



ACID SULFATE SOILS MANAGEMENT PLAN

Submission to Byron Shire Council

To undertake the demolition of a single two storey dwelling and the construction of a multi dwelling housing development comprising 4 x two storey dwellings and 4 x in ground swimming pools with associated swimming pools, driveways and landscaping.

Lot 4 Section 19 DP758207
No. 50 Shirley Street, Byron Bay

for:
Mr. David Willis

April 2021



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1. Executive Summary

Ardill Payne and Partners (APP) has been engaged by David Willis to provide town planning services in the preparation and lodgment of a development application and statement of environmental effects with Byron Shire Council.

The proposed development involves the erection of a multi dwelling housing development containing 4 x double storey dwellings and 4 x in-ground swimming pools upon a residential lot at No. 50 Shirley Street, Byron Bay.

Works are proposed to be undertaken within land mapped as partial Class 3 and partial Class 5 acid sulfate soils as per the Byron LEP 2014. Consent is therefore required for:

Class 3

- works more than 1m below the natural ground surface
- works by which the watertable is likely to be lowered more than 1m below the natural ground surface

Class 5

- Works within 500 metres of adjacent Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum and by which the watertable is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2, 3 or 4 land

An ASSMP can be prepared as a contingency plan under the guidelines without detailed investigations. Therefore a management plan for any acid sulfate soils that may be encountered during the works has been prepared.

Provided below is the following:

- aerial photograph of subject and adjoining land – **Figure 1**
- contour and detail survey of the subject land – **Figure 2**
- extract of Council's acid sulfate soils map – **Figure 3**



Figure 1 – Subject Site Extract SIXMaps

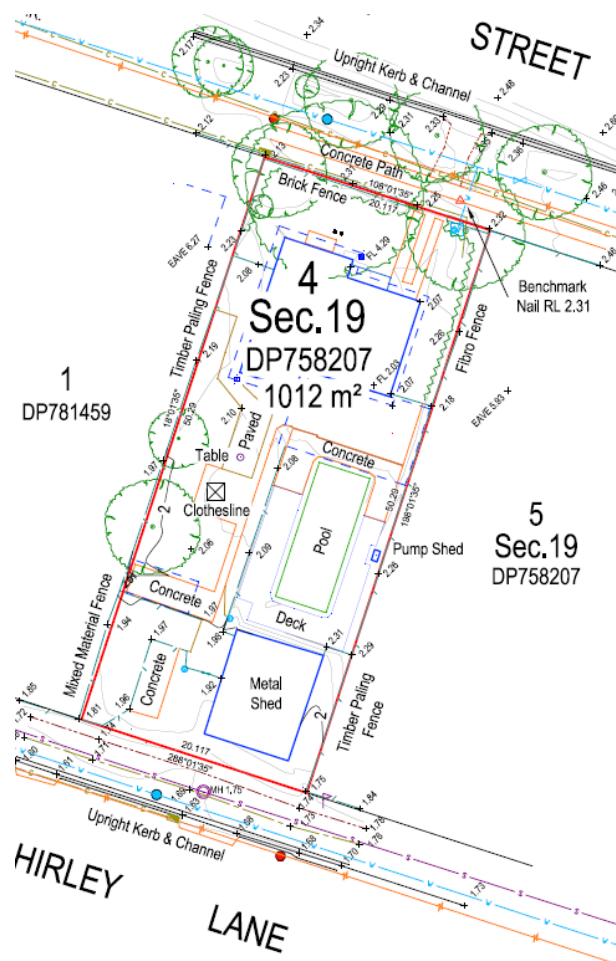


Figure 2 – Extract of contour and detail survey



Figure 3 – ASS Mapping (BLEP)

2. Acid Sulfate Soil Identification

The field pH of ASS in their undisturbed state is pH 4 or more and may be neutral or alkaline. They pose a considerable environmental risk when disturbed, as they will become severely acidic when exposed to air and oxidised.

Any lowering of the watertable or excavation that removes the watertable that protects potential acid sulfate soils will result in their aeration, and the exposure of iron sulfide sediments by drainage or excavation to oxygen, will generate sulfuric acid.

Should acid sulfate soils be identified during the works, then the management practices outlined in this report shall be adhered to.

During the installation of foundations/footings, underground services and the construction of the in-ground swimming pools in potentially affected areas, excavated material shall be visually inspected. Potentially contaminated material may have some or all of the following characteristics:

- have a sulphurous or tar like smell when excavated
- may contain blue or green material
- may contain pale yellow staining or mottling within the excavated material
- may be water-logged soils, soft buttery blue grey or dark greenish grey muds
- may be mid to dark grey estuarine silty sands or sands
- may be dark grey to black bottom sediments of estuaries

If potentially ASS are identified in the excavation or in material being removed, works should immediately halt and the following actions be undertaken:

- APP environmental consultant (EC) be contacted
- immediately bund material excavated whilst awaiting confirmation on material type
- APP EC to undertake a visual assessment and testing to determine if materials are ASS

If material is identified as ASS follow management practices outlined in this report.

3. Treatment Measures

3.1 Soil Treatment Measures

If any samples taken during the works indicate that they contain ASS, the following procedure is to be employed:

- Excavated material spread within a designated bunded area in layers of workable depth (typically not more than 0.3m loose thickness);
- Lime applied to the excavated AASS/PASS material as well as around the base of the excavation, at a rate as indicated by the appropriate laboratory sample results to neutralise potential acidity;
- Lime thoroughly mixed with soil materials through the use of a rotary hoe, pulvi-mixer or some similar mechanical process as nominated by the contractor to achieve a thorough mix. The liming should be confined to areas of manageable size and an apron of fine lime shall be provided when stockpiling for any length of time;
- Field testing of soil and water will be required to verify that the lime has neutralised AASS or PASS materials and increased the pH;
- Validation soil samples collected at a rate of one sample per 250m³ of excavated soil and submitted for laboratory analysis using the SPOCAS method. Testing will be required to produce Total Potential Acidity (TPA) results of less than the action criteria in Table 4.4 of the ASSMAC guidelines;
- Should the field pH tests show that the soil acidity has not achieved the above standard, then the material must be re-worked and more lime added until it is verified that the soil meets the required standard;
- If the soil results show great variability, then the treatment rates should be re-assessed and higher frequency verification tests adopted (eg 1 in 150m³); and
- Once adequate neutralisation is achieved, the soil will be suitable for replacement as trench back-fill. Excess soil shall be treated as specified above and disposed of on-site.

Results from monitoring shall be kept on-site during construction and be available for inspection by the engineer, Council or State Government officers. Details of the treatment and monitoring activities should be provided to the site Engineer on a monthly basis, until the completion of the works.

Delivery dockets for the agricultural lime should be kept with other site records to demonstrate that adequate neutralising agent was used on site.

3.2 Groundwater Treatment Measures

Groundwater may be intercepted during the proposed works however no de-watering is proposed, therefore no treatment of groundwater is proposed.

Surface water shall be directed away from any excavations.

4. Acid Sulfate Soil Waste Classification & Disposal

If an Acid Sulfate treatment process is required, then ASS/PASS excavated soils cannot not to be disposed of off-site until the following activities are completed. The activities described below principally relate to soil classification and legal disposal thereof. They are derived from the *NSW EPA Waste Classification Guidelines (Parts 1 & 4)* (NSW EPA, 2014).

- Following neutralisation, the generator of the waste must chemically assess the soil in accordance with Step 5 of Part 1 of the *Waste Classification Guidelines*. This will determine whether there are any other contaminants that may affect how the waste is classified for disposal.
- Once classified, the waste must be taken to a land-fill licensed to accept that class of waste.
- Prior arrangements should be made with the occupier of the land-fill to ensure that it is licensed to accept the waste. The land-fill site should be informed that the AASS has been treated in accordance with the neutralising techniques outlined in the ASS annual and that the waste has also been classified in accordance with Part 1 of the *Waste Classification Guidelines*.
- Records of who transported the waste and waste dockets/receipts for the waste facility will be kept by the responsible party.

The waste regulatory framework is established under the principal legislation of the *Protection of the Environment Operations (POEO) Act 1997*. Under Chapter 1, Section 6 of the *POEO Act*, the EPA is the appropriate regulatory authority for scheduled activities, where scheduled activities are those described in Schedule 1 of the *POEO Act*. This particular activity is described in clause 49 of Schedule 1.

5. Contingency Measures

The following contingency measures are for any works that are 1m below the existing surface, including excavations for foundations/footings, underground services and the construction of the in-ground swimming pools.

Soil from excavations is not expected to be stockpiled out of the excavation for longer than 24 hours, therefore no analysis is proposed for this material. If material is stockpiled out of an excavation for longer than 24 hours, soil acidity in disturbed materials should be monitored. Should the field pH tests show that the soil acidity has not been neutralised, then the material must be re-worked and additional lime treatment carried out until it is verified that the soil meets the required standard.

No water is proposed to be discharged off-site. However, in the event that water is required to be discharged off-site, if monitoring of collected water at the point of discharge indicates the pH is below acceptable discharge limits, then discharge must immediately cease and further treatment be carried out. Agricultural lime may only be applied following directions by the ASS Consultant who shall direct the Contractor in mixing procedures such that lime is added in small increments so as not to cause unduly high water pH levels (ie above 8.5). The agricultural lime shall be stored in a covered and bunded area to prevent accidental release to waters.

In the event that pH measurement of exposed soils in excavations does not meet required levels, lime shall be spread over the affected area and the pH levels further monitored.

Sufficient lime is to be stored in a dry location on-site to permit the immediate implementation of the above contingency measures.

6. Conclusion

This Acid Sulfate Soils Management Plan has been provided to address the requirements of Clause 6.1 of the Byron LEP 2014 to support and inform a DA/SEE for the proposed demolition of a single dwelling and the erection of a multi dwelling housing development containing 4 x double storey dwellings and 4 x in-ground swimming pools upon a residential lot at No. 50 Shirley Street, Byron Bay.

Acid sulfate material may potentially be encountered during the installation of excavations of foundations/footings, underground services and the construction of the in-ground swimming pools.

The Acid Sulfate Soils Management Plan contained in this report will ensure that any ASS material is treated, managed and disposed of (if applicable) appropriately so as to prevent any detrimental effects on the environment. All excavated materials shall meet Local and State Government ASS/PASS discharge/disposal requirements and approvals prior to removal from the site. It is assumed that all excavated material will be re-used on site (where possible and practicable).

7. General Notes

General

Geotechnical and environmental reports present the results of investigations carried out for a specific project and usually for a specific phase of the project (e.g. preliminary design). The report is based on specific criteria, such as the nature of the project, underground utilities or scope of service limitations imposed by the Client. The report may not be relevant for other phases of the project (e.g. construction), after some time or where project details and clients change.

Soil and Rock Description

Soil and rock descriptions are based on AS1726-1993 using visual and tactile assessment except at discrete locations where field and/or laboratory tests have been carried out. Refer to the terms and symbols sheet for definitions.

Groundwater

The water levels indicated are taken at the time of measurement and depending on material permeability may not reflect the actual groundwater level at those specified locations. Also groundwater levels can vary with time due to seasonal or tidal fluctuation, construction activities and other external factors.

Interpretation of Results

The discussion and recommendations in the accompanying report are based on extrapolation/interpolation from data obtained at discrete locations and other external sources and guidelines. The actual interface between the materials may be far more gradual or abrupt than indicated. Also actual conditions in areas not sampled may differ from those predicted.

The report is based on significant background details that only the authors can be aware of, and therefore implementation of the recommendations by others may lead to misinterpretation and complications. Therefore this company should be consulted to explain the reports implications to other involved parties.

Reporting relies on interpretation of often limited factual information based on judgement and opinion which has a level of uncertainty and ambiguity attached to it, and is far less exact than other design disciplines. This should be considered by users of the report when assessing the implications of the recommendations.

Change in Conditions

Subsurface conditions can change with time and can vary between test locations. Construction operations at or adjacent to the site and natural events such as floods, earthquakes or groundwater fluctuations can also affect subsurface conditions.

8. Scope of Engagement

This report has been prepared by Ardill Payne & Partners (APP) on behalf of David Willis for the purpose of an Acid Sulfate Soil Management Plan and is not to be used for any other purpose or by any other person or corporation.

This report has been prepared from the information provided to us and from other information obtained as a result of enquiries made by us. APP accepts no responsibility for any loss or damage suffered howsoever arising to any person or corporation who may use or rely on this document for a purpose other than that described above.

No part of this report may be reproduced, stored or transmitted in any form without the prior consent of APP.

APP declares that it does not have, nor expects to have, a beneficial interest in the subject project.

To avoid this advice being used inappropriately it is recommended that you consult with APP before conveying the information to another who may not fully understand the objectives of the report. This report is meant only for the subject site/project and should not be applied to any other.