



Acid Sulfate Soil Report

Address | 167 Riverview Road, Avalon Beach

Client | Mr Simon Ehrlich

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Job Number 23-072-02

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1. Report Background

1.1 Purpose of the Report

Northern Beaches Council has requested that Acid Sulfate Soil issues for the domestic maritime facility at 167 Riverview Road, Avalon Beach ("The Property") be addressed.

An underwater survey and a Marine Habitat Survey report was prepared for Mr Simon Ehrlich by Waterfront Surveys Australia in July 2021. Sediment samples have not been collected for laboratory analysis of acid sulfate soils. This Acid Sulfate Soil desktop report is to be read in conjunction with that Marine Habitat Survey report, as the proposed plans have not changed.

The purpose of this report is to provide all the necessary data required for an assessment to be done by Northern Beaches Council in regard to Acid Sulfate Soil issues at The Property.

1.2 Background About Acid Sulfate Soils

Acid sulfate soils (ASS) are soils that contain iron sulfides (mostly pyrite). ASS are widespread in estuarine floodplains of coastal NSW; found in coastal lowlands such as mangrove tidal flats, salt marshes and low-lying swamp areas. When drainage or excavation brings atmospheric oxygen into these previously waterlogged soils, the pyrite is oxidised to form sulfuric acid. As the acid moves through the soil profile, it can release contaminants such as aluminium and heavy metals. These contaminants may enter surrounding waterways, significantly decrease water quality, killing fish and damaging sensitive ecosystems.

Should the production of acid exceed the neutralising capacity of soil, so that the pH falls to below 4, these soils are known as actual acid sulfate soils (AASS). Potential acid sulfate soils (PASS) are waterlogged soils rich in pyrite that have not been oxidised, and are completely innocuous to the environment if kept underwater and not exposed to atmospheric oxygen (Naylor *et al.* 1998 and OzCoasts 2008).

2. Proposed Structures of the Waterfront Development

The proposed waterfront development at The Property consists of the installation of a new jetty, ramp, pile stabilised pontoon and mooring pile. The only components of the proposed works that would involve any disturbance to the seabed are:

- five turpentine jetty piles;
- two hollow steel pontoon stabilising piles; and
- one turpentine mooring pile.

The five jetty piles and the single mooring pile would be constructed of turpentine wood. These piles would be hammered into the mixed sandy and rocky subtidal seabed. They would not require any pre-drilling and there would be no upwards movement of seabed sediment.

The two pontoon piles would be constructed of hollow steel, with teeth welded on their toes. These two piles would be drilled to set level.

There is no dredging proposed in this development.

3. Assessment of Potential Acid Sulfate Soil Impacts of the Proposed Development

The only disturbance to the seabed at 167 Riverview Road, Avalon Beach from the proposed development would be the insertion of five turpentine jetty piles, one turpentine mooring pile and two hollow steel pontoon stabilising piles into the seabed. There is no dredging works proposed.

The piling works would create a short-term increase in turbidity, with the displaced sediment remaining in suspension within the water column, before resettling to the seabed. No sediments would be exposed to atmospheric oxygen during these piling works, and therefore would not oxidise to form sulfuric acid. In addition, marine waters are relatively alkaline (approximately 8.0 – 8.2 pH) and have the capacity to resist pH change through the neutralising effects of carbonate buffering.

Due to the absence of dredging works at the site and the nature of the proposed piling works for the development, I have assessed that no sediments will be exposed to atmospheric oxygen. This then leads on to the assessment that the development will not cause the production of acid sulfate soils at the site of 167 Riverview Road, Avalon Beach.

Prepared by



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4. References

Acid Sulfate Soils Management Advisory Committee (ASSMAC) (1998). Acid Sulfate Soils Manual.

Naylor, S.D., Chapman, G.A., Atkinson, G. Murphy, C.L., Tulau, M.J., Flewin, T.C., Milford, H.B. and Morand D.T. (1998). Guidelines for the Use of Acid Sulfate Soil Risk Maps, 2nd ed., Department of Land and Water Conservation, Sydney.

OzCoasts (web reference 2008). Information about Australia's estuaries and coasts – Acid Sulfate Soils.