

GALES-KINGSCLIFF

PTY LTD
ABN: 75 093 540 080

Environmental Management Strategy

for the

Cudgen Lakes Sand Quarry

Approved

Project Approval No. 05_0103B

Prepared by:



R.W. CORKERY & CO. PTY. LIMITED

June 2017

- Notes:
1. References to the conditional requirements referred to throughout this report relate to the Project Approval issued on 16 June 2009 and modified 19 February 2016.
 2. This document makes reference to a range of government agencies which were in existence at the time of the document's approval. In recognition of the fact that the names of government agencies may change throughout the life of the Cudgen Lakes Sand Quarry, a reference should be made to the prevailing name of the respective agency at the relevant time.
 3. The Director-General of the Department of Planning and Infrastructure is now referred to as the Secretary of the Department of Planning and Environment hence, all references to Director-General (DP&I) should in the future be recognised as the Secretary (DPE).

Approved by
the Secretary's nominee, Howard Reed
on 5 July 2017

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GLOSSARY OF ACRONYMS

AHD	-	Australian Height Datum
AS	-	Australian Standard
CCC	-	Community Consultative Committee
DPE	-	Department of Planning and Environment
DP&I	-	Department of Planning and Infrastructure
EMS	-	Environmental Management Strategy
EPA	-	Environment Protection Authority
EPL	-	Environment Protection Licence
INP	-	<i>NSW Industrial Noise Policy 2000</i>
ISO	-	International Standards Organisation
NZS	-	New Zealand Standard
OEH	-	Office of Environment and Heritage
PA	-	Project Approval
PASS	-	Potentially Acid Sulfate Soil
PM ₁₀	-	Particulate Matter less than 10 microns in diameter
RMS	-	NSW Roads and Maritime Services
VENM (a)	-	Non-acid generating Virgin Excavated Natural Material
VENM (b)	-	Potentially acid generating Virgin Excavated Natural Material



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1. INTRODUCTION

1.1 OVERVIEW

Project Approval (PA) 05_0103B was issued for the Cudgen Lakes Sand Quarry (“the quarry”) by the Minister for Planning on 16 June 2009 and modified 19 February 2016. A copy of PA 05_0103B is reproduced in **Appendix 1**. The quarry is located at Cudgen approximately 1km south of the Tweed River and 8km south of the New South Wales/Queensland Border (see **Figure 1**).

This Environmental Management Strategy (EMS), which forms part of the integrated Quarry Management System, describes the overall framework for environmental management for the establishment and operation of the quarry and associated infrastructure. The EMS also addresses the principal strategies to be adopted by Gales-Kingscliff Pty Ltd (hereafter “Gales”) and the Quarry Operator, including compliance management and monitoring, conflict resolution and consultation / information dissemination processes.

Gales’ principal objectives in the development and operation of the quarry are to:

1. provide the necessary fill materials required to complete the Gales’ proposed development strategy for its landholdings within the Kingscliff / Chinderah / Cudgen area;
2. recover the remaining high quality fine sand resources to supply the region’s construction industry;
3. provide a licenced facility capable of accepting and processing both non-acid generating virgin excavated natural materials (VENM(a)) and acid-generating virgin excavated natural material (VENM(b));
4. create a recreational lake with surrounding parkland, walkways and sporting fields consistent with the recreational and environmental land uses of the Gales’ strategic development plan for its landholdings;
5. maintain compliance with PA 05_0103B, other relevant approvals, licences and permits and meet accepted industry standards and reasonable community expectations; and
6. operate the quarry in a safe and environmentally responsible manner.

The requirements with respect to the timing for submission and contents of the EMS are contained within *Condition 5(1)* of PA 05_0103B. **Table 1** reproduces *Condition 5(1)* and identifies where in this document each required element of the EMS is addressed.

1.2 STRATEGIC CONTEXT

The aim of the EMS is to provide an overall framework for the environmental management of the quarry, and outline Gales’ commitment to proactive community and environmental management and demonstrate a commitment to reducing environmental and community impacts. The structure of the EMS is generally based around the ISO 14001 standard for environmental management systems ‘Plan-Do-Check-Act’ process. **Table 2** provides a summary of this strategic approach to environmental management as described in the EMS.





Table 1
Coverage of Requirements in Condition 5(1) of PA 05_0103B

Requirement	Coverage
SCHEDULE 5: ENVIRONMENTAL MANAGEMENT, MONITORING, REPORTING & AUDITING	
1. The Proponent shall prepare and implement an Environmental Management Strategy for the project to the satisfaction of the Director-General. This strategy must:	
(a) be submitted to the Director-General prior to starting quarrying operations on the site	-
(b) provide the strategic context for environmental management of the project;	1.2
(c) identify the statutory requirements that apply to the project;	3.0
(d) describe in general how the environmental performance of the project would be monitored and managed;	5.0
(e) describe the procedures that would be implemented to:	
• keep the local community and relevant agencies informed about the construction, operation and environmental performance of the project;	6.1
• receive, handle, respond to, and record complaints	6.2
• resolve any disputes that may arise during the life of the project	6.3
• respond to any non-compliance;	7.0
• manage cumulative impacts; and	8.0
• respond to emergencies; and	9.0
(e) describe the role, responsibility, authority, and accountability of the key personnel involved in the environmental management of the project.	4.0

Table 2
Strategic Context of the Environmental Management Strategy

Feature	Context within EMS	EMS Section
Plan	• Maintain register of legal and other requirements	Section 3
	• Maintain register of environmental aspects and impacts	5.1
	• Set environmental objectives and targets	Section 5
	• Develop environmental programs and management plans	Section 5
Do	• Identify and allocate responsibilities for environmental management	Section 4
	• Develop and maintain operating procedures	Section 5
	• Maintain external communications with regulators, members of the public and other stakeholders	Sections 6 and 7
	• Effectively manage complaints	6.2
	• Effectively manage disputes	6.3
	• Manage cumulative impacts of Gales and other operations	Section 8
• Implement emergency preparedness and response strategies / plans	Section 9	
Check	• Complete an annual review of compliance with environmental statutory requirements during the preparation of the Annual Review	5.1
	• Undertake environmental monitoring	Section 5
	• Undertake environmental inspections	Section 7
	• Review non-compliances and corrective/preventive action plans	Section 7
	• Commission independent audits of operations	Section 7
Act	• Undertake a periodic review and revision of the EMS by senior management	Section 10
	• Implement and review non-compliance and corrective/preventive actions	Section 7



2. DESCRIPTION OF THE CUDGEN LAKES SAND QUARRY

The operation of the quarry will result in the recovery of approximately 5 000 000m³ of sand over a period of 15 to 20 years. The Quarry Site covers a total area of 67ha which includes:

- a 37ha extraction site south of Altona Drive ('southern extraction site');
- a 9ha extraction site north of Altona Drive ('northern extraction site');
- an initial processing area covering 1ha within the northwestern corner of the southern extraction site; and
- a permanent processing area north of Altona Drive covering an area of 3.7ha.

Two pipeline corridors will also be utilised to supply sand to fill sites within the local area. These are referred to as the "northern pipeline corridor" (0.8km in length) and the "eastern pipeline corridor" (1.5km in length). The northern pipeline corridor is located in the road reserve on the western side of Tweed Coast Road and the eastern pipeline corridor within the road reserve for a proposed subdivision road east of Tweed Coast Road. Two alternate pipeline corridors have also been designated. The principal components of the quarry and location of the pipeline corridors are shown in **Figure 2**.

The operation of the quarry will comprise the following principal activities.

- (i) Hydraulic sand extraction and transportation to approved fill sites.
- (ii) Hydraulic and mechanical removal, processing and production of sand products for the regional construction industry.
- (iii) Receipt and, where possible, processing of VENM(a) to yield additional products for the construction industry.
- (iv) Progressive backfilling of the northern extraction pond and the southern extraction pond edges with VENM(a) unsuitable for processing.
- (v) Receipt and, where possible, processing of VENM(b) to yield additional products for the construction industry.
- (vi) Receipt and internment / backfilling of VENM(b) beneath finalised sections of the extraction ponds.
- (vii) Development of a landform consistent with the development strategy to be implemented by Gales.

The maximum annual extraction rate will be 650 000m³. This will comprise up to 200 000m³ of various grades of sand for supply to the construction industry with the remaining 450 000m³ of fill sand being intermittently extracted for hydraulic transportation to approved fill sites.

As extraction proceeds, the northern extraction pond will be progressively backfilled with VENM to ultimately create areas of land suitable for a range of sporting fields, recreational facilities or other uses. Finalised sections of the southern extraction pond will be progressively rehabilitated in order to form a recreational lake and surrounding parklands.



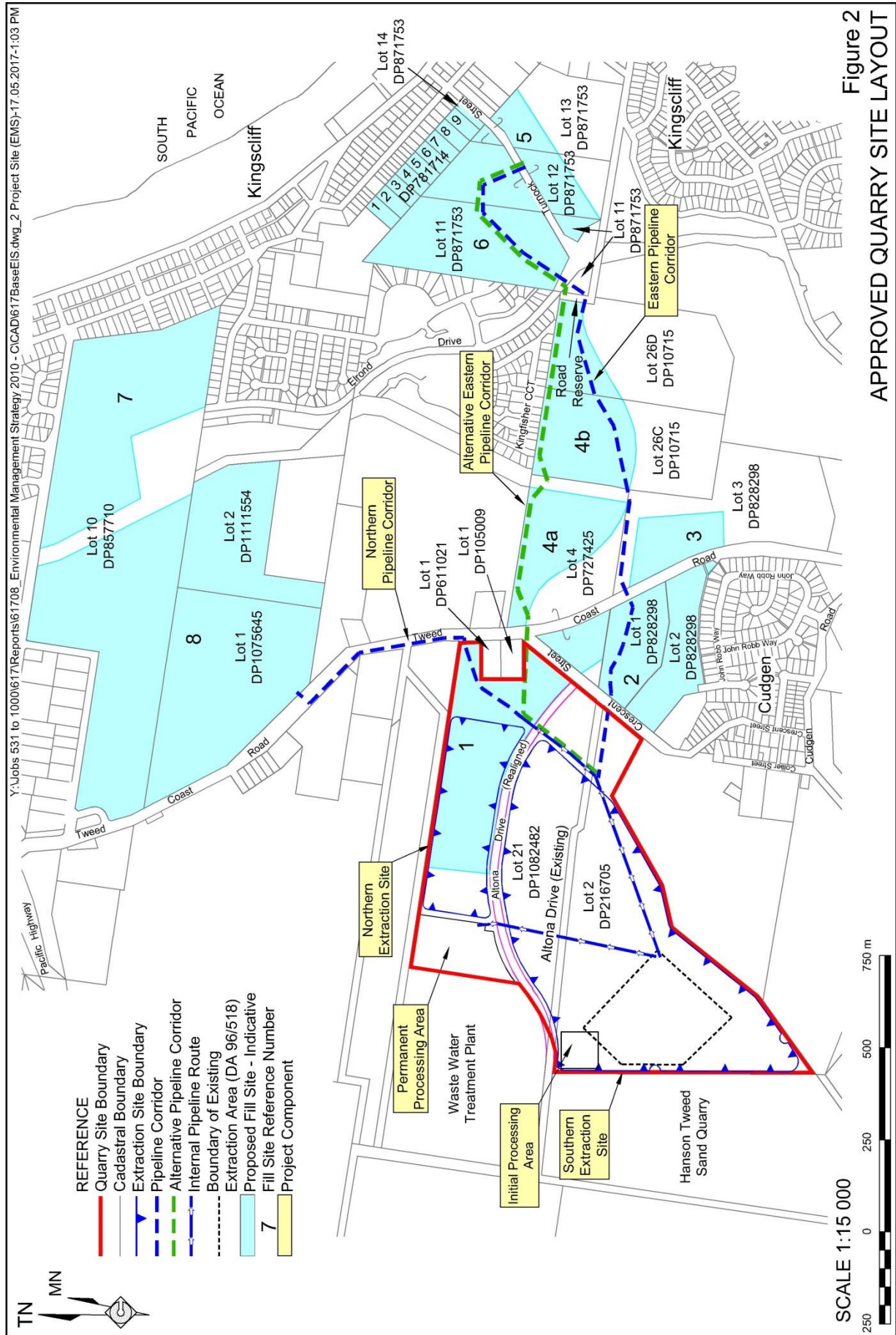


Figure 2 APPROVED QUARRY SITE LAYOUT



3. STATUTORY REQUIREMENTS

3.1 APPROVALS, LICENCES, PERMITS AND LEASES

The following approvals have / will be obtained to enable the quarry to proceed.

- a) A variation to **Environment Protection Licence 12385** (Section 58 of the *Protection of the Environment Operations Act 1997* (POEO Act)). Required for extractive industry and crushing, grinding and separating works. Notably, as VENM is not classified as a waste material under Schedule 1 of the POEO Act, the quarry will not be considered a waste facility and a licence will not be required for this activity.
- b) **Water Licencing** (*Water Management Act 2000*). Required to pump water from the aquifer beneath the Quarry Site. Water Supply Works Approval 30CA321269 and Water Access Licence 40902 have been issued for the approved operations.
- c) **Road Construction Permit** (Section 138 of the *Roads Act 1993*). Required for road intersections (if not already constructed) and pipelines beneath Council roads and within road reserves. To date, permits DWY16_0349 and DWY16_0366 have been issued for the pipeline crossing of Crescent Street and minor works for access from Altona Drive.

3.2 LEGISLATION

The key reference documents include the following Acts and their respective regulations.

- *Contaminated Land Management Act 1997.*
- *Dangerous Goods (Road & Rail Transport) Act 2008.*
- *Environmental Planning and Assessment Act 1979.*
- *Fisheries Management Act 1994.*
- *Local Government Act 1993.*
- *National Parks and Wildlife Act 1974.*
- *Native Vegetation Act 2003.*
- *Protection of the Environment Administration Act 1991.*
- *Protection of the Environment Operations Act 1997.*
- *Roads Act 1993.*
- *Soil Conservation Act 1938.*
- *Threatened Species Conservation Act 1995.*
- *Water Act 1912.*
- *Water Management Act 2000.*
- *Work, Health and Safety Act 2011*



3.3 MISCELLANEOUS STANDARDS AND GUIDELINES

3.3.1 Standards

The following standards are, or are potentially, of relevance to the integrated Quarry Management System. AS refers to an “Australian Standard, NZS refers to “New Zealand Standard” and ISO refers to the “International Standards Organisation”.

- AS/NZS 3580.1.1:2016 Methods for sampling and analysis of ambient air - Guide to siting air monitoring equipment.
- AS 2601 – 2001 Demolition of Structures.
- AS/NZS 3580.10.1 – 2016 Methods for Sampling and Analysis of Ambient Air – Determination of Particulates – Deposited Matter – Gravimetric Method.
- AS 4282 – 1997 – Control of Obtrusive Effects of Outdoor Lighting.
- AS 1940 – 2004 and Amendment 2 – 2006 The Storage and Handling of Flammable and Combustible Liquids.
- AS 1596 – 2014 The Storage and Handling of LP Gas.
- AS / NZS 3580.9.6 – 2015 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter PM₁₀ high volume sampler with size-selective inlet – Gravimetric Method.
- AS / NZS 3580.9.3 – 2015 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – Total Suspended Particulate Matter (TSP) – High volume sampler gravimetric method.
- ISO 14001 – 2015 Environmental Management Systems – Requirements with guidance for use.
- ISO 19011 – 2011 Guidelines for Auditing Management Systems.

3.3.2 Guidelines

The following guidelines are, or are potentially, of relevance to the integrated Quarry Management System.

- Acid Sulfate Soil Manual (Acid Sulfate Soil Management Advisory Committee 1998).
- Australian Dangerous Goods Code 7th Edition.
- Guidelines for Best Practice Community Consultation in the NSW Mining and Extractive Industries (NSW Minerals Council, 1999).
- Community Consultative Committee Guidelines (DPE November 2016).
- Managing Urban Stormwater: Soils and Construction (Department of Housing, 2004).
- Managing Urban Stormwater: Soils and Construction Volume 2E (DECC, 2008)
- National Water Quality Management Strategy: Australian Guidelines for Water Quality Monitoring and Reporting (ANZECC/ARMCANZ, 2000).
- NSW EPA Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (DEC, 2007).



- NSW EPA Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (DEC, 2004).
- NSW Road Noise Policy (DECCW, 2011).
- NSW Industrial Noise Policy (EPA, 2000).
- Waste Classification Guidelines (EPA, 2014).

4. ENVIRONMENTAL MANAGEMENT RESPONSIBILITY, PERSONNEL AND ROLES

Gales recognises that the success of the quarry's development and operation from a corporate, neighbour, and broader community perspective will be enhanced through the achievement of the following objectives.

- 1) The development of a sense of project ownership, community membership and environmental responsibility by all personnel.
- 2) A recognition and acceptance of the physical, biological and social sensitivities of the quarry by all personnel.
- 3) Developing a culture of environmental awareness as an integral part of all planning and day-to-day activities. The awareness will be achieved through workforce and, to a lesser extent, community education.
- 4) Maintaining an honest and open relationship with the community members and ensuring expeditious responses to any issues which may arise.

Ultimate responsibility for the achievement of the above objectives will lie with the Managing Director of Gales. However, overall site-based responsibility for all activities and all personnel on the Quarry Site, including their compliance with all applicable laws, regulations, licences and approvals and achievement of the desired environmental outcomes, is the responsibility of the Quarry Operator.

In addition to their overarching site-based responsibility, the Quarry Operator will be specifically responsible for:

- ensuring all contractors, sub-contractors and service-personnel are appropriately qualified and / or licenced to undertake the required work and have a good environmental performance record;
- ensuring all operations are undertaken in accordance with relevant planning and environmental approvals, licences, permits, and legislation;
- management / implementation of the various management plans and monitoring programs;
- receipt of and response to any complaints;
- notification and reporting of any notifiable / reportable incidents;
- communication with government agencies and the local community;
- workforce induction / training;



- post-induction education and contact with all site-based employees on environmental matters;
- retention and provision to Gales of all necessary records and data for preparation of environmental reporting and demonstration of compliance; and
- keeping abreast of applicable new developments in environmental research and technology as it applies to environmental management on quarry sites.

Though retaining the responsibilities identified above, the Quarry Operator may, with agreement of Gales, delegate specific tasks to suitably qualified and / or experienced sub-contractors and / or consultants.

An Administration Officer role will also be undertaken by Gales and/or delegated to a suitable consultant or contractor. The role of the Administration Officer will be to assist the Quarry Operator to conform with the requirements of the relevant environmental laws and regulations, approvals, licences, permits and environmental management systems and plans.

Specifically, the Administration Officer will be responsible for:

- preparation of environmental reporting in conjunction with and utilising information provided by the Quarry Operator;
- review and distribution of environmental reports / management plans etc.;
- considering and advising on matters identified in the relevant planning and environmental approvals, licences, and permits and compliance with those conditions, and other environmental matters;
- assisting with the co-ordination / management of effective monitoring programs;
- assisting with communications, consultations, and meetings with government agencies and the local community; and
- keeping abreast of applicable new developments in environmental research and technology as it applies to environmental management on quarry sites.

5. ENVIRONMENTAL PERFORMANCE – MANAGEMENT AND MONITORING

5.1 INTRODUCTION

A risk analysis and detailed assessment of the anticipated environmental impacts associated with the quarry was included in the *Environmental Assessment* and supporting *Specialist Consultants Studies Compendium*. Environmental monitoring to determine compliance against the conditions of PA 05_0103B will be managed by the Quarry Operator and Administration Officer.



The success of Gales' environmental performance at the quarry will be assessed by the satisfaction of the Conditions of PA 05_0103B, Conditions within the Environment Protection Licence (EPL) and other approvals or licences. This, in turn, will be measured by way of achievement of key performance outcomes and satisfaction of Gales' objectives with respect to the management of:

- water resources;
- acid sulphate soils;
- ecology;
- transportation;
- noise;
- air quality;
- heritage; and
- visibility.

The assessment of performance, which may be quantitative and / or qualitative, will be reported in each relevant Annual Review.

The following sub-sections outline the key performance outcomes with respect to each of the above areas.

5.2 WATER RESOURCES

5.2.1 Flooding and Drainage

The Quarry Site is located near the southern boundary of the Kingscliff-Chinderah-Cudgen floodplain adjacent the northern boundary of the Cudgen Plateau and is traversed by the western drain which is aligned parallel to and south of Altona Drive (existing). The Quarry Site is also drained by two drains which are aligned east-west adjacent to the southern and northern boundaries.

The Quarry Site is influenced by both local catchment floods and Tweed River overbank floods. During a 100 Year ARI flood peak, the velocity of floodwaters traversing the Quarry Site is very low and generally in the order of 0.1m/s for both local catchment and Tweed River floods.

In addition to the erosion and sediment control measures outlined in the Erosion and Sediment Control Plan (Section 3.3 of the Soil and Water Management Plan [SWMP]), mitigation measures and management procedures to be adopted with respect to flooding and drainage will include the following.

- Removal of sections of the bunding surrounding the extraction areas once floodwaters have receded to allow floodwaters trapped behind the bunds to drain freely to the western drain.
- Filling of the initial and permanent processing area approximately 0.75m to 1.0m above the natural ground surface (1.55m AHD to 1.8m AHD). This will prevent inundation of the processing area during local catchment floods.
- Prior to a forecast of a Tweed River overbank flood, the entrance to the permanent processing area will be blocked with sand relocated from on-site stockpiles to reduce the level of inundation within the processing area.



- Maintenance of drainage paths, outside the bunded and filled areas, to the western drain parallel and south of Altona Drive. This will allow floodwaters to drain freely once the Tweed River drops and the drainage network regains function.
- Preparation of a flood evacuation plan prior to commencement of operations. The plan relates primarily to a Tweed River overbank flood and will ensure that personnel respond appropriately to a warning of an imminent overbank flood. Due to the extensive warning times (6 to 12 hours) for an overbank flood, vulnerable equipment and machinery could be moved / removed and personnel safely evacuated.

The realignment of the western drain adjacent to and south of Altona Drive as part of the approved realignment of Altona Drive will also provide a more efficient drain and allow faster drainage of floodwaters towards the Tweed River.

5.2.2 Surface Water and Groundwater

The groundwater resources within the local area are located within two aquifers, namely the Quaternary sands beneath the Tweed River floodplain and the Tertiary basalts of the Cudgen Plateau.

Other than the initial dredge pond created under Development Consent DA 96/518 and the drains discussed in Section 5.2.1, there are no significant or permanent surface water sources within the Quarry Site.

The most critical management control relating to groundwater will involve monitoring of a range of groundwater parameters as outlined within the Groundwater Monitoring Program (Section 7.5 of the SWMP) to ensure the predictions within the *Environmental Assessment* are being achieved.

Mitigation measures which relate to impacts from the exposure of potential acid sulfate soils and associated impacts on water quality will be implemented as described within Section 5.3 and the Acid Sulfate Soil Management Plan (Section 4 of the SWMP).

In order to reduce potential impacts on groundwater levels, the maximum extraction rate within the southern extraction pond has been limited to 450 000m³ per year for the first two years of operations or until a sufficient size extraction pond is created to allow extraction at a rate of 650 000m³ per year. During this initial period (and throughout the life of the operation), the level of extraction will be adjusted to ensure that groundwater drawdown levels remain within the limits predicted.

Additionally, the following hydrocarbon handling and storage procedures will be implemented to reduce the potential for contamination of surface water or groundwater.

- All hydrocarbons will be securely stored within designated storage areas.
- All storage tanks and areas will be either self bunded or bunded with impermeable surfaces and capacity to contain 110% of the largest storage tank capacity.
- All water from the workshop within the permanent processing area will be directed to an oil-water separator.



In the event that the quality or availability of surface water or groundwater on a surrounding landholding has been adversely affected as a result of the quarry operations, Gales would seek to reach an agreement to either replace any reductions in available groundwater supplies through re-establishment of water yields, such as extending the depth of the bore (if appropriate), or provide an alternative source of water, such from the extraction ponds or from groundwater sources elsewhere on Gales' land. Where appropriate and agreed between both parties, alternative forms of compensation (e.g. other property improvements) may be provided.

A Soil and Water Management Plan has been prepared for the quarry in accordance with *Condition 3(19)* of PA 05_0103B including a water balance, erosion and sediment control plan and surface water and groundwater monitoring programs. A Flood Evacuation Plan has also been prepared in accordance with Commitment 6.6 of the Final Statement of Commitments.

Table 3 presents the objectives and key performance outcomes for water resources.

Table 3
Objectives and Key Performance Outcomes – Water Resources

OBJECTIVES	KEY PERFORMANCE OUTCOMES
<p>(a) To protect the quality of surface and groundwater resources.</p> <p>(b) To ensure groundwater availability to, or use by, local landowners is not compromised and that mechanisms are in place for the amelioration and / or compensation to account for any adverse impacts.</p> <p>(c) To effectively separate “clean” and “dirty”.</p> <p>(d) To regularly assess, amend and document the effectiveness of the site’s water management controls.</p> <p>(e) To prepare, implement and review as necessary a Soil and Water Management Plan, including a site water balance, surface and groundwater monitoring programs, and an Erosion and Sediment Control Plan.</p> <p>(f) To prepare, implement and review as necessary a Flood Evacuation Plan.</p>	<p>(i) All activities are undertaken in accordance with the approved Soil and Water Management Plan, including the following.</p> <ul style="list-style-type: none"> - Appropriate water control systems are in place. - No significant erosion or sedimentation is evident external to the extraction ponds. - “Clean” and “dirty” waters are effectively segregated. - Waters “contaminated” or potentially “contaminated” with hydrocarbons are collected and treated in an appropriate manner. - The quality of the groundwater resource is not adversely affected. - The availability of groundwater to local users is not reduced and / or remains within predicted levels. - Surface and Groundwater response plan is in place or established if negative groundwater level and chemical fluctuations exceed natural variability. - Effective water controls remain in place on cessation of quarrying and neither groundwater nor surface water quality is reduced. - Ground and surface water monitoring results continue to comply with relevant criteria / objectives post quarry operation. <p>(ii) All monitoring results, general observations and changes to water management are reported in each Annual Review.</p> <p>(iii) Effective implementation of the Flood Evacuation Plan in the event of a Tweed River overbank flood.</p>

5.3 ACID SULFATE SOILS AND SEDIMENTS

Soils and sediments within the Quarry Site consist of black silty sandy topsoil ranging from approximately 0.2m to 0.5m overlying a medium to fine grained grey sand interbedded with shelly and humic material to a depth of approximately 20m.

According to the Cudgen 1:25 000 Department of Natural Resources acid sulfate soil planning map, the Quarry Site is located within a Class 3 area which may be affected by acid sulfate soils. Previous acid sulfate soil studies undertaken within and surrounding the Quarry Site were supplemented by further investigations by HMC (2008). These investigations indicate Potential Acid Sulfate Soil and sediment (PASS) in the upper sediment profile (<6m depth) although there is very little existing acidity in the soil and sediments.

In contrast with the upper 6m of sediments, in all boreholes below 6m depth, the buffering capacity within the sediments exceeds the acid generating capacity and therefore would neutralise any acid generation which might occur due to the oxidation of sulfidic sediments.

A site specific Acid Sulfate Soil and Sediment Management Plan (ASSMP) (Section 4 of the SWMP) has been compiled for the operation in accordance with *Condition 3(19)* of PA 05_0103B and relevant guidelines. The management plan covers two main aspects, namely the management of acid generation during extraction operations and the management of potentially acid generating Virgin Excavated Natural Material (VENM(b)). The comprehensive groundwater and surface water monitoring programs will also provide a system for detecting any acid that may be generated by any acid sulfate soils and sediments or VENM(b).

Table 4 presents the objectives and key performance outcomes for acid sulphate soils and sediments.

Table 4
Objectives and Key Performance Outcomes – Acid Sulfate Soils and Sediments

OBJECTIVES	KEY PERFORMANCE OUTCOMES
(a) To protect the quality of surface and groundwater resources. (b) To ensure VENM(b) imported to site is appropriately managed to avoid acid generation. (c) To regularly assess, amend and document the effectiveness of the site's acid sulphate soil and sediment controls. (d) To prepare, implement and review as necessary an Acid Sulfate Soil and Sediment Management Plan.	(i) All activities are undertaken in accordance with the approved Acid Sulfate Soil and Sediment Management Plan, including the following. <ul style="list-style-type: none"> - The quality of the groundwater and surface water resources are not adversely affected by acid sulfate soil or sediment oxidation. - All acid sulphate soil and sediment sampling and testing is completed at the required frequencies - All VENM(b) requiring internment is managed such that it does no cause acidification of the groundwater. - Surface and Groundwater response plan is in place or established if negative groundwater chemical fluctuations exceed natural variability. (ii) All monitoring results, general observations and changes to acid sulphate soil and sediment management are reported in each Annual Review.



5.4 TERRESTRIAL FLORA AND FAUNA

Flora and fauna surveys of the Quarry Site and pipeline corridors were undertaken between 2003 and 2006. The surveys identified a total of ten vegetation communities within and surrounding the Quarry Site and pipeline corridors. The most common community is exotic grassland which essentially encompasses the entire Quarry Site except for a small area of *Casuarina glauca* Woodland and regenerating *Casuarina glauca* and rainforest plantings near the eastern boundary.

A total of 75 bird, 14 mammal, three reptile, seven amphibian and one fish species were recorded within the Quarry Site and proposed northern pipeline corridor. Of these, three bird species are considered Threatened under the *Threatened Species Conservation Act 1995* and one under the *Environment Protection and Biodiversity Conservation Act 1999*. Each of these species was recorded flying over the survey area (as opposed to directly residing within it).

The eastern pipeline corridor would be installed within an area cleared for a separately approved road corridor and would therefore not result in additional disturbance of any vegetation communities or fauna habitat.

With the implementation of the management measures outlined within the *Environmental Assessment* and summarised below, it was assessed by Idyll Spaces (2008) and Kendall & Kendall (2008) that the quarry operations would not result in any significant impacts on flora or fauna.

Mitigation and management measures relating to flora and fauna that will be implemented are as follows.

- Vegetation to be retained will be clearly defined and marked prior to the commencement of site establishment to ensure that native vegetation clearing is confined only to those areas required for quarry operations.
- Noxious weeds will be controlled within the Quarry Site.
- Rehabilitation and landscaping will utilise local native plant species recommended by Idyll Spaces (2008) and outlined within the Landscape Management Plan that provide forage opportunities for nectarivorous and frugivorous birds and bats.
- In the event that a small number of trees are required to be removed for the laying of the pipelines, replacement plantings of the same tree species would be undertaken within the same area. In particular, within the northern pipeline corridor, *Banksia integrifolia*, a nectar-producing plant utilised by such species as the Common Blossom Bat, and *Allocasuarina littoralis*, a specific food tree species of the Glossy Black Cockatoo, will be avoided, wherever possible.

Table 5 presents the objectives of flora and fauna management along with the key performance outcomes.

Table 5
Objectives and Key Performance Outcomes – Flora and Fauna

OBJECTIVES	KEY PERFORMANCE OUTCOMES
(a) To minimise potential impacts on threatened flora and fauna.	(i) Flora and Fauna management in accordance with commitments within the <i>Environmental Assessment</i> .
(b) To minimise clearing of native vegetation.	(ii) Preparation of a Landscape Management Plan to the satisfaction of the Secretary of DPE.
(c) To maximise re-establishment / regeneration of native vegetation and utilisation of this by native fauna.	(iii) Successful implementation of the Landscape Management Plan.
(d) To control noxious weeds.	(iv) Efforts and progress in flora and fauna management reported in Annual Review.
(e) To develop and implement a Landscape Management Plan incorporating a Rehabilitation Plan.	

5.5 AQUATIC ECOLOGY

A single shallow drainage channel adjacent to the existing Altona Drive is aligned east-west through the southern extraction site (the ‘western drainage channel’) with other drainage channels running along the southern and northern boundaries of the Quarry Site. A shallow drain is located between the western drainage channel and the southern drain, however, it is of higher elevation, dry for long periods and hence of little aquatic value.

Assessment of the aquatic habitat together with desktop searches of Threatened species databases indicate that there are no aquatic Threatened species, population or ecological communities or areas of conservation significance that are likely to be affected by the quarry operations.

The principal management measures relating to aquatic ecology include the following.

- Creation of fringing wetlands within selected areas during finalisation of dredge pond sections in accordance with the Landscape Management Plan.
- Preparation of a Blue Green Algae Management Plan in accordance with *Condition 3(23)* of PA 05_0103B.
- During realignment of the western drainage channel (approved as part of the realignment of Altona Drive):
 - maintain the original connection to other upstream and downstream drainage channels;
 - avoid stranding native fish and, where possible, relocate them to similar habitat; and
 - where permanent crossings are to be constructed (eg. access road crossings), they allow fish free passage through the channel.



5.6 TRANSPORTATION

Condition 3(36) of PA 05_0103B requires the preparation of a Traffic Safety Plan for the quarry operations to the satisfaction of the Secretary. The plan includes details on measures to reduce the risk to other road users from quarry-related vehicles during both construction and operation. The Traffic Safety Plan also includes a Driver's Code of Conduct.

In addition to the various road upgrade and intersection works outlined within the *Environmental Assessment*, measures to minimise impacts in relation to transportation will include the following.

- Product despatch and VENM receipt will only be undertaken within the approved hours of operation, that is, no product or VENM transport vehicles will enter or leave the Quarry Site outside the designated hours.
- All speed limits will be strictly adhered to.
- No vehicles will be permitted to turn right from Crescent Street to Tweed Coast Road (unless appropriate upgrades of the intersection are undertaken during the duplication of Tweed Coast Road). All south-bound vehicles will need to make an appropriate turn at the Pacific Highway – Tweed Coast Road interchange.
- No heavy vehicles will be permitted to turn right from Altona Drive to Crescent Street (due to the 10t limit).
- Hinged or unhinged truck turning signs will be erected as appropriate at suitable locations on Altona Drive, Crescent Street and Chinderah Road and be displayed during operational hours. Should hinged signs be utilised, discussions will be held with the management at Hanson Tweed Sand Quarry to ensure appropriate display of the signage during operations at both quarries.
- The Proponent will establish a telephone complaints line to enable any traffic-related incidents, unsafe operation or general concern to be reported.
- All exiting laden trucks will use an on-site weighbridge (permanent processing area) or be loaded by a front-end loader fitted with weigh cells to ensure all RMS weight restrictions are adhered to.
- Mechanical road sweeping on Altona Drive and the entrances to the Quarry Site entrances will be undertaken, when required due to Gales's operations, to reduce the potential for dust lift-off.
- All product loads will be covered to minimise dust, particulate matter and debris emissions.

Table 6 presents the objectives and key performance outcomes for transportation.



Table 6
Objectives and Key Performance Outcomes – Transportation

OBJECTIVES	KEY PERFORMANCE OUTCOMES
(a) To keep the local community informed and to respond quickly and effectively to issues and complaints.	(i) Routine liaison with local residents to ensure their satisfaction with all aspects of transportation.
(b) To develop a Traffic Safety Plan in consultation with the RMS and Tweed Shire Council.	(ii) All transport trucks are well maintained, roadworthy and drivers act in courteous manner.
(c) To maintain a covered load policy for all trucks carting material to / from the quarry.	(iii) Payment of contributions to the maintenance of public roads in accordance with <i>Condition 2(15)</i> of PA 05_0103B.
	(iv) Preparation of a Traffic Safety Plan which is approved by the Secretary of DPE.
	(v) Performance reported in Annual Review.

5.7 NOISE

The noise impacts of the quarry at all non-project related residences are predicted to be within the nominated NSW Industrial Noise Policy 2000 (INP) criteria although it is recognised that operations, whilst compliant with the INP criteria may still be audible.

The applicable criteria for noise generated by the quarry operations, as specified by *Condition 3(3)* of PA 05_0103B, are shown in **Table 7**.

Table 7
Project Noise Criteria

<i>Location</i>	<i>Day and Evening¹</i> <i>L_{Aeq} (15 min) dB(A)</i>	<i>Shoulder¹</i> <i>L_{Aeq} (15 min) dB(A)</i>
Residences on privately owned land	47	44

Condition 3(4) of PA 05_0103B also requires that all reasonable and feasible measures to ensure that the cumulative noise generated by the quarry and other industrial developments does not exceed the following levels on privately owned land.

- L_{Aeq} (11 hour) 50 dB(A) – Day¹.
- L_{Aeq} (4 hour) 45 dB(A) – Evening¹.
- L_{Aeq} (9 hour) 40 dB(A) – Night¹.

To verify compliance with the applicable noise criteria, a Noise Monitoring Program has been prepared in accordance with *Condition 3(7)* of PA 05_0103B. The Noise Monitoring Program also outlines the noise controls that will be implemented.

Table 8 presents the objectives and key performance outcomes for noise.

¹ Day: 7:00am to 6:00pm, Evening: 6:00pm to 10:00pm, Night: 10:00pm to 6:30am, Shoulder: 6:30am to 7:00am



Table 8
Objectives and Key Performance Outcomes – Noise

OBJECTIVES	KEY PERFORMANCE OUTCOMES
(a) To manage the quarry operations to minimise noise and ensure emissions satisfy the nominated criteria under all nominated conditions.	(i) Noise management in accordance with the noise management controls outlined within the Noise Monitoring Program.
(b) To prepare a Noise Monitoring Program, including a Noise Monitoring Protocol.	(ii) All earthmoving equipment to comply with the sound power levels used in the <i>Environmental Assessment</i> .
(c) To keep the local community and regulators informed and to respond quickly and effectively to issues and complaints in accordance with the Noise Monitoring Protocol.	(iii) All earthmoving equipment is fitted with broadband (frequency modulated) reversing beepers or alternative safety devices (eg. reversing cameras).
(d) To monitor construction and operational noise in accordance with the Noise Monitoring Program to ensure compliance.	(iv) Monitoring undertaken in accordance with the Noise Monitoring Program.
	(v) Noise emissions are compliant with <i>Condition 3(3)</i> of PA 05_0103B.
	(vi) The receipt of valid noise-related complaints is eliminated or minimised.
	(vii) Monitoring results are included in the Annual Review.
	(viii) Any issues arising are managed in accordance with the complaints management section of the Noise Monitoring Protocol.
	(ix) All roads within the Quarry Site are regularly maintained to limit noise impacts.
	(x) Strict adherence to hours of operations, including transport activities.
	(xi) Open dialogue with neighbours and the local community to ensure community satisfaction.

5.8 AIR QUALITY

Modelling of air quality impacts within the *Environmental Assessment* indicated that deposited dust, total suspended particulates and annual PM₁₀ levels would remain below the applicable air quality criteria. The 24hr PM₁₀ levels were predicted to be equal to the applicable criteria at one receptor, when operating at maximum production within the permanent processing area and incorporating the dust emissions from the adjoining Hanson Tweed Sand Quarry, and below criteria at all remaining receptors. During operations within the initial processing area, the maximum project-only 24hr PM₁₀ is predicted to remain well below the project criteria (highest 31µg/m³) and below the cumulative maximum 24hr PM₁₀ (highest 45µg/m³).

The applicable criteria for air quality as specified by *Condition 3(8)* of PA 05_0103B are shown in **Table 9**.

Table 9
Air Quality Criteria

Air Quality Indicator	Averaging Period	Maximum Increase	Maximum Level
Deposited dust or dust fallout	Annual	2g/m ² /month	4g/m ² /month
TSP	Annual	-	90µg/m ³
PM ₁₀	24 hour	-	50µg/m ³
	Annual	-	30µg/m ³



To verify compliance with the applicable air quality criteria, a Dust Monitoring Program has been prepared in accordance with *Condition 3(9)* of PA 05_0103B. The Dust Monitoring Program identifies the strategies and monitoring to be adopted to maintain compliance with air quality criteria.

Table 10 presents the objectives and key performance outcomes for air quality.

Table 10
Objectives and Key Performance Outcomes – Air Quality

OBJECTIVES	KEY PERFORMANCE OUTCOMES
(a) To minimise air quality impacts on local residents and land users.	(i) Air quality management in accordance with air quality controls outlined within the Dust Monitoring Program.
(b) Visible air pollution and fume emissions are minimised.	(ii) A network of environmental monitoring stations is in place and utilised to manage and / or assess operational performance.
(c) To ensure the results of all air quality monitoring are within the applicable air quality criteria.	(iii) Activities that generate dust are managed such that licence and approval limits are met.
(d) To minimise dust impacts on motorists on local roads.	(iv) Measures such as water application and progressive rehabilitation are in place to reduce the potential for wind erosion.
(e) To keep the local residents and community informed and respond quickly to any issues or complaints raised.	(v) Monitoring is consistent with the Dust Monitoring Program and undertaken in accordance with the relevant Australian Standards.
(f) To establish an effective meteorological monitoring system.	(vi) Monitoring data provided to landowners / residents where air quality criteria are not satisfied.
(g) Greenhouse gas emissions are minimised consistent with operational practicalities.	(vii) Results and analyses of all air quality monitoring are included in each Annual Review.
	(viii) Issues arising are managed in accordance with the Air Quality Monitoring Protocol.

5.9 ABORIGINAL HERITAGE

Archaeological investigations undertaken during the preparation of the *Environmental Assessment* did not identify any cultural heritage sites within the Quarry Site or pipeline corridors.

Though no Aboriginal sites or relics were found, the Tweed Byron Local Aboriginal Land Council (LALC) will be invited to observe during the burying of the pipelines within the northern pipeline corridor. In the event that the alternative northern pipeline corridor is required, a field survey by an experienced heritage consultant and the Tweed Byron LALC would be undertaken.

An Aboriginal Cultural Heritage Management Plan has also been prepared in accordance with *Condition 3(33)* of PA 05_0103B and includes:

- an Aboriginal cultural heritage induction protocol for employees;
- a description of the process for Aboriginal inspection of excavations for the northern pipeline corridor;



- a description of the measures that would be implemented if any new Aboriginal objects or skeletal remains are discovered within or beyond the area of disturbance; and
- a description of the process for identifying a long-term storage location should Aboriginal relics be discovered that require salvage.

Table 11 presents the objectives of Aboriginal cultural heritage management along with the key performance outcomes.

Table 11
Objectives and Key Performance Outcomes – Aboriginal Cultural Heritage

OBJECTIVES	KEY PERFORMANCE OUTCOMES
(a) To protect and preserve any Aboriginal heritage sites should they be discovered within the Quarry Site or pipeline corridors.	(i) Recorded presence of Tweed LALC representative during excavations within the northern pipeline corridor.
(b) A representative of the Tweed LALC is invited to be present during excavations within the northern pipeline corridor.	(ii) Implementation of the Aboriginal Cultural Heritage Management Plan.

5.10 VISIBILITY

Views of the various activities within the Quarry Site will be possible from surrounding local vantage points including low elevation views from local roads, Nobel Lakeside Park and Chinderah Golf Course and elevated views from the Cudgen Plateau and parts of the Cudgen residential area. Distant views will also be possible from elevated parts of Kingscliff, Terranora and Banora Point.

The following visual controls will be implemented to reduce potential adverse impacts upon visual amenity.

- The permanent processing area will be surrounded by a 3m high bund planted with native shrub species.
- The initial processing area will have landscaping (planting of shrubs) along the eastern and southern boundary to enhance the appearance of the area.
- A visual screen will be planted along the eastern extent of the Quarry Site.
- The Quarry Site will be progressively rehabilitated so that non-vegetated areas would be minimised.
- The Quarry Site will be maintained in a clean and tidy condition at all times.
- Air quality controls will be implemented (see Section 5.8) to reduce visible dust.
- Floodlights or other required lighting will be positioned and directed so as to minimise light emissions. Where lighting is not required at any given time, it would not be used.

Table 12 presents the objectives and key performance outcomes for visibility.



Table 12
Objectives and Key Performance Outcomes – Visibility

OBJECTIVES	KEY PERFORMANCE OUTCOMES
(a) To design and construct the quarry infrastructure in a manner that minimises visual contrasts. (b) To minimise disturbance in advance of extraction consistent with operational requirements. (c) To maintain the site in a clean and tidy condition. (d) To minimise visible dust generation and deposition. (e) To use tree screens and bunding to minimise the visibility of equipment and impact of lights on mobile equipment. (f) To ensure that all external lighting associated with the mine complies with Australian Standard AS4282 1997 – Control of Obtrusive Effects of Outdoor Lighting, ie. wherever possible, all quarry lighting is directed downward. (g) To improve the long-term visual amenity of the Quarry Site through creation of a lake with fringing wetlands and parklands.	(i) Visual bunds and vegetation screens are established in accordance with <i>Condition 3(41)</i> of PA 05_0103B. (ii) The Quarry Site is organised, clean and tidy at all times. (iii) Equipment / facility lighting obscured or directed away from residences / roadways. (iv) Procedures are in place to record and respond to any complaints relating to lighting and / or visual amenity. (v) Rehabilitation is undertaken progressively in accordance with the Landscape Management Plan. (vi) General performance is reported in Annual Review.

6. INFORMATION DISSEMINATION, COMPLAINTS MANAGEMENT AND DISPUTE RESOLUTION

6.1 INFORMATION DISSEMINATION

Gales is committed to a policy of community membership and a sense of quarry ownership by employees and local community members, and will undertake a program of regular liaison / contact with local residents, land owners and the broader community to inform them of the quarry's progress. Such a program will also provide an opportunity to discuss issues of "concern" which residents are reticent to register as complaints. All such liaison / contacts / comments will be documented.

Dissemination of information to the local community and relevant agencies regarding the quarry establishment, operation, and environmental performance, will be achieved by both formal and informal means including the following.

1) **The Community Consultative Committee (CCC).**

The CCC includes representatives of the local community and Tweed Shire Council and is chaired by an independent chairperson. The CCC members act as local focal points for the provision of information to, and receipt of comments from, community members. CCC meetings will be held at least four times per year (or at other frequencies as determined by the CCC). During meetings, Gales representatives will provide advice on the status of site establishment activities,



the quarry's progress, environmental performance and monitoring results, complaints etc. The CCC meetings will also act as a forum for discussion of each of the above aspects or any other issue brought up by members of the community through the CCC representatives, or directly with Gales.

The minutes of the CCC meeting will be available on Gales' website and / or other venue agreed by the CCC.

In addition to their tabling at CCC meetings, relevant environmental monitoring results pertaining to individual landholders will be provided on request, and all results will be available for public examination. Gales will seek advice from each relevant land owner as to their desire to receive monitoring results.

2) **Annual Review.**

In accordance with *Condition 5(5)* of PA 05_0103B each year, an Annual Review will be prepared which will:

- a) identify the standards and performance measures that apply to the project;
- b) describe the works carried out in the last 12 months and those that will be carried out in the next 12 months;
- c) include a summary of the complaints received during the past year, and compare this to the complaints received in the previous 5 years;
- d) include a summary of the monitoring results for the project during the past year;
- e) include an analysis of the monitoring results against the relevant:
 - impact assessment criteria / limits;
 - monitoring results from previous years; and
 - predictions in the *Environmental Assessment*;
- f) identify any trends in the monitoring over the life of the project;
- g) identify and discuss any non-compliance during the previous year;
- h) describe what actions were, or are being, taken to ensure compliance; and
- i) list the sources of VENM material received at the site and the tonnage of materials received from each source during the Annual Review period.

The Annual Review will address all matters identified in the Project Approval for inclusion in each Annual Review. The Annual Review will be provided to DPE, Council, other relevant agencies and the CCC members and made available on Gales' website within 1 month of report completion.



3) **Other Methods.**

Other methods of information dissemination would include the following.

- a) Provision of copies of all management plans / strategies or monitoring programs, together with the results of independent audits undertaken in accordance with PA 05_0103B to the DPE, Tweed Shire Council, CCC and making these publicly available on Gales' website within one month of approval plan / strategy / program.
- b) Documenting visits by relevant government agencies, e.g. DPE or EPA to inspect the Quarry Site and Gales performance, together with the provision of reports or information, as requested.
- c) Maintaining regular formal and informal contact with relevant agencies.
- d) Providing reports to relevant authorities in the event of a non-compliance or a potential non-compliance with respect to statutory criteria or guidelines.

6.2 COMPLAINTS RECEIPT AND RESPONSE PROCEDURES

In order to receive, record and respond to any complaints in a timely manner, Gales will establish and maintain a telephone complaints line for the purpose of receiving complaints from any member of the public in relation to its activities. The complaints line will be operational 24 hours per day, seven days per week, be publicly advertised and the details supplied to adjacent land owners. All complaints will be registered in a database and responded to within 24 hours of the receipt of a complaint (or the next business day). The following information will be recorded (where it can be reasonably obtained) in the database.

- The date / time the complaint was made.
- Complainant's name.
- Telephone number.
- Nature of complaint.

The nature of the response will depend on the nature and source of complaints but will include one or more of the following actions.

1. Liaison with the complainant to ascertain all details and to identify the nature and source of the complaint and provide supplementary details for the log. Details recorded in the log will include:
 - the date and time of the complaint;
 - the method by which the complaint was made;
 - personal details (if supplied);
 - the nature of the complaint;
 - action taken in relation to the complaint including any follow-up contact; and
 - if no action, the reason why.



2. As appropriate, the initiation of monitoring or other investigations to verify or otherwise the exceedance or non-compliance with approval or licence condition(s).
3. Initiation of appropriate changes in operating practices or procedures.
4. Conducting a follow-up interview with the resident to determine their level of satisfaction with the response and the resultant outcome.

A copy of the report sheet will be supplied to the complainant, if requested. A summary of the complaints received in each 12 month period will also be included in each Annual Review, together with a comparison with the number and nature of complaints received in the previous 5 years.

6.3 DISPUTE RESOLUTION

In the event that any complainant does not consider that the response or reactions adequately address their concerns, the following procedure will be adopted.

1. A meeting will be convened with the Quarry Manager and, if required, Administration Officer to seek resolution of the matter. The complainant will be provided with a written response, detailing the results of investigations undertaken and the agreed actions to be taken regarding the measures to be implemented.
2. On implementation of the nominated measures, a further meeting will be convened to seek advice of satisfaction, or otherwise, regarding the outcomes.

If, after 21 days following Steps 1 and 2, the complainant believes the matter remains unresolved and no further agreement can be reached as to additional measures to be undertaken, the matter will be referred to DPE for independent review.

7. RESPONSE TO NON-COMPLIANCES

Compliance with all approvals, plans and procedures will be the responsibility of all personnel employed on or in association with the quarry. Programs to identify and promote responsibilities will be developed through promotion of project ownership under the direction of the Quarry Operator and Administration Officer.

The Quarry Operator will undertake regular inspections, internal audits and initiate directions identifying any remediation / rectification work required, and areas of actual or potential non-compliance, with all directions provided to the relevant party in writing and/or diarised.



In accordance with Section 148 of the *Protection of the Environment Operations Act 1997*, any notifiable non-compliance with approvals (eg. exceedance of performance criteria) or licences or incidents that cause or may cause material harm to the environment will be reported to the EPA, DPE and relevant authorities immediately². In accordance with *Condition 5(4)* of PA 05_0103B, within 6 days of notifying the Department and relevant authorities, a written report will be provided that:

- a) describes the date, time, and nature of the exceedance / incident;
- b) identifies the cause (or likely cause) of the exceedance / incident;
- c) describes what action has been taken to date; and
- d) describes the proposed measures to address the exceedance / incident.

Any non-compliance with the requirements of the quarry's Environment Protection Licence No. 12385 will also be reported on each Annual Licence Return.

A review of compliance with all conditions of PA 05_0103B will be undertaken during the preparation of each Annual Review. Additionally, in accordance with *Condition 5(6)* of PA 05_0103B, an independent environmental audit will be undertaken within 2 years of the commencement of quarrying operations and every 5 years thereafter. A copy of the independent audit will be provided to DPE and relevant agencies within 1 month of completion together with response to any recommendations within the audit. A copy of all publicly available documents will be placed on Gales' website.

8. CUMULATIVE IMPACT MANAGEMENT

The potential for cumulative impacts principally relate to the following operations.

- Hanson Tweed Sand Quarry.
- Kingscliff Waste Water Treatment Plant.
- Australian Bay Lobster Farm.

Gales will maintain a proactive relationship with the management personnel for these operations, particularly the Hanson Tweed Sand Quarry, and seek ways to reduce the potential for or respond to cumulative impacts. Additionally, Gales will seek to establish an integrated monitoring network and data sharing arrangement with these operations. An integrated monitoring approach would provide a more cost effective and comprehensive dataset for various environmental aspects and allow for improved interpretation of monitoring results.

² *Condition 5(3)* of PA 05_0103B requires notification within 24hrs, however, subsequent legislation changes require immediate notification. Compliance should be achieved with the more stringent requirement.



9. EMERGENCY RESPONSE

A Pollution Incident Response Management Plan (PIRMP) has been prepared in accordance with Section 153A of the *Protection of the Environment Operations Act 1997*. The PIRMP includes a review of the potential environmental hazards and details on how to respond and manage a pollution incident, including emergency contacts. Importantly, any emergency situations or incidents which do or could potentially have caused environmental harm, will be reported to EPA and other relevant authorities (refer to Section 7).

Health and safety matters will be managed in accordance with the Quarry Operator's Occupational Health and Safety Management Plan.

All site personnel will be trained in situation recognition and emergency response procedures, with regular updates through toolbox talks.

10. REVIEW AND IMPROVEMENT

The review and revision, if required, of the EMS is to be undertaken periodically (as a minimum following each independent audit) and will consider:

- the review of any audit findings;
- the results of monitoring programs;
- achievement of objectives and key performance outcomes;
- the relevance of the objectives and key performance outcomes to current and future conditions; and
- any information provided by and/or concerns of stakeholders.

If any significant changes are made to the EMS as part of one of these reviews, the revised EMS will be provided to DPE for approval.

11. REFERENCES

HMC Environmental Consulting Pty Ltd, 2008. *Acid Sulfate Soils, Soil Contamination & Agricultural Suitability Assessment for the Cudgen Lakes Sand Extraction Project*, prepared on behalf of Gales-Kingscliff Pty Ltd.

Idyll Spaces, 2008. *Flora Assessment Cudgen Lakes Sand Extraction Project*, prepared on behalf of Gales-Kingscliff Pty Ltd.

Kendall & Kendall Pty Ltd, 2008. *Fauna Assessment Cudgen Lakes Sand Extraction Project*, prepared on behalf of Gales-Kingscliff Pty Ltd.



Appendix 1

Project Approval

05_0103B

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Project Approval

Section 75J of the *Environmental Planning and Assessment Act 1979*

I approve the project application referred to in schedule 1, subject to the conditions in schedules 2 to 5.

The reason for these conditions is to:

- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the on-going environmental management of the project.

The Hon Kristina Keneally MP
Minister for Planning

Sydney

2009

SCHEDULE 1

Project Application:

05_0103B

Proponent:

Gales-Kingscliff Pty Ltd

Approval Authority:

Minister for Planning

Land:

- | | |
|-----------------|--|
| Extraction Area | <ul style="list-style-type: none">• Lot 21 DP 1082482• Lot 2 DP 216705• Altona Drive road reserve |
| Pipeline Routes | <ul style="list-style-type: none">• Lots 1 & 3 DP 828298• Lots 26C & 26D DP 10715• Lots 11 & 12 DP 871753• Lot 1 DP 1075645• Tweed Coast Road road reserve• Crescent Street road reserve• Lot 4 DP 727425• road reserve between Lot 26D DP 10715 & Lot 11 DP 871753• Elrond Drive road reserve• Turnock Street road reserve |

Project:

Cudgen Lakes Sand Extraction Project

February 2016 Modification shown in red type



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DEFINITIONS

Annual Report	The report required by condition 5 of Schedule 5
CCC	Community Consultative Committee
Council	Tweed Shire Council
Day	The period from 7.00am to 6.00pm, Monday to Saturday
DECC	Department of Environment and Climate Change
Department	Department of Planning and Environment
DPI	Department of Primary Industries
DPI – Water	Department of Primary Industries - Water
EA	Environmental Assessment of the project titled <i>Environmental Assessment of the Cudgen Lakes Sand Extraction Project</i> prepared by R W Corkery & Co. Pty Limited dated May 2008, including the response to issues raised in submissions, dated August 2008, and supplementary information provided by the Proponent on 29 April and 29 May 2009
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000</i>
EPL	Environment Protection Licence under the <i>POEO Act</i>)
Evening	The period from 6.00pm to 10.00pm
Extraction area	The land defined as the extraction area in Schedule 1
Land	Land means the whole of a lot, or contiguous lots owned by the same landowner, in a current plan registered at the Land Titles Office at the date of this approval
Minister	Minister for Planning, or delegate
MOD 1 EA	Modification application 05_0103 MOD 1 and accompanying documents titled <i>Environmental Assessment for the Modification of PA 05_0103</i> , prepared by R.W. Corkery & Co Pty Limited and dated December 2015, including the Response to Submissions dated January 2016
PASS	Potential acid sulphate soil
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
Privately-owned land	Land that is not owned by a public agency or a quarrying company
Project	The development as described in the EA and MOD 1 EA
Proponent	Gales Kingscliff Pty Ltd, or its successors in title
RMS	Roads and Maritime Services
Secretary	Secretary of the Department, or nominee
SEPP	State Environmental Planning Policy
Shoulder	The period from 6.00am to 7.00am
Statement of Commitments	The Proponent's commitments in Appendix 2
Site	Land to which the Project Approval applies
Temporary Processing Area	Temporary Processing Area, as described in MOD 1 EA and depicted in Figure 3 in Appendix 1.
VENM	Virgin excavated natural material, as defined in the POEO Act



SCHEDULE 2 ADMINISTRATIVE CONDITIONS

Obligation to Minimise Harm to the Environment

1. The Proponent shall implement all reasonable and feasible measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the project.

Surrender of Consents

2. Within 18 months of the date of this approval, or as otherwise approved by the **Secretary**, the Proponent shall surrender all previous development consents for sand extraction on Lot 2 DP 216705 and Lot 21 DP 1082482, to the satisfaction of the **Secretary**.

Terms of Approval

3. The Proponent shall:
 - (a) carry out the project generally in accordance with the EA, MOD 1 EA and the Project Layout Plans; and
 - (b) comply with the conditions of this approval and the Statement of Commitments.

Notes

- The Project Layout Plans are shown in Appendix 1.
- The Statement of Commitments is reproduced in Appendix 2.

- 3A. If there is any inconsistency between the documents in condition 3, the most recent documents shall prevail to the extent of any inconsistency. The conditions of this approval shall prevail over documents in condition 3(a) to the extent of any inconsistency.
4. The Proponent shall comply with any reasonable requirement/s of the **Secretary** arising from the Department's assessment of:
 - (a) any reports, plans, programs or correspondence that are submitted in accordance with this approval; and
 - (b) the implementation of any actions or measures contained in these reports, plans, programs or correspondence.

Limits on Approval

5. Sand extraction operations may take place until 1 July 2029.

*Note: Under this Approval, the Proponent is required to rehabilitate and revegetate the site to the satisfaction of the **Secretary**. Consequently this approval will continue to apply in all other respects other than the right to conduct quarrying operations until the site has been rehabilitated and revegetated to a satisfactory standard.*

6. The Proponent shall not remove from the extraction area, by any means, more than 650,000 cubic metres of material a year.
7. The Proponent shall not transport from the extraction area by road more than 300,000 tonnes of material per year.
8. The Proponent shall not import to the extraction area more than 45,000 tonnes per year of VENM. The Proponent shall ensure that material imported in compliance with this condition does not contain waste.

Management Plans/Monitoring Programs

9. With the prior approval of the **Secretary**, the Proponent may submit any management plan or monitoring program required by this approval on a progressive basis.

Protection of Public Infrastructure

10. The Proponent shall:



- (a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the project; and
- (b) relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the project.

Note: This condition does not apply where such costs have already been provided by the Proponent through applicable road contribution or S94 plans (see Condition 14 below).

Compliance with Relevant Legislation and Other Approvals

11. The Proponent shall comply with all relevant Australian Standards and Codes (including Building Code of Australia) and obtain all necessary approvals required by State and Commonwealth legislation in undertaking the project.

Notes:

- Under Part 4A of the EP&A Act, the Proponent is required to obtain construction and occupation certificates for any proposed building works.
- Part 8 of the EP&A Regulation sets out the requirements for the certification of the project.

Demolition

12. The Proponent shall ensure that all demolition work is carried out in accordance with AS 2601-2001: *The Demolition of Structures*, or its latest version.

Operation of Plant and Equipment

13. The Proponent shall ensure that all plant and equipment used at the site is:
 - (a) maintained in a proper and efficient condition; and
 - (b) operated in a proper and efficient manner.

Section 94 Contributions

14. Prior to carrying out any development, or as otherwise agreed by Council, the Proponent shall pay Council \$91,761.00 in accordance with Section 7.1 of Council's *Tweed Road Contribution Plan No.4 Version 5.1* and \$399.40 in accordance with Council's *Section 94 Plan No.18*.
15. After submission of each **Annual Report** and on receipt of an invoice from Council, the Proponent shall pay to Council an amount calculated by Council to be the Proponent's contribution under Section 7.2 of Council's *Tweed Road Contribution Plan No.4 Version 5.1* in respect of the heavy haulage of VENM to the site.



**SCHEDULE 3
ENVIRONMENTAL PERFORMANCE CONDITIONS**

GENERAL EXTRACTION AND PROCESSING PROVISIONS

Identification of Boundaries

1. Within 1 month of the date of approval of the Landscape Management Plan (see condition 28 below), the Proponent shall:
 - (a) engage a registered surveyor to mark out the boundaries of the approved limits of extraction;
 - (b) submit a survey plan of these boundaries to the **Secretary**; and
 - (c) ensure that these boundaries are clearly marked at all times in a permanent manner that allows operating staff and inspecting officers to clearly identify those limits.

Note: The limit of extraction includes the areas described in the EA and shown conceptually on the plans in Appendix 1.

Pipeline Corridor

2. Prior to commencing work to install pipelines in the pipeline corridors (shown conceptually in Appendix 1), the Proponent shall submit for the approval of the **Secretary**:
 - (a) a survey plan of the route of the pipeline;
 - (b) evidence that this route does not require native vegetation clearing;
 - (c) evidence that the fill sites have approval for filling; and
 - (d) in relation to the eastern pipeline:
 - (i) evidence that any vegetation cleared from the eastern pipeline corridor following the date of this approval has been lawfully carried out in accordance with another approval;
 - (ii) details of proposed measures to protect vegetation during pipeline installation, operation and removal; and
 - (iii) details of measures, developed in consultation with **OEH**, to provide opportunities for the Wallum Froglet to cross the eastern pipeline.

NOISE

Impact Assessment Criteria

3. The Proponent shall ensure that the noise generated by the project during the operating hours specified in condition 5, does not exceed the noise impact assessment criteria in Table 1.

<i>Receiver Location</i>	<i>Day and Evening L_{Aeq} (15 min) dB(A)</i>	<i>Shoulder L_{Aeq} (15 min) dB(A)</i>
Residences on privately owned land	47	44

Table 1: Noise Impact Assessment Criteria

Notes:

- *Noise generated by the project is to be measured in accordance with the relevant requirements of the NSW Industrial Noise Policy.*
- *The noise limits do not apply if the Proponent has an agreement with the relevant owner/s of the residence/land to generate higher noise levels, and the Proponent has advised the department in writing of the terms of the agreement.*

Cumulative Noise Criteria

4. The Proponent shall take all reasonable and feasible measures to ensure that noise generated by the project combined with the noise generated by other industrial development does not exceed the following amenity criteria on any privately owned land, to the satisfaction of the **Secretary**:
 - L_{Aeq} (11 hour) 50 dB(A) – Day;
 - L_{Aeq} (4 hour) 45 dB(A) - Evening and
 - L_{Aeq}(9 hour) 40 dB(A) - Night



Hours of Operation

5. The Proponent shall comply with the operating hours in Table 2.

Activity	Day	Time
Site establishment, sand or soil extraction by excavator, dry processing, product transport by road, VENM receipts, other quarry related activities, maintenance (if audible at neighbouring residences)	Monday – Friday	7:00am to 6:00pm
	Saturday	7:00am to 1:00pm
	Sunday and Public Holidays	Nil
Sand extraction by dredging and pumping to the processing plant, wet processing.	Monday – Friday	7:00am to 10:00pm
	Saturday	7:00am to 4:00pm
	Sunday and Public Holidays	Nil
Sand extraction by dredging and pumping to fill sites.	Monday – Friday	7:00am to 6:30pm
	Saturday	7:00am to 1:00pm
	Sunday and Public Holidays	Nil
Operation of dredge to fill pipeline with water or pipeline flushing	Monday – Friday	6.30am to 7.00pm
	Saturday	6.30am to 1.30pm
	Sunday and Public Holidays	Nil
Maintenance (if inaudible at neighbouring residences)	Any day	Any time

Table 2: Operating Hours

Continuous Improvement

6. The Proponent shall:

- (a) implement all reasonable and feasible best practice noise mitigation measures;
- (b) investigate ways to reduce the noise generated by the project; and
- (c) report on these investigations and the implementation and effectiveness of these measures in the **Annual Report**, to the satisfaction of the **Secretary**.

Noise Monitoring Program

7. The Proponent shall prepare a Noise Monitoring Program for the project to the satisfaction of the **Secretary**. This program must:

- (a) be submitted to the **Secretary** for approval prior to carrying out any development on the site;
- (b) provide details of how the noise performance of the project would be monitored, including monitoring at the following locations:
 - Residence G;
 - Residence DD;
 - Residence F;
 - Residence B; and
 - Residence O;
 include a noise monitoring protocol for evaluating compliance with the relevant noise limits in this approval.

The Proponent shall implement the approved monitoring program as approved from time to time by the **Secretary**.

Note: For more information on the monitoring locations see Appendix 3.



AIR QUALITY

Impact Assessment Criteria

8. The Proponent shall ensure that dust generated by the project does not cause exceedances of the criteria listed in Tables 3 to 5 at any privately owned land.

<i>Pollutant</i>	<i>Averaging period</i>	<i>Criterion</i>
Particulate matter < 10 µm (PM ₁₀)	24 hour	50 µg/m ³

Table 3: Short Term Impact Assessment Criteria for Particulate Matter

<i>Pollutant</i>	<i>Averaging period</i>	<i>Criterion</i>
Total suspended particulate (TSP) matter	Annual	90 µg/m ³
Particulate matter < 10 µm (PM ₁₀)	Annual	30 µg/m ³

Table 4: Long Term Impact Assessment Criteria for Particulate Matter

<i>Pollutant</i>	<i>Averaging period</i>	<i>Maximum increase in deposited dust level</i>	<i>Maximum total deposited dust level</i>
Deposited dust	Annual	2 g/m ² /month	4 g/m ² /month

Table 5: Long Term Impact Assessment Criteria for Deposited Dust

Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia AS/NZS 3580.10.1-2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method.

Dust Monitoring Program

9. The Proponent shall prepare a Dust Monitoring Program for the project to the satisfaction of the **Secretary**. This program must:
- be submitted to the **Secretary** for approval prior to carrying out any development on the site; and
 - include details of how the air quality performance of the project would be monitored, and include a protocol for evaluating compliance with the relevant air quality criteria in this approval.

The Proponent shall implement the approved monitoring program as approved from time to time by the **Secretary**.

SOIL AND WATER

Discharges

10. Except as may be expressly provided for by an EPL, the Proponent shall not discharge any water from the project or ancillary operational areas. The Proponent shall ensure that the extraction pits subject to sand excavation are maintained and operated to prevent discharges of any surface water.

Water Quality Objectives

11. The Proponent shall aim to meet the water quality objectives in Table 6 for water in the dredge pond and in groundwater adjacent the dredge pond, unless otherwise approved by the **Secretary**.

<i>Pollutant</i>	<i>Unit of Measure</i>	<i>Water Quality Objectives</i>
Turbidity	NTU	5 - 20
pH	pH	6.5 – 8.5
Oil and Grease	mg/L	10
Salinity	µS/cm	<3,000
Dissolved oxygen	mg/L	>6
Chlorophyll-a	µg/L	2-10
Faecal coliforms	Median No./100mL	<1000
Enterococci	Median No./100mL	<230
Algae and blue-green algae	No. of cells/mL (M.aeruginosa)	<50,000
	mm ³ /L (total biovolume)	<4
Sodium	mg/L	<500
Potassium ion	mg/L	<40
Magnesium ion	mg/L	<100
Chloride ion	mg/L	<1000
Sulphate ion	mg/L	<800
Bicarbonate ion	mg/L	<400
Soluble Iron ion	mg/L	<20
Soluble aluminium ion	mg/L	<0.5
Ammonium ion	mg/L	<20

Table 6: Water Quality Objectives

Notes:

- The objectives for dissolved oxygen, turbidity and algae are relevant to surface water only.
- The Department acknowledges that short term exceedances of these objectives may occur during natural events such as heavy rainfall or flooding.
- The Department acknowledges that pre-existing water quality may not meet the objectives for some analytes, including salinity. The Proponent shall strive to meet the water quality objectives through implementation of the Soil and Water Management Plan (see condition 19 below), as far as is reasonable and feasible and within the Proponent's control, to the satisfaction of the **Secretary**.

PASS Fines Management

12. The Proponent shall ensure that all excavated PASS fines material is returned to below the watertable as soon as possible to prevent oxidation, unless adequately neutralised in accordance with methods approved under the Soil and Water Management Plan (see condition 19 below).
13. The Proponent must not remove material from the site that:
- has a Chromium reducible Sulfur level exceeding 0.03% Sulfur; or
 - contains a pH less than 5.5 in 1:5 water suspension.
14. The Proponent shall ensure that PASS material to be interred in the excavation is discharged into the pond at a depth of no less than 3 metres from the water surface, and that all fines are deposited to a final depth of at least 8 metres below the water surface, unless an alternative method is approved by **DPI - Water** and the **Secretary**.



Note: Material that would settle to a depth of at least 8 metres may be placed in the pond at a depth of less than 3 metres by excavator or similar equipment.

Flood Management

15. All earthworks, including drainage and bunding works, shall be contained wholly within the site.
16. The Proponent shall cease sand extraction and processing activities not less than 24 hours prior to the commencement of overflow from any extraction pond or as soon as notification is received of an impending flood, if notification is provided less than 24 hours prior. No sand extraction or processing shall occur while an extraction pond is overflowing.
17. The Proponent shall ensure that the flood storage capacity of the site is not less than the pre-existing flood storage capacity at all stages of the project. Details of the available flood storage capacity shall be reported in each **Annual Report**.
18. The top of the earth bunding around the northern and southern extraction ponds shall not exceed 1.8 m AHD. Spillways shall be provided at the eastern and western extents of each bund and shall be a minimum of 50 m wide and not exceed 1.3 m AHD. Bunds and spillways shall be suitably surfaced (for example grassed or rock lined) to avoid scour and erosion during storm and flood events.
- 18A. **The Proponent shall ensure the pad of the temporary processing area does not exceed a height of 1.8 m AHD.**

Management and Monitoring

19. The Proponent shall prepare a Soil and Water Management Plan for the project to the satisfaction of the **Secretary**. This plan must:
 - (a) be prepared in consultation with **DPI - Water** and **EPA**;
 - (b) include a:
 - Water Balance;
 - Erosion and Sediment Control Plan;
 - Acid Sulfate Soil Management Plan;
 - Blue-Green Algae Management Plan;
 - Surface Water Monitoring Program; and
 - Groundwater Monitoring Program; and
 - (c) be submitted to the **Secretary** prior to starting quarrying operations, and prior to carrying out any development on the site in the case of the Erosion and Sediment Control Plan.

The Proponent shall implement the approved management plan as approved from time to time by the Secretary.

20. The Water Balance shall include:
 - (a) details of all water extracted, transferred, used and/or discharged by the quarry;
 - (b) the source of all water collected or stored on the site, including rainfall, stormwater and groundwater; and
 - (c) measures to minimise water use or water loss by the project.
21. The Erosion and Sediment Control Plan shall:
 - (a) be consistent with the relevant requirements of *Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition, 2004* (Landcom), and Council's codes including its *Code of Practice for Soil and Water Management on Construction Sites, Development Design Specification D7 – Stormwater Quality and Tweed Urban Stormwater Quality Management Plan*, except that should an inconsistency occur between these documents, the higher standard shall apply;
 - (b) identify activities that could cause soil erosion and generate sediment;
 - (c) describe measures to minimise soil erosion and the potential for the transport of sediment to downstream waters;
 - (d) describe the location, function, and capacity of erosion and sediment control structures; and
 - (e) describe what measures would be implemented to maintain these structures over time.



22. The Acid Sulfate Soil Management Plan shall:
- be consistent with the *NSW Acid Sulphate Soil Advisory Committee's Acid Sulfate Soil Manual*; and
 - define procedures for managing the potential acid sulfate soils on the site, including sample testing and procedures.
23. The Blue-Green Algae Management Plan shall:
- be prepared by a suitably qualified blue-green algae expert, whose appointment has been approved by the **Secretary**;
 - be consistent with extant guidelines for blue-green algae management including the NHMRC's *Guidelines for Managing Risks in Recreational Water*;
 - describe the measures that would be implemented to prevent and control the sources of algal blooms over the short, medium and long term; and
 - define procedures for the management and notification of identified algal blooms.
24. The Surface Water Monitoring Program shall include:
- detailed baseline data on surface water quality;
 - surface water impact assessment criteria;
 - a program to monitor surface water levels and quality;
 - a program to manage any water releases from the site;
 - a program to monitor bank and bed stability; and
 - a protocol for the investigation, notification and mitigation of identified exceedances of the surface water impact assessment criteria.
25. The Groundwater Monitoring Program shall include:
- detailed baseline data on groundwater levels and quality, based on statistical analysis;
 - groundwater impact assessment criteria;
 - a program to monitor groundwater levels and quality;
 - a program to monitor groundwater level effects on groundwater dependent vegetation, and on groundwater supply to adjoining properties;
 - a protocol for the investigation, notification and mitigation of identified exceedances of the groundwater impact assessment criteria; and
 - a protocol for making good any adverse effect of changes to groundwater levels or quality associated with the project on water use on surrounding properties.

Pipeline Management

26. For the life of the pipelines, the Proponent shall maintain the pipelines, ensuring that any leaks or maintenance issues are detected and repaired to the satisfaction of the **Secretary**.

REHABILITATION AND LANDSCAPING

Rehabilitation

27. The Proponent shall progressively rehabilitate the site to the satisfaction of the **Secretary**.

Landscape Management Plan

28. The Proponent shall prepare a Landscape Management Plan for the project to the satisfaction of the **Secretary**. This plan must:
- be prepared:
 - by suitably qualified consultants, including a specialist hydrologist, coastal engineer, wetlands ecologist and landscape architect;
 - in consultation with Council, **DPI - Water** and DPI-Fisheries; and
 - in accordance with extant guidelines including the **DPI – Water's Constructed Wetlands Manual, Volumes 1 and 2** and the **DPI's Policy and Guidelines: Aquatic Habitat Management, 1999**;
 - be submitted to the **Secretary** prior to starting quarrying operations on the site; and
 - include a:
 - Rehabilitation Management Plan; and
 - Long Term Management Strategy.



The Proponent shall implement the approved management plan as approved from time to time by the Secretary.

Note: The Department accepts that the initial Landscape Management Plan may not include the detailed Long Term Management Strategy. However, a conceptual strategy must be included in the initial plan, along with a timetable for augmentation of the strategy with each subsequent review of the plan.

29. The Rehabilitation Management Plan must include:
- (a) the rehabilitation objectives for the site and pipeline corridors;
 - (b) a description of the short, medium, and long term measures that would be implemented to:
 - rehabilitate and stabilise the site and pipeline corridors; and
 - manage the restored vegetation and wetland habitat established on the site;
 - (c) detailed performance and completion criteria for the rehabilitation and stabilisation of the site;
 - (d) consideration of outcomes if VENM material received for backfilling is less than optimum;
 - (e) a detailed description of how the performance of the rehabilitation of the site would be monitored over time to achieve the stated objectives;
 - (f) a detailed description of what measures would be implemented over the next 5 years to rehabilitate and manage the landscape of the site and revegetation areas including the procedures to be implemented for:
 - progressively rehabilitating and stabilising areas disturbed by quarrying;
 - implementing revegetation and regeneration within the disturbance areas;
 - protecting areas outside the disturbance areas, including vegetation adjoining pipelines;
 - managing impacts on fauna, including measures to enable Wallum Froglet to cross the eastern pipeline;
 - controlling terrestrial and aquatic weeds and pests;
 - controlling access; and
 - reducing the visual impacts of the project;
 - (g) a description of the potential risks to successful rehabilitation and/or revegetation, and a description of the contingency measures that would be implemented to mitigate these risks; and
 - (h) details of who is responsible for monitoring, reviewing, and implementing the plan.
30. The Long Term Management Strategy must:
- (a) define the objectives and criteria for quarry closure and post-extraction management;
 - (b) investigate options for the future use of the site;
 - (c) describe the measures that would be implemented to minimise or manage the ongoing environmental effects of the project; and
 - (d) describe how the performance of these measures would be monitored over time.

Rehabilitation Bond

31. Prior to starting quarrying operations on the site, the Proponent shall lodge a rehabilitation bond for the project with the Secretary. The sum of the bond shall be calculated at:
- (a) \$2.50/m² for the total area to be disturbed and/or revegetated in each 5 year review period (see condition 32 below); and
 - (b) \$1.50/m² for the total area of land previously disturbed and/or rehabilitated by the project, to the satisfaction of the Secretary.

Notes:

- If the rehabilitation and revegetation works are completed to the satisfaction of the Secretary, the Secretary will release the rehabilitation bond.
- If the rehabilitation and revegetation works are not completed to the satisfaction of the Secretary, the Secretary will call in all or part of the rehabilitation bond, and arrange for the satisfactory completion of the relevant works.

32. Within 6 months of each Independent Environmental Audit (see condition 6 of schedule 5) excluding the inaugural audit, unless the Secretary directs otherwise, the Proponent shall review, and if necessary revise, the sum of the rehabilitation bond to the satisfaction of the Secretary. This review must consider:
- (a) the effects of inflation;
 - (b) any changes to the total area of disturbance; and
 - (c) the performance of the rehabilitation and revegetation to date.



ABORIGINAL CULTURAL HERITAGE

Aboriginal Cultural Heritage Management Plan

33. The Proponent shall prepare an Aboriginal Cultural Heritage Management Plan to the satisfaction of the **Secretary**. This plan must:
- (a) be prepared in consultation with the relevant Aboriginal communities;
 - (b) be submitted to the **Secretary** for approval prior to carrying out any development; and
 - (c) include a:
 - description of the Aboriginal cultural heritage induction protocol for employees;
 - description of the process for Aboriginal inspection of excavations for the northern pipeline corridor;
 - description of the measures that would be implemented if any new Aboriginal objects or skeletal remains are discovered during the project either within or beyond the area of disturbance; and
 - description of the process for identifying a long-term storage location should Aboriginal relics be discovered within the project site requiring salvage.

The Proponent shall implement the approved management plan as approved from time to time by the **Secretary**.

TRAFFIC AND TRANSPORTATION

Road Works

34. Prior to despatch of sand by road, the Proponent shall:
- (a) upgrade the intersection of Tweed Coast Road and Crescent Street for right turning vehicles to AUSTRROADS CHR treatment; and
 - (b) upgrade the intersection of Tweed Coast Road and Crescent Street for left turning vehicles to AUSTRROADS Figure 6.24 left turn treatment, to the satisfaction of Council.

Note: In the event that the Tweed Coast Road is upgraded prior to the commencement of the despatch of sand by road, the Proponent shall pay \$105,000 (indexed annually by CPI) to Tweed Shire Council as a contribution to intersection works on Tweed Coast Road and Crescent Street for trucks entering onto Tweed Coast Road from Crescent Street.

Road Haulage

35. Trucks are not permitted to enter the site prior to 7.00am on any day.

Note: This condition does not apply to delivery of material if that delivery is required by police or other authorities for safety reasons, and/or the operation or personnel or equipment are endangered. In such circumstances, notification is to be provided to DECC and the affected residents as soon as possible, or within a reasonable period in the case of emergency.

36. The Proponent shall prepare a Traffic Safety Plan for the project to the satisfaction of the **Secretary**. This plan must:
- (a) be prepared in consultation with the **RMS** and Tweed Shire Council;
 - (b) include measures to minimise the risk to other road users from project-related vehicles on public roads during construction and operation, including vehicles proceeding across Altona Drive between the southern and northern parts of the site;
 - (c) prohibit trucks departing the site from turning right from Crescent Street to Tweed Coast Road; and
 - (d) be submitted to the **Secretary** prior to commencing construction work.

The Proponent shall implement the approved safety plan as approved from time to time by the **Secretary**.

37. Product and VENM trucks are not to utilise Altona Drive west of the site or Crescent Street south of Altona Drive, except for the purpose of delivery or collection local to those streets.

38. The Proponent shall ensure that all loaded vehicles:
- (a) entering or leaving the site have their loads covered; and



- (b) leaving the site are cleaned of materials that may fall on the road before they are allowed to leave the site.

Parking

- 39. The Proponent shall provide sufficient parking on-site for all project-related traffic and visitors, in accordance with Council's parking codes and to the satisfaction of the **Secretary**. No on street parking shall be undertaken.

VISUAL IMPACT

Visual Amenity

- 40. The Proponent shall minimise the visual impacts of the project to the satisfaction of the **Secretary**.
- 41. The Proponent shall establish and subsequently maintain the vegetation screen around the extraction area within 12 months of the date of this approval.

Note: The vegetation screen shall be detailed in the Landscape Management Plan required under condition 28.

Lighting Emissions

- 42. The Proponent shall:
 - (a) take all practicable measures to mitigate off-site lighting impacts from the project; and
 - (b) ensure that all external lighting associated with the project complies with *Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting*, to the satisfaction of the **Secretary**.

Advertising

- 43. The Proponent shall not erect or display any advertising structure(s) or signs on the site without the written approval of the **Secretary**.

Note: This does not include business identification, traffic management and safety or environmental signs.

WASTE MANAGEMENT

- 44. The Proponent shall minimise the amount of waste generated by the project to the satisfaction of the **Secretary**.

EMERGENCY AND HAZARDS MANAGEMENT

Dangerous Goods

- 45. The Proponent shall ensure that the storage, handling, and transport of dangerous goods are conducted in accordance with the relevant *Australian Standards*, particularly AS1940 and AS1596, and the *Dangerous Goods Code*.

Safety

- 46. The Proponent shall secure the project to ensure public safety to the satisfaction of the **Secretary**.

Bushfire Management

- 47. The Proponent shall:
 - (a) ensure that the project is suitably equipped to respond to any fires on-site; and
 - (b) assist the rural fire service and emergency services as much as possible if there is a fire on-site.

PRODUCTION DATA

- 48. The Proponent shall:
 - (a) provide annual production data to the DPI using the standard form for that purpose; and
 - (b) include a copy of this data in the **Annual Report**.



TEMPORARY PROCESSING AREA

49. The Proponent shall ensure that the office facilities for the temporary processing area:
- (a) are designed with ventilation emanating from the side facing away from the Kingscliff Waste Water Treatment Plant; and
 - (b) have air conditioning facilities installed prior to occupation.



SCHEDULE 4 ADDITIONAL PROCEDURES

NOTIFICATION OF LANDOWNERS

1. If the results of monitoring required in schedule 3 identify that impacts generated by the project are greater than the relevant impact assessment criteria, then the Proponent shall notify the **Secretary**, affected landowners, and/or existing or future tenants accordingly, and provide quarterly monitoring results to each of these parties until the results show that the project is complying with the relevant criteria.

INDEPENDENT REVIEW

2. If a landowner considers that the project is exceeding the impact assessment criteria in schedule 3, then he/she may ask the **Secretary** in writing for an independent review of the impacts of the project on his/her land.

If the **Secretary** is satisfied that an independent review is warranted, the Proponent shall within 3 months of the **Secretary** advising that an independent review is warranted:

- (a) consult with the landowner to determine his/her concerns;
 - (b) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the **Secretary**, to conduct monitoring on the land, to determine whether the project is complying with the relevant criteria in schedule 3, and identify the source(s) and scale of any impact on the land, and the project's contribution to this impact; and
 - (c) give the **Secretary** and landowner a copy of the independent review.
3. If the independent review determines that the project is complying with the relevant criteria in schedule 3, then the Proponent may discontinue the independent review with the approval of the **Secretary**.
 4. If the independent review determines that the project is not complying with the relevant criteria in schedule 3, and that the project is primarily responsible for this non-compliance, then the Proponent shall:
 - (a) implement all reasonable and feasible measures, in consultation with the landowner, to ensure that the project complies with the relevant criteria; and
 - (b) conduct further monitoring to determine whether these measures ensure compliance; or
 - (c) secure a written agreement with the landowner to allow exceedances of the relevant criteria in schedule 3,to the satisfaction of the **Secretary**.

If the additional monitoring referred to above subsequently determines that the project is complying with the relevant criteria in schedule 3, or the Proponent and landowner enter into a negotiated agreement to allow these exceedances, then the Proponent may discontinue the independent review with the approval of the **Secretary**.

5. If the landowner disputes the results of the independent review, either the Proponent or the landowner may refer the matter to the **Secretary** for resolution.

If the matter cannot be resolved within 21 days, the **Secretary** shall refer the matter to an Independent Dispute Resolution Process (see Appendix 4).

SCHEDULE 5 ENVIRONMENTAL MANAGEMENT AND MONITORING CONDITIONS

ENVIRONMENTAL MANAGEMENT STRATEGY

1. The Proponent shall prepare an Environmental Management Strategy for the project to the satisfaction of the **Secretary**. This strategy must:
 - (a) be submitted to the **Secretary** prior to starting quarrying operations on the site;
 - (b) provide the strategic context for environmental management of the project;
 - (c) identify the statutory requirements that apply to the project;
 - (d) describe in general how the environmental performance of the project would be monitored and managed;
 - (e) describe the procedures that would be implemented to:
 - keep the local community and relevant agencies informed about the construction, operation and environmental performance of the project;
 - receive, handle, respond to, and record complaints;
 - resolve any disputes that may arise during the life of the project;
 - respond to any non-compliance;
 - manage cumulative impacts; and
 - respond to emergencies; and
 - (f) describe the role, responsibility, authority, and accountability of the key personnel involved in the environmental management of the project.

The Proponent shall implement the approved strategy as approved from time to time by the **Secretary**.

ENVIRONMENTAL MONITORING PROGRAM

2. The Proponent shall prepare an Environmental Monitoring Program for the project to the satisfaction of the **Secretary**. This program must be submitted to the **Secretary** prior to starting quarrying operations on the site, and consolidate the various monitoring requirements in schedule 3 of this approval into a single document.

INCIDENT REPORTING

3. Within 24 hours of detecting an exceedance of the limits/performance criteria in this approval or the occurrence of an incident that causes (or may cause) material harm to the environment, the Proponent shall notify the Department and other relevant agencies of the exceedance/incident.
4. Within 6 days of notifying the Department and other relevant agencies of an exceedance/incident, the Proponent shall provide the Department and these agencies with a written report that:
 - (a) describes the date, time, and nature of the exceedance/incident;
 - (b) identifies the cause (or likely cause) of the exceedance/incident;
 - (c) describes what action has been taken to date; and
 - (d) describes the proposed measures to address the exceedance/incident.

ANNUAL REPORTING

5. Within 12 months of the date of this approval, and annually thereafter, the Proponent shall submit an **Annual Report** to the **Secretary** and relevant agencies including Council. This report must:
 - (a) identify the standards and performance measures that apply to the project;
 - (b) describe the works carried out in the last 12 months;
 - (c) describe the works that will be carried out in the next 12 months;
 - (d) include a summary of the complaints received during the past year, and compare this to the complaints received in previous years;
 - (e) include a summary of the monitoring results for the project during the past year;
 - (f) include an analysis of these monitoring results against the relevant:
 - impact assessment criteria/limits;
 - monitoring results from previous years; and
 - predictions in the EA;
 - (g) identify any trends in the monitoring results over the life of the project;
 - (h) identify any non-compliance during the previous year;



- (i) describe what actions were, or are being, taken to ensure compliance; and
- (j) list the sources of VENM material received at the site and the tonnage of materials received from each source during the period to which the **Annual Report** refers.

INDEPENDENT ENVIRONMENTAL AUDIT

6. Within 2 years of the start of quarrying operations on site, and every 5 years thereafter, unless the **Secretary** directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. This audit must:
 - (a) be conducted by a suitably qualified, experienced, and independent person(s) whose appointment has been approved by the **Secretary**;
 - (b) include consultation with the relevant agencies;
 - (c) assess the environmental performance of the project, and its effects on the surrounding environment;
 - (d) assess whether the project is complying with the relevant standards, performance measures and statutory requirements;
 - (e) review the adequacy of any strategy/plan/program required under this approval; and, if necessary,
 - (f) recommend measures or actions to improve the environmental performance of the project, and/or any strategy/plan/program required under this approval.
7. Within 1 month of completion of each Independent Environmental Audit, the Proponent shall submit a copy of the audit report to the **Secretary** and relevant agencies, with a response to all of the recommendations in the audit report.
8. Following each Independent Environmental Audit, the Proponent shall review and if necessary revise each of the environmental management and monitoring strategies/plans/programs in schedules 3 and 5, to the satisfaction of the **Secretary**. The revised strategies/plans/programs shall be submitted to the **Secretary** within 6 months of completing the audit.

COMMUNITY CONSULTATIVE COMMITTEE

9. Prior to starting quarrying operations on the site, the Proponent shall establish a CCC for the project. This CCC must be established and operated in accordance with the *Guideline for Establishing and Operating Community Consultative Committees for Mining Developments*, and to the satisfaction of the **Secretary**.

*Note: With the approval of the **Secretary**, the Proponent may combine the CCC with the CCC for the Hanson Tweed sand extraction operation.*

ACCESS TO INFORMATION

10. Within 1 month of the approval of any plan/strategy/program required under this approval (or any subsequent revision of these plans/strategies/programs), or the completion of any independent environmental audit or **Annual Report**, the Proponent shall:
 - (a) provide a copy of the relevant document/s to Council and relevant agencies; and
 - (b) ensure that a copy of the relevant document/s is made publicly available on site and/or at the Proponent's regional office and on the Proponent's website, to the satisfaction of the **Secretary**.
11. During the project, the Proponent shall:
 - (a) make a summary of monitoring results required under this approval publicly available at the Proponent's regional office and on the Proponent's website; and
 - (b) update these results regularly (at least every 3 months), to the satisfaction of the **Secretary**.



APPENDIX 1
PROJECT LAYOUT PLANS

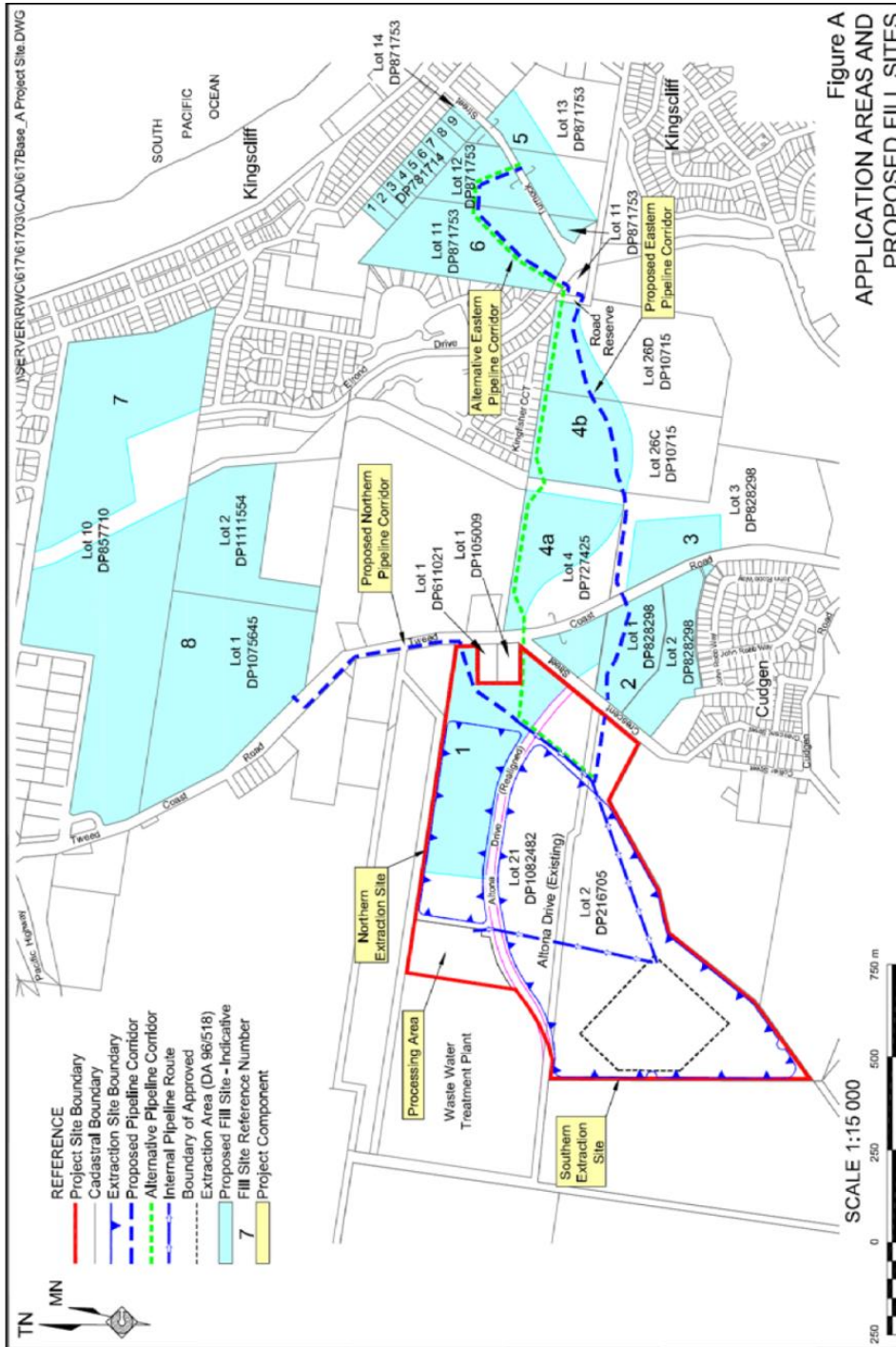


Figure 1 – Application Areas

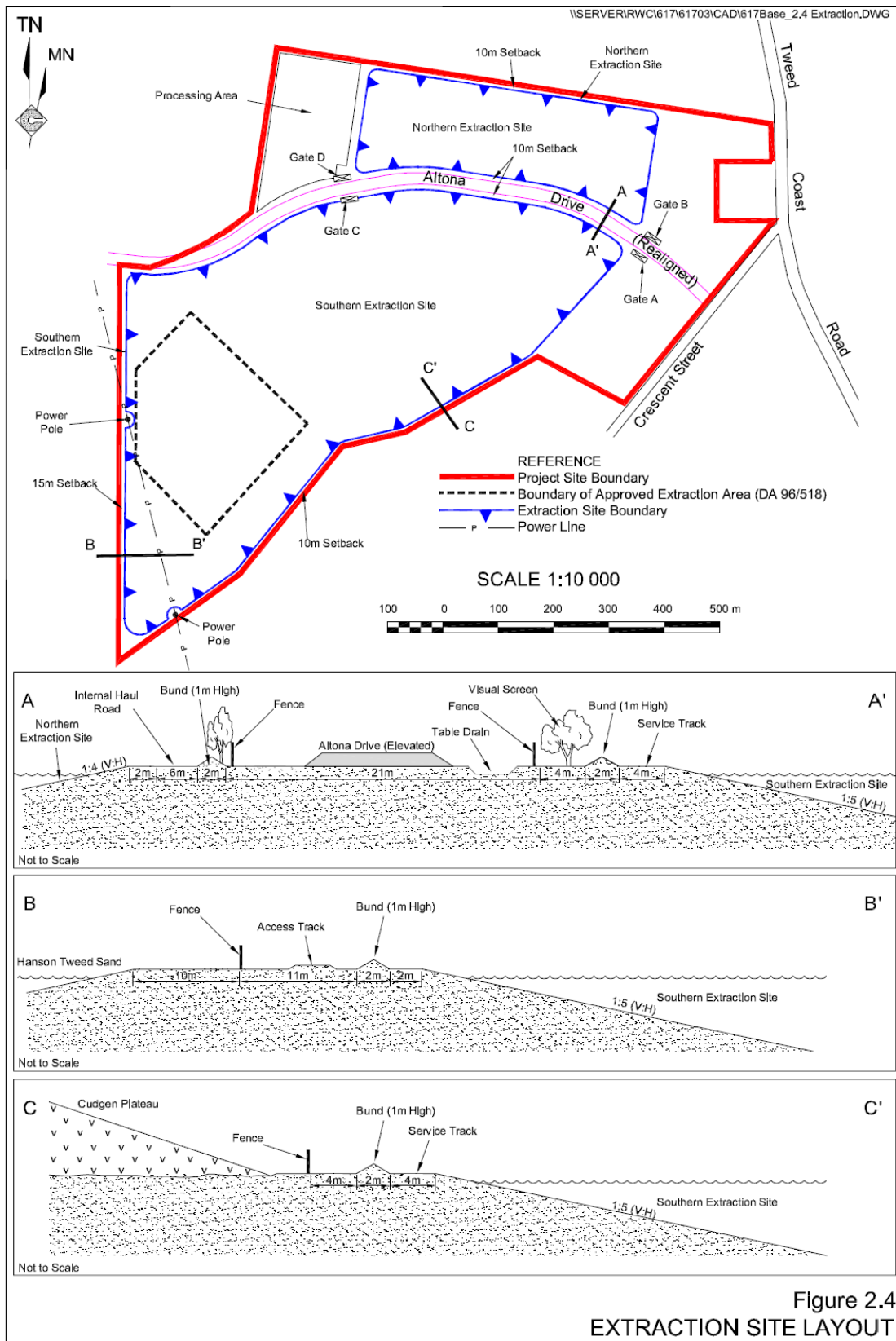


Figure 2.4
EXTRACTION SITE LAYOUT

Figure 2 – Extraction Site Layout

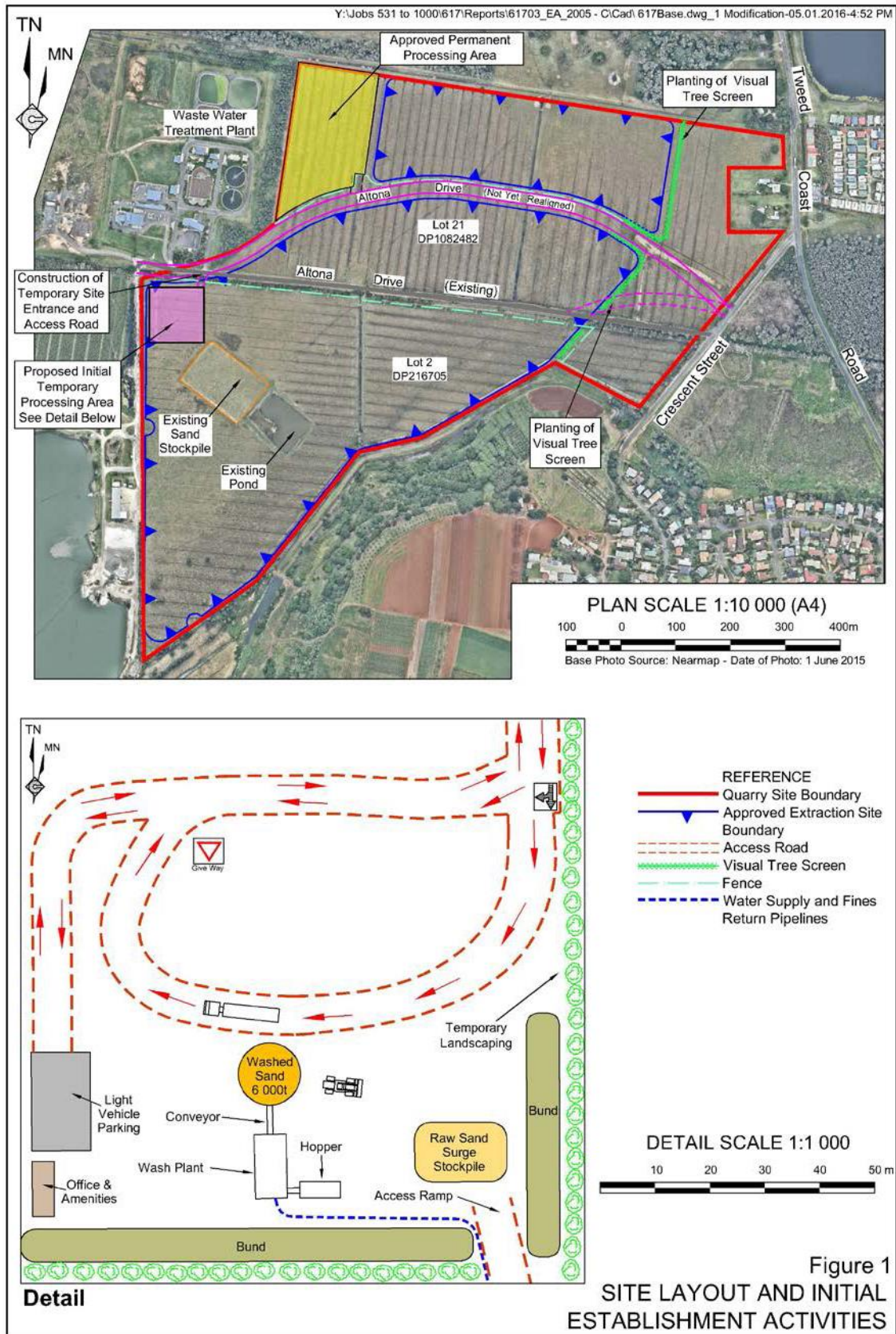


Figure 3 – Temporary Processing Area

APPENDIX 2
STATEMENT OF COMMITMENTS

Desired Outcome	Action	Timing
1. Area of Activities		
All approved Project components are constructed and activities are undertaken in the area(s) nominated on the approved plans and figures (unless moved slightly to avoid individual trees within the pipeline corridors).	1.1 Survey and mark the boundaries of the areas of disturbance.	Prior to site establishment and each extraction stage.
2. Sand Extraction and Processing		
Final extraction boundaries remain stable.	2.1 Ensure extraction batters for all long-term boundaries are formed no steeper than 1:5 (V:H).	Continuous.
Extraction and processing rates do not exceed assessed maximum rates.	2.2 Ensure the extraction rate is contained to limit initial drawdown levels (see Commitments 7.1 and 7.3).	During initial operational stages.
	2.3 Ensure total extraction rates do not exceed 650 000m ³ per year.	Continuous during operations.
	2.4 Ensure no more than 200 000m ³ (300,000 tonnes) of sand is processed per year.	Continuous during operations.
3. Operating Hours		
Management of operating hours of work in accordance with project approval conditions.	3.1 Undertake all site establishment activities between 7:00am and 6:00pm Monday to Friday and 7:00am to 1:00pm Saturdays.	During Site Establishment.
	3.2 Undertake all sand extraction (dredging to processing area) and processing between 7:00am and 10:00pm Monday to Friday and 7:00am to 4:00pm Saturdays.	During operations.
	3.3 Undertake all sand extraction (dredging to fill sites) between 7:00am to 6:30pm Monday to Friday and 7:00am to 1:00pm Saturdays.	During operations.
	3.4 Undertake all soil removal and sand extraction (excavation) between 7:00am and 6:00pm Monday to Friday and 7:00am to 1:00pm Saturdays.	During operations.
	3.5 Undertake all product distribution and VENM receipt between 7:00am and 6:00pm Monday to Friday and 7:00am to 1:00pm Saturdays.	During operations.
	3.6 Undertake audible site maintenance between 7:00am to 6:00pm Monday to Friday and 7:00am to 1:00pm Saturdays.	During operations.
	3.7 Undertake inaudible site maintenance at any time.	During operations.
4. Waste Management		
Minimisation of general waste creation and maximisation recycling wherever possible.	4.1 Dispose all recyclables and general waste in appropriate waste receptacles.	As required.
Minimisation of the potential risk of environmental impact due to waste creation, storage and / or disposal.	4.2 Place all oversize materials within the VENM(a) receipt area.	As required.
	4.3 Inter any oversize materials suspected of being acid generating to settle beneath at least 8 m of water.	As required.

Desired Outcome	Action	Timing	
5. Rehabilitation			
The creation of a stable final landform, available for the proposed future use(s) of recreation and nature conservation.	5.1	Progressively backfill the northern extraction pond to the natural ground level.	When suitable backfill and backfill areas are available
	5.2	Progressively backfill selected finalised sections of the southern extraction pond to create wetland areas.	When suitable backfill and backfill areas are available
	5.3	Stabilise all earthworks and disturbed areas no longer required for Project-related activities in order to minimise erosion and sedimentation, dust lift-off and to reduce visual intrusion.	As areas become available.
	5.4	Conduct ongoing annual rehabilitation monitoring and maintenance.	Ongoing.
	5.5	Cross-rip all unsealed roads and remove all buildings and structures not required for the final land use.	Following completion of operations.
	5.6	Prepare a Rehabilitation Management Plan.	Prior to the commencement of extraction operations.
6. Flooding and Drainage			
Minimisation of potential flooding impacts upon the Project and surrounding land users and property.	6.1	Construct and maintain shallow spillways (approximate elevation 1.3m AHD) within the bunds surrounding the extraction ponds at the eastern and western extent of the bunding adjacent the deepest part of the extraction pond.	Continuous whilst bunding in place.
	6.2	Remove sections of bunding once floodwaters have peaked to allow floodwaters trapped behind the bunds to drain freely to the western drainage channel as the flood recedes.	During flood event.
	6.3	Fill the processing area approximately 0.75m to 1.0m above natural ground level (1.55m AHD to 1.8m AHD) to prevent inundation of the processing area during local catchment floods.	During site establishment.
	6.4	Block the entrance to the processing area with sand relocated from on-site stockpiles prior to a forecast Tweed River overbank flood to reduce the level of inundation within the processing area.	Prior to forecast Tweed River overbank flood.
Minimisation of potential flooding impacts upon the Project and surrounding land users and property.	6.5	Maintain drainage paths outside of the bunded and filled areas to allow floodwaters to drain freely.	Continuously.
	6.6	Prepare a flood evacuation plan to ensure that personnel respond appropriately to a warning of an imminent Tweed River overbank flood.	Prior to commencement of operations.



Desired Outcome	Action	Timing
	6.7 Realign the western drainage channel parallel to and south of Altona Drive to provide a more efficient drain and allow faster drainage of floodwaters towards the Tweed River.	During realignment of Altona Drive (separate approval).
7. Groundwater		
Minimisation of potential groundwater quality or quantity impacts upon surrounding groundwater users (including groundwater-dependent ecosystems).	7.1 Commence extraction within the southern extraction pond at an equivalent rate of 100 000m ³ per year and progressively ramp up in increments of up to 100 000m ³ .	Commencement of extraction within southern extraction area.
	7.2 Ensure the maximum extraction rate within the southern extraction pond does not exceed 450 000m ³ per year during the first two years of operations or until a sufficient size extraction pond is created to allow extraction at a rate of 650 000m ³ per year.	During the first 2 years of operation.
	7.3 Adjust sand extraction rates to ensure that groundwater drawdown levels remain within the predicted limits.	Ongoing during operations.
	7.4 Install a height gauge within the Southern Extraction Pond so that water levels can be monitored daily to m AHD.	Following commencement of sand extraction.
	7.5 Undertake standard monitoring for pH, EC, temperature, REDOX potential and groundwater level (m AHD) at the monitoring locations nominated in the Groundwater Monitoring Plan.	Monthly during the first year of operations and subject to review, extend to quarterly.
	7.6 Undertake comprehensive monitoring for pH, EC, temperature, REDOX potential, groundwater level (m AHD), dissolved oxygen, calcium, magnesium, sodium, potassium, bicarbonate, sulfate, chloride, filterable iron, aluminium and arsenic. Monitoring will be undertaken by a suitably qualified or trained person at the monitoring locations nominated in the Groundwater Monitoring Plan and analysis undertaken at a NATA accredited laboratory.	Quarterly during the life of operations.
Minimisation of potential groundwater quality or quantity impacts upon surrounding groundwater users (including groundwater-dependent ecosystems).	7.7 Continue groundwater monitoring following the cessation of extraction and placement of VENM.	Quarterly, following completion of operations for 12 months and annually thereafter for 5 years.
	7.8 Regularly review monitoring data.	Quarterly during the first year of operations and six monthly following the first year.
	7.9 Provide a summary of the monthly / quarterly data relevant to each bore to the respective landowners.	Ongoing during monitoring.

Desired Outcome	Action	Timing
	7.10 Compile an annual summary of all monitoring results and forward to DPI - Water as part of the annual return for the site.	Ongoing during monitoring.
	7.11 Coordinate all monitoring activities with those already underway by Hanson Construction Materials and Australian Bay Lobster to ensure meaningful analyses can be obtained from all monitoring on the flood plain.	Ongoing during monitoring.
	7.12 Consult with each likely affected landowner and investigate complaints of poor water quality in neighbouring dams/bores.	Ongoing during operations.
	7.13 Undertake a more detailed sampling and analysis program to identify the source of the drawdown or contamination in the event the following is detected. <ul style="list-style-type: none"> • Deterioration in groundwater quality outside of the effects of drought or flood due to on-site activities. • Significant variations in groundwater level outside drought or flood conditions due to on-site activities. • Formation of a cone of depression or a groundwater mound that extends beyond the site boundary. 	If and when listed event occurs.
Minimisation of potential groundwater quality or quantity impacts upon surrounding groundwater users (including groundwater-dependent ecosystems).	7.14 Negotiate an agreement with each affected landholder in the event water quality or quantity is adversely affected to either: <ul style="list-style-type: none"> • deepen the existing bore or install a replacement bore; • pay a cash compensation equal to the assessed cost of deepening the bore; • provide an alternative water supply, such as from the extraction ponds or groundwater bore registered to the Proponent; or • provide an appropriately sized rainwater storage tank to enhance property water storage. 	When the water quality or quantity of available groundwater is adversely affected.
	7.15 Investigate and secure a suitable alternative water supply (or other form of compensation) for R.W. Julius commensurate with the agreed legal water usage from groundwater supplies from Lot 1 DP598073.	Prior to commencement of dredging.



Desired Outcome	Action	Timing
	7.16 Monitor, using data loggers, water levels and water usage rates within the dams on the R. Julius property that would potentially be affected.	Measurements to occur on a monthly basis during ongoing operations.
	7.17 Implement the provision of an alternative water supply or other agreed compensation.	In the event water supplies are adversely affected.
	7.18 Provide copies of any negotiated agreements to the Department of Planning and Department of Water and Energy for their records.	In the event an agreement is negotiated.
8. Surface Water		
Prevention of discharge of dirty, acidic or otherwise contaminated water from the Project Site.	8.1 Reduce sand extraction and temporarily cease VENM placement if a significant deterioration in extraction pond water quality occurs, until the source is identified and appropriate amelioration measures are implemented.	In the event significant deterioration of extraction pond water occurs.
	8.2 Regularly monitor surface water to provide an accurate assessment of the adequacy of practices implemented as part of the operation.	Ongoing.
9. Acid Sulfate Soils and Sediments, Soil Contamination and Agricultural Suitability		
Minimisation of PASS and VENM(b) acidification and adequate treatment and storage of these materials.	9.1 Convey return water (from both the wash plant and fill sites) in a manner which ensures fines / silts remain in suspension and do not settle in the return pipelines. If a pipeline is not used, undertake sluicing in a manner that ensures turbulent flow and sufficient velocity to prevent the deposition of fines material within the drainage line.	Ongoing during processing and hydraulic transportation of fill sand.
	9.2 Return all separated fines to the extraction ponds for final placement with the return outlet located at a minimum 3m below the water surface within the extraction ponds.	During return of fines to extraction ponds.
	9.3 Settle silts/fines arising from processing a minimum depth (typically 8m) below the surface of the southern extraction pond.	During internment of silts / fines.
	9.4 Do not extract residual clay material from the base of the sand resource.	Ongoing during extraction.
	9.5 Ensure a suitably qualified or trained person assesses imported material (VENM) in accordance with the ASSMAC guidelines and confirms its classification as VENM prior to acceptance at the Project Site.	Ongoing during VENM receipt.

Desired Outcome	Action	Timing
	9.6 Place VENM(b), received at the premises which is intended to be: <ul style="list-style-type: none"> • dredged or interned within the southern extraction pond to settle at a minimum of 8m below the surface water; or • placed within the northern extraction area a minimum depth of -2.0m AHD; within a nominated period.	Within 24 hours of the time of its excavation at the originating site.
The level of documentation for managing and reporting matters relating to Potentially Acid Sulfate Soils and Sediments is comprehensive and appropriately maintained.	9.7 Compile a site specific Acid Sulfate Soil and Sediment Management Plan for the Project in accordance with relevant legislation and in consultation with government agencies, in particular DPI - Water and DECC. Ensure the management plan covers both the management of acid generation during extraction operations and the management of potentially acid generating VENM(b).	Prior to commencement of quarrying operations.
	9.8 Retain records of monitoring on site together with the application rates of the alkaline amendment used as neutralising agents. Provide these records to statutory authorities upon request.	Ongoing.
The level of documentation for managing and reporting matters relating to Potentially Acid Sulfate Soils and Sediments is comprehensive and appropriately maintained.	9.9 Obtain documentation for each truck load of VENM(b) received at the Project Site that demonstrates that the excavation of VENM(b) and its transport and handling has been conducted in accordance with the NSW ASS Manual to prevent the generation of acid.	Ongoing during VENM receipt.
	9.10 Submit to the DECC(EPA) an annual return (in accordance with the issued Environment Protection Licence) which outlines the results of all required monitoring.	Annually.



Desired Outcome	Action	Timing
	9.11 Retain documentation for each truck load of VENM(b) received at the site which indicates: <ul style="list-style-type: none"> the details of the originating site (name, address, owner and developer, contact details); the details of the transportee (name, address, contact details, vehicle registration); date and time of the extraction of the VENM(b); pH of the VENM(b) at the time of its extraction, and at the time immediately prior to its placement underwater; and the name of the person (certified practicing soil scientist) who assessed the material and classified it as VENM(b). 	Ongoing during VENM(b) receipt.
	9.12 Ensure verification of neutralising agent application volumes and verification results are available.	Prior to burial of VENM(b).
Prevention of any off-site impacts as a result of acidification of soil, sediments or water.	9.13 Treat stripped topsoil/loam at determined rates prior to use in earth bunds or rehabilitation.	During stripping programs.
	9.14 Treat and validate washed sand where required.	Ongoing during processing operations.
	9.15 Collect and analyse soil samples at a rate of 4 per hectare.	Prior to removal of topsoil and loam.
	9.16 Incorporate an alkaline amendment into the topsoil / loam at the calculated rate (based on the results of sampling).	Prior to removal or following placements on treatment pads.
	9.17 Complete the validation sampling of treated soil at a rate one sample per 1 000m ³ .	Following treatment and prior to placement of soil.
Prevention of any off-site impacts as a result of acidification of soil, sediments or water.	9.18 Construct bunding around the extraction and processing areas to control drainage.	During site establishment and ongoing adjustments during operations.
	9.19 Ensure all surface water and runoff from the extraction and processing areas drains or is pumped into the extraction ponds.	Ongoing throughout operations.
	9.20 Process extracted material via a hydrocyclone (such as would be used within the wash plant) or similar to hydraulically separate the fines (potentially containing pyrite) from the sand resource (except when material has been treated to ameliorate acid potential).	Ongoing during processing operations.
	9.21 Treat all material not processed using a hydrocyclone or similar with alkaline amendments.	Ongoing during processing.

Desired Outcome	Action	Timing
Demonstration that adverse impacts arising from Potentially Acid Sulfate Soils and Sediments are not evident on site.	9.22 Undertake validation testing of extracted sand and stripped topsoil/loam as described in Table 4.9 of the Environmental Assessment and in accordance with the NSW ASS Manual (ASSMAC, 1998) and amended laboratory methods.	As required and ongoing during operations.
	9.23 Audit the effectiveness of the operational safeguards and monitoring by an external environmental consultant.	Initially quarterly and reducing to annually during operations.
	9.24 Test the pH of the water into which the VENM(b) is placed to ensure it is not less than 6.5 at any time.	Ongoing during disposal of VENM.
	9.25 Undertake monitoring as outlined in Table 4.10 of the Environmental Assessment in relation to VENM(b) receipt and processing / internment.	Ongoing during disposal of VENM.
	9.26 Test the pH of the VENM(b) immediately prior to under-water disposal / backfilling to ensure the pH is not less than 5.5.	Prior to underwater disposal on VENM(b).
	9.27 Undertake a internal environmental audits of VENM(b) receipt and treatment during the initial stages of the operation to ensure appropriate treatment is being conducted and records are up to date.	Monthly during VENM(b) receipt.
	Appropriate procedures are in place to manage any departures from nominated procedures or criteria.	9.28 Complete the following in the event that validation or monitoring criteria are exceeded for topsoil, loamy sand or sand. <ul style="list-style-type: none"> • Test the acid neutralising capacity of the stripped topsoil or hydraulically separated sands. • Incorporate alkaline amendments at the appropriate rate if the measured acid neutralising capacity is insufficient to neutralise the existing and potential acidity. • Undertake validation testing following treatment of loamy sand and unprocessed sand and apply additional alkaline amendments as required. Repeat process until compliance with action criteria is met.
9.29 Terminate VENM(b) receipt at the premises if the pH of the water falls below accepted levels, until approval to continue is received in writing from the DECC(EPA).		In event extraction pond waters pH is <6.5 or <1 pH unit below background levels.



Desired Outcome	Action	Timing
	<p>9.30 Complete the following in the event monitoring criteria are exceeded for imported VENM(b).</p> <ul style="list-style-type: none"> • Sample at the maximum rate of one sample / 1 000m³ and test for SCR and total actual acidity. • Treat the material with the calculated amount of alkaline amendment if any records indicate SCR >0.03% or total actual acidity >18mol H+/t. • Treat the material with the calculated amount of alkaline amendment. Undertake verification testing at the rate of 1 sample/per 1 000m³ to confirm SCR <0.03% and total actual acidity <18mol H+/t prior to final placement or further processing. 	In the event monitoring criteria are exceeded.
Appropriate procedures are in place to manage any departures from nominated procedures or criteria.	<p>9.31 Undertake the following as soon as possible after becoming aware that any waste/material accepted at the premises is not VENM.</p> <ul style="list-style-type: none"> • Notify the EPA in writing. • Remove the material/waste from the premises and dispose of it at a facility licensed to take such waste. • Implement a procedure to audit all further incoming loads from that waste origin site prior to accepting any further waste, until such time as the results of such audits demonstrate that the waste origin site's screening and assessment procedures have been corrected to prevent further miss-classification of waste. 	In the event waste / material not classified as VENM accepted onto the Project Site.
	<p>9.32 Introduce hydrated lime at the appropriate rate if the extraction pond water quality fails accepted levels and ensure target pH level of 6.5 to 8.5 is not "overshot" leading to severely alkaline conditions (pH>9.0).</p>	In event pH of extraction ponds fall below 6.5.
10. Flora and Fauna		
Minimisation of short and long term impacts on flora within the Project Site and pipeline corridors.	<p>10.1 Progressively rehabilitate completed works within the Project Site to maximise cover of native vegetation in appropriate areas and minimise opportunities for erosion and weed invasion.</p>	As areas become available for rehabilitation.
	<p>10.2 Define and clearly mark vegetation for retention prior to the commencement of site establishment to ensure that native vegetation clearing is confined only to those areas required for Project operations.</p>	Prior to commencement of site establishment activities.
	<p>10.3 Control noxious weeds on the Project Site.</p>	Ongoing.

Desired Outcome	Action	Timing
	10.4 Place pipelines within pipeline corridors so as to avoid the need to clear trees or shrubs wherever possible.	During placement of pipes.
Establishment of native vegetation with ecological and conservation value.	10.5 Utilise local native plant species recommended by Idyll Spaces (2008) for rehabilitation and landscaping. Within and adjacent the final lake (Note: vegetation set back from the final lake would reflect the specific land use – eg. sporting fields, gardens, etc).	During rehabilitation and landscaping activities.
	10.6 Undertake replacement planting of the same tree species within the same area in the unlikely event that a small number of trees are required to be removed for the laying of the pipelines.	In the event trees are required to be removed within the pipeline corridor.
11. Aquatic Ecology		
Minimisation of short and long term impacts on aquatic ecology within and surrounding the Project Site.	11.1 During the realignment of the western drainage channel as part of the realignment of Altona Drive. <ul style="list-style-type: none"> • maintain the original connection to other upstream and downstream drainage channels; • avoid stranding native fish and, where possible, relocate them to similar habitat; • ensure fish free passage through the channel is made available where permanent crossings are to be constructed (eg. access road crossings); and • consult with DPI and DECC officers during the realignment process. 	During the realignment of Altona Drive and the western drainage channel.
	11.2 Create wetlands along finalised sections of the southern extraction pond (see Commitment No. 5.2).	Ongoing.
	11.3 Develop a Blue-Green Algae Management Plan incorporating a monitoring program.	Prior to the commencement of sand extraction.
	11.4 Undertake frequent and regular monitoring of temperature, dissolved oxygen, nutrients, colour and concentrations of blue-green algae.	Weekly during summer and monthly monitoring during winter.
	11.5 Obtain samples and readings from the upper 0.5m of the water at least at four locations around the periphery of the dredge pond and two in the centre.	Ongoing.



Desired Outcome	Action	Timing
12. Traffic and Transport		
Vehicle movements related to the Project do not have undue effects on traffic flow and accident rates on the surrounding road network.	12.1 No vehicles permitted to turn right from Crescent Street to Tweed Coast Road. (Note: Light vehicles travelling south from the Project Site would be directed to travel on Crescent Street/Cudgen Road.	Continuous or until upgrade of Crescent Street / Tweed Coast Road intersection.
	12.2 No heavy vehicles to turn right from Altona Drive to Crescent Street.	Continuous.
	12.3 Weigh all product trucks using the on-site weighbridge and ensure all RMS weight restrictions are adhered to.	Ongoing during product despatch.
	12.4 Inform all truck drivers and staff of road rules, speed restrictions and considerate driving practices.	On engagement of each driver.
Vehicle movements related to the Project do not have undue effects on traffic flow and accident rates on the surrounding road network.	12.5 Ensure all drivers are aware of all relevant operational hours (See also Commitment No. 3.5).	On engagement of each driver.
	12.6 Undertake mechanical road sweeping of Altona Drive and site access roads.	As required for project-related mud/sand tracking.
	12.7 Cover all product loads to reduce dust lift off.	Continuous during product despatch.
	12.8 Realign Altona Drive in accordance with DA 05/1450.	Prior to sand extraction within the southern extraction site reaching the existing alignment of Altona Drive.
	12.9 Construct the upgraded intersection of Altona Drive and Crescent Street together with a short section of road to link with the existing Altona Drive and an additional two passing bays along the existing alignment of Altona Drive.	Prior to despatch of products from the processing area or the receipt of VENM.
	12.10 Construct the four entrances to the Project Site from Altona Drive with the sealed carriageway of Altona Drive flared out to 9m wide for approximately 15m in advance of each access (from the right hand turn perspective) using a 25m transitional length. Ensure the access road is 10m wide at its intersection with Altona Drive providing a 15m inside radius for the left hand turn out.	During site establishment and realignment of Altona Drive.
	12.11 Implement appropriate management controls including the use of warning signs and manual traffic control during the laying of pipelines adjacent to Tweed Coast Road and during the underboring of the road crossings.	As required during site establishment.

Desired Outcome	Action	Timing
	12.12 Establish a telephone complaints line, advertised in the local telephone directory, to enable any traffic-related incidents, unsafe operation or general concern to be reported. Investigate all complaints and act decisively on substantiated incidents.	Ongoing during site establishment and operations.
	12.13 Implement a truck driver's code of conduct required to be signed by all Company employed or contracted truck drivers. The code will outline each truck driver's responsibility and the process to be undertaken in the event of a complaint.	Prior to product despatch or VENM receipt.
13. Noise		
All activities are undertaken in such a manner as to reduce the noise level generated, minimise impacts on surrounding landholders and/or residents and ensure noise levels remain below relevant DECC criteria.	13.1 Acoustically treat the dredge including the enclosure of the engine with acoustic louvres and install a high performance muffler.	Prior to hydraulic extraction.
	13.2 Undertake a series of tests prior to commissioning the sand processing plant to ensure compliance with the noise limits at all locations and confirm that the equipment to be used on the Project Site have sound power levels comparable to those used within the noise modelling assessment.	Prior to commissioning of processing plant.
	13.3 Install an acoustic fence on the processing area bund (see Figure 2.6) to increase the height of the noise barrier on the southern side of the processing area.	Prior to commissioning processing plant.
	13.4 Enclose the noisier components of the equipment to promote noise reduction of the plant.	Prior to commissioning processing plant.
	13.5 Fit all mobile vehicles on the site with broadband type reversing beepers or alternative safety devices such as strobe lights and / or cameras.	Prior to use of vehicle.
	13.6 Regularly service all equipment on site to ensure sound power levels of each item remains at or below that nominated for noise modelling purposes.	Ongoing.
	13.7 Maintain the internal road network to an acceptable standard to limit body noise from empty trucks.	Ongoing.
	13.8 Strictly adhere to all approved hours of operation.	Continuous.
	13.9 Undertake a program of noise monitoring to confirm that noise emission levels from the site establishment and construction period are within acceptable limits at the surrounding assessment locations.	Site establishment.

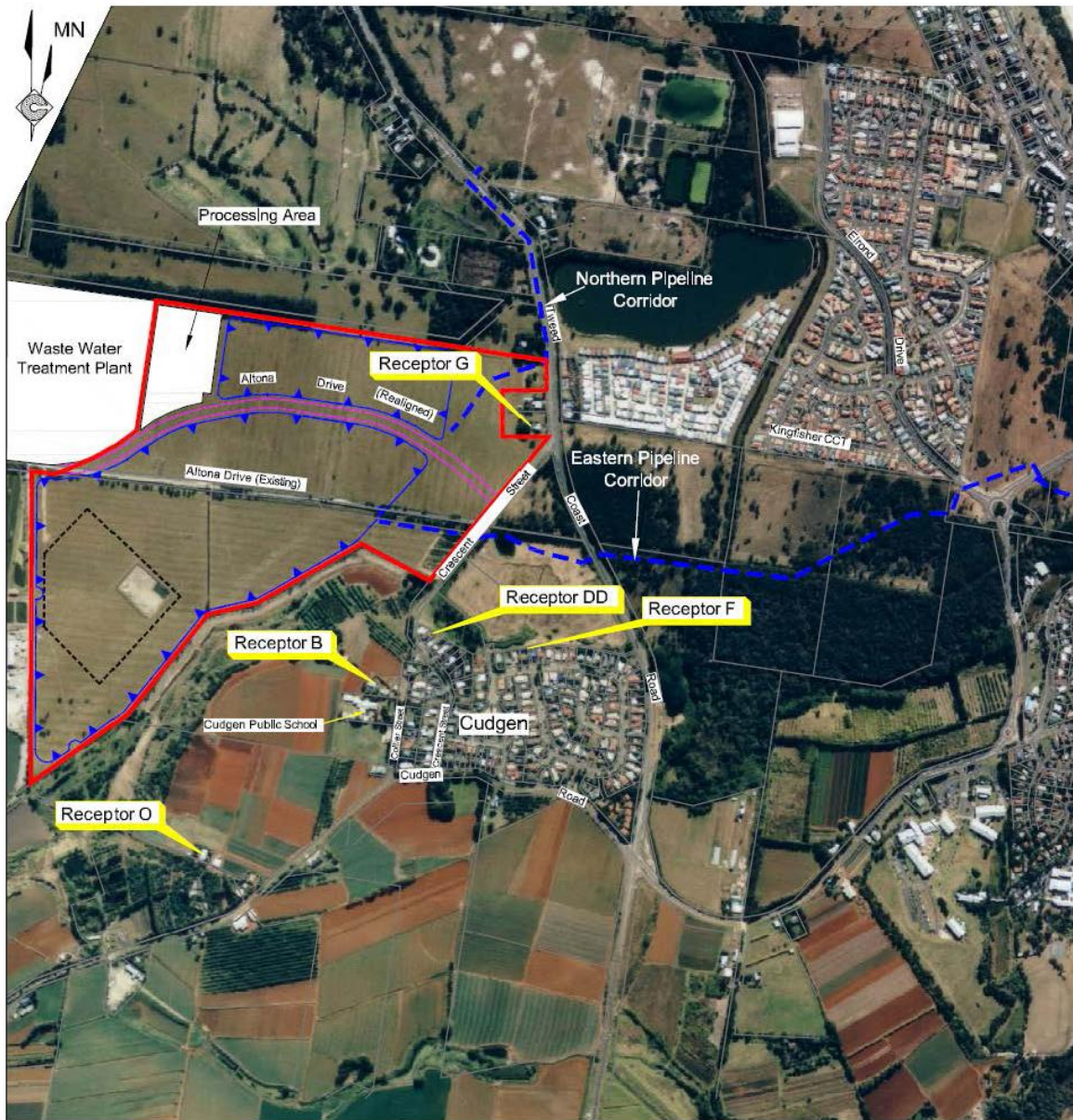


Desired Outcome	Action	Timing
	13.10 Undertake an ongoing monitoring program to demonstrate that noise emissions from the Project Site are within the Project specific noise limits at the surrounding assessment locations.	Annually or biennially.
	13.11 Regularly review the extent of noise monitoring throughout the life of the Project to ensure meaningful data is being collected.	Ongoing.
14. Air Quality		
Site activities are undertaken without exceeding DECC air quality criteria or adversely impacting on surrounding receivers.	14.1 Install water sprays to control dusts generated during screening and dry processing.	During processing and blending.
	14.2 Undertake progressive rehabilitation / stabilisation of available areas of disturbance (eg. finalised sections or backfilled areas of the extraction ponds).	As areas become available.
	14.3 Clean accumulated tracked road mud, dry dusts, sand or spillages on Altona Drive using a street sweeper.	As required.
	14.4 Cover product trucks loads to prevent wind-borne losses and spillages.	Continuously for <u>all</u> product trucks.
	14.5 Prepare an air monitoring program to ensure that DECC air quality goals for dust (TSP, PM ₁₀ and deposited dust) are met.	Prior to commencement of operations.
	14.6 Undertake monitoring in accordance to the DECC document "Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales" (DECC, 2005), and more specifically, in accordance with AS 2922-1987 "Ambient Air – Guide for the Siting of Sampling Units" (NSW DECC Method AM-1) and AS 3580.9.6-2003 "Particulate Matter – PM ₁₀ – high volume sampler with size-selective inlet".	During monitoring.
	14.7 Annually review the dust monitoring program to ensure that the data being collected is meaningful.	Annually.
	14.8 Ensure the screening and blending plant does not exceed a daily <u>average</u> processing rate greater than 100tph.	During screening and blending.
15. Aboriginal Heritage		
Site activities are undertaken without impacting upon any known Aboriginal heritage items.	15.1 Invite any Aboriginal stakeholders to observe during the burying of the pipelines within the northern pipeline corridor.	During installation of northern pipeline.
	15.2 Stop works at and adjacent to any Aboriginal sites or relics, if found.	During site establishment, construction or operational works.

Desired Outcome	Action	Timing
	15.3 Contact the regional archaeologist of the Coffs Harbour DECC and relevant Aboriginal Stakeholders if any Aboriginal sites or relics, if found.	During site establishment, construction or operational works.
Site activities are undertaken without impacting upon any known Aboriginal heritage items.	15.4 Receive authorisation from the DECC and Tweed Byron LALC prior to proceeding with any works in the vicinity of any identified Aboriginal sites or relics, if found.	During site establishment, construction or operational works.
	15.5 Prepare a simple Cultural Heritage Information booklet for use in induction of employees and contractors.	Prior to commencement of site establishment.
	15.6 Undertake agency consultation with Aboriginal representatives in relation to the ongoing management of identified items of Aboriginal heritage.	In the event items of Aboriginal heritage are identified within the Project Site.
16. Visibility		
Reduced visual amenity impacts upon surrounding landholders and the local community.	16.1 Surround the processing area by a 3m high bund planted with native shrub species.	During site establishment.
	16.2 Plant a visual screen between the eastern extent of the extraction sites and Tweed Coast Road providing visual screening from motorists on Tweed Coast Road.	During site establishment.
	16.3 Progressively rehabilitate the Project Site such that non-vegetated areas would be minimised.	As areas become available.
	16.4 Maintain the Project Site in a clean and tidy condition at all times.	Continuous.
	16.5 Implement air quality controls (see Commitment No. 14).	Ongoing.
	16.6 Position and direct floodlights or other lighting to minimise light emissions, with lighting not required at any given time not used.	Ongoing.

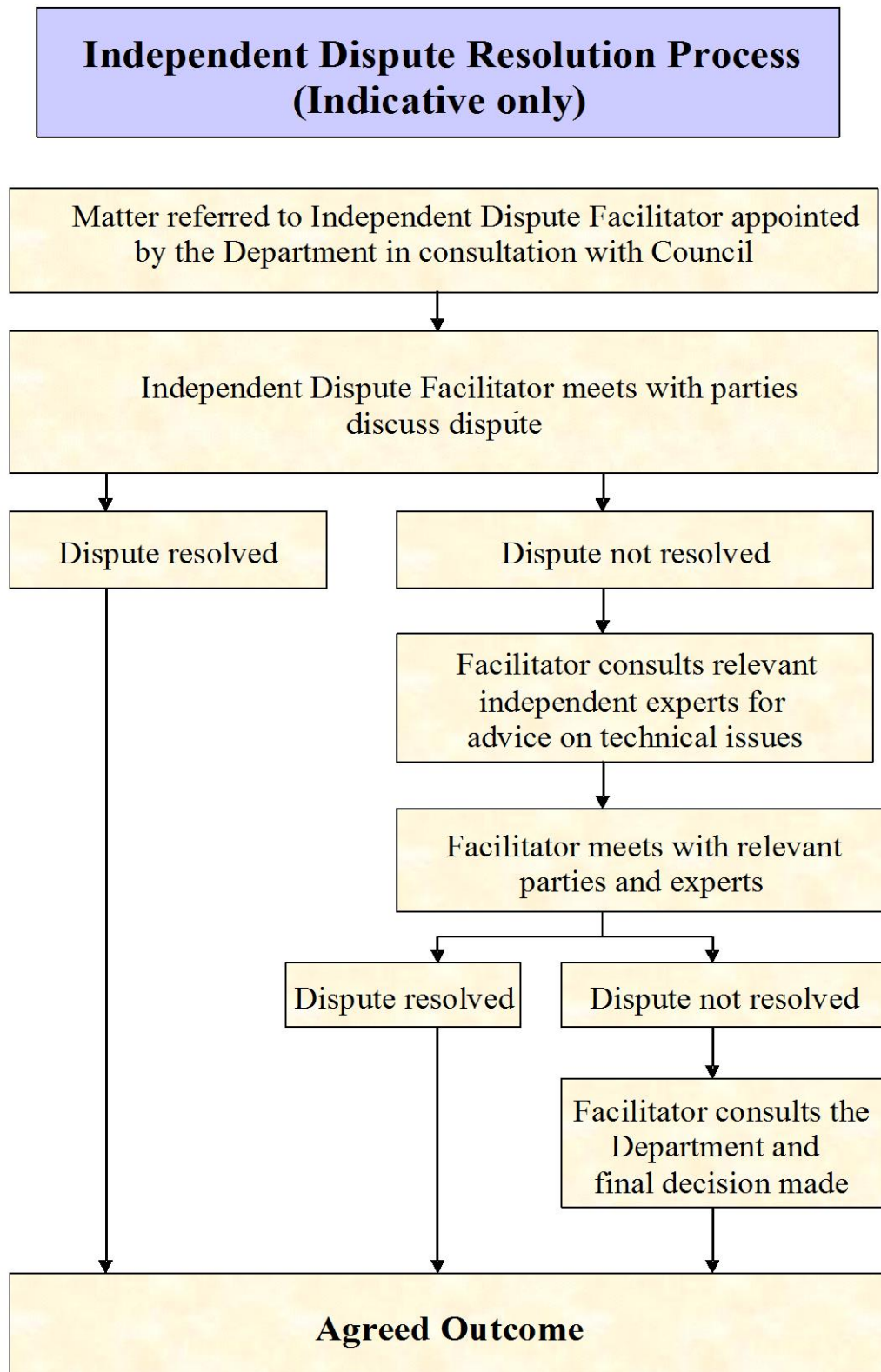


APPENDIX 3
NOISE MONITORING LOCATIONS



REFERENCE
— Project Site Boundary
- - - Proposed Pipeline Corridor
- - - Extraction Site Boundary

APPENDIX 4
INDEPENDENT DISPUTE RESOLUTION PROCESS



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