



ACID SULFATE SOILS MANAGEMENT PLAN

Submission to Richmond Valley Council

To undertake the construction of a detached dual occupancy and 2 x in-ground swimming pools

Lot 8 DP 1290626
22 George Street, Broadwater

for:

Taylah and Oscar Linton-France and Kye Watson

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1. Executive Summary

Ardill Payne & Partners has been commissioned by Taylah and Oscar Linton-France and Kye Watson to prepare a Development Application (DA) and Statement of Environmental Effects (SEE) with Richmond Valley Council. Development consent is sought for the construction of a detached dual occupancy and 2 x in-ground swimming pools on a recently created vacant residential lot, being Lot 8 DP 1290626, No. 22 George Street, Broadwater.

Works are proposed to be undertaken on land mapped as Class 2 acid sulfate soils under the RVLEP 2012. An ASSMP can be prepared as a contingency plan under the guidelines and Clause 6.1(3) of the RVLEP 2012 without detailed investigations. Therefore, a management plan for any acid sulfate soils that may be encountered during the works has been prepared.

The subject land is highly modified having been extensively cleared, filled and developed for roads and infrastructure purposes.

An aerial photograph of the subject and adjoining land and an extract of the acid sulfate soils planning map are provided below (NB: This photograph pre-dates the subdivision works that have now been undertaken on the land):



Figure 1 – Subject Site (SixMaps)

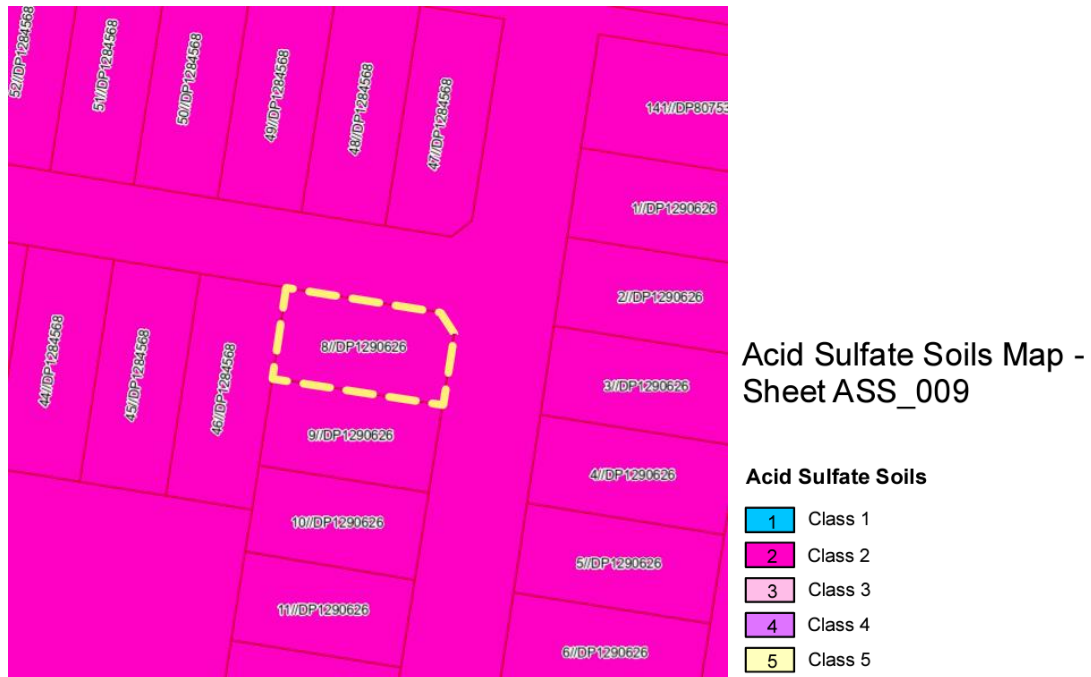


Figure 2 – ASS Mapping (ePlanning Spatial Viewer)

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 excavation works for the installation of the under-ground infrastructure and swimming pools, 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 potential 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 the management practices that are 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 are 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 below the existing surface, involving excavations for footings and the installation of underground reticulation infrastructure 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 RVLEP 2012 to support and inform a DA/SEE for the construction of a detached dual occupancy and 2 x in-ground swimming pools.

The subject land is highly modified (containing roads and vacant and developing residential lots) that has been subject to clearing, filling and civil works. Acid sulfate material may potentially be encountered during excavations for installation of infrastructure services and footings and 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 Taylah and Oscar Linton-France and Kye Watson to support and inform a DA/SEE 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.