Preliminary Acid Sulfate Soil Assessment

43 and 45 Florence Terrace - Scotland Island

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Date of issue:
3/03/2023

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1.1. Introduction

The owners of 43 and 45 Florence Terrace, Scotland Island (the Site) are proposing to install a new ramp and pontoon (with two pontoon piles) and berthing area (with three mooring piles). These waterfront structures will all be located below the Mean High Water Mark (M.H.W.M.) at the site.

Northern Beaches Council's online mapping tool identifies the site as having 'Class 1' soils. The classification of the site as 'Class 1' indicates a high probability that acid sulfate soil (ASS) could be present at the site. As required by clause 7.1 of Pittwater Local Environment Plan 2013 (PLEP), an ASS preliminary assessment is required for the site to ensure that the proposed development does not disturb, expose or drain acid sulfate soils and cause environmental damage.

This ASS preliminary assessment:
- considers the PLEP, relevant mapping and guidelines relating to ASS;
- considers the proposed works and the potential of the disturbance that may require further management;
- outlines the mitigation measures that will be implemented to manage potential ASS;
- determines if an ASS Management Plan is required for the site, in accordance with the Acid Sulfate Soil Manual 1998, (*Acid Sulfate Soil Management Advisory Committee NSW ASSMAC 1998*).

1.2. Project Proposal

The works will consist of the following new waterfront structures (see also **Figure 1**):

- ramp (9.0 x 1.2m), aluminium frame with hardwood timber decking;
- floating pontoon (3 x 4m) with two (2) timber pontoon piles. The pontoon would be aluminium - framed with HDPE floats and hardwood timber decking; and
- berthing area with three mooring piles.

1.3. Planning controls and guidelines

The relevant planning controls and guidelines include:

- Pittwater Local Environmental Plan 2014 (PLEP);
- Acid Sulfate Soil Manual 1998 (Acid Sulfate Soil Management Advisory Committee NSW ASSMAC 1998); and
- Model Acid Sulfate Soils Local Environmental Plan 1999 (Model ASS LEP).

The proposed 'water recreational facilities' are permissible with consent in the W1 zone under the PLEP, and the design has been completed in accordance with Pittwater council's development controls. Northern Beaches Councils online mapping tool shows there are potential ASS on the site (Class 1) which require further consideration in relation to the proposed works.

The Acid Sulfate Soil Manual (1998) notes that a preliminary assessment of the site should:

1. review the relevant planning instruments (section 1.3);
2. establish the nature of the proposed works – (refer to **sections 1.2 & 1.6**);
3. review information from contractors experienced in such works and take advice from acid sulfate expert consultants (throughout document);

4. establish whether ASS are present on the site and if they are in concentrations that warrant the preparation of an ASS Management Plan (refer to **sections 1.4 & 1.6)**.
5. provide information to assist in designing a soil and water assessment program – if needed.
6. provide information to assist in decision making.

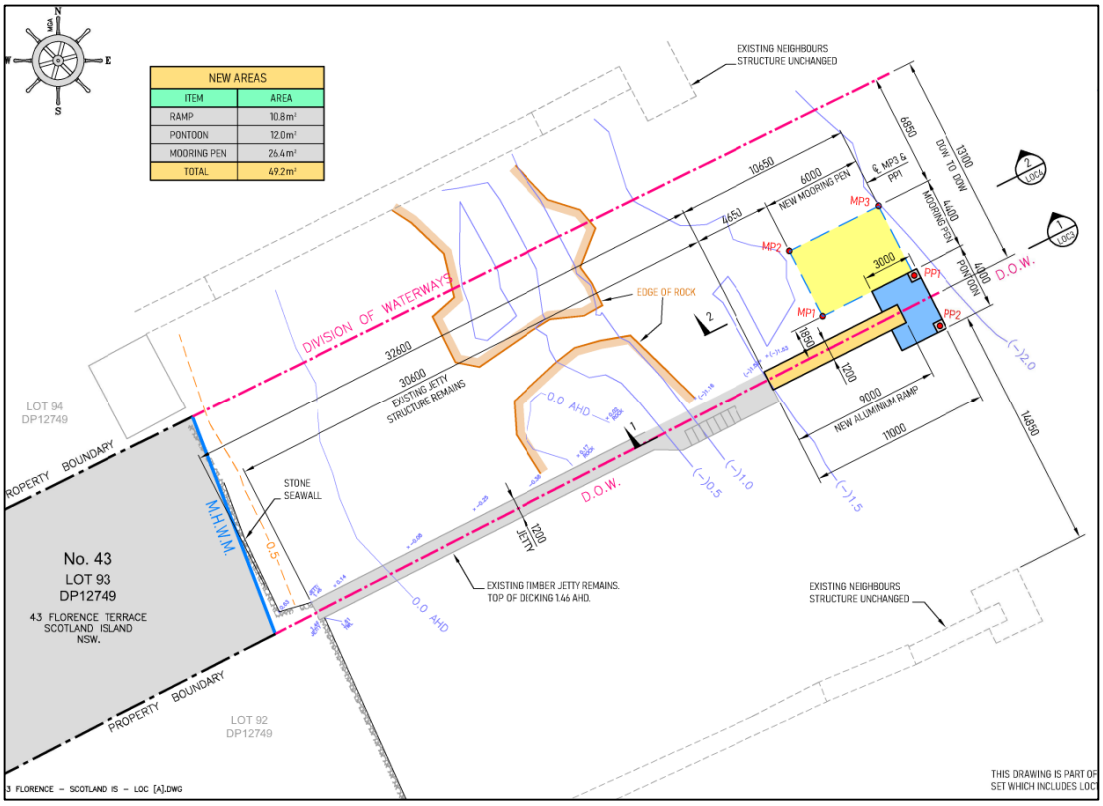

Figure 1 – Proposed works

1.4. ASS Maps

Preliminary site investigations using Council's online mapping tool identify the site as having Class 1 soils with a high probability of ASS (coloured blue on **Figure 2**). Note the Class 1 soils are located below the M.H.W.M) where the proposed works will occur.

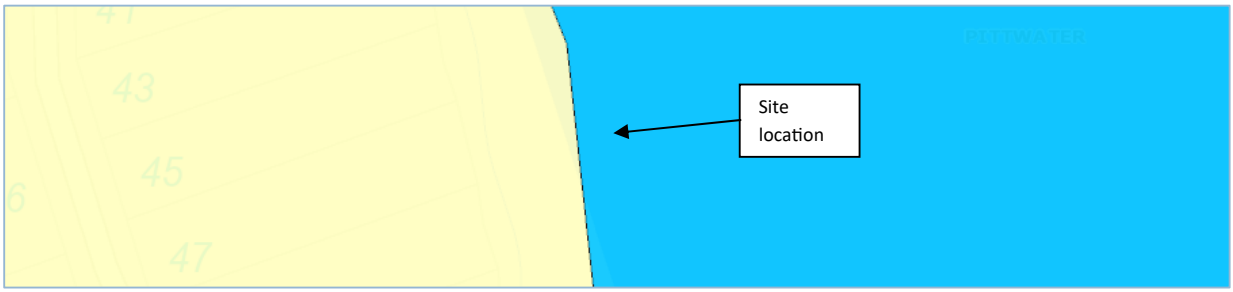

Figure 2- Council ASS mapping

1.5. Understanding ASS

ASS are naturally occurring soils containing 'iron sulfides'. The disturbance of this soil and subsequent exposure to air begins an oxidation process which creates of sulfuric acid. Sulfuric acid can leach into natural waterways, creating severe environmental impacts.

Acid sulfate soil requires time out of the water, exposed to the air, to activate the formation of sulfuric acid. It is understood that due to time and natural ecological action, sediments on the surface of the seabed in this area of up to approximately 0.5m are saturated by overlaying oxygenated waters. This upper layer of sedimentation offers no significant potential of acid sulfate soil.

1.6. Works and Risk Analysis

The existing site is located in a Class 1 area, identifying that there is a "high possibility" of ASS present in the area of the proposed works. The key risk associated with the proposal is the pile driving works, as the piling of the two pontoon piles and three mooring piles will be directly into Class 1 soils (in the seabed).

PILE DRIVING

The piling will be completed using the drilling of a socket, approximately up to a maximum depth of 2.5m into the solid seabed.

Pile driving exerts downwards forces on the seabed. During pile driving, the sediment remains under water, resettling on the seabed quite quickly due to the natural compounds in the water of the area. Spoil will not be removed from the water and therefore not exposed to the air but may create temporary turbidity of the water. This turbidity will be controlled and minimised using silt curtains.

As there will be no removal of soil from the water and any disturbance will further be controlled in water, there will be **minimal risk of any exposure** of the soil to the air to trigger any oxidation process and any formation of sulfuric acid.

The overall analysis returns a **"low" risk level** for any pollutants associated with ASS. The information provided in this report meet the provisions of PLEP 7.1.

FURTHER CONCERNS

Responding to PLEP 7.1, construction works involving piles without any excavation works, will have no material impact on the local water-table (intertidal or sub-tidal), either from the perspective of the level of the water-table or from the perspective of the balance of freshwater vs groundwater vs saline waters.

No other disturbance to the seabed area will be undertaken as part of this proposed development.

1.7. ASS - Mitigation Measures

As the project managing entity, Copley Marine Consulting Group requires contractors under its project management banner to adhere to accepted best practise during all constructions works, as will be noted as part of the Construction Environmental Management Plan.

Maritime structures in the local waterway must be maintained in good and safe repair as per License agreements with Crown Lands. This means that piling works will always be necessary and so best practise for acid sulfate soil mitigation has been developed for general use by environmentally conscious contractors. This best practise as outlined below, is the generally accepted best workable mitigation plan for pile works.

Best practise mitigation methods include:

- Use of silt curtains to minimise any movement, specifically outwards spread, of sediment and hasten the settlement process once the disturbance has ceased.
- The use of specific barge mounted piling equipment.
- The washing down, from the water barge, of removed piles prior to relocating them for destruction or reuse. If this immediate washing down is not possible, then the cleaning of said piles into water within a short window (usually 12-18 hours) and the recording of such activities for future reference.

With these measures in place, the works are classified low risk in terms of the potential for ASS to be disturbed, exposed to the air and oxidised. The environmental mitigations identified above will be implemented within the Construction Environmental Management Plan for the site to assist in limiting the disturbance of soil. As the proposal is low risk, a detailed ASS Management Plan is not required for the works.

1.8. Conclusion

This preliminary assessment of the proposed works has been prepared in accordance with clause 7.1 of the PELP and the Acid Sulfate Soils Manual 1998.

The proposed works are in an area with Class 1 ASS classification on the Council ASS hazard map which requires a preliminary assessment of the associated risk of the works and the impact to the environment.

The piling works will be completed using a piling barge with washing facilities and silt curtains with no soil being removed from the water (or a wet environment) to start the oxidization process. While temporary turbidity of the water will occur, the piling works will be completed individually and hence the volume of disturbance will be limited and closely managed.

Silt curtains, installed prior to works, will be utilised during pile driving and pile removal operations to limit the spread of soil outside of the existing pile driving/ removal area and assist in settling it back to the seabed quickly. The site Construction Environmental Management Plan will include these measures to assist in limiting the disturbance of soil.

The preliminary assessment has found that potential ASS will not be oxidised and therefore an ASS Management Plan is not required (as per the Acid Sulfate Soils Manual 1998). In addition, it is considered the works meet the objectives of clause 7.1 of the PLEP in that the development would not disturb, expose or drain acid sulfate soils and cause environmental damage.