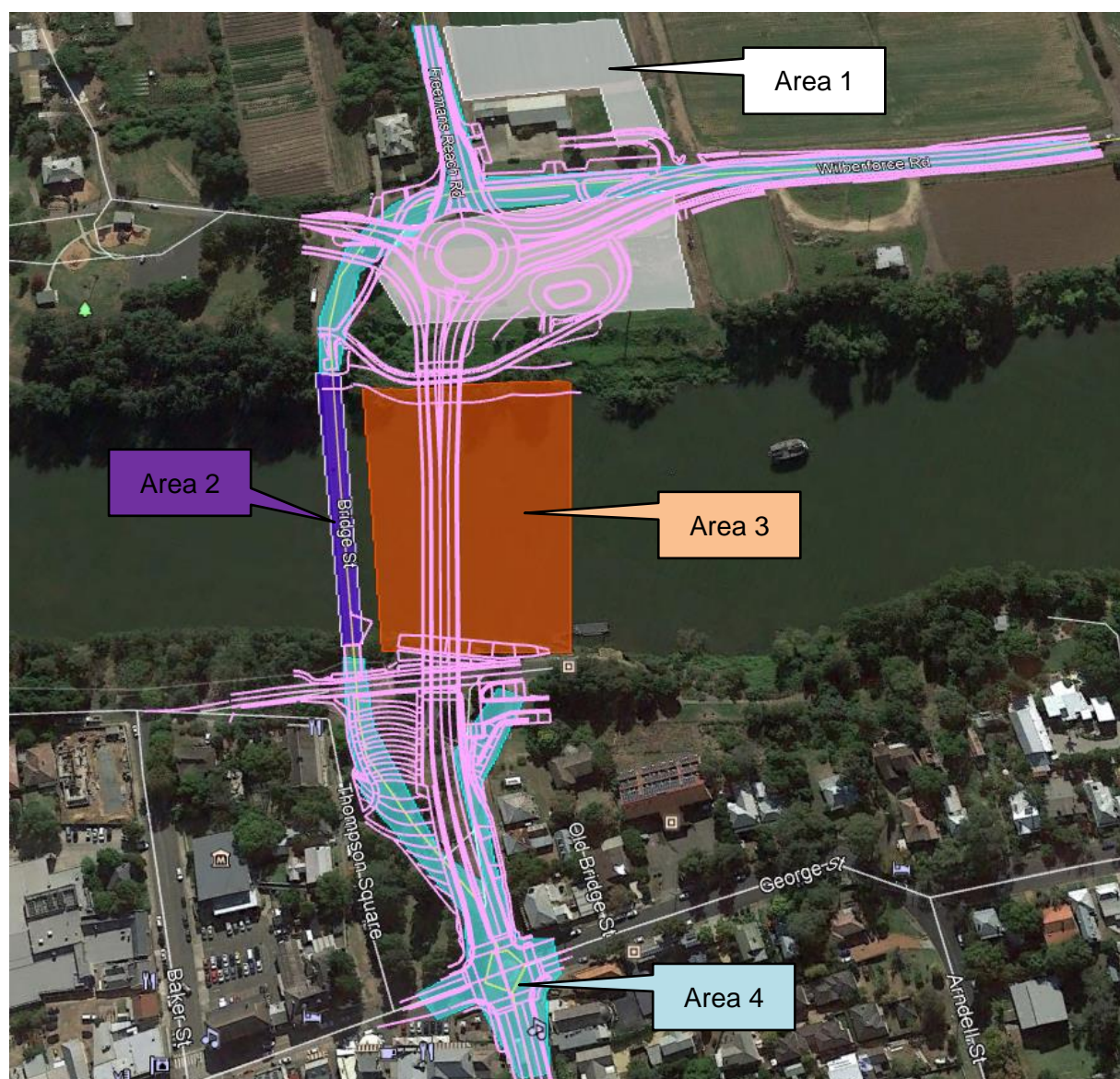
## Potential contaminants of concern

Based upon the outcomes of the Stage 1 preliminary site investigation and the Stage 2 detailed site investigation the sites and potential contaminants of concern have been identified in the table below.

Site/ source	Contaminants of concern	Location
Area 1 Turf farm / agricultural areas	Organochlorine Pesticides (OCP), Organophosphorus Pesticides (OPP), herbicides and heavy metals.	To the north and east of the northern approach of Windsor Bridge. Forms part of the proposed roundabout on the northern bank.
Area 2 Deterioration of bridge structures underneath Windsor Bridge (i.e. crossbeams, utility pipes and pits, break walls and pylons).	Heavy metals (associated with paints), asbestos, and Total Petroleum Hydrocarbons (TPH), Benzene, Toluene, Ethylbenzene, Xylene (BTEX), Polycyclic Aromatic Hydrocarbons (PAH), Polychlorinated Biphenyls (PCB) (associated with fill material behind the break walls).	Underneath the first span of the bridge on both the northern and southern sides. Utility pipes and pits associated with the bridge.
Area 3 Deposition of potentially contaminated sediments from upstream during flooding events.	The EIS concluded Cu, Pb, Zn concentrations are below the low range Interim Sediment Quality Guidelines (ANZECC 2000) and indicate that the sediments in the river around Windsor are not contaminated.	Along river banks and sediments throughout the site.
Area 4 Existing road pavements	Coal tar	There is potential for coal tar to be found in the existing road pavements, although none has been identified in the EIS for the project area.



## Mapped areas of potential contaminants of concern



### Induction/Training

All Georgiou personnel are to be inducted on the identification of potential land contamination including asbestos contaminated material and coal tar in existing asphalt. They will be trained in the relevant actions associated with this procedure during the project site induction and regular toolbox talks.

### Procedure

Follow the procedure listed below in the case of unexpected contamination finds;

1. Works will cease in the area and the supervisor and ESR will be notified immediately
2. The area should be cordoned off to prevent access by other workers and public
3. The ESR will notify TFNSW Representative and engage a suitably qualified environmental consultant to provide interim advice based on visual inspection on construction health and safety, material storage and material disposal to allow construction to proceed as soon as practical.

4. The suitably qualified environmental consultant will prepare a Remediation Action Plan in accordance with EPA guidelines on contaminated land management and this will be provided to TfNSW under G36 hold point cl 4.2.3.
5. Unexpected potentially contaminated material will be excavated and separately stockpiled in a secure location on strong impermeable plastic sheeting and covered top and sides with securely fitted plastic sheeting.
6. The stockpile will be protected by adequate sediment controls to collect runoff and prevent overland stormwater flow from affecting the base of the stockpile.
7. Potentially contaminated materials from different parts of the construction area will be segregated into separate stockpiles. The separate stockpiles should be signposted and the source location of the materials on site recorded.
8. When the potentially contaminated material has been removed, the area from which this material was excavated will also be isolated. Further excavation or other construction work will not occur in that area until advice from a suitably qualified environmental consultant is provided confirming that any contaminated material has been removed and that the area is suitable for further excavation or construction activity.
9. The location from which potentially contaminated materials is excavated and the location of the stockpile of excavated material will be recorded on a site plan. Records will include an outline of the area and depth of the potentially contaminated materials and the volume of material excavated.
10. A suitably qualified environmental consultant will assess the potentially contaminated material and prepare a report advising whether the material is contaminated at levels exceeding the NSW EPA endorsed guidelines for reuse on-site and/or whether the material needs to be disposed of off-site as waste, and the classification of that waste.
11. Where contaminated material is assessed as being unsuitable for reuse on site, the area where the material was excavated will require validation.

#### **For asbestos**

- If any potential asbestos found during construction, works should cease in the area and an asbestos assessment should be conducted by suitably qualified environmental consultant.
- The removal work must be undertaken in accordance with How to manage and Control Asbestos in the Workplace and How to Safely Remove Asbestos which includes the disposal of the material at an appropriately licensed facility by appropriately licensed personnel. Air monitoring will occur if the risk assessment, indicates the need for it.

#### **For Coal tar**

- If encountered, it must be managed in accordance with the Coal Tar Management Plan (CEMP Appendix B9) and TfNSW's "Technical Direction Environment ETD 2015/021: Coal tar asphalt handling and disposal".
- All excavated coal tar must be disposed of to an appropriately licensed facility in accordance with the requirements of NSW EPA Waste Classification Guidelines. The potential contaminated area will be quarantined, including from the public and will be communicated to all persons working on a site. A suitably qualified environmental consultant will be engaged to do further investigation to verify the substance and level of contamination.