Scoping Report.

REQUEST FOR SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

ATTACHMENT 16

KEY ENVIRONMENTAL ISSUES METHODOLOGY & SCOPING REPORT

OCTOBER 2019

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PROJECT

SEARS APPLICATION FOR TWEED SAND PLANT REDEVELOPMENT - CONSIDERATION OF KEY ENVIRONMENTAL ISSUES

PREPARED FOR

HANSON CONSTRUCTION MATERIALS PTY LTD

DATE

NOVEMBER 2019

GILBERT SUTHERLAND

DOCUMENT CONTROL

DOCUMENT 12035_SEARS_REH1F.docx
TITLE SEARS Application for Tweed Sand Plant Redevelopment – Consideration of Key Environmental Issues
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CLIENT REFERENCE –

SYNOPSIS This report outlines the process and outcomes of a Scoping Study undertaken to define the key environmental issues associated with the proposed redevelopment of Hanson Construction Materials' (Hanson) Tweed Sand Plant (TSP) located in Cudgen NSW. This report defines the key environmental issues and the proposed methodologies that will be adopted for their assessment as part of an Environmental Impact Study.

REVISION HISTORY

REVISION #	DATE	EDITION BY	APPROVED BY
1	11/19	E. Holton	E. Holton & L. Varcoe

DISTRIBUTION

	REVISION NUMBER							
Distribution	1	2	3	4	5	6	7	8
Department of Planning Industry and Environment	1							
Hanson Construction Materials Pty Ltd	1							
Burchill Engineering Solutions Pty Ltd								
Zone Planning								
G&S library & file	1							

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1 Introduction

This report outlines the process and outcomes of a Scoping Study undertaken to define the key environmental issues associated with the proposed redevelopment of Hanson Construction Materials' (Hanson) Tweed Sand Plant (TSP) located in Cudgen, New South Wales.

For each of the key issues identified by the Scoping Study a preliminary review has been completed including:

- An assessment of the existing characteristics of the TSP site with respect to the identified issue
- A review of the relevant management practices currently in place at the TSP site
- The proposed methodology for assessment of the issue to be completed as part of an Environmental Impact Statement (EIS).

This report forms an appendix to Hanson's application for the Secretary's Environmental Assessment Requirements (SEARs) for redevelopment of TSP.

2 Scoping of environmental issues

2.1 Scoping process

To identify key environmental issues that would require detailed assessment in an EIS, Hanson conducted a stakeholder consultation process and instructed G&S to review the environmental aspects relevant to the existing TSP operation.

2.2 Key issues identified

The following list describes the key environmental issues that have been identified as relevant for this proposal:

- Agricultural Land Capability (ALC)
- surface water
- groundwater
- Acid Sulfate Soils (ASS)
- end-use concepts.

For each of the key issues a preliminary review has been completed including:

- an assessment of the existing characteristics of the TSP site with respect to the identified issue
- a review of the relevant management practices currently in place at the TSP site, and
- development of a proposed methodology for assessment of the issue to be completed as part of the EIS.

Details of the review are provided in Section 3 of this report.

2.3 Other issues

In addition to the key environmental issues noted above, a number of additional aspects that were identified as relevant to the project that would also be considered in the EIS. These issues include:

- air quality
- noise
- heritage and
- flora and fauna.

Assessment of these issues would follow the guidance of the legislation, regulations and standards applicable to each. As such, a detailed assessment methodology is not necessary and is provided as part of this Scoping Report.

3 Proposed approach to assessment of key issues

For each of the identified issues a preliminary review has been completed including:

- An assessment of the existing characteristics of the TSP site with respect to the identified issue.
- A review of the relevant management practices currently in place at the TSP site and their applicability to the redeveloped site.
- The proposed methodology for assessment of the issue to be completed as part of the EIS.

3.1 Agricultural land capability

The existing TSP site and proposed expansion area are mapped as 'RU1 Primary Production' and 'RU2 Rural Landscapes'. Development for the purposes of an extractive industry is, with consent, permissible in the RU1 and RU2 zones.

Biophysical Strategic Agricultural Land (BSAL) is land with high quality soil and water resources capable of sustaining high levels of productivity. The NSW Government has undertaken regional scale mapping of BSAL lands in the Tweed LGA. That mapping classifies the existing TSP site as BSAL, but not the proposed expansion area.

The proposed expansion area covers lands that have historically been used for sugar cane production and more recently, cattle grazing. Preliminary review of available information indicates that sugar cane production has not occurred at the site since approximately 2004. The proposed TSP Redevelopment would result in the permanent loss of these lands to agricultural production. It is acknowledged that this issue will require careful consideration and is likely to generate significant interest from relevant stakeholders.

Proposed assessment of agricultural land capability for the Development Application

The following scope of works would be undertaken:

- Identification of lands subject to the proposal, including current and historical land uses.
- Site-based assessments to confirm existing mapping and the agricultural suitability/ capability of those lands.
- An assessment of impacts on the local sugar industry and economy due to land fragmentation and alienation of current and future activity as prime and regionally significant farmland.
- An assessment of impacts of fragmentation and alienation of the subject site and adjacent lands on existing and future agricultural capability to grow food and fibre as per state, regional and local strategic directions and variation criteria.
- An assessment of opportunity costs resulting from permanent loss of, sterilisation or underutilisation of the land from any future productive activities and/or development.
- Consultation with local and regional stakeholders.

3.2 Surface water

The existing TSP dredge lake has been formed through progressive dredging of the identified sand resource since commencement of sand extraction in the early 1980's. The lake currently forms a groundwater window that has a surface area of ~29.4 hectares (ha) and a maximum depth of 20 metres (m).

Expansion of the existing TSP operations would be undertaken progressively over a period of 30 years and would ultimately result in the creation of one large dredge lake or two to three smaller lakes. The potential for the expansion project to impact on local surface water quality and the quality of waters within the dredge lake are important considerations to be addressed by the Development Application. Accordingly, a detailed analysis of likely impacts and proposed management techniques is proposed.

Existing onsite surface water quality

A comprehensive monitoring regime is currently occurring at the site. It includes weekly operational monitoring of indicator parameters

and biannual compliance monitoring of a full suite of water quality characteristics in accordance with the site's approved Soil and Water Management Plan (SWMP).[1] This program of monitoring has been conducted since 2005 and has resulted in a comprehensive data set which characterises surface water quality conditions over time.

The following range of parameters are monitored and the results included in the data set:

- pH
- dissolved oxygen (DO)
- temperature
- turbidity
- oxidation-reduction potential (ORP)
- electrical conductivity (EC)
- cations and anions
- dissolved metals
- nutrients and
- cyanobacteria-related parameters.

The data set demonstrates that surface water quality within the current TSP dredge lake has remained mostly compliant with the site's water quality objectives since issue of the Development Consent in 2006.

With respect to cyanobacteria, long-term results indicate the ongoing presence of a seasonal algal bloom with the potential to produce algal toxins. The characteristics of the lake's cyanobacteria population have been extensively analysed and expert advice sought to determine appropriate hazard and risk management techniques. Recent results have been encouraging with a significant reduction in algal cell numbers since 2017.

The attributes of waters within the dredge lake have been extensively investigated and reported in each Annual Review for the site. The most recent version of this report was submitted to DPIE, TSC and OEH in September 2019 and should be referred to for further details of the site's surface water quality.

Surface water management – current approach

The TSP dredge lake is a groundwater window that gradually increases in area as dredging progresses. Extraction of the sand resource is by dredge, with no dewatering of the lake or surrounding lands. The extracted resource is processed through a wash plant with all process waters returned to the lake via pipe, overland flow or infiltration to groundwater.

All activities are managed under an approved Soil and Water Management Plan, which details comprehensive monitoring and management provisions for onsite surface waters. This approach to extraction, processing, monitoring and management, substantially limits the potential for the operation to negatively impact local surface environments during normal operations and has proven effective at maintaining acceptable water quality within the dredge lake.

Proposed methodology for surface water quality assessment

As the current approach to surface water management has proven effective and efficient approach, it is proposed that the TSP expansion would be operated in largely the same manner, albeit on a larger scale. With that objective, a comprehensive assessment would be undertaken to assess the surface water quality impacts associated with the proposal including:

- Water quality within the dredge lake during extraction, and an assessment of associated risks to the environment and human health.
- Water quality within the dredge lake at the cessation of sand extraction, including any implications to the proposed end-use(s) of the site as informed by an assessment of risks to the environment and human health.
- The impacts associated with removal or relocation of existing surface drains across the expansion area.

[1] Gilbert & Sutherland (May 2019). 'Soil and Water Management Plan for Tweed Sand Plant (Phases 3 and 4), Cudgen, New South Wales'.

- Potential impacts to surrounding users of surface water (or associated groundwaters).

The surface water assessment would include the following scope of works:

- Building on the surface water quality database for the existing TSP site, a baseline surface water quality monitoring program would be undertaken at locations throughout the current site and proposed expansion area. The number of monitoring rounds would be sufficient to ensure seasonal variation is demonstrated and that an adequate dataset is obtained to allow a robust statistical analysis.
- A nutrient balance would be completed to assess the inputs and outputs of nutrients from the lake over time to inform ongoing cyanobacterial management strategies.
- Preparation of a detailed site water balance and pond model would be completed to help assess the lake's long-term hydrological performance. The model(s) would consider all potential inflows and outflows to the dredge lake including any operational water uses and the impacts associated with disturbance/ relocation of existing surface drains across the expansion area. The model(s) would allow for prediction of potential water quality changes as the lake expands and give an indication of the likely water quality post cessation of extraction.
- An environmental risk assessment would be completed to assess the risks associated with the expansion and inform site management strategies.
- Environmental values would be established and site-specific surface water quality objectives determined based on the collected data and with reference to the ANZECC 2000 Guidelines for Fresh and Marine Water Quality.
- Licensing requirements or other approvals under the Water Act 1912 and/or Water Management Act 2000 would be identified.
- A Soil and Water Management Plan would be prepared for the proposed development, incorporating necessary strategies to minimise, mitigate and manage identified surface water impacts of the proposed expansion.

3.3 Groundwater

The potential for the proposed TSP expansion to impact on local groundwater environments, existing groundwater users and groundwater dependent ecosystems (GDE) are important considerations to be addressed by the Development Application. Accordingly, and a detailed analysis of likely impacts and proposed management techniques is proposed.

Existing onsite groundwater quality

As with surface water, a comprehensive groundwater monitoring regime (across a network of 15 groundwater bores) is currently occurring at the site, including monthly operational monitoring of indicator parameters and biannual compliance monitoring of a full suite of quality characteristics in accordance with the site's approved SWMP. This program of monitoring has been in place since 2005, resulting in a comprehensive data set which characterises groundwater quality conditions at the site over time.

With the exception of nutrients and cyanobacteria, the current groundwater monitoring suite is consistent with the site's surface water monitoring program. Data collected to date indicates that the site's groundwater salinity ranges from fresh in the shallower bores (~6 m depth) to saline in the deeper bores (~17 m). Groundwater levels at the site vary by a maximum of ~1.5 m, increasing in response to rainfall and decreasing following dry periods. Groundwater gradients across the site are relatively shallow, reflecting the site's flat topography and consistent stratigraphy. Groundwater quality recorded to date is variable, with results for some parameters (including salinity and metals) exceeding the site's water quality objectives at times.

Groundwater attributes have been extensively investigated over time and reported in each Annual Review for the site. The most recent version of this report was submitted to DPE, TSC and OEH in September 2019 and should be referred to for further details of the site's surface water quality.

Groundwater management – current approach

The TSP dredge lake is a groundwater window that gradually increases in area as dredging progresses. Extraction of the sand resource is by dredge, thus no dewatering of the lake or surrounding lands occurs. The extracted resource is processed through a wash plant with all process waters returned to the lake via pipe, overland flow or infiltration to groundwater.

All activities are managed under an approved Soil and Water Management Plan, which details comprehensive monitoring and management provisions for onsite groundwaters. This approach to extraction, processing, monitoring and management substantially limits the potential for the operation to negatively impact local groundwater environments during normal operations. It has proven effective at maintaining acceptable water quality within the dredge lake and avoiding impacts on groundwater quality associated with dewatering of ASS.

Proposed groundwater quality assessment for the Development Application

The resource within the proposed expansion area will continue to be extracted by dredge, avoiding the need for dewatering of the insitu material. This approach greatly reduces impacts to the groundwater environment, both in terms of groundwater quality and level.

No significant changes to the height of the groundwater table are likely to occur as a result of the project and changes to groundwater quality such as acidification (due to the presence of ASS throughout the project footprint) will be minimised by adopting the existing site processes.

As the proposed expansion would involve disturbance of the groundwater environment (mapped as *'High groundwater vulnerability'* in the TLEP 2014) careful assessment, monitoring and management will be necessary. The proposed assessment would investigate the following potential groundwater impacts:

- Groundwater quality during extraction, and an assessment of associated risks to the environment and human health.
- Groundwater quality at the cessation of sand extraction, including any implications to the proposed end-use(s) of the site as informed by an assessment of risks to the environment and human health.
- Impacts to groundwater flow directions.
- Potential impacts to groundwater users.

The groundwater assessment would include the following scope of works:

- Building on the groundwater database for the existing TSP site, a baseline groundwater monitoring program would be undertaken at locations throughout the current site and proposed expansion area. The number of monitoring rounds completed would be sufficient to demonstrate seasonal variation, and that an adequate dataset is obtained to allow a robust statistical analysis.
- Modelling of groundwater levels and flow directions for selected milestones throughout the operational life of the project and at the cessation of extraction activities.
- An environmental risk assessment would be completed to assess the risks associated with the expansion and to inform site management strategies.
- Environmental values would be established and site-specific groundwater quality objectives determined based on the collected data and with reference to the *ANZECC 2000 Guidelines for Fresh and Marine Water Quality*.
- Identification of any licensing requirements or other approvals under the *Water Act 1912* and/or *Water Management Act 2000*
- A Soil and Water Management Plan would be prepared for the proposed development, incorporating all necessary strategies to minimise, mitigate and manage the proposed expansion's identified groundwater impacts.

3.4 Acid sulfate soils

Acid sulfate soils (ASS) are present within the existing TSP site. Due to the similarities in soils, elevation (<RL 5.0 mAHD) and geology, the proposed expansion areas are likely to contain ASS. The proposed TSP expansion will involve the extraction and handling of these ASS materials. As such, ASS investigation and management are important considerations to be

addressed by the Development Application.

ASS Management – current approach

ASS Management at TSP is currently divided into two separate methodologies based on the mode of disturbance (being either dry excavation or wet excavation (dredging)).

Topsoils and overburden (material above the groundwater table) are removed via dry-excavation methods progressively in advance of the extraction face. These materials are analysed and, where required, treated through the addition of lime to neutralise any Net Acidity.

The sand resource at TSP contains a small percentage of PASS fines which are removed from the product sand through the use of a hydrocyclone. Those fines are then returned to the dredge lake via a dedicated fines return system and released into the water column to achieve a final deposition depth of at least eight metres below the water surface. This process achieves long-term management of the fines by placing them in a stable, low dissolved oxygen environment thus preventing ongoing disturbance and minimising opportunities for oxidation.

Frequent monitoring of extracted sands is undertaken and indicates highly consistent results over time. The material at the site also exhibits a high ratio of acid neutralising capacity (ANC) compared to its acid generating potential (AGP). The material is essentially self-neutralising. The results of this monitoring are reported each year in the Annual Review.

This methodology has proven successful over the life of the TSP operations with stable pH levels maintained in the lake and no evidence of the occurrence of acidic reactions.

Proposed ASS assessment for the Development Application

Extensive drilling has been conducted in the immediate vicinity of the proposed expansion area including within Phases 4 and 5 of the existing TSP site, the neighbouring lands to the east (Cudgen Lakes Sand Extraction) and a number of locations within the Australia Bay Lobster Producers (ABLP) site to the west. These investigations have shown the materials in those areas to be consistent and this is supported by the results of quarterly sampling of dredged sands at the existing TSP operation.

Building on the investigations undertaken for the existing site, available data from adjacent developments and the comprehensive data set obtained through ongoing monitoring of the extracted sands at TSP, an Acid Sulfate Soil Assessment (ASSA) would be undertaken for the proposed expansion area. That investigation would aim to:

- assess the ASS characteristics of material throughout the proposed expansion area, and
- confirm whether TSP's existing approach to ASS management will be appropriate for the proposed expansion (and if not, provide sufficient information for determination of alternative management measures).

For a dredging development proposal of this size, the ASSMAC Guideline recommends construction of boreholes at a rate of two boreholes per hectare but notes that:

> *'The level of assessment undertaken, or the complexity of an acid sulfate soils management plan, should match the level of risks to the environment from the proposed activity.'*

Seven (7) boreholes were constructed in Phase 5 (~29 hectares) as part of the 2005/2006 EIS. Due to the consistency of results obtained no further holes are proposed in this area.

The same rate of investigation is proposed for the remainder of the proposed expansion area being some 156 hectares comprising Lot 2 DP1192506, Lot 706 DP1000580, Lot 51 DP1166990 and Lot 50 DP1056966. This equates to the construction of up to 40 boreholes across the proposed development site. While this rate differs from the aforementioned ASSMAC Guideline investigation rate, this level of assessment is commensurate with the risk management approach supported by the ASSMAC Guideline. With respect to risk management we note the following:

1. The ASS dataset available from previous ASS assessments at Lot 2 DP777905 and adjoining sites is extensive, and demonstrates that the %S is relatively uniform across the subject site and surrounds.

2. There is a considerable amount of borehole data and TSP excavation records to demonstrate that the geomorphology of strata at Lot 2 DP777905 are relatively uniform in both composition and depth.
3. The sands encountered during borehole construction and commercial sand extraction contain relatively marginal amounts of pyrite.
4. Significant difficulty and expense is associated with the recovery of undisturbed samples from saturated, consolidated sediments at greater depths.
5. TSP management has committed to the hydraulic separation and treatment of all commercially extracted sand. The extracted sand would be subject to verification testing following hydraulic separation.
6. No dewatering will be undertaken as part of the proposal.

We note that further detailed ASSA assessments (if required) could form part of the Project's approval conditions to be conducted on a stage-by-stage basis as dredging progresses.

The ASSA would include the following scope of works:

- Construction of up to 40 boreholes throughout the expansion area to adequately characterise the presence of ASS materials.
- Boreholes would be constructed to approximately one metre below the maximum proposed depth of extraction (approximately 20m) or until borehole refusal or evidence of the Pleistocene clay layer that underlies the sand resource.
- Boreholes would be sited to provide good coverage of the expansion area to allow characterisation of the ASS risk associated with the resource.
- At each borehole, samples would be collected at relevant intervals for field screening (pH_{Field} and pH_{Fox} testing).
- Based on the field screening results, materials exhibiting the most pronounced potential actual acid sulfate soil (PASS)/actual acid sulfate soil (AASS) characteristics would be selected for laboratory analysis using the CRS/TAA method.
- The investigation would be conducted with reference to the NSW Acid Sulfate Soils Management Advisory Committee (ASSMAC) Guidelines (1998) and the Australian Soil and Land Survey Field Handbook.
- The results of the investigation would be used to determine whether the existing ASS management procedures will be suitable for the expansion or whether alternative measures are more suitable.
- The proposed management measures would be incorporated into the Soil and Water Management Plan for the proposed development, including all necessary strategies to minimise, mitigate and manage the disturbance of ASS within the project footprint.

3.5 End use concepts

The approved end-use of the existing TSP site is a public access recreational fishing facility. Ongoing monitoring and management of water quality and progressive rehabilitation of the site are aimed at facilitating a smooth transition from sand extraction operation to recreational facility.

Similar to the end-use proposed under the existing approval, the core component of the proposal for the expanded site is to create a public access, multi-use facility which will support recreational activities. Through the stakeholder consultation completed to date, the following aspects were derived as the core goals that must be achieved by the end-use proposal:

- A self-sustaining, water body with stable acceptable water quality.
- A diverse ecosystem of native flora designed to provide habitat for native fauna.
- A visually pleasing site with water bodies and vegetation designed to achieve a 'natural' appearance.
- Low maintenance infrastructure to enhance the recreational appeal of the site.
- The incorporation of any necessary infrastructure to ensure public safety.

TSP currently operates under an approved Rehabilitation and Landscape Management Plan

(RLMP).[2] Rehabilitation at the site is undertaken progressively as dredging advances in a westerly direction. Wetlands and riparian areas have been constructed around the current perimeter of the lake, as well as along the western boundary of the approved Phase 4 extraction area. In such areas as the western boundary, wetlands have been constructed in advance of the progression of dredging to allow the plants to establish and mature prior to being exposed to the full dredge lake.

The proposed expansion would significantly increase the ultimate size of the extraction lake which would increase rehabilitation and landscape requirements. Consistent with the current approach to rehabilitation, landscaping across the proposed expansion area would be progressive, and advanced ahead of dredging works to ensure the wetlands are mature prior to being exposed to the full dredge lake.

Rehabilitation and landscape management requirements will be assessed as part of the EIS for the proposed expansion, including provision of suitable drawings to identify proposed rehabilitation areas and likely species. The Rehabilitation and landscape assessment will work in parallel with the flora and fauna, visual amenity, lake stability, and bushfire assessments forming part of the overall EIS.

[2] James Warren and Associates (March, 2019). Revised Rehabilitation and Landscape Management Plan, Tweed Sand Plant, Altona Road, Cudgen.

4 Other issues

4.1 Flora and fauna

Parts of the proposed expansion area (known as Phase 5) are currently in use as a tea tree plantation, however the majority of the expansion area is characterised by historically cleared farmlands that are not currently cultivated. The site contains only small areas of vegetation that have habitat potential and these are typically located around the southern perimeter of the site.

A flora and fauna assessment was undertaken for the TSP site in 2005 and concluded that the TSP development was unlikely to have any significant flora or fauna impacts. Given the similarities between the current TSP site and proposed expansion area, similar findings are likely. However, a comprehensive flora and fauna assessment would be undertaken for the expansion area in accordance with current legislation and relevant policies.

4.2 Land contamination

No known intensive activities likely to lead to contamination of soils or water have been undertaken at either the existing TSP site or the proposed expansion area. As such, no specific contamination management measures are currently required at the site.

Whilst contamination is unlikely to be encountered in the proposed expansion area, a desktop site contamination assessment would be undertaken to identify evidence (if any) of historical land uses with the potential to contaminate those areas. This assessment would be undertaken to address TSC's Contaminated Land Policy (Version 1.1). Should any historical contaminating activities be identified through this preliminary assessment, further investigations would be undertaken to determine the presence and extent of site contamination and any necessary remedial actions.

4.3 Heritage

A heritage assessment was undertaken for the TSP site as part of the 2005 EIS. That assessment identified no sites or items of indigenous or non-indigenous significance at the existing TSP site and the Tweed-Byron Local Aboriginal Land Council (TBLALC) did not object to the expansion of TSP at the time.

Review of Tweed Aboriginal Cultural Heritage Management Plan 2018 mapping indicates a place of Aboriginal Cultural Heritage Significance within the existing Phase 1 to 4 extraction lake. Basic AHIMS searches also identify one Aboriginal site recorded or near Lot 22 DP1082435. Tweed Aboriginal Cultural Heritage Management Plan 2018 mapping and basic AHIMS searches do not identify any other known items of Aboriginal Cultural Heritage on the site.

To confirm these initial findings, an assessment of indigenous and non-indigenous aspects of significance that relate to the proposed expansion site would be undertaken in consultation with the TBLALC as part of the EIS in accordance with the relevant legislation, policies and guidelines.

4.4 Air quality

An Air Quality Impact Assessment would be undertaken for the proposed development in accordance with the NSW EPA's Approved Methods for Modelling the Assessment of Air Pollutants in NSW and having regard to the Voluntary Land Acquisition and Mitigation Policy.

A site-specific assessment would be undertaken in accordance with these policies and where required the report would include:

- reasonable and feasible mitigation measures to minimise dust and emissions; and
- site specific monitoring and management measures applicable to the types of impacts likely to be generated by the development.

4.5 Noise

A Noise Impact Assessment would be completed for the site (including transport related noise impacts) in general accordance with the Interim Construction Noise Guideline, NSW Industrial Noise Policy and the NSW Road Noise Policy respectively, and having regard to the Voluntary Land Acquisition and Mitigation Policy.

A site specific assessment would be undertaken in accordance with these policies and where required the report would include:

- reasonable and feasible mitigation measures to minimise noise emissions; and
- monitoring and management measures, applicable to the noise generating activities.

5 Limitations of reporting

Gilbert & Sutherland Pty Ltd has attempted to be accurate providing this information. The interpretation of scientific data, however, involves professional judgement. As such, interpretation is open to error.

In recognising the potential for errors in scientific interpretation, Gilbert & Sutherland Pty Ltd does not guarantee that the information is totally accurate or complete and clients are advised not to rely solely on this information when making commercial decisions. Any representation, statement, opinion or advice, expressed or implied is made in good faith and on the basis that the authors, Gilbert & Sutherland Pty Ltd, their agents or employees are not liable (whether by reason of lack of care or otherwise) to any person for any damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement or advice referred to above.

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