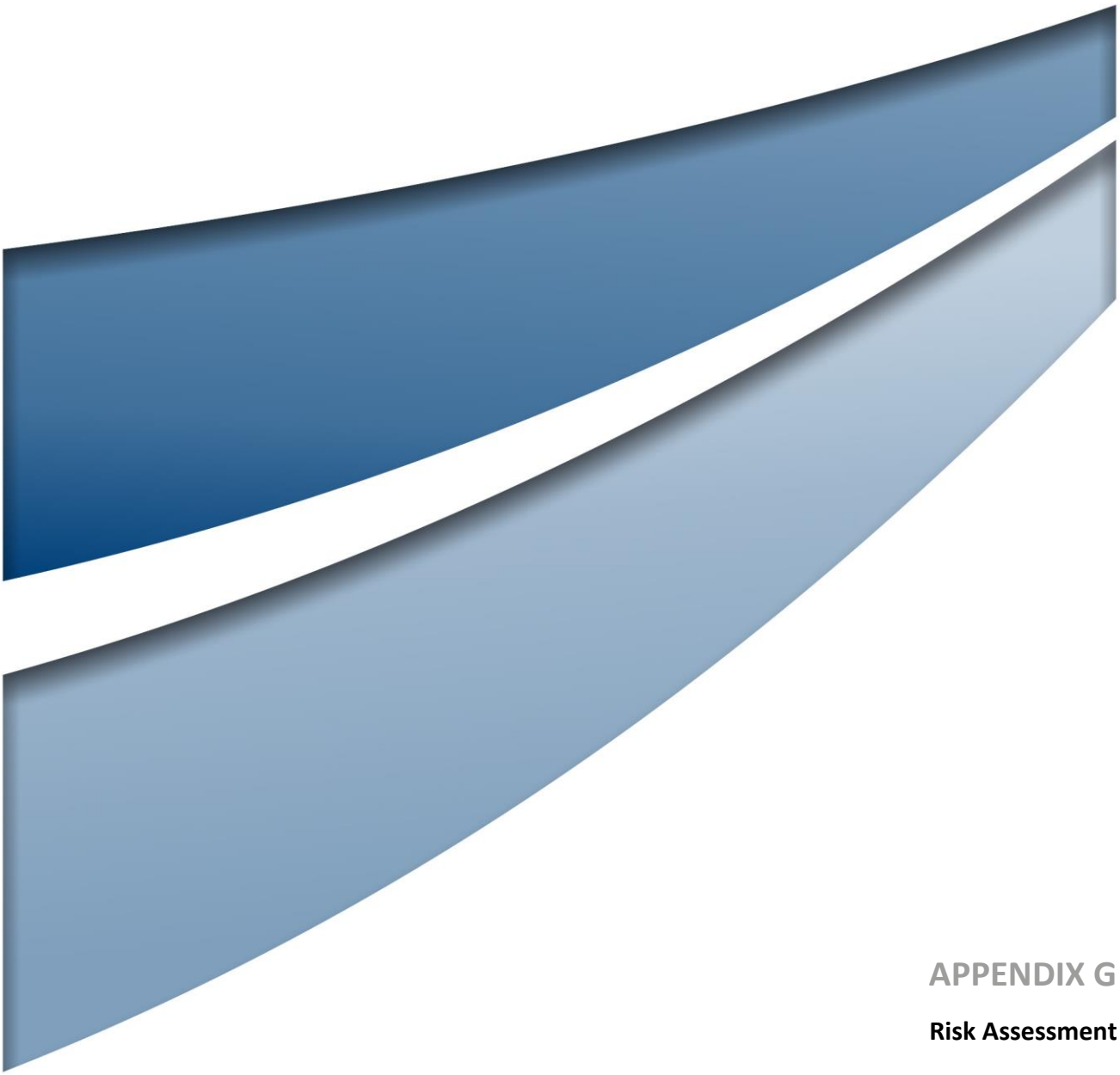

APPENDIX G

Risk Assessment

Environmental Risk Analysis

An environmental risk assessment was undertaken for the Project to identify the key issues which warrant further detailed assessment and discussion. The methodology used for this process follows the general principles outlined in Australian Standard AS/NZS 4360:1999 Risk Management and Environmental Risk Management – Principles and Process (Standards Australia, 2000).

The method used for the environmental risk assessment encompasses the following key steps:

1. Establish the context for the risk assessment process

2. Identify environmental risks

3. Analyse risks

4. Evaluate risks to determine significant issues

Each of these steps is discussed further below.

Establish the Context

The risk assessment undertaken for the Project considers risks to the natural environment and members of the public. The 'Project' was considered to be the processes and activities described in Section 2.2 of the Preliminary Environmental Assessment and the subsequent EIS, categorised as shown in **Table 1**.

Table 1 - Process Areas and Activities Considered

Process Area	Process Boundary	Activities
Installation / construction	Installation and construction of proposed equipment to increase throughput	Construction of product stockpiles, product storage bays, car parking, washing bays, water tanks etc
Operation	Continued operations with increased throughout capacity	The receival, stockpiling, recycling (crushing / mulching), loading and distribution of construction and green waste through the facility
Ancillary Areas	Other activities undertaken to support installation and operation	Storage & handling of goods, maintenance

Risk Identification

Risk identification involves identifying the environmental risks to be managed, and in its simplest form involves the analysis of the severity and frequency of potential impacts and the operational processes underlying any impact.

In order to provide a systematic framework to identify environmental risks, the following process was used:

1. Select a component of the surrounding environment that may be impacted by the Project.

2. Identify the activities that may affect the surrounding environment.
3. Identify the potential environmental impacts (positive or negative) for each value, as a result of these activities.

Risk Analysis

Risks are typically analysed by combining possible consequences and their likelihood, in the context of existing measures to control the risk. The consequence and likelihood of each risk determines the level of risk.

Each risk was assessed using a five level qualitative ranking of consequence and likelihood as listed in **Table 2** and **Table 3** respectively. This yields a five by five risk analysis matrix and results in four levels of risk: "extreme", "high", "moderate" and "low", as shown in **Table 4**.

Table 2 - Qualitative Measures of Environmental Consequence

Severity Level	Natural Environment	Legal / Government	Heritage	Community/Reputation/ Media
(1) Insignificant	Limited damage to minimal area of low significance.	Low-level legal issue. On the spot fine. Technical non-compliance prosecution unlikely. Ongoing scrutiny / attention from regulator.	Low-level repairable damage to commonplace structures.	Low level social impacts. Public concern restricted to local complaints. Could not cause injury or disease to people.
(2) Minor	Minor effects on biological or physical environment. Minor short-medium term damage to small area of limited significance	Minor legal issues, non-compliances and breaches of regulation. Minor prosecution or litigation possible. Substantial hardship from regulator.	Minor damage to items of low cultural or heritage significance. Mostly repairable. Minor infringement of cultural heritage values.	Minor medium-term social impacts on local population. Could cause first aid injury to people. Minor, adverse local public or media attention and complaints.
(3) Moderate	Moderate effects on biological or physical environment (air, water) but not affecting ecosystem function. Moderate short-medium term widespread impacts (e.g. significant spills).	Serious breach of regulation with investigation or report to authority with prosecution or moderate fine possible. Substantial difficulties in gaining approvals.	Substantial damage to items of moderate cultural or heritage significance. Infringement of cultural heritage / scared locations.	Ongoing social issues. Could cause injury to people which requires medical treatment. Attention from regional media and/or heightened concern by local community. Criticism by NGOs. Environmental credentials moderately affected.
(4) Major	Serious environmental effects with some impairment of ecosystem function. Relatively widespread medium-long term impacts.	Major breach of regulation with potential major fine and/or investigation and prosecution by authority. Major litigation. Project approval seriously affected.	Major permanent damage to items of high cultural or heritage significance. Significant infringement and disregard of cultural heritage values.	On-going serious social issues. Could cause serious injury or disease to people. Significant adverse national media/public or NGO attention. Environment/management credentials significantly tarnished.

Severity Level	Natural Environment	Legal / Government	Heritage	Community/Reputation/ Media
(5) Catastrophic	Very serious environmental effects with impairment of ecosystem function. Long term, widespread effects on significant environment (e.g. national park).	Investigation by authority with significant prosecution and fines. Very serious litigation, including class actions. License to operate threatened.	Total destruction of items of high cultural or heritage significance. Highly offensive infringements of cultural heritage.	Very serious widespread social impacts with potential to significantly affect the well being of the local community. Could kill or permanently disable people. Serious public or media outcry (international coverage). Damaging NGO campaign. Reputation severely tarnished. Share price may be affected.

Table 3 - Qualitative Measure of Likelihood

Level	Descriptor	Description	Guideline
A	Almost Certain	Consequence is expected to occur in most circumstances	Occurs more than once per month
B	Likely	Consequence will probably occur in most circumstances	Occurs once every 1 month – 1 year
C	Occasionally	Consequence should occur at some time	Occurs once every 1 year - 10 years
D	Unlikely	Consequence could occur at some time	Occurs once every 10 years – 100 years
E	Rare	Consequence may only occur in exceptional circumstances	Occurs less than once every 100 years

Source: AS/NZS 4360:1999 Risk Management

Table 4 - Qualitative Risk Matrix

	Maximum Reasonable Consequence				
Likelihood of the Consequence	(1) Insignificant	(2) Minor	(3) Moderate	(4) Major	(5) Catastrophic
(A) Almost certain	High	High	Extreme	Extreme	Extreme
(B) Likely	Moderate	High	High	Extreme	Extreme
(C) Occasionally	Low	Moderate	High	Extreme	Extreme
(D) Unlikely	Low	Low	Moderate	High	Extreme
(E) Rare	Low	Low	Moderate	High	High

Source: AS/NZS 4360:1999 Risk Management

The level of risk assessed was based on a risk level with the existing environmental management controls at Concrush in place. This allows for the identification of the extent of potential project related impacts and the identification of the major issues warranting further assessment.

Although the risk rating gives no quantification of the actual value of the risk for a particular aspect, it does allow a relative comparison between issues to enable risks to be prioritised, facilitate informed decisions about treating risks and help identify whether a risk is acceptable.

Table 5 shows the format used for the Project environmental risk assessment.

Table 5 – Format for Preliminary Project Environmental Risk Assessment

Project Activities	Environmental Value	Potential Impacts/ Consequences	Status and Proposed Control	Risk Assessment	Further Assessment required	Key Issue
Identifies the Project's activities that may affect the Environmental Value	Components of the surrounding environment that can be affected by the Project	This describes any change to the environment, whether adverse or beneficial, wholly or partly resulting from the Project's activities	Details current understanding of the existing environment and existing controls	Assessment of likelihood, consequence and risk score. Assumes existing controls in place	Identifies potential impacts that warrant further assessment based on risk of potential impacts	Highlights the key issues requiring further assessment

Risk Evaluation

Risk evaluation concerns setting priorities for decisions about risk. The purpose of risk evaluation is to compare risks against significance criteria to determine the degree of assessment required. The application of significance criteria will reduce the number of activities that require specific management attention and provides an opportunity to prioritise environmental issues based on predetermined criteria.

Although guidelines and regulations provide great detail on risk identification and characterisation, there is less guidance on what constitutes an acceptable level of risk. This is because the development of risk acceptance criteria is quite subjective and is not an exact science or based on a complex formula. For each risk assessment process there is a degree of flexibility in defining its own criteria to determine which impacts are potentially "significant" and which are not. For the purposes of this risk assessment, significant risks have been defined as those with a risk rating of high or extreme, as defined by **Table 4**.

It is important to note that certain impacts associated with the Project's activities may be predetermined as significant by State or Federal legislation. These 'regulated' impacts, whilst not always rated as significant based on risk score alone, will also require further assessment to be undertaken.

Concrush Pty Ltd – Teralba Facility Increase to Throughput Capacity

Preliminary Environmental Risk Analysis

Activity	Environmental Value	Potential Impact	Status and Proposed Control	Risk Assessment			Further Assessment Requirements	Key Issue?
				C	L	R		
Construction								
	Ecology	Loss of native flora, fauna or endangered ecological communities	Undertake Ecological Assessment as part of EIS Prepare a CEMP	2	C	Moderate	Undertake Ecological Assessment as part of EIS	N
	Ecology – Impacts to aquatic ecology and wetlands	Impacts to aquatic ecology / Coastal wetlands	Undertake Ecological Assessment as part of EISEIS will consider indirect impacts to Coastal wetlands	2	C	Moderate	Undertake Ecological Assessment as part of EIS	N
	Noise	Noise Generation - impact to sensitive receivers specifically as a result of the construction phase	Further assessment and modelling to be done as part of EIS	2	D	Low	Undertake noise impact assessment as part of EIS	N
	Traffic and Transport	Any additional traffic required for construction	Further assessment and traffic modelling to be done as part of EIS	2	D	Low	Undertake Traffic Impact Assessment as part of EIS	N

Activity	Environmental Value	Potential Impact	Status and Proposed Control	Risk Assessment			Further Assessment Requirements	Key Issue?
				C	L	R		
OPERATION PHASE								
	Noise	Noise Generation - impact to sensitive receivers	Further assessment and modelling to be done as part of EIS Recommend mitigation measures to be implemented within the EIS Alter project design to reduce impacts (if necessary)	3	B	High	Undertake Noise Impact Assessment as part of EIS	Y
	Air Quality	Dust Generation - Impact to sensitive receivers and degradation of local air quality	Further assessment and modelling to be done as part of EIS Recommend mitigation measures to be implemented within the EIS Alter project design to reduce impacts (if necessary)	3	B	High	Undertake Air Quality Impact Assessment as part of EIS	Y
	Traffic and Transport	Increased traffic as a result of increased throughput capacity	Further assessment and modelling to be done as part of EIS	2	C	Moderate	Undertake Traffic and Transport Impact Assessment as part of EIS	Y
	Soil and Water	Erosion and Sediment Runoff	Review and update (if required) existing water management controls as part of EIS Explore water reuse onsite to save on potable water Additional assessment on planning the water management system	3	B	High	Assess impacts to soil, surface water and groundwater as part of EIS	Y
	Soil and Water	Flooding part of the site is identified as being flood prone	Assess flooding as part of the EIS	3	D	Moderate	Assess impacts to soil, surface water and groundwater as part of EIS	N
	Soil and Water	Disturbance of Acid Sulfate Soils	The site consists of Class 2 acid sulfate soils land. The implications of acid sulfate soils will be assessed in the EIS	1	E	Low	Assess impacts to soil, surface water and groundwater as part of EIS	N

Activity	Environmental Value	Potential Impact	Status and Proposed Control	Risk Assessment			Further Assessment Requirements	Key Issue?
				C	L	R		
	Soil and Water	Increase in water demand	Undertake review of the existing and proposed water demand for the operation	2	D	Low	Assess impacts to soil, surface water and groundwater as part of EIS	N
	Aboriginal Archaeology	Disturbance of Aboriginal Places or sites	AHIMS searches indicate there are no known sites or places within the Lot. There are 95 sites located within 4km radius of the Lot. Due Diligence Assessment to be done as part of EIS	1	E	Low	Undertake Due Diligence Assessment as part of the EIS	N
	Historic Heritage	Disturbance of sites of European Heritage significance	The Lake Macquarie Local Environmental Plan 2014 heritage map and register does not identify any heritage items within the site. Further desktop Assessment to be done as part of EIS	1	E	Low	Undertake Desktop Assessment as part of the EIS	N
	Waste (excluding concrete and other products)	Any operational waste	Minimal waste (excluding concrete and other products) is anticipated. A desktop assessment to be done as part of EIS	2	D	Low	Desktop Assessment to be done as part of EIS	N
	Greenhouse Gas and Energy	Generation of greenhouse gases / energy consumption	The EIS will include a quantitative assessment of greenhouse gas emissions of the project and qualitative assessment of the impact of these emissions on the environment	2	D	Low	Quantitative GHG assessment to be undertaken as part of the EIS	N
	Hazards	Injuries or deaths, environmental damage and loss of property	A preliminary risk screening to be completed as part of EIS	2	D	Low	A preliminary risk screening to be completed as part of EIS	N
	Visual	Changes to aesthetics of operations in landscape	Further assessment to be done as part of EIS	2	D	Low	Further assessment to be done as part of EIS	N
	Bushfire	Need for vegetation clearing	Further assessment to be done as part of EIS	2	D	Low	Further assessment to be done as part of EIS	N

Activity	Environmental Value	Potential Impact	Status and Proposed Control	Risk Assessment			Further Assessment Requirements	Key Issue?
				C	L	R		
	Contamination	Soil and/or water contamination from spills or leaks	Review any existing information and determine the need for further studies if required	2	D	Low	Review any existing information and determine the need for further studies if required	N
	Socio-Economic	Negative socio-economic impacts	A detailed Socio-economic Impact Assessment will be prepared as part of EIS including profiling, impact scoping, impact assessment and strategy development	2	D	Low	Further desktop assessment to be done as part of EIS	N