# MARINE POLLUTION RESEARCH PTY LTD

Marine, Estuarine and Freshwater Ecology, Sediment and Water Quality Dynamics A.B.N. 64 003 796 576 25 RICHARD ROAD SCOTLAND ISLAND NSW 2105 PO BOX 279 CHURCH POINT NSW 2105 TELEPHONE (02) 9997 6541 E-MAIL panink@bigpond.com

Mr. S Crosby Steven Crosby & Associates Pty Ltd PO Box 204 CHURCH POINT NSW 2105

01 June 2022

# PROPOSED BOATSHED AND SHARED JETTY EXTENSION 5-7 RICHARD ROAD SCOTLAND ISLAND - ACID SULFATE SOIL (ASS) ASSESSMENT AGAINST CLAUSE 7.1 OF THE PITTWATER LEP 2014



**Figure 1** View of existing shared jetty facility at Nos 5 to 7 Richard Road Scotland Island looking at No 5 (east side). The proposed boatshed and ramp will be located off the wooden deck at No 5.

#### **1 INTRODUCTION**

I have been requested by *Stephen Crosby and Associates Pty Ltd* (SCA) to provide an Acid Sulfate Soil Assessment Report for a proposed shared jetty extension at Nos 5 to 7 Richard Road Scotland Island (**Figure 1**) plus a new Boatshed and ramp facility at No 5. The proposal is set out on drawings 2151-DA01 and DA022 Site Plans and DA03 Sections and Elevations dated July 2021 and prepared by *Stephen Crosby & Associates Pty Ltd*. As the land where the proposal is sited is *Class 1* on the acid sulfate soil hazard map, the proposal requires assessment against Clause 7.1 of the Pittwater LEP 2014.

The project will require the following in-ground works:

- Demolition of the existing facility sea-stairs plus a portion of the outer deck, including six associated piles. Construction will require placement of eight piles for the elongated jetty plus the relocated shared deck and sea-stair facility.
- The proposed boatshed facility and the walkway plus ramp facility require placement of 13 piles into high intertidal rock rubble over basement rock or into inshore sand plus gravel over basement rock.

#### **1.1 Land and Seabed Descriptions**

The land and seabed at the site are described as follows (see **Figures 2 and 3**):

- The foreshore for the No 5 property (for the boatshed) comprises a reclamation behind a block sandstone seawall with paving.
- The proposed inshore works are located over a low gradient intertidal basement rock shelf which is covered with rock rubble or silty sand of varying thickness
- The basement rock shelf dips gently down to the north-east with progressively more rock rubble cover and more basement rock-shelf exposed.
- The rock rubble and exposed basement rock extends to around 19m offshore with a progressively thicker silty-sand cover offshore and under the proposed shared jetty outer works.

Figures 2 and 3 show the existing inshore rock rubble and sandy cover over basement rock at the subject and adjacent properties at low tide becoming deeper offshore silty sand cover offshore.

Marine Pollution Research Pty Ltd



Figure 2 Basement rock and shale in upper intertidal at No 5 (looking west).



**Figure 3** Basement rock and shale in upper intertidal that transitions to muddy sand and sand offshore at No 7 (looking south)

# 2 CLAUSE 7.1 OF PITTWATER LEP 2014 & ASS MANUAL REQUIREMENTS

5 Richard Rd Scotland Is ASS Assessment MPR 1352

Marine Pollution Research Pty Ltd

- 4 -

This Section sets out the Pittwater LEP 2014 (PLEP) requirements as follows:

PLEP Clause 7.1 (2) states that Development Consent is required for the carrying out of works described in the Table to this subclause on land shown on the <u>Acid Sulfate Soils Map</u> as being of the class specified for those works and for Class 1 Lands the works are described as "any works". LEP Clause 7.1 (6) states that Despite subclause (2), development consent is not required under this clause to carry out any works if:

(a) the works involve the disturbance of less than 1 tonne of soil and

(b) the works are not likely to lower the water-table.

The ASS Manual (ASSMAC 1998) model ASS LEP states inter alia that:

The Model Acid Sulfate Soils LEP requires that if works:

- involve disturbance of more than one (1) tonne of soil or lowering of the water-table; and
- trigger the criteria relating to the land (see the ASS Planning Maps which are based on the level of risk associated with the soil characteristics and the depth and type of works),

a preliminary test must be undertaken to determine if an ASS Management Plan is required. If an ASS Management Plan is required, a development application must be lodged for the works. The Model ASS LEP clauses only apply to works likely to result in environmental impacts from the disturbance of acid sulfate soil. - 5 -

### **3 ASSESSMENT OF PRESENT APPLICATION AGAINST LEP PROVISIONS**

The proposal is located in southern Pittwater, which has the full tide range of around 0m Lowest Astronomical Tide (LAT) to +2m HAT (Highest Astronomical Tide). The project Plan Contours are shown as mAHD, where 0m AHD approximates +0.925m LAT. The site is open to South East Pittwater and Bayview to the south with resultant wind waves and passing vessel wash.

With respect to ASS impact assessment, the works require removal of six existing piles that support the present jetty head and placement of eight new piles for the new shared jetty head and sea-stairs. The inshore boatshed, ramp and walkway will require the placement of 13 support piles.

#### 3.1 Potential for ASS Soil Disturbance During Demolition

In terms of disturbance of the seabed for the demolition phase, the proposal requires the removal of six jetty piles:

- Piles are generally driven to around 3m depth on average in Pittwater and due to remobilisation and bioturbation of surface sediments by physical and faunal activity over time, the top half metre of seabed sediment is saturated by overlaying oxygenated waters so that there is no significant PASS remaining in this upper layer.
- Assuming a (conservative) consistent level of PASS in sub-surface sediments, up to 2.5m of pile surface are driven into PASS sediments. At about 0.3m diameter, each pile has a maximum 2.35m<sup>2</sup> of pile surface in contact with PASS sediments prior to pulling.
- For the pile removal project to generate the 1000kg of disturbed PASS required for PLEP Clause 7.6, each 0.3m diameter pile would need to disturb and bring to the surface some 167 kg of PASS sediment.
- That is, each pile would need to have a minimum 70 mm depth layer of PASS uniformly adhering to the whole 2.5m length of pile brought to the surface.

Whilst these piles have been driven into sub-surface PASS sediments during construction, when they are subsequently removed (generally by direct extraction from the ground), this is almost always done using barge mounted equipment with the piles then extracted through tidal waters:

- For the most part there is very low adhesion of sub-surface soils extracted with the piles, as friction effects from the surrounding pressurised soils during the extraction process rubs the soils off, with residual sub-surface soil mixing with shallow saline and non-ASS surface sediments on final extraction.
- Accordingly, for the most part there is a short pulse of adhered soil material dispersed to the overlaying waters as the pile is extracted through the water column.

5 Richard Rd Scotland Is ASS Assessment MPR 1352

• Rarely, where there are adhesive clays, there may be some sediment adhering to the piles as it is raised above the surface and these are likely to be PASS. These layers are thin (no more than 5mm) and non-uniform in areal distribution around the pile.

The resultant pulse subsurface sediments mobilised by the pile extraction procedure are dispersed in the estuarine waters and do not provide any ASS hazard, as they remain saturated in the estuarine waters and ASS/PASS require time out of the water for these soils to be oxygenated (in air) to trigger or start the acid forming process. These soils will eventually be dispersed and reincorporated into estuarine sediments and pose no ASS/PASS risk to overlaying waters or to seabed sediments and seabed biota.

Whilst the small amounts of PASS that may remain adhered to the piles that are brought to the surface can become ASS, this requires considerable time (up to 18 hours exposure to air). Whilst overall this is a low risk given the small amounts of soils that are actually brought out of the water, the risk can be further minimised by appropriate pile removal management as detailed in **Section 3.5** below.

# 3.2 Potential for PASS Soil Disturbance During Construction

In terms of PASS soil disturbance during construction, there will be no excavation required for the project as all piles are to be driven into the seabed.

- All the new piles are to be driven into inter-tidal or shallow sub-tidal sediments from a bargemounted pile driving rig and therefore there will be no sediments mobilised, as the pile driving action pushes and compresses soils aside with some entrained downwards via friction effects. As a result, the sediments remain intact and under water, and as they are not exposed to air, there is no risk of acid generation arising from piling activities.
- Pile driving is associated with pulse turbidity, and this is caused partly by rig and pile driving head lateral vibration, and also via compression of sediments, whereby the laterally-compressed sediments compress waters in adjacent benthic fauna burrows jetting turbid water up out from burrows.
- As the local waters are generally full marine salinity, these sediments rapidly fall back to re-settle on the seabed.
- There is therefore no 'secondary excavation' or any exposure to air of sediments associated with turbidity caused by pile placement/driving.

5 Richard Rd Scotland Is ASS Assessment MPR 1352

- 6 -

- 7 -

#### **3.3** Potential for Alteration of the Water Table

The level of the water table below the tidal seabed will fluctuate dynamically according to the interplay of gravity pressure from fresh groundwater flow (which varies with the rate of wet or dry weather infiltration), and the back pressure imposed by the tidal waters that saturate the seabed sediments down to the water table.

Accordingly, removal or placement of piles will have no material effect on the sub-surface water table levels nor on the rates of exchange/mixing of freshwater groundwater with overlaying saline waters. That is, there is no potential for alteration of the water table associated with pile removal or driving activities into intertidal and sub-tidal waters. Further, as there are no temporary or permanent excavations associated with the project inshore, there will be no lowering of the local water table.

#### 3.4 Assessment against Pittwater LEP 2014 Clause 7.1

In sum, no soil is to be excavated for the piling project, there will be less than 1 tonne of PASS disturbed for the project, and the small amounts of PASS that would be disturbed and brought from the seabed surface would for the most part be returned to the estuarine waters to be dispersed and re-incorporated into the seabed sediments with no exposure to air. and no opportunity to become ASS. Accordingly, the project would meet both provisions of Pittwater LEP Clause 7.1 (6) and thus the project should not require development consent under Section 7.1 (2), and there is no requirement for the preparation of an ASS Management Plan as per Clause 7.1 (3).

Over and above this conclusion, it is also concluded that there is likely to be a small residual amount of PASS adhering to some piles that are removed which, if left intact on the piles, and with the piles subsequently stored exposed to air, could generate a small amount of acid.

Whilst, based on my assessment of the proposal, I conclude that the project as described above would meet the objectives of Clause 7.1 (1), in that the development would not disturb, expose or drain acid sulfate soils OR cause environmental damage to the locality or to the waters and ecology of Pittwater, I also conclude and recommend that the residual risk from the small amounts of sediments adhering to pulled piles as described above be managed *in situ* via the following recommended pile removal management plan.

#### 3.5 Recommended Pile Removal and Placement Management Plan

The following Pile Removal and Placement Plan is intended to mitigate any residual environmental risk from the small amounts of sediments adhering to pulled piles:

- 1. Pile removal and placement works are to be enclosed using a floating silt curtain to facilitate rapid dispersal of disturbed sediments back to the seabed.
- 2. All seabed sedimental material on demolished piles is to be hosed off piles prior to piles leaving the silt curtain area, preferably as each pile is being pulled.
- 3. Piles or demolition material with adhered sub-surface seabed sediment that cannot be cleaned immediately but needs to be stored exposed to air prior to cleaning must be washed and hosed off into estuarine waters contained by the floating silt curtain as soon as practicable with a maximum exposure time of 18 hours.
- 4. For any pile or other demolition material with adhered sediment that cannot be cleaned immediately, the operator/contractor must keep a log book entry of the time of extraction out of the water, the manner and place of storage of the material and the time, manner and placement of hosed off material (in accordance with point 3 above).

Signed:

Pour Animeli

This report has been prepared by Paul Anink, Managing Director and Principal Scientist at Marine Pollution Research Pty Ltd. Final Report 01 June 2022.