

**CONCRUSH INCREASE TO
CAPACITY PROJECT
TERALBA, NSW**

Environmental Impact Statement

FINAL

November 2018



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Prepared by
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on behalf of
Concrush Pty Ltd

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Executive Summary

Concrush Pty Ltd (Concrush) is seeking development consent to increase the processing and storage capacity of the existing resource recovery facility located on part of Lot 2 DP 220347 at 21 Racecourse Road, Teralba, New South Wales (NSW) (refer **Figure 1.1**). The existing Concrush facility recycles concrete, asphalt, bricks, pavers, roof tiles, wall and floor tiles, rock, sand, plasterboard and green waste from domestic households and commercial industry. These materials are then recycled into specification and non-specification quality products such as roadbase, drainage aggregates, pipe bedding and haunch, packing fines, decorative aggregates and mulches. These products are used within the civil and construction industries or for commercial, domestic and household applications. The increase to capacity project (the Project) will involve alterations and additions to the existing facility in order to provide greater on-site storage capacity that is required for the increased level of throughput.

The existing facility is located within the suburb of Teralba, in the Lake Macquarie Local Government Area (LGA). It covers an area of approximately 2.4 hectares (ha) and is located between Cockle Creek to the east and the Main North Rail Line to the west (refer to **Figure 1.1**).

The Project is a State Significant Development (SSD) and requires approval under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The development application will be lodged with the Planning Secretary of NSW Department of Planning and Environment (DPE).

This Environmental Impact Statement (EIS) has been prepared by Umwelt Environmental and Social Consultants (Umwelt) on behalf of Concrush to assess the potential environmental and community impacts of the Project.

The Project

Concrush currently processes approximately 108,000 tonnes (t) of construction and demolition and green waste material per annum (pa), and stores up to a maximum of 40,000 t of waste material on site at any one time. Concrush proposes to increase the production capacity to up to 250,000 tpa of waste and allow for an increased storage capacity, up to 150,000 t of waste material to accommodate the proposed levels of production. It is anticipated that the volume of materials recycled and products sold will increase over a period of time up to the maximum production level of 250,000 tpa. The Project would require a capital investment value of approximately \$1.1 million (M) excluding mobile equipment over approximately 5 years, and would increase the amount of building and construction waste able to be recycled in the Lake Macquarie Region. This would reduce the volume of this type of waste potentially being sent to local landfills including Awaba and Summerhill. The Project will also contribute towards achieving the objectives of the NSW Government's Waste Avoidance and Resource Recovery Strategy 2014 - 21.

The Project site would increase in area by 2.4 ha for a total site area of 4.8 ha. The majority of the Project site has been previously disturbed, however the Project would require the removal of some planted landscape trees and some grasses to accommodate the additional stockpiling/processing areas.

A description of the individual elements of the proposed Project including additional plant and equipment are summarised in **Table 3.1** and shown on **Figures 3.1** and **3.2**.

Table 1 Proposed Project Components

Component	Description
Hardstand areas	Hardstands will be constructed in material processing areas and stockpile areas (will require some site levelling). Hardstands will consist of 200 mm thick recycled roadbase). Internal access roads will have a two coat seal.
Material Processing Areas	Processing areas for the crushers and screens.
Waste and Product Stockpile Areas	Waste and product stockpiles will be established with a stockpile height of up to 10 m. It is anticipated that up to 150,000 t of material will be stored onsite.
Upgrade of existing facilities	The existing weighbridge and office will be upgraded, and the existing lunch room and maintenance shed will be relocated to facilitate the new site layout.
Waste Tracking System	The existing Wasteman software will be used to track the details of all inbound and outbound loads
Production Compound	The relocated lunch room, toilet and maintenance shed will be grouped together to form a compound for production staff.
Retail Area	This area will be restricted to light vehicles and small trucks and will include an area for tipping and an area containing concrete bays of products for sale.
Storage Bays	Concrete storage bays will be constructed using 1 m ³ concrete blocks.
Concrete Walls	A two metre high concrete wall will be constructed close to the southern Project site boundary using 1 m ³ concrete blocks. The wall will prevent stockpiled material encroaching on swale drains and moving offsite. Concrete walls may also be used to delineate other areas of the site.
Green Waste Pasteurisation	An aeration system using four electronically driven and computer controlled fans to push air through movable perforated pipes underneath the pasteurisation piles will be implemented in the green waste area. This system allows more control of oxygen levels in the pasteurisation process compared to the tradition turnover process.
Wheel Wash	A vehicle wheel wash bay will be constructed immediately after the exit weighbridge to reduce tracking of material onto public roads.
Concrete Washout Bay	A wet concrete washout bay will be constructed consisting of a bunded, impermeable area with an isolated catchment. Wet concrete and agitator washout will be captured in the concrete washout bay.
Water Management System	The existing Water Management System (WMS) will be upgraded involving resizing of existing sediment basins, new sediment basins, swale drains and a leachate dam and artificial wetland to treat nutrient runoff. Water tanks and associated poly pipe and pumps will be installed to allow collection and re-use of stormwater for dust suppression.
Trommel Screening Machine	Addition of a Trommel screening machine for sorting of green waste.
Primary Jaw Crusher	The primary jaw crusher will be replaced on a like for like basis at some point in time as part of future operations.
Perimeter Landscaping - Mounds, Fencing and Lighting	Landscape mounds will be established on the perimeter to limit visibility. 1.8 m high security fencing and security lighting are also to be installed.
Utilities	The existing Ausgrid connection is via a power pole in the north east corner of the site. The power supply will be extended to the south west corner of the site via an underground connection.
Pug mill	A pug mill may be installed in the future to allow fast mixing of materials to produce products such as road base.
Ballast wash facility	A processing area may be dedicated to a ballast wash facility to allow for processing of rail ballast.

It is anticipated that the volume of materials recycled and products sold will increase over a period of time up to the maximum production level of 250,000 tpa. To most efficiently meet the increase in demand for recycling of materials and products, it is proposed to stage the Project by undertaking some elements of the site upgrade once all approvals have been granted and implementing other elements of the Project as required when certain production levels are reached. Two Project stages and the associated approximate production level have been identified as follows:

- Stage 1 – upon receipt of all approvals required for the Project (refer **Figure 3.1**)
- Stage 2 – at approximately 200,000 up to 250,000 tpa (refer **Figure 3.2**).

Need and Justification

The NSW Government and specifically the Environment Protection Authority (EPA) currently operate a 5 yearly Waste Avoidance Resource Recovery Strategy (WARR). The WARR outlines future directions and supports investment in infrastructure, encourages innovation and improvements in recycling behaviour (EPA 2017). Two key elements of the WARR that the Project will help achieve are:

- Increasing construction and demolition waste recycling to 80%
- Increasing waste diverted from landfill to 75%.

Increasing the throughput capacity of the Concrush facility will allow for increased recycling of construction and demolition waste. This will, in turn, result in less waste potentially going to local landfills such as Awaba and Summerhill and will assist in achieving the NSW Government goals stated above.

There has been a strong ongoing demand for Concrush's products. With population growth in the region this demand will continue and likely increase. The Newcastle and Lake Macquarie Regions are currently experiencing a development and infrastructure boom with substantial construction, and associated demolition, works being undertaken. There is therefore a market and community need for construction and demolition waste recycling facilities such as Concrush. The Project will allow Concrush to continue to service this demand.

The Project is considered an industrial activity and the Project site is located on land that is zoned for industrial uses. The Project site has been previously disturbed and includes the existing operational area as well as an increase to the operational area. The Project site is a brownfields site that is considered suitable for the proposed use.

Consultation

As part of the EIS process, consultation has been undertaken with government authorities as well as the local community. The key issues identified through the consultation process include: traffic, noise, air quality, water quality, drainage, contamination, waste, heritage, visual, biodiversity and hazard and risk.

Overview of Environmental Factors

This EIS includes a detailed assessment of the potential environmental and social impacts of the Project and identifies the management and mitigation measures that will be implemented to minimise these impacts to the environment and community as a result of the Project. A summary of the key findings of the assessment process is provided in **Table 2**.

Table 2 Summary of the Key Environmental Impact Assessment Findings

Environmental/ Community Issue	Overview of Potential Impacts
Noise	<p>The land uses surrounding the Project site include road and rail transport, industry and some residential areas. These land uses all influence the existing noise environment in the vicinity of the Project site.</p> <p>Sensitive receivers were identified and grouped into five noise catchment areas (NCA) for the purposes of quantifying the existing ambient acoustic environment. NCA 1 includes the nearby residences north of the Project site. NCA 2 includes the residences south and east of the Project site, including Bunderra Estate and the associated aged care facility which are currently being constructed. NCA 3 represents a recreational area adjacent to Cockle Creek, NCA 4 represents future residences to the east of the Project site and NCA 5 represents an industrial receiver to the west.</p> <p>Noise emitted from the Project site during the construction phase has been considered in terms of the Interim Construction Noise Guideline (ICNG) (DECC 2009). Operational noise from the Project site has been considered in terms of the requirements of the Noise Policy for Industry (NPI) (EPA 2017). The computer-based modelling software package CadnaA (version 2017) was used to predict the noise levels likely to be produced by the Project within the surrounding environment.</p> <p>In accordance with the NPI, evaluation of the noise levels monitored in the environment surrounding the Project site has resulted in project-specific criteria for day-time, evening and night-time that are based on a combination of the Intrusiveness and Amenity Criteria. Other relevant criteria include the Road Traffic Noise Criteria from the NSW Road Noise Policy (DECCW 2011) and Construction Noise Criteria in the ICNG.</p> <p>For the operational noise assessment a list of noise sources on the Project site was developed. These sources were assigned to a number of scenarios based on expected operations during the day, evening and night time periods. With the implementation of reasonable and feasible mitigation measures there were some exceedances above the Project specific criteria for some operational scenarios during the day and night.</p> <p>For NCA 1 the predicted 4 dB exceedance of the Project specific criteria during the day does not exceed the amenity noise level and under the NPI is considered a marginal exceedance. This affects two residences in NCA 1, immediately north of the Project site.</p> <p>For select sensitive receivers in NCA 2, the maximum predicted exceedance is 2 dB. According to the NPI, an exceedance of less than 2 dB is considered negligible, as the difference would not be discernible by the average listener. This exceedance occurs during the day on the western edge of NCA 2. The area identified within NCA 2 that would be subject to these negligible exceedances are already being affected by existing road traffic noise as they are located adjacent to a busy road that provides one of the primary routes for residents of western Lake Macquarie to access the Glendale and Wallsend areas.</p> <p>During the evening the Project would comply with the Project specific noise criteria for all NCAs.</p> <p>Concrush currently undertakes night work when required and is seeking approval to continue to have the ability to undertake night works. However, the Concrush facility is primarily a day time operation. The need for undertaking night works will be based on market demand, primarily for projects that require delivery of material at night. Night time operations would be restricted to trucks tipping waste material and being loaded with stockpiled material. Concrush would not undertake any processing works during the night time period. The night time noise modelling was undertaken on worse case meteorological conditions of temperature inversion and 2m/s wind.</p> <p>At night, NCA 2 will experience an exceedance of 5 dB, however this does not exceed the amenity level and is therefore considered a marginal exceedance in accordance with the NPI.</p> <p>At NCA 1, the night time exceedance is predicted to be 8 dB, and exceeds the recommended amenity noise level which is considered a significant exceedance. There are two residences within NCA 1 and night time works would only be undertaken if Concrush was supplying material to a project being undertaken during night time. As the modelling was undertaken</p>

Environmental/ Community Issue	Overview of Potential Impacts
	<p>on worse case conditions it is proposed to undertake noise monitoring during the first two nights of operation. Actual noise levels will be identified and compared to criteria with consideration given to additional targeted mitigation. Concrush has undertaken consultation with the two residents and explained the noise modelling results and the proposed approach to undertake monitoring.</p> <p>No residences will experience noise levels above the criteria during construction.</p> <p>The predicted traffic noise is less than the relevant criteria for both day and night periods.</p>
Air quality	<p>The air quality in the Teralba local area is influenced by surrounding land uses including industrial activities such as the Macquarie Coal Preparation Plant, Metromix Quarry, and the Project site. Other land uses such as residential areas, bushland and road and rail transport are likely to have less influence on local air quality.</p> <p>The potential for air quality impacts, both odour and dust from the Project was determined in accordance with the EPA's <i>Approved Methods for the Modelling and Assessment of Air Pollutants in NSW</i> (Approved Methods) (EPA, 2016).</p> <p>The main potential for odour impacts as a result of the Project is the green waste stockpiles. The modelling results indicate that the ground level odour concentrations are not predicted to exceed the odour impact criteria of 2.0 odour units for the closest receivers.</p> <p>The modelling results also indicate that for PM₁₀ and PM_{2.5} both the 24-hour and annual average impact assessment criteria can be met at the maximum production rate of 250,000 tpa.</p> <p>For total suspended particulates (TSP) the assessment found that the impact assessment criteria is unlikely to be exceeded as a result of the Project as:</p> <ul style="list-style-type: none"> • The predicted increments only represent a maximum of 2% of the impact assessment criteria. • The results of the other dust modelling (i.e. PM₁₀ and PM_{2.5}) are within their respective impact criteria. <p>For annual depositional dust the dispersion modelling results show that the assessment criteria can be met for the future operations at the maximum capacity of 250,000 tpa.</p> <p>The construction assessment modelling results show that the 24 hour impact assessment criteria of 50 µg/m³ will be met for the nearest receivers.</p> <p>A range of odour and dust management and mitigation measures will be implemented including monitoring, use of atomising sprays on machinery, sealing of haul roads, use of the water cart and cessation of dust generating activities during certain meteorological conditions.</p>
Traffic	<p>The Traffic Impact Assessment was undertaken to investigate the range of traffic and transport aspects of the Project site and its surrounds with specific reference to the requirements of the Guide to Traffic Generating Developments.</p> <p>The roads leading from the Project site are identified as Collector Roads in Lake Macquarie City Council (LMCC)'s road hierarchy. Access for trucks carrying raw materials to the Project site and product from the Project site will be via Racecourse Road, then proceed to the main road network at Five Islands Road/Toronto Road via York Street and Toronto Road North. Smaller vehicles may access the site via a northern route comprising Racecourse Road, The Weir Road, Northville Drive and then Wakefield Road to the west which leads to a connection with the M1 Motorway. Vehicle movements north of the site entrance are restricted by the low clearance bridge (4.2 m) under the Main Northern Railway.</p> <p>Traffic counts and intersection surveys were undertaken to confirm the AM and PM peak periods, monitor any local queuing, and determine the presence of industrial (truck) traffic. The results of these surveys show that the roads serving as the main access routes for the Project site currently operate well within their technical, functional and environmental capacity levels as described by Austroads and NSW Roads and Maritime (Roads and Maritime) guidelines.</p>

Environmental/ Community Issue	Overview of Potential Impacts
	<p>Data collected at the Concrush weighbridge was used to derive average daily forecast vehicle numbers, based on the existing vehicle profiles, such as car, utility, rigid truck, semi-trailer, truck and dog, and then applying a pro rata increase in throughput from the current production to the projected 250,000 tpa. In addition to average daily vehicle numbers, peak daily forecast vehicle numbers were derived to represent busy periods.</p> <p>The traffic impact assessment has demonstrated that the roads surrounding the Project site will continue to operate well within their technical and functional lane capacity levels as described by Austroads and NSW RMS guidelines.</p> <p>Similarly, there would be little change to intersection performance. Overall the traffic assessment has determined that with the Project the road network will continue to operate at acceptable levels.</p> <p>A swept path analysis was undertaken to assess turning manoeuvres for light and heavy vehicles accessing the Project site as well as internal circulation through the site (refer Appendix J). The turning manoeuvres into and out of the site for light and heavy vehicles can be undertaken successfully with allowance for two way passing. The site layout allows for all vehicle types to manoeuvre through the site in a forward direction.</p>
Soil and water management	<p><i>Soils</i></p> <p>The Project site is located on the alluvial flats of Cockle Creek. Soils are deep (>200 cm) yellow Soloths, Yellow Podzolic, Yellow Earths and Grey Earths soils. Soils have a moderate to high erodibility and a moderate to high erosion hazard under concentrated flows. No actual acid sulfate soils (ASS) were identified from the samples collected on site. However, a comparison of the field pH to the pH after oxidation identified a distinct drop in pH indicating that net acid generating ability is likely. As such, the natural soils are considered to be potential acid sulfate soils (PASS) and if exposed they are likely to generate acid leachate. Although it is not anticipated, if excavation or earthworks into natural soils to depths near to the groundwater table (approximately 3.0 to 5.0 m below ground level) are required an Acid Sulfate Soils Management Plan (ASSMP) will be prepared for the Project to identify the management measures that will be implemented to ensure there are no environmental impacts associated with acid generation from any excavated PASS.</p> <p><i>Water Quality</i></p> <p>LMCC monitors turbidity levels and chlorophyll-a concentrations in Cockle Creek estuary to provide an indication of ecosystem health. In addition to this, five rounds of water quality monitoring in Cockle Creek upstream and downstream of the Project site as well as sampling of on-site stormwater samples have been collected to inform this EIS.</p> <p>This background information indicates that the estuary has an existing high level of disturbance. However this is not unexpected given the historical industrial land use (e.g. the former Pasminco smelter and Incitec fertiliser manufacturing facility) and present land use activities (light industrial, commercial and urban development) in the catchment.</p> <p>The site water quality results exhibit elevated concentrations of total suspended solids (TSS) and nutrients in addition to a wide range of pH values. Green waste processing is the primary source of nutrients in water sampled within the Concrush Water Management System (WMS). The overall water management strategy is to retain as much water as available for on-site reuse in material processing and dust suppression. Primary controls will comprise sediment dams, a Leachate Dam and a Constructed Wetland. Site water storage tank capacity will be increased by at least 200 kL to 310 kL.</p> <p>Runoff and seepage from the green waste catchment will be contained in the leachate dam which will be sized to accommodate the runoff from a 1 in 10 year, 24 hour duration storm event. Water captured in the leachate dam will be transferred to the constructed wetland for nutrient and sediment removal. Discharge from the leachate dam to the constructed wetland will be at a rate to enable the design capacity to be restored within 5 days of a rainfall event. Treated water from the constructed wetland will be transferred by pump to water storage tanks for reuse.</p>

Environmental/ Community Issue	Overview of Potential Impacts
	<p>The implementation of the conceptual proposed WMS incorporating additional stormwater storage for reuse, a constructed wetland and improved operational management practises will enable nutrient concentrations in site runoff to be substantially reduced for the Project.</p> <p>Processing and handling of concrete, bricks and tiles is the primary source of TSS in site water. The implementation of the proposed site WMS incorporating improved erosion and sediment controls and additional stormwater storage for reuse will ensure TSS concentrations in site runoff will be substantially reduced for the Project.</p> <p>The estimated average discharge nutrient concentrations are comparable with baseline nutrient water quality results measured in Cockle Creek during rainfall events.</p> <p>The implementation of the conceptual proposed WMS incorporating additional stormwater storage for reuse, a constructed wetland and improved operational management practises will enable nutrient concentrations in site runoff to be substantially reduced for the Project.</p> <p>Processing and handling of concrete, bricks and tiles is the primary source of TSS in site water. The implementation of the proposed site WMS incorporating improved erosion and sediment controls and additional stormwater storage for reuse will ensure TSS concentrations in site runoff will be substantially reduced for the Project.</p> <p>The estimated average discharge nutrient concentrations are comparable with baseline nutrient water quality results measured in Cockle Creek during rainfall events.</p>
	<p><i>Groundwater quality</i></p> <p>Incorporation of a leachate barrier system for the Project green waste storage and handling areas in accordance with the Environmental Guidelines for Composting and Related Organics Processing Facilities (NSW Department of Conservation, 2004) will result in the Project having a very low risk of impacting groundwater water quality.</p> <p><i>Flooding</i></p> <p>The Project site is located in the Cockle Creek Estuary catchment that forms part of the broader Lake Macquarie catchment and is classified as having a high flood risk based LMCC flood risk mapping. The lower portions of the Project site are within the 1% Average Exceedance Probability (AEP) flood extent as determined by the Winding Creek and Lower Cockle Creek Floodplain Risk Management Study and Plan (BMT WBM, 2016).</p> <p>The 1% AEP flood levels as quoted in the Lake Macquarie Council's Property Enquiry tool indicate the following levels:</p> <ul style="list-style-type: none"> • 2.35 mAHD for catchment flooding (Winding Creek and Lower Cockle Creek Flood Study, 2013) • 1.50 mAHD for Lake flooding (Lake Macquarie waterway Flood Study). <p>Most of the Project site is above RL 1.50 mAHD (LiDAR survey dated by September 2014) and hence not subject to Lake flooding. The applicable flooding envelope is therefore RL 2.35 mAHD.</p> <p>It is proposed to fill the Project site above RL 2.35mAHD thereby meeting the 1% AEP flood standard. Filling represents a loss of flood storage of approximately 1 ML, mostly located on the eastern boundary of the Project site. The proposed Leachate Dam and Sediment Dams to be constructed will provide an on-site stormwater detention capacity of approximately 0.3 ML which offsets approximately 30% of the flood storage loss. The remaining 0.7 ML storage loss is considered insignificant in comparison with the broader catchment flood volume from the 1% AEP flood.</p>

Environmental/ Community Issue	Overview of Potential Impacts
Soil and water management	<p><i>Water Balance</i></p> <p>The water balance undertaken for the Project demonstrates an increase rainfall/runoff inflow for the Project as a consequence of the additional catchment area and dam surface area compared to the existing operation as well as a significant increase in Project dust suppression demand. Off-site discharge volumes, which would occur in periods of high rainfall are also shown to increase which is a result of increase rainfall/runoff inflows.</p> <p>There is also an increased water demand as a result of the larger Project catchment area (stockpiles, open areas), increased dust suppression application rates to improve air quality performance and higher material processing rates. Water to supply operational demands will be sourced from captured stormwater runoff on site and the Hunter Water potable supply.</p>
Ecology	<p>As the Project is SSD it requires a Biodiversity Assessment Method (BAM) assessment under the <i>Biodiversity Conservation Act 2016</i> (BC Act). A Biodiversity Development Assessment Report (BDAR) has been prepared to assess the potential biodiversity impacts of the Project in accordance with the BAM.</p> <p>The Project site is primarily dominated by exotic vegetation that has invaded previously disturbed areas. While the majority of the Project site is dominated by exotic vegetation there are some areas that contain native flora species. These include the landscape bunds which have been planted with swamp oak (<i>Casuarina glauca</i>) and some adjacent areas within the exotic vegetation that contain regenerating swamp oak. No threatened ecological communities listed under the BC Act or <i>Environment Protection and Biodiversity Conservation Act 1999</i> were recorded within the Project site.</p> <p>A small area of degraded freshwater wetland occurs on the western boundary of the site. While this area is also highly degraded and infested with weed species, the habitat in this area is considered more likely to comprise fauna habitat than other areas of the Project site. The Project design has been developed to avoid this potential habitat area.</p> <p>The Project would require the removal of native vegetation associated with some of the planted landscape bunds. Approximately 0.07 ha of native vegetation which provides marginal fauna habitat would be removed. The Project would not result in any substantial indirect impacts on the biodiversity values of surrounding lands such as connectivity, corridors, habitat fragmentation or light emissions.</p> <p>In accordance with the BAM and BC Act, no vegetation communities or fauna species and habitats require offsetting as a result of the Project.</p>
Bushfire	<p>The Project site is not identified as bush fire prone land in the LMCC Bush fire Prone Land mapping system. Land to the west and southwest of the site is mapped as bush fire buffer land. The existing vegetation immediately to the west is generally sparse; the existing vegetation to the south of the Project site and to the southwest beyond the railway corridor represents a fuel load which could be capable of sustaining and promoting a bush fire and is the most significant threat to the Project site.</p> <p>All development is required to be consistent with the aims and objectives of Planning for Bushfire Protection (PBP) 2006. While the requirements of PBP 2006 do not specifically apply to a Project of this nature, the methods in PBP 2006 for calculating Asset Protection Zones (APZ) have been used as a guide in the assessment of the Project. The proposed design of the Project site layout allows for adequate separation distance to meet the APZ requirements.</p> <p>During the pasteurisation process there is the potential for combustion of the green waste stockpiles. Concrush actively manage the pasteurisation process to minimise this potential by measuring the temperature within the middle of the pasteurisation stockpiles on a daily basis and taking action as necessary to reduce the risk of combustion of green waste.</p> <p>The main access to the Project site is from Racecourse Road which provides good access for emergency vehicles if required. Access to and around the Project site will always be maintained throughout operation.</p>

Environmental/ Community Issue	Overview of Potential Impacts
Aboriginal Heritage	<p>A search of the AHIMS register was undertaken for the Project site on 18 July 2018 confirming that no known items or places of Aboriginal heritage significance are located in or within 200 m of Lot 2 DP 220347. The Project site is located on land that has been clearly disturbed by past land use developments and the Project does not involve any ground disturbance within areas not subject to previous disturbance. As such, it is assessed that there is a low likelihood of impact to Aboriginal objects.</p>
Historic Heritage	<p>A search of the Australian heritage regulatory databases and the Lake Macquarie LEP 2014 found a number of locally listed items within 400 m of the Project site, none of which are located within the Project site. Any historical heritage items/archaeological material that may have previously existed on the site would have been removed during previous disturbance and industrial activity. No potential heritage items were observed during walkovers of the Project site and no works are proposed within previously undisturbed locations. None of the locally listed heritage items would be impacted by the Project.</p>
Socio-economic	<p>A Social Impact Assessment (SIA) was undertaken for the Project which involved several key phases:</p> <ul style="list-style-type: none"> • Developing a profile of social and economic context • Identifying the impacts and opportunities that are most important to the local community • Assessing and predicting the significance of impacts • Developing strategies that address and manage the predicted social impacts. <p>The key stakeholders for the Project were: the local community, employees, state and local government, education and community groups and nearby industries.</p> <p>Two Project Information Sheets describing the proposed Project and outcomes of key assessments were provided to approximately 475 local residents and commercial stores in Boolaroo, Teralba and along the Concrush transport route. Four local residents responded to the first Information Sheet to outline their concerns with the Project. Interviews were also undertaken with industry, education and community groups including two local businesses and two schools in close proximity to the Project. The key concerns raised during consultation with stakeholders were: traffic impacts, road design, noise, air quality and to a lesser degree water contamination.</p> <p>Concrush is committed to implementing the management and mitigation measures described in this report to reduce the potential for impacts on the community and environment. Concrush will also continue to consult with the community post implementation of the Project to confirm that experienced impacts are in line with predicted impacts.</p> <p>Concrush will continue making contributions to local community groups including public schools and sporting organisations.</p>
Visual	<p>The existing Concrush site is approximately 2.4 ha in size and is characterised by stockpiles of materials with machinery and equipment working at the stockpiles as well as heavy vehicles moving throughout the site.</p> <p>The site and immediately surrounding areas are distinctly industrial in character strongly reflecting the zoning and land use of the area. Views to the site are available from the rail corridor for passengers on trains travelling north or south as well as vehicles on Racecourse Road. Some intermittent glimpses of the site are also available for vehicles travelling on TC Frith Avenue to the east of the site.</p> <p>The main change to the visual environment as a result of the Project would be the increase in size of the Project site. The activities, plant and equipment, stockpiles and vehicles present at the existing site would generally remain the same but would be present over a larger area as the Project site would increase from 2.4 to 4.8 ha. The increase in size of the site would result in a larger stockpile area and increased vehicular activity.</p>

Environmental/ Community Issue	Overview of Potential Impacts
	<p>A visual assessment including three dimensional terrain modelling has been undertaken for the Project. The purpose of the assessment was to determine the locations surrounding the Project site from which the Project elements would be visible.</p> <p>A radial analysis was undertaken from potential viewpoints along TC Frith Avenue and from within the Bunderra Estate to determine the extent that the Project site would be visible from these locations. This analysis showed that only relatively fleeting glimpses of the Project site may be available to motorists or cyclist and pedestrians while travelling on TC Frith Avenue in the vicinity of the Project Site. This is largely due to the fringing vegetation on both the eastern and western banks of Cockle Creek.</p> <p>From the highest point on the Bunderra Estate at Boolaroo views are generally restricted to the north west, which is towards the Project site, however views are mostly restricted by vegetation along Cockle Creek. As such, it is predicted that there would be narrow glimpses, likely between trees, where stockpiles on the Project site could potentially be seen. It should be noted that the analysis did not take into account other houses on the Bunderra Estate that would likely be built between this view point and the Project site which would further restrict views from this location. There are also landscape plantings on the western boundary of Bunderra Estate, including Casuarina trees, which as they grow will provide further screening of potential views towards the Project site.</p> <p>The visual impacts associated with the Project are considered minor.</p>
Contamination	<p>The Project site has been built up using fill material and used for industrial purposes for many years prior to Concrush being established. An assessment was undertaken to investigate the potential for contamination impacts as a result of the Project and to determine the suitability of the proposed use in accordance with SEPP 55. The criteria from Assessment of Site Contamination (ASC) National Environment Protection Measure (NEPM) 2013 was used to determine the significance of any contamination found. The ASC NEPM criteria cover human health and ecological health with relevant criteria corresponding to the applicable land use. This assessment has applied the commercial/industrial land use criteria for both human health and ecological health categories.</p> <p>Fieldwork involving test pitting and bore holes was undertaken to obtain soil and ground water samples. Laboratory testing and analysis was undertaken with regard to the following potential contaminants: benzene, toluene, ethyl benzene, xylenes (BTEX), total recoverable hydrocarbons (TRH), polycyclic aromatic hydrocarbons (PAH), phenols, cyanide, metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), asbestos and acid sulfate soils.</p> <p>Within the soil samples TRH, BTEX, PAH, phenols, cyanide and metals concentrations were either not detected or were detected at low concentrations below the relevant criteria with the exception of the following:</p> <ul style="list-style-type: none"> • Sample BH2/a which reported benzo(a)pyrene (B(a)P) at 11.6mg/kg which is in excess of the ASC NEPM ecological screening level (1.4mg/kg) • Samples BH1/a (664mg/kg), TP7/a (552mg/kg), TP8/a (526mg/kg), TP9/a (1,610mg/kg), TP9/b (4,150mg/kg) and TP12/b (925mg/kg) which reported zinc in excess of the calculated ASC NEPM ecological screening level (360mg/kg). <p>The exceedance of the ecological screening level for B(a)P and zinc in soil is not considered to be significant for the proposed land use. The exceedance of the ecological screening level has no bearing on risk to human health.</p> <p>Asbestos was not detected in any soil samples analysed, however, chrysotile asbestos was detected within bonded asbestos containing materials (ACM) fragments collected from 0.5m depth at three test pit locations. The bonded material was in good condition at the time of sampling, with no visible fibres. It is recommended that a clean fill layer of 0.5 m depth be placed across the southern part of the Project site. As no major excavation works are proposed as part of the Project, exposure to bonded ACM fragments would be very limited and it is considered that the presence of random fragments of bonded asbestos in</p>

Environmental/ Community Issue	Overview of Potential Impacts
	<p>subsurface layers would not present a significant risk to human health as a clean fill capping layer is proposed. A marker layer such as geotech fabric will be placed beneath the clean fill capping layer to clearly delineate the previously disturbed soils beneath the marker layer and the clean fill above it.</p> <p>For groundwater samples TRH, BTEX, PAH, phenols and metals concentrations were either not detected or were detected at low concentrations below the relevant criteria with the exception of sample BH1 and BH2 which reported arsenic in excess of the ecological criterion of 0.0013mg/L.</p> <p>The results of the assessment show that for the contaminants of concern were either not detected or were below the human health criteria for the applicable land use. As such, the proposed industrial use of the land as a waste recycling facility is considered an appropriate use in accordance with SEPP 55.</p>
Waste	<p>Concrush is committed as part of its Waste Management Plan to the management of waste streams in accordance with the principles of the waste hierarchy, where emphasis is placed upon reduce, reuse, recycle prior to disposal of wastes.</p> <p>The Protection of the Environment Operations (Waste) Regulation 2014 enables the EPA to issue resource recovery exemptions 'where the application of a waste material to land, its use as a fuel, or use in connection with a process of thermal treatment is a bona-fide, fit-for-purpose, re-use opportunity rather than a means of waste disposal' (EPA 2015). Concrush receives waste concrete and green waste which are subject to separate resource recovery exemptions. These materials will be managed on site in accordance with the conditions and requirements of the relevant exemption.</p> <p>Given the nature of the Project where a large part of construction will be the creation of hardstands from material obtained from the current Concrush operations, minimal waste will be generated during the construction phase. Potential waste streams during construction include:</p> <ul style="list-style-type: none"> • General Solid Waste (putrescible and non-putrescible) including limited construction waste and general waste from construction personnel. <p>Construction wastes will be separated and recycled where possible and facilities will be provided for general wastes generated by construction staff. Any construction waste that cannot be recycled will be collected by an appropriately licensed contractor and disposed of at an appropriately licensed facility.</p> <p>The wastes likely to be generated during operation of the Project include:</p> <ul style="list-style-type: none"> • General solid waste (putrescibles), associated with food waste and waste from litter bins from employees • General solid waste (non-putrescible), associated with recyclable products such as glass, paper and cardboard. <p>Limited quantities of general domestic and office waste will be generated by staff and will be disposed of through an appropriately licenced waste and recycling services.</p> <p>Waste streams will be managed in accordance with the principles of the waste hierarchy, with emphasis on reduce, reuse, recycle prior to disposal of its wastes.</p>
Greenhouse gas	<p>A greenhouse gas and energy assessment (GHGEA) was prepared to meet the requirements of the EP&A Act. The GHGEA includes a quantitative assessment of the potential Scope 1, 2 and 3 emissions associated with the Project, and an assessment of the potential impacts of these emissions on the environment.</p> <p>The GHGEA was prepared using an assessment framework consistent with the internationally recognised Greenhouse Gas (GHG) Protocol (WBCD / WRI 2004) and the most recent Australian emission factors published in the National Greenhouse Accounts (NGA) Factors (DoEE 2017).</p>

Environmental/ Community Issue	Overview of Potential Impacts
	<p>A construction and demolition waste recycling facility has a number of potential emission sources, however, the dominant emission sources, often targeted by mitigation measures and of key interest to stakeholders, can be summarised as:</p> <ul style="list-style-type: none"> • diesel use • electricity use • product transport. <p>The Project is forecast to increase Scope 1 emissions by approximately 940 t CO₂-e per annum. The increase in Scope 1 emissions is due to an increase in on-site diesel demand associated with processing additional product.</p> <p>The Project is forecast to increase Scope 2 emissions by approximately 50 t CO₂-e per annum. The increase in Scope 2 emissions is due to an increase in on-site electricity demand associated with processing additional product.</p> <p>The Project will increase Scope 3 emissions by approximately 760 t CO₂-e per annum. The increase in Scope 3 emissions associated with the Project is due to the following factors:</p> <ul style="list-style-type: none"> • Purchasing additional diesel • Purchasing additional electricity • Engaging third party contractors to deliver additional products. <p>The Project's greenhouse gas emissions will have a disperse impact as they are highly mobile and are generated up and down the supply chain.</p> <p>To put the Project's emissions into perspective, under current policy settings, global greenhouse gas emissions are forecast to reach 56,200,000,000 t CO₂-e per annum by 2025 (UNEP 2016). During operation, the Project will contribute approximately 0.0000017% to global emissions per annum (based on its projected Scope 1 emissions). The Scope 2 and 3 emissions associated with the Project will be generated by greenhouse gas sources outside the operational control of Concrush, and are attributable to other proponents/facilities.</p>
Hazard and risk	<p>Under SEPP 33 – Hazardous and Offensive Development (DoP, 1992) (SEPP 33), a preliminary risk screening of a proposed development is required to determine the need for a Preliminary Hazard Analysis (PHA).</p> <p>The preliminary risk screening compares the Project hazardous material storage quantities that have the potential to create off site impacts as well as transport quantities and frequency with SEPP 33 trigger values.</p> <p>Concrush store only minor quantities of dangerous goods with relevant SEPP 33 screening thresholds on site (e.g. Class 3 flammable liquids, Class 2.1 flammable gas and Class 5.1 oxidising substances). Concrush will store all flammable and combustible liquids in accordance with the requirements of <i>AS1940 The storage and handling of flammable and combustible liquids</i>.</p> <p>None of the hazardous materials to be stored at the Project site are above SEPP 33 screening thresholds and therefore a PHA is not required.</p> <p>Concrush has safety management system documents and procedures including a Pollution Incident Response Management Plan (PIRMP). The PIRMP will be applied to ensure that all foreseeable emergency events are considered and adequate site specific systems are put in place to ensure site personnel and equipment are ready and able to deal with an emergency situation.</p>

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1.0 Introduction

Concrush Pty Ltd (Concrush) is seeking development consent to increase the processing and storage capacity of the existing resource recovery facility located on part of Lot 2 DP 220347 at 21 Racecourse Road, Teralba, New South Wales (NSW) (refer to **Figure 1.1**). The existing Concrush facility provides cost effective options for recycling of concrete, asphalt, bricks, pavers, roof tiles, wall and floor tiles, rock, sand, plasterboard and green waste for domestic households and commercial industry. These materials are then recycled into specification and non-specification quality products such as roadbase, drainage aggregates, pipe bedding and haunch, packing fines, decorative aggregates and mulches. These products are used within the civil and construction industries or for commercial, domestic and household applications. The 'Concrush increase to capacity project' (the Project) will involve alterations and additions to the existing facility in order to provide greater on-site storage capacity that is sufficient for the increased level of throughput.

The existing facility is located within the suburb of Teralba, in the Lake Macquarie Local Government Area (LGA). It covers an area of approximately 2.4 hectares (ha) and is located between Cockle Creek to the east and the Main North Rail Line to the west (refer to **Figure 1.1**).

The Project is a State Significant Development (SSD) and requires approval under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The development application will be lodged with the Planning Secretary of NSW Department of Planning and Environment (DPE).

This Environmental Impact Statement (EIS) has been prepared by Umwelt Environmental and Social Consultants (Umwelt) on behalf of Concrush to assess the potential environmental and community impacts of the Project. This EIS has been prepared in accordance with the requirements of the Planning Secretary of DPE as detailed in **Section 1.4**.

1.1 The Proponent

The proponent for the Project is Concrush Pty Ltd (Concrush). Concrush was established in 2002 after recognising the need for a construction and demolition recycling facility in the Lake Macquarie region. Concrush is a locally owned and operated business based at Teralba.

1.2 Overview of the Proposed Project

Following strong demand for their recycling service and the increased focus on maximising recycling of construction materials by the community and State and local government, Concrush is seeking an increase to the processing and storage capacity of the existing facility. Concrush has been operating since 2002 currently recycles approximately 108,000 tonnes (t) of waste material per annum (pa). Concrush is seeking approval for a staged increase in throughput capacity to up to 250,000 t of waste material recycled per annum. It is anticipated that this would consist predominately of construction and demolition waste, with a small volume of green waste, however, this would vary based on market demand. Concrush will require a waste storage capacity on-site that is sufficient for this level of throughput, anticipated to be up to 150,000 t at any point in time.

It is anticipated that production levels would increase over time. As such, the Project will be constructed in two stages to allow for the proposed Project elements to come online as required in line with increasing production. Further details on staging are provided in **Section 3.1.2**. The proposed works include the following:

- **Hardstands** - to be constructed for material processing areas and stockpile areas. Hardstands will consist of 200 millimetre (mm) thick recycled roadbase. Some site levelling will be required to establish the hardstands

- **Material Processing Areas** - processing areas for the crushers and screens
- **Waste and Product Stockpile Areas** - additional waste and product stockpiles will be established maintaining the existing stockpile height of up to 10 metres (m). It is anticipated that up to 150,000 t of material will be stored onsite at any one time
- **Upgrade of existing facilities** – the existing weighbridge and office will be upgraded, and the existing lunch room and maintenance shed will be relocated to facilitate the new site layout
- **Waste tracking system** – the existing Wasteman software will be used to track the details of all inbound and outbound loads
- **Storage Bays** - concrete storage bays will be constructed using 1 m³ concrete blocks.
- **Concrete Walls** – a 2 m high concrete wall will be constructed close to the southern Project site boundary using 1 m³ concrete blocks. The wall will prevent stockpiled material encroaching on swale drains and moving offsite. Concrete walls may also be used to delineate other areas of the site
- **Green waste pasteurisation** - An aeration system using four electronically driven and computer controlled fans to push air through movable perforated pipes underneath the pasteurisation piles will be implemented in the green waste area. This system allows more control of oxygen levels in the pasteurisation process compared to the tradition turnover process.
- **Retail Area** - this area will be restricted to light vehicles and small trucks and will include an area for tipping and an area containing concrete bays of products for sale
- **Wheel Wash** – a vehicle wheel wash bay will be constructed immediately after the exit weighbridge to reduce tracking of material onto public roads
- **Concrete washout bay** – a wet concrete washout bay will be constructed consisting of a bunded, impermeable area with an isolated catchment. Wet concrete and agitator washout will be captured in the concrete washout bay
- **Water Tanks** - water tanks and associated poly pipe and pumps will be installed to allow collection and re-use of stormwater for dust suppression
- **Trommel Screening Machine** - Trommel screening machine for sorting of green waste
- **Primary Jaw Crusher** – the existing primary jaw crusher will be replaced with more modern equipment
- **Pug mill** - a pug mill may be installed in the future to allow fast mixing of materials to produce products such as road base
- **Ballast wash facility** - a processing area may be dedicated to a ballast wash facility to allow for processing of rail ballast
- **Mounds, Fencing and Lighting** - landscape mounds will be established on the perimeter for flood protection and to limit views into the site. A 2 m high security fence and security lighting on high poles will also to be installed along parts of the site perimeter.

1.3 Schedule of Lands

The Project is located on part of the land identified as Lot 2 DP 220347. The land is leased by Concrush from B & S Scrap Metals Pty Ltd. Concrush has extended the lease area to include the extended site area associated with the Project and have a long term lease in place.

A letter from B & S Scrap Metals Pty Ltd identifying its consent to the submission of this development application and EIS is presented in **Appendix A**.

1.4 Secretary's Environmental Assessment Requirements

The Project is SSD requiring approval under Part 4 of the EP&A Act. In accordance with Schedule 2, Part 2 of the EP&A Regulation, the Secretary's Environmental Assessment Requirements (SEARs) were requested from DPE for the preparation of the EIS. A copy of the SEARs is contained in **Appendix B**. A checklist of compliance with the SEARs is provided in **Table 1.1**.

Table 1.1 Secretary's Environmental Assessment Requirements Checklist

Secretary's Environmental Assessment Requirements	Relevant EIS Section
General Requirements The Environmental Impact Statement (EIS) for the development must meet the form and content requirements in clauses 6 and 7 of Schedule 2 of the <i>Environmental Planning and Assessment Regulation 2000</i> . The EIS must include a:	
<ul style="list-style-type: none"> detailed description of the development, including: <ul style="list-style-type: none"> accurate history of the site, including development consents; need for the proposed development; justification for the proposed development; likely staging of the development - including demolition, construction, and operational stage/s; likely interactions between the development and existing, approved and proposed operations in the vicinity of the site; plans of any proposed building works; any contributions required to offset the proposal; and any impacts on matters of National Environmental Significance. 	Sections 3.0 and 4.1
<ul style="list-style-type: none"> demonstrate that the site is suitable for the proposed use in accordance with State Environmental Planning Policy No 55 – Remediation of Land; 	Sections 4.2.5 and 6.12
<ul style="list-style-type: none"> consideration of all relevant environmental planning instruments, including identification and justification of any inconsistencies with these instruments; 	Section 4.0
<ul style="list-style-type: none"> consideration of issues discussed in Attachment 2 (public authority responses to key issues); 	Section 6.0
<ul style="list-style-type: none"> risk assessment of the potential environmental impacts of the development, identifying the key issues for further assessment; 	Section 6.1
<ul style="list-style-type: none"> detailed assessment of the key issues specified below, and any other significant issues identified in this risk assessment, which includes: <ul style="list-style-type: none"> a description of the existing environment, using sufficient baseline data; an assessment of the potential impacts of all stages of the development, including any cumulative impacts, taking into consideration relevant guidelines, policies, plans and statutes; a description of the measures that would be implemented to avoid, minimise and if necessary, offset the potential impacts of the development, including proposals for adaptive management and/or contingency plans to manage any significant risks to the environment; and 	Sections 2.0, 6.0 and 7.0
<ul style="list-style-type: none"> a consolidated summary of all the proposed environmental management and monitoring measures, highlighting commitments included in the EIS. 	Section 7.0

Secretary's Environmental Assessment Requirements	Relevant EIS Section
<p>The EIS must also be accompanied by a report from a qualified quantity surveyor providing:</p> <ul style="list-style-type: none"> • a detailed calculation of the capital investment value (as defined in clause 3 of the EP&A Regulation 2000) of the • proposal, including details of all assumptions and components from which the CIV calculation is derived; • a close estimate of the jobs that will be created by the development during the construction and operational phases of the development; and • certification that the information provided is accurate at the date of preparation. 	Appendix C
<p>Key Issues</p> <p>The EIS must address the following specific matters:</p> <ul style="list-style-type: none"> • Waste Management – including: <ul style="list-style-type: none"> ○ a description of the waste streams that would be accepted at the site including maximum daily, weekly and annual throughputs and the maximum size for stockpiles; ○ a description of waste processing operations, including a description of the technology to be installed, resource outputs, and the quality control measures that would be implemented; ○ details of how waste would be stored (including the maximum daily waste storage capacity of the site) and handled on site, and transported to and from the site including details of how the receipt of non-conforming waste would be dealt with; ○ detail the developments waste tracking system for incoming and outgoing waste; ○ detail the quality of waste produced and final dispatch locations; ○ details of the waste management strategy for demolition, construction and ongoing operational waste generated; and ○ the measures that would be implemented to ensure that the development is consistent with the aims, objectives and guidance in the NSW Waste Avoidance and Resource Recovery Strategy 2014- 2021. 	Sections 3.1.2 and 6.13
<ul style="list-style-type: none"> • Suitability of the Site – including: <ul style="list-style-type: none"> ○ details of all development consents and approved plans for the existing facility, including for all structures, plant and equipment; ○ results of an independent audit of the operation of the existing facility against the conditions of all development consents and all Environmental Protection Licences in force in respect of the existing facility to ascertain the baseline of the site; and ○ a detailed justification that the site can accommodate the proposed increase in processing capacity, having regard to the scope of the operations of the existing facility and its environmental impacts and relevant mitigation measures. 	Section 3.4
<ul style="list-style-type: none"> • Soil and Water – including: <ul style="list-style-type: none"> ○ characterisation of the nature and extent of contamination on the site and a description of proposed management measures; ○ a description of water and soil resources, topography, hydrology, watercourses and riparian lands on or nearby to the site; ○ a detailed site water balance including identification of water requirements for the life of the project, measures that would be implemented to ensure an adequate and secure water supply is available for the proposal and a detailed description of the measures to minimise the water use at the site; ○ characterisation of water quality at the point of discharge to surface and/or groundwater against the relevant water quality criteria (including details of the contaminants of concern that may leach from the waste into the wastewater and proposed mitigation measures to manage any impacts to receiving waters); 	Section 6.5

Secretary's Environmental Assessment Requirements	Relevant EIS Section
<ul style="list-style-type: none"> ○ detailed flooding assessment; ○ details of stormwater/wastewater/leachate management systems including the capacity of onsite detention system/s, onsite sewage management and measures to treat, reuse or dispose of water; ○ a description of erosion and sediment controls; ○ an assessment of potential impacts to soil and water resources, topography, drainage lines, watercourses and riparian lands on or nearby to the site; and ○ consideration of salinity and acid sulphate soil impacts. 	
<ul style="list-style-type: none"> ● Air Quality and Odour – including: <ul style="list-style-type: none"> ○ a quantitative assessment of the potential air quality, dust and odour impacts of the development in accordance with relevant EPA guidelines. This is to include the identification of existing and potential future sensitive receivers and consideration of approved and/or proposed developments in the vicinity; ○ the details of buildings and air handling systems and strong justification (including quantitative evidence) for any material handling, processing or stockpiling external to a building; ○ a greenhouse gas assessment; and ○ details of proposed mitigation, management and monitoring measures. 	Section 6.3
<ul style="list-style-type: none"> ● Noise and Vibration – including: <ul style="list-style-type: none"> ○ a quantitative assessment of potential demolition, construction, operational and transport noise and vibration impacts in accordance with relevant Environment Protection Authority guidelines. This is to include the identification of existing and potential future sensitive receivers and consideration of approved and/or proposed developments in the vicinity; and ○ details and justification of the proposed noise mitigation and monitoring measures. 	Section 6.2
<ul style="list-style-type: none"> ● Traffic and Transport – including: <ul style="list-style-type: none"> ○ details of all traffic types and volumes likely to be generated during construction and operation, including a description of haul routes; ○ an assessment of the predicted impacts of this traffic on road safety and the capacity of the road network, including consideration of cumulative traffic impacts at key intersections using SIDRA or similar traffic model. This is to include the identification and consideration of approved and/or proposed developments in the vicinity; ○ detailed plans of the proposed layout of the internal road and pedestrian network and parking on site in accordance with the relevant Australian Standards; ○ plans of any proposed road upgrades, infrastructure works or new roads required for the development; ○ plans demonstrating how all vehicles associated with construction and operation awaiting loading, unloading or servicing can be accommodated on the site to avoid queuing in the street network; and ○ swept path diagrams depicting vehicles entering, exiting and manoeuvring throughout the site for both heavy and light vehicles. 	Section 6.4

Secretary's Environmental Assessment Requirements	Relevant EIS Section
<ul style="list-style-type: none"> • Fire and Incident Management – including: <ul style="list-style-type: none"> ○ an assessment of bushfire risks and asset protection zones (APZ) in accordance with NSW Rural Fire Service guidelines; and ○ technical information on the environmental protection equipment to be installed on the premises such as air, water and noise controls, spill clean-up equipment and fire (including management of fire water, location of fire hydrants and water flow rates at the hydrant) management and containment measures 	Section 6.7
<ul style="list-style-type: none"> • Heritage – including: <ul style="list-style-type: none"> ○ a detailed assessment of Aboriginal cultural heritage; and ○ an assessment of environmental heritage, including identification of measures to mitigate and manage impacts on any heritage conservation area and/or items of heritage significance in the vicinity. 	Section 6.8 and 6.9
<ul style="list-style-type: none"> • Mining subsidence – including consideration of the <i>Mine Subsidence Compensation Act 1961</i> and consultation with Subsidence Advisory NSW. 	Section 4.2.5 and 5.1
<ul style="list-style-type: none"> • Visual – including a detailed visual impact assessment of the proposed development and consideration of the amenity of the surrounding area. 	Section 6.11
<ul style="list-style-type: none"> • Flora and Fauna – including: <ul style="list-style-type: none"> ○ an assessment of impacts on biodiversity in accordance with the <i>Biodiversity Conservation Act 2016</i>; and ○ consideration of the <i>North East Regional Forest Agreement and the Regional Forest Agreement Act 2002</i>. 	Section 6.6
<ul style="list-style-type: none"> • Hazards – including: <ul style="list-style-type: none"> ○ a preliminary risk screening completed in accordance with State Environmental Planning Policy No. 33 – Hazardous and Offensive Development and Applying SEPP 33 (DoP, 2011), with a clear indication of class, quantity and location of all dangerous goods and hazardous materials associated with the development; and ○ should preliminary screening indicate that the project is "potentially hazardous" a Preliminary Hazard Analysis (PHA) must be prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6 - Guidelines for Hazard Analysis (DoP, 2011) and Multi-Level Risk Assessment (DoP, 2011). 	Section 6.15
<p>Plans and Documents</p> <p>The EIS must include all relevant plans, architectural drawings, diagrams and relevant documentation required under Schedule 1 of the EP&A Regulation 2000. These documents should be included as part of the EIS rather than as separate documents.</p>	
<p>Consultation</p> <p>During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners.</p> <p>In particular, you must consult with:</p> <ul style="list-style-type: none"> • Ausgrid; • Lake Macquarie City Council; • Department of Primary Industries; • Environment Protection Authority; • Fire and Rescue NSW; • Hunter Water; • Office of Environment and Heritage; • Roads and Maritime Services; 	Section 5.0

Secretary's Environmental Assessment Requirements	Relevant EIS Section
<ul style="list-style-type: none"> • Rural Fire Service; • Subsidence Advisory NSW; • Sydney Trains; • Transport for New South Wales; and • the surrounding land owners and occupiers that may be affected by the proposal. <p>The EIS must describe the consultation process and the issues raised, and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, a short explanation should be provided.</p>	

1.5 Project Team

Concrush engaged Umwelt to undertake the environmental impact assessment for the Project and prepare an EIS. The following technical specialists were used:

- Better Transport Futures – Traffic Impact Assessment
- McLaren Traffic Engineering – Swept Path Analysis
- RCA Australia – Air Quality Assessment
- RCA Australia – Noise Assessment
- RCA Australia - Contamination Assessment
- Umwelt – Soil and Water Management
- Umwelt – Ecology
- Umwelt – Aboriginal and Historic Heritage
- Umwelt – Social Impact Assessment.

1.6 EIS Structure

The purpose of this EIS is to enable the consent authority to consider the potential environmental impacts of the Project as part of determining the development application. The EIS has been prepared in accordance with the EP&A Act, EP&A Regulation and the SEARs for the Project.

The **Executive Summary** provides a brief overview of the Project and the major findings of the EIS.

Section 1 introduces the Project, providing a brief overview of the proposed Project and also identifies where within the EIS the SEARs have been addressed.

Section 2 describes the existing site and surrounds and provides an overview of the existing environment and existing operations.

Section 3 contains a detailed description of the proposed Project.

Section 4 outlines the planning context for the Project, including the applicability of Commonwealth, State and local legislation.

Section 5 describes the stakeholder consultation.

Section 6 contains comprehensive analysis and assessment of the key environmental and community issues.

Section 7 provides a summary of the mitigation measures and commitments proposed to be adopted throughout the life of the Project.

Section 8 contains a conclusion and justification for the Project.

Section 9 contains a list of references cited in the EIS.

Section 10 contains a list of abbreviations and glossary.



Legend

Concrush Recycling Facility

FIGURE 1.1
Locality Plan

2.0 Existing Site Description

2.1 The Existing Concrush Site

The existing Concrush site is situated in the suburb of Teralba, within the Lake Macquarie LGA, and covers an area of approximately 2.4 ha (refer **Figure 2.1**). The existing site is bound to the west by the Main North Rail Line and to the east by Racecourse Road and Cockle Creek. Access to the existing site is via a driveway on Racecourse Road.

The Project site is predominantly devoid of vegetation, with the exception of some isolated shrubs, grassed areas and landscaped trees and shrubs planted along parts of the existing site boundaries which act as a wind break and visual screen for adjacent properties.

2.2 Land Use

Concrush operate an approved concrete and demolition recycling facility, identified in the 2002 development consent (DC/02/00558/1N) from Lake Macquarie City Council (LMCC) as ‘concrete crushing, grinding and separating works’. The existing site would continue to be used as a concrete and demolition recycling facility during operation of the Project.

The area surrounding the existing site includes a range of different land uses (refer **Figure 2.2**). These include Racecourse Road and Cockle Creek immediately to the east, a wrecker’s yard to the north, the Main North Rail Line and Teralba Colliery and Macquarie Coal Preparation Plant to the west and a scrap metal recycling yard to the south. The Bunderra residential estate is located approximately 200 m to the east of the existing site on the opposite side of Cockle Creek. The closest residential areas of Teralba are located approximately 1.3 kilometres (km) to the south east of the existing site.

2.2.1 Previous Land Use and Site History

Prior to Concrush’s 2002 consent and the existing recycling facility, the Project site formed part of the scrap metal yard, Lucky’s Scrap Metals. Lucky’s Scrap Metals was established in 1972 and continues to operate but on a reduced site area on the land adjoining the south of the Concrush site.

2.2.2 Approved and Proposed Operations in the Local Area

Within the Teralba local area there are proposed and/or recently approved developments that have been taken into consideration in determining the potential community and environmental impacts of the Project. These developments include the Bunderra Estate and associated seniors housing subdivision located on the eastern side of Cockle Creek at Boolaroo. Once Bunderra Estate and the seniors housing is fully developed, the nearest residential dwellings will be approximately 200 m from the Project site.

Within the Metromix quarry off Rhondda Road at Teralba there is an approved development application for the replacement of the existing aged asphalt plant with a new asphalt plant. This development would not result in any additional sensitive receivers within the local area but may contribute some traffic within the Teralba local area. This cumulative impact has been considered in the traffic assessment.



Image Source: Nearmap (May 2017)
Data Source: NSW LPI (2017)

0 20 40 80 m
1:1 500

Legend

- Existing Concrush Recycling Facility
- ① Site Office
- ② Weighbridge Office
- ③ Maintenance Shed/lunch room/toilet
- ④ Weighbridges
- ⑤ Car Parking
- ⑥ Product Bays
- ⑦ Landscape Bunds

File Name (A4): R03/3972_048.dgn
20180725 10.58

FIGURE 2.1
Existing Operations



Image Source: Nearmap (May 2017)
Data Source: LPI (2017), Department of Planning and Environment - NSW (2017)

0 250 500 750m
1:15 000

Legend

Project Site

FIGURE 2.2

Surrounding Land Use

2.3 Utilities and Services

The site is currently serviced by electricity and telecommunications. There is no water or sewerage connection to the site. The site office amenities include a chemical toilet facility with hand basin.

Water for dust suppression is administered via the water cart and is sourced from on-site storage as well as a Hunter Water stand pipe located on Racecourse Road near the Teralba Bowling Club.

2.4 Existing Operations

Concrush have been operating since 2002 and currently crush and screen concrete and demolition waste materials and green waste. These materials are recycled in accordance with the NSW Environment Protection Authority (EPA) Resource Recovery Order under Part 9, Clause 93 of the *Protection of the Environment Operations (Waste) Regulation 2014 – The Concrush crushed concrete, concrete washout and recycled materials order (2017)*. Once recycled, these materials are sorted into specification compliant and non-specification compliant quality products such as roadbase, drainage aggregates, pipe bedding and haunch, packing fines and decorative aggregates which can be used within the civil and construction industries or for commercial, domestic and household applications.

Pasteurised garden organics are also produced by Concrush under the EPA Resource Recovery Order – *The Pasteurised Garden Organics Order (2016)*. Under this order, garden organics such as raw mulch and plant materials including leaves, plant trimmings, grass, flowers and fruit are pasteurised to reduce the number of plant and animal pathogens. The pasteurised garden organics are then supplied to domestic households and commercial industry as Fine (premium) mulch and Coarse (forest) mulch.

Concrush currently recycles approximately 108,000 t of waste material per annum and stores up to 40,000 t of waste material on site at any one time in accordance with the existing site Environmental Protection Licence (EPL) No. 13351. Concrush monitors the volumes of waste and products stored on site at any one time through its waste tracking system and sales and production records and reports on the storage volumes on a monthly basis to EPA.

Operating hours are 7am to 5pm Monday to Friday and 7am to 4:00pm Saturdays, closed Sunday. There are occasional night time operations to meet specific project needs.

2.4.1 Existing Infrastructure and Equipment

Existing infrastructure includes (refer **Figure 2.1**):

- a site office building (demountable)
- a lunch room and amenities
- the weighbridge office
- inbound and outbound weighbridges
- a maintenance shed - for maintenance activities and storage of equipment
- a shipping container – used primarily for the bunded storage of oils and the site spill kit
- concrete product storage bays
- concrete blocks and signage for the direction of traffic
- fencing.

The equipment currently in use at the Concrush facility includes:

- a primary jaw crusher – which does the majority of crushing work
- a cone crusher
- two front end loaders
- three excavators and associated attachments - sheers, pulverisers and buckets
- two multi deck screens
- one tractor – primarily used for street sweeping and loading small trailers
- two water carts
- one road sweeper

2.4.2 Waste Materials Received

The waste materials currently received by Concrush include:

- demolished concrete
- bricks/pavers/roof tiles
- ceramic wall and floor tiles
- concrete washout
- wet concrete
- clean mixed – concrete/brick/pavers/tiles
- clean rock/sandstone/clay/VENM/ENM
- road bases – quarried materials, milled road bases, Mix 3 (a road base product), sub base and base course materials
- asphalt – deep lift asphalt, milled asphalt, asphaltic concrete, two coat seal
- ballast
- green waste and stumps.

2.4.3 Waste Tracking and Load Inspection

Concrush use the Wasteman tracking system to record details of all inbound and outbound waste material. The Wasteman tracking system records the following details:

- vehicle registration number
- customer type
- date/time of transaction
- what material is being brought in/taken off site

- which suburb material has come from/or going to
- the weight of the material brought in/taken off site
- purchase order/job number (if applicable).

Each vehicle load is manually inspected by Concrush staff at the weighbridge prior to tipping. If visual inspection from the weighbridge is not sufficient to clear a load for tipping, staff may instruct the vehicle operator to tip a small portion of the load onto a cleared hardstand portion for a second visual inspection.

Concrush do not accept construction and demolition waste loads where the following materials are detected:

- asbestos containing materials
- fibrous cement products
- gyprock
- compressed concrete
- coal tar.

Concrush do not accept garden organic waste loads where the following materials are detected:

- asbestos containing materials
- steel or metal material
- plastic, PVC or vinyl products
- construction and demolition waste
- gyprock or plasterboard material
- engineered wood products
- treated or coated wood products
- noxious weeds or grape vines
- soil or clay material.

If any of the above materials are detected the load is rejected and a Rejected Load Confirmation form is completed and provided to the vehicle operator. The vehicle is then directed off-site and advised to dispose of the load at an appropriately licensed facility.

A record of all rejected loads is recorded in Concrush's Rejected Loads Register and reported to the EPA.

2.4.4 The Recycling Process

Concrush receives and stockpiles waste building material and green waste prior to processing. The key stages of processing are as follows:

- Waste receipt – light and heavy vehicles from local residents and construction industry contractors via driveway from Racecourse Road.

- Vehicles report to weighbridge office – weighing and load inspection to ensure no unauthorised material.
- Tracking system – Wasteman software tracks the details of all loads both inbound and outbound.
- Raw material stockpiling – vehicles tip/unload waste material then exit via outbound weighbridge. Waste material is then formed into raw material stockpiles by an excavator.
- Processing:
 - Concrete and demolition waste - excavator feeds material from the raw material stockpiles into the primary jaw crusher/cone crusher/multi deck screens depending on the waste being processed and the product being made
 - Secondary processing – as part of the crushing/screening process, timber and reinforcing steel is automatically separated from the demolition material and stockpiled for further processing. Reinforcing steel is stockpiled and collected by a contractor and transported off site for recycling at another licensed facility. Separated timber material is transferred to the green waste raw stockpile for processing on site
 - Green waste – when the stockpile size reaches approximately 200 t a contractor with a mobile mulcher is brought to site to mulch the stockpiled green waste
- Product stockpiling – after processing, products are relocated by front end loader to individual stockpiles bays for sale and quality control and compliance testing if required.

The facility currently processes approximately 108,000 t of waste material per annum and stores up to 40,000 t of waste material on site at any one time. The maximum height of raw/product stockpiles on site is 10 m. The waste is received via cars, utilities, trailers, tipper trucks and truck and dogs. Products are transported from the site via trailers and large and small trucks including semi-trailers. While domestic building waste represents only a small portion of Concrush's waste recycling business, Concrush encourages local residents to use the facility for recycling their domestic building waste as it provides residents with a sustainable alternative to dumping waste at local landfills at Awaba and Summerhill.

2.4.5 Product

The products that Concrush produces for sale are summarised in **Table 2.1**.

Table 2.1 Concrush Products

Product Type	Description / Uses
Pavement Materials	
20mm Recycled Concrete Base	The recycled concrete is a high quality material that compacts easily. This product is used as road base and pavement making material.
20mm Recycled Blended Base	Demolished concrete, brick, roof tiles, ceramic tiles, road base and asphalt are crushed and blended to form this product. This product is used as road base and pavement making material.
Recycled Concrete Packing Fines	This product is used as bedding material and other construction applications.
Drainage Aggregates	
10 and 20mm Recycled Concrete Aggregate	Drainage and filter material that is commonly used for backfilling pipes and in subsurface drains and as a filter medium for retaining walls.
70mm Recycled Concrete Cobble	Drainage material commonly used as a filter medium for retaining walls, for the construction of site access/ haul roads and as coarse fill.

Product Type	Description / Uses
Decorative Aggregate	
10 and 20mm Recycled Decorative Aggregate	This product is comprised of demolished brick, pavers and roof tiles. It is commonly used for various decorative landscaping applications.
Mulches	
Recycled Forest Mulch (Coarse)	This mulch is suitable for commercial, domestic and household landscaping applications. It can also be used in rehabilitation and bank stabilisation.
Recycled Premium Mulch (Fine)	It is high quality, dark and finely graded mulch that is suitable for commercial, domestic and household landscaping applications.

2.5 Property Description and Ownership

The existing Concrush site is located within part of Lot 2 DP 220347, leased from B & S Scrap Metals Pty Ltd who own the land. It covers an area of approximately 2.4 ha.

2.6 Sensitive Receivers and Environmental Aspects

As shown on **Figure 2.2**, the nearest residential areas are currently:

- Boolaroo - located approximately 330 m to the south-east of the Project site
- Argenton - located approximately 1.1 km to the north-east of the Project site, and
- Teralba – located approximately 1.3 km to the south-west of the Project site.

In addition, there is a large portion of land to the east of the Project site which has been remediated following the closure of the former Pasminco lead smelter. This land, consisting of the approved Bunderra Estate and associated seniors housing development, is now zoned R3 – medium density residential under the Lake Macquarie Local Environmental Plan 2014 (LMLEP 2014). Once Bunderra Estate and the seniors housing are fully developed, the nearest residential dwellings will be approximately 200 m from the Project site.

The Project site does not form part of a ‘coastal wetland’ as defined under *State Environmental Planning Policy (SEPP) Coastal Management*, however there are Coastal wetlands located approximately 100 m to the north and approximately 400 m to the south (downstream) of the Project site. An area of degraded freshwater wetland is located along the western boundary of the proposed expanded part of the Project site. This degraded wetland area is protected from physical damage by an existing earth bund on its eastern edge. This earth bund will be extended as part of the Project to provide a physical barrier along the length of the wetland area and it will not be impacted as a result of the project.

The proposed Project site falls within the Coastal Environment Area as defined by SEPP Coastal Management mapping, however as no change to the existing land use is proposed, the Project is unlikely to result in negative impacts to the sensitive coastal zone.

2.7 Environmental Management and Monitoring Systems

Concrush’s current operations are undertaken in accordance with their well-established Environmental Management Plans (EMPs) for the site. The Operational Environmental Management Plan (OEMP) and associated environmental management sub-plans outline environmental actions to appropriately manage operations to minimise impacts to the environmental and community. The OEMP and environmental management sub-plans are reviewed regularly by Concrush and updated where necessary as new management controls are developed as a result of optimisation of operations, or through ongoing monitoring of the environmental management systems in place.

The environmental management sub-plans and policies which underpin the OEMP include:

- Noise Management Plan (NPM) – the key components of this plan include identification of controls for noise emission sources, complaints handling procedure, training and awareness for Concrush staff and subcontractors and the noise monitoring program. The existing noise monitoring locations are shown in **Figure 2.3**
- Air Quality Management Plan (including odour) (AQMP) – the key components of this plan include identification of potential dust and odour emission sources, complaints handling procedure, training and awareness for Concrush staff and subcontractors and the air quality monitoring program. Concrush’s air quality monitoring system is comprised of four depositional dust gauges located on the existing site boundaries which are sampled on a monthly basis. Real time monitoring of fine particulate matter (PM10) is undertaken on an as needs basis or following an air quality complaint. The depositional dust monitoring locations are shown in **Figure 2.4**
- Site Water Management Plan (SWMP) – the objectives of this plan include minimisation of erosion of undisturbed land and sedimentation of water courses as well as promotion of employee environmental awareness. The plan describes the Water Management System (WMS) and details the water quality monitoring which is undertaken quarterly and after significant wet weather events (>25 mm rainfall in 24 hours). The water quality monitoring locations are shown on **Figure 2.4**
- Waste Management Plan (WMP) – this plan describes the different waste streams generated at the site, outlines the record keeping and waste tracking requirements and provides a system for the management of waste at the site including a monitoring program to track compliance with relevant site orders and the EPL. The process for inspecting incoming waste and dealing with unauthorised waste is documented
- Pasteurised Garden Organics Management Plan (PGOMP) – this plan provides a procedure for the processing of garden organic material and ensuring compliance with *The Pasteurised Garden Organics Order (2016)*
- Pollution Incident Response Management Plan (PIRMP) – this plan establishes the administrative structure and procedures for handling and reporting of an emergency at the site
- Sample Test and Material Management Plan – this plan describes the process and procedures for ensuring sampling and testing is undertaken in accordance with the resource recovery order - *Concrush crushed concrete, concrete washout and recycled materials order 2017*
- Rejected Load Policy – all incoming loads are manually inspected by Concrush staff at the weighbridge. This policy outlines the types of waste that Concrush will not accept if detected within a load.

Concrush undertakes ongoing monitoring and review of its environmental performance with the aim of continually improving ongoing operations. This includes:

- Routine monitoring – Concrush undertakes routine monitoring of air quality and water quality, in addition to quality control sampling of recycled concrete materials; and pasteurised organic materials which are assessed against the relevant Resource Recovery Orders.
- Review of environmental performance – environmental performance is discussed at weekly toolbox talks, monthly management meetings and annually in the EPA Annual Return.

The Annual Return that Concrush submits to the NSW EPA includes:

- A statement of compliance
- Corrective and preventative actions taken to address any non-compliance

- Actions taken to improve various system elements
- A monitoring and complaints summary.

2.8 Complaints Handling

Concrush operates a 24-hour complaints line on 02 4958 3777, accessible to the public and local community, which provides opportunity to express any complaints or issues of concern. A summary of the complaints received over the last few years is provided below.

In April 2016 a local resident registered a complaint about the water cart passing their property on the way to refilling from the Hunter Water hydrant. Concrush liaised with Hunter Water who made a hydrant accessible outside of Teralba Bowling Club which required the water cart to pass fewer houses on route to refilling.

In September 2017 a complaint was received by the EPA in relation to dust from Concrush's operations. Concrush advised the EPA that the water cart was in operation due to wind and that they were continuing to monitor dust in relation to their operation.

In May 2018 Concrush received a call asking why they were wetting down the site entry at Racecourse Road. The caller identified that cars were getting dirty from the wet pavement outside the Concrush entry when driving past the site. The Concrush staff member explained the need to be undertaking dust suppression activities to minimise wind-blown dust.

In May 2018 LMCC and the EPA received a complaint about watering down of the Concrush site entry/Racecourse Road and the potential for concrete to be tracked onto the road and potentially entering Cockle Creek. A LMCC inspector visited the site that day and was satisfied that the Concrush site watering activities were not resulting on concrete being tracked onto Racecourse Road and that there was no material entering Cockle Creek.



Legend

- Existing Concrush Recycling Facility
- X Existing Noise Monitoring Location

FIGURE 2.3

Noise Monitoring Locations



Image Source: Nearmap (May 2017)
Data Source: NSW LPI (2017)

0 20 40 80 m
1:1 500

Legend

- ▭ Existing Concrush Recycling Facility
- ▴ Dust Monitoring Location
- ▴ Water Monitoring Location

FIGURE 2.4

Depositional Dust and Water Quality
Monitoring Locations

3.0 Proposed Project

3.1 The Project

3.1.1 Proposed Operations

Concrush proposes a gradual increase to the production capacity in line with market demand up to 250,000 t of waste per annum and an increased storage capacity to accommodate the proposed levels of production. It is anticipated that the volume of materials recycled and products sold will gradually increase over a period of time up to the maximum production level of 250,000 tpa. Green waste storage inventories will be maintained below 200 t and the processing rate will be no greater than 5,000 tpa. The daily and weekly volume of waste through the site will be dependent on market demand and will vary from day to day and week to week. However, the possible maximum daily volume based on peak traffic movements and assuming truck and dog capacity would be approximately 5,800 t and therefore weekly maximum throughput would be 34,800 t.

The Project would require a capital investment value of approximately \$1.1M excluding mobile equipment over a likely 5 year period, and would increase the amount of building and construction waste able to be recycled in the Lake Macquarie Region. This would reduce the volume of this type of waste potentially being sent to local landfills including Awaba and Summerhill. The Project will contribute towards achieving the objectives of the NSW Government's Waste Avoidance and Resource Recovery Strategy 2014 - 21.

A quantity surveyor's estimate of the built elements of the Project is provided in **Appendix C**.

The Project will include increasing the area of the recycling facility as well as changes to the existing site layout but will retain the existing operational activities described in **Section 2.4**.

The existing site would increase in area by 2.4 ha for a total Project site area of 4.8 ha. The majority of the Project site has been previously disturbed, however the Project would require the removal of some planted landscape trees and some grasses to accommodate the additional stockpiling/processing areas.

A description of the individual elements of the proposed Project including additional plant and equipment are summarised in **Table 3.1** and shown on **Figures 3.1** and **3.2**.

Table 3.1 Proposed Project Components

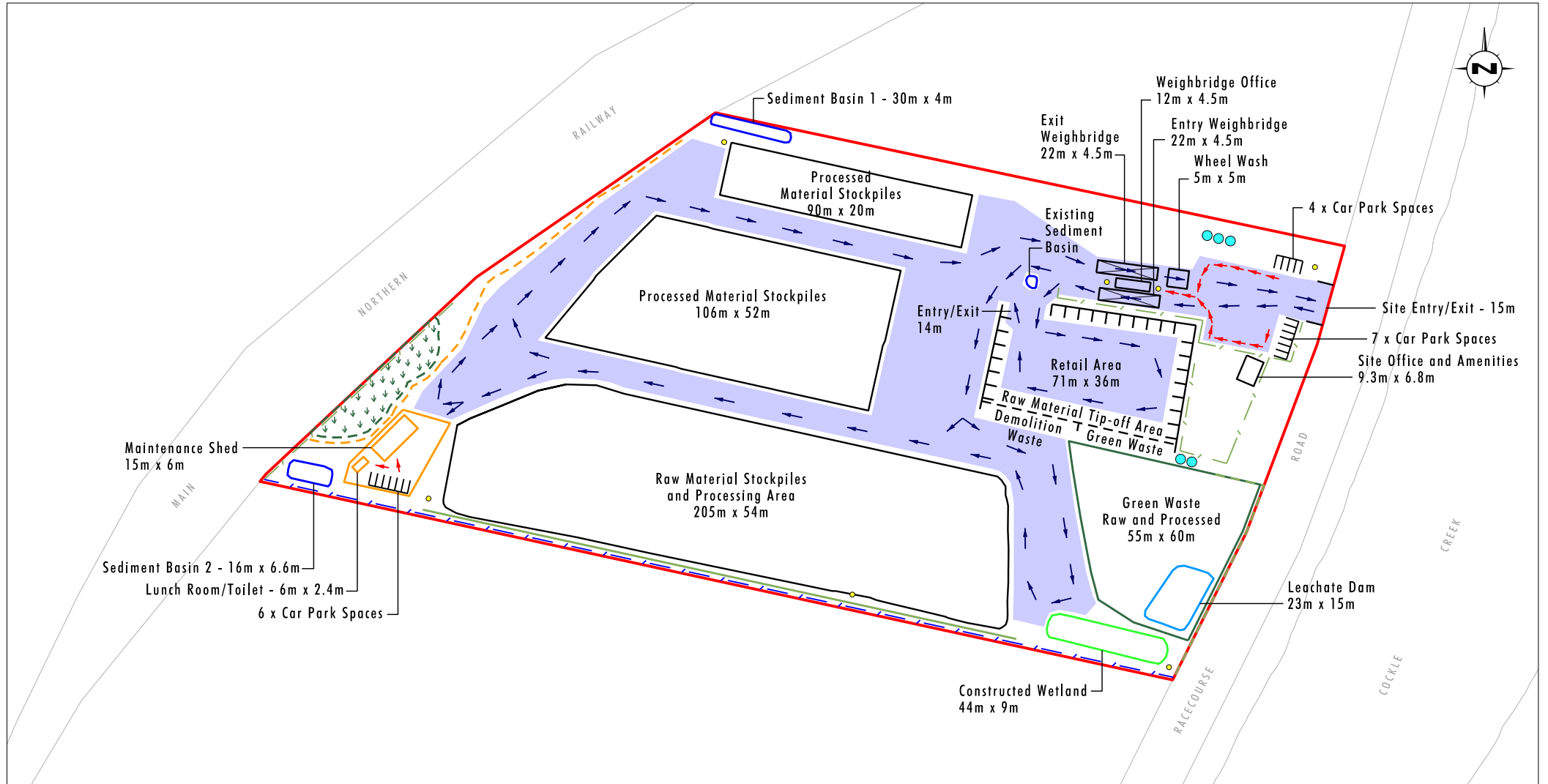
Component	Description
Hardstand areas	Hardstands will be constructed in material processing areas and stockpile areas (will require some site levelling). Hardstands will consist of 200 mm thick recycled roadbase). Internal access roads will have a two coat seal.
Material Processing Areas	Processing areas for the crushers and screens.
Waste and Product Stockpile Areas	Waste and product stockpiles will be established with a stockpile height of up to 10 m. It is anticipated that up to 150,000 tonnes of material will be stored onsite.
Upgrade of existing facilities	The existing weighbridge and office will be upgraded, and the existing lunch room and maintenance shed will be relocated to facilitate the new site layout.
Waste Tracking System	The existing Wasteman software will be used to track the details of all inbound and outbound loads
Production Compound	The relocated lunch room, toilet and maintenance shed will be grouped together to form a compound for production staff.
Retail Area	This area will be restricted to light vehicles and small trucks and will include an area for tipping and an area containing concrete bays of products for sale.

Component	Description
Storage Bays	Concrete storage bays will be constructed using 1 m ³ concrete blocks.
Concrete Walls	A 2 m high concrete wall will be constructed close to the southern Project site boundary using 1 m ³ concrete blocks. The wall will prevent stockpiled material encroaching on swale drains and moving offsite. Concrete walls may also be used to delineate other areas of the site.
Green Waste Pasteurisation	An aeration system using four electronically driven and computer controlled fans to push air through movable perforated pipes underneath the pasteurisation piles will be implemented in the green waste area. This system allows more control of oxygen levels in the pasteurisation process compared to the tradition turnover process.
Wheel Wash	A vehicle wheel wash bay will be constructed immediately after the exit weighbridge to reduce tracking of material onto public roads.
Concrete Washout Bay	A wet concrete washout bay will be constructed consisting of a bunded, impermeable area with an isolated catchment. Wet concrete and agitator washout will be captured in the concrete washout bay.
Water Management System	The existing Water Management System (WMS) will be upgraded involving resizing of existing sediment basins, new sediment basins, swale drains and a leachate dam and artificial wetland to treat nutrient runoff. Water tanks and associated poly pipe and pumps will be installed to allow collection and re-use of stormwater for dust suppression.
Trommel Screening Machine	Addition of a Trommel screening machine for sorting of green waste.
Primary Jaw Crusher	The primary jaw crusher will be replaced on a like for like basis at some point in time as part of future operations.
Perimeter Landscaping - Mounds, Fencing and Lighting	Landscape mounds will be established on the perimeter to limit visibility. 1.8 m high security fencing and security lighting are also to be installed.
Utilities	The existing Ausgrid connection is via a power pole in the north east corner of the site. The power supply will be extended to the south west corner of the site via an underground connection.
Pug mill	A pug mill may be installed in the future to allow fast mixing of materials to produce products such as road base.
Ballast wash facility	A processing area may be dedicated to a ballast wash facility to allow for processing of rail ballast.

3.1.2 Project Staging

It is anticipated that the volume of materials recycled and products sold will increase over a period of time up to the maximum production level of 250,000 tpa. The daily and weekly volume of waste through the site will be dependent on market demand and will vary from day to day and week to week. However, the possible maximum daily volume based on peak traffic movements and assuming truck and dog capacity would be approximately 5,800 t and therefore weekly maximum throughput would be 34,800 t. Concrush propose to implement a compliance tracking register along with the existing waste tracking system to ensure that the annual production limit is complied with. To most efficiently meet the increase in demand for recycling of materials and Concrush products, it is proposed to stage the Project by undertaking some elements of the site upgrade once all approvals have been granted and implementing other elements of the Project as required when certain production levels are reached. Two Project stages and the associated approximate production level have been identified as follows:

- Stage 1 – upon receipt of all approvals required for the Project (refer **Figure 3.1**)
- Stage 2 – at approximately 200,000 tpa up to 250,000 tpa (refer **Figure 3.2**).

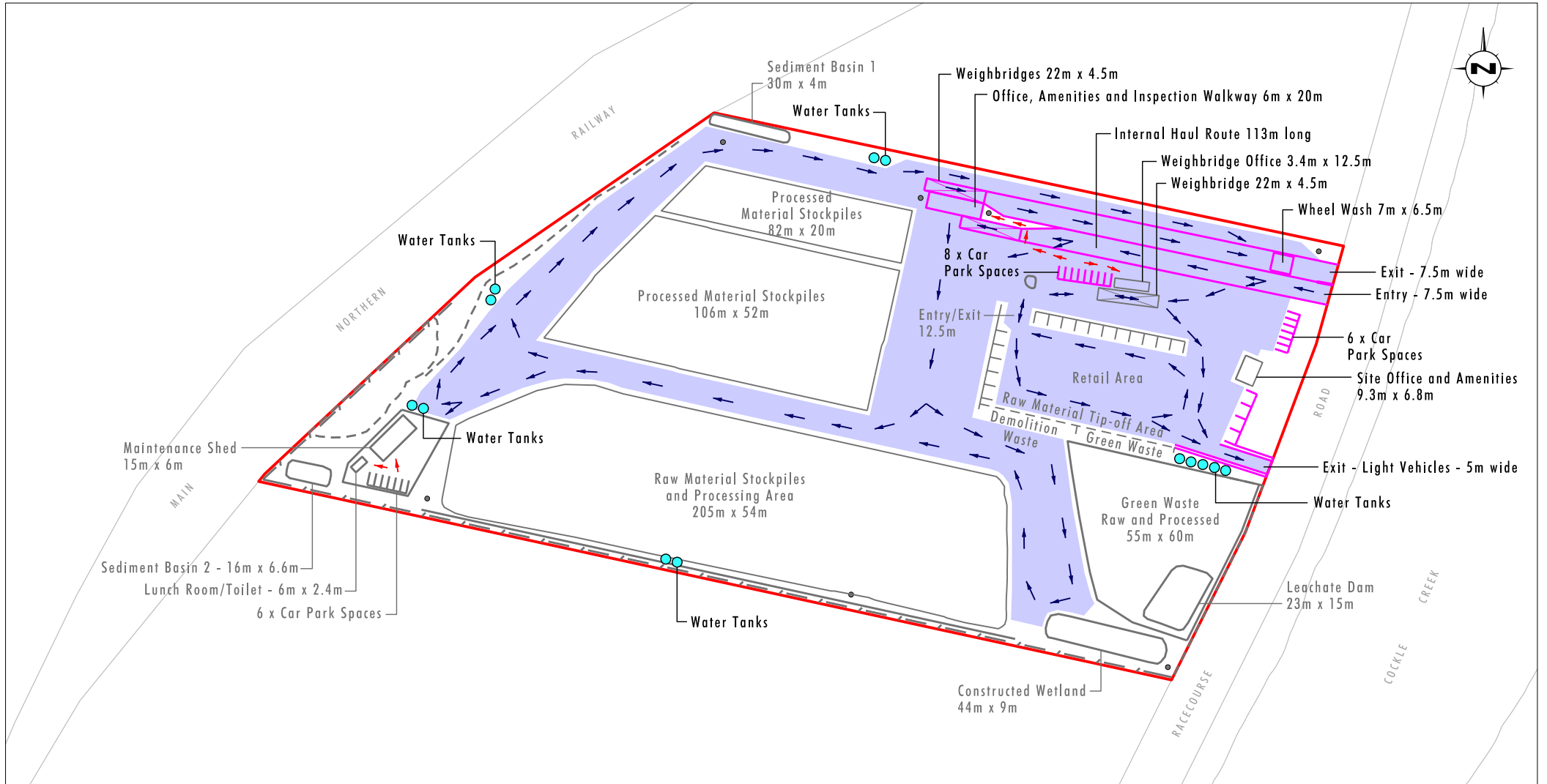


Data Source: Concrush (2018)

0 25 50 100m
1:2 000

FIGURE 3.1

**Stage 1 - Conceptual Layout
Up to 200 000 Tonnes per Annum**



Data Source: Concrush (2018)

0 25 50 100m
1:2 000

- Legend**
- Project Site
 - Stage 2
 - Water Tanks
 - Security Lighting
 - Pedestrian Movement
 - General Vehicle Movement
 - Internal Roads/Hardstand Area

File Name (A4): R03/3972_076.dgn
20181108 11.35

FIGURE 3.2

Stage 2 Conceptual Layout
Up to 250 000 Tonnes per Annum

The key components of the two Project stages are described below.

Stage 1

Stage 1 would be implemented once all approvals have been granted. The key elements of Stage 1 are:

- Construction of all hardstand areas (processing areas and waste and product stockpiles)
- Creation of the retail area
- Widen site access and install sliding gate
- Re-configuration of existing exit only weighbridge to allow for vehicle exit and entry to facilitate entry to the site
- Construct production compound by relocating maintenance shed and lunch room and toilet
- Augment the existing water management system to incorporate the leachate dam, constructed wetland, additional sediment basins, drainage swales, flood mitigation bund, water storage tanks and sprinkler systems
- Establish wheel wash, landscaping mounds, fencing, power line extension and lighting
- Two coat seal of internal access roads
- Replace primary jaw crusher.

Stage 2

Stage 2 would be implemented when production reaches approximately 200,000 tpa up to the Project limit of 250,000 tpa. The key elements of Stage 2 are:

- Relocation of the existing exit weighbridge, construction of a new entry weighbridge and establishment of the new weighbridge office
- The existing entry weighbridge becomes the retail area weighbridge and the existing weighbridge office becomes the retail area weighbridge office
- Construction of a new exit onto Racecourse Road from the retail area for light vehicles (less than 2 t) only
- Two coat seal of remaining internal access roads
- Establish pug mill
- Establish ballast wash facility
- Establish trommel screening machine for green waste
- Establish aeration system for green waste pasteurisation.

Material Processing Areas

A range of activities would be undertaken within the material processing areas. This would include: trucks tipping, waste inspection, waste receipt, stockpiling, mixing, grading, sorting, pulverising, primary crushing, electromagnetic steel capture, vacuum foreign waste removal (such as plastic and paper), sorting, multideck screening and sizing of material, secondary and tertiary crushing (cone crusher and impacters), shearing (stumps and logs), material volume measuring, material discharge using automated stockpiler and use of mobile loaders. Power generation systems including diesel and electric generators would be used within the material processing areas.

Dust will be controlled within the material processing areas through the use of sprays on the crushers and screens, as used in the existing operations, with a new sprinkler system to be established to manage potential dust from stockpiles.

Upgrade of Existing Facilities

To accommodate the revised site layout and increased production the existing entry gate, driveway, weighbridge and site offices will be upgraded. The lunch room, toilet and maintenance shed will be relocated and grouped together in the south western portion of the Project site forming the production compound (refer to **Figure 3.1**). These upgrades will be undertaken in a staged process so that the required changes/infrastructure is in place to accommodate the increased production. Details on the proposed staging are provided in **Section 3.1.2**.

Site Access

As part of Stage 1 the existing 7 m wide site entry would be widened to 15 m and the existing swinging gates reconfigured to be a single sliding gate.

As part of Stage 2 the site access would be relocated to the north so that the access driveway is against the northern boundary of the Project site to maximise the usable area of the site (refer **Figure 3.2**). This alteration would tie in with the Stage 2 relocation of the weighbridges described below. Stage 2 would also involve establishing a new exit onto Racecourse Road from the retail area for light vehicles (less than 2 t) only (refer to **Figure 3.2**).

Weighbridge

The current weighbridges provide for separate entry and exit weigh points. This arrangement will be maintained for Stage 1 of the Project, however, the exit weighbridge will be set up to allow both exit and entry traffic to facilitate trucks entering the site during busy times. This configuration is adequate to manage truck movements up to 200,000 tpa.

Stage 2 of the project involves relocating the existing exit weighbridge and establishment of a new entry weighbridge. These weighbridges will be located further west within the site (refer **Figure 3.2**) to enable efficient traffic movement from Racecourse Road and through the Project site. The new weighbridge arrangement would include a new weighbridge office incorporating offices, kitchenette and toilet facilities (refer to **Appendix D** for building plans)

The existing entry weighbridge and weighbridge office will remain in their current locations and become the retail area weighbridge and office to be utilised by light vehicles only. This will allow greater separation of light and heavy vehicle movements.

Production Compound

A production compound would be formed by relocating the existing lunch room, toilet and maintenance shed from the north eastern part of the site to the south western portion of the site to be closer to where the majority of production will occur. Relocating the existing facilities will also enable a reconfigured traffic flow off Racecourse Road. No utilities adjustments are required for the production compound as water supply will continue to be via water storage tanks and the toilet is a chemical treatment facility that is not connected to the sewerage system.

Power

Currently the site is connected to Ausgrid's main power supply along Racecourse road via a power pole located in the north east corner of the site. The Project will include an underground extension of the internal power from the north east corner of the site to the south western portion of the site. This will allow for power supply to the relocated lunch room/toilet and maintenance shed.

Retail Area

Access to the retail area would be restricted to light vehicles (cars, utes, trailers) for the general public as well as small trucks. Activities within this area would include tip off of green waste and demolition materials. The retail area would also contain 30 to 40 small bays containing different products and landscape materials for sale. The mulch storage bays will be roofed. Some products for sale would not be produced at Concrush but would be brought in to enable a 'one stop shop' approach for the general public's landscape needs. Products not produced at Concrush would include coloured pebbles and some soils.

Light vehicles would enter via the site driveway and pass over the light vehicle only weighbridge (from Stage 2 onwards) before entering the retail area. On exiting the retail area vehicles would again pass over the weighbridge (if required) before exiting via the site driveway. The existing weighbridge office will remain in its current location and become the retail area weighbridge office (refer **Figure 3.2**).

Water Management System

The WMS has been designed to incorporate aspects of the existing WMS and to allow for substantial capture and re-use of stormwater on site. Captured water will be used for dust suppression on stockpiles, hardstand areas and internal access roads. The key elements of the water management system are as follows (refer **Figure 3.1**):

- Separate contained catchment for the green waste area incorporating a leachate dam
- Creation of artificial wetland for treatment of runoff from the green waste area
- Two additional sediment basins and retention of existing basin for management of internal site runoff
- Maintenance of some existing drainage lines and establishment of new swale drains
- Maintaining existing 35,000 litre capacity water storage tanks and installation of an additional 75,000 litre capacity tanks for storage of recaptured stormwater
- Extension of the existing stockpile sprinkler system incorporating sprinklers along the site perimeter on poles at 15 m intervals to allow full coverage of existing and proposed stockpiles
- Small portable pumps with flexible hose to allow for additional dust suppression across the site on an as needs basis
- Addition of water cart with a capacity of 12,500 litres to the existing water cart (capacity 8,500 litres).

Stormwater will be re-used on site for the following purposes:

- Wetting down of stockpiles using sprinklers and soakers sprays
- Wetting down of internal roads using sprays and water cart
- Water sprays on crushing and screening plant
- Washing of materials.

Further details of the WMS are provided in **Section 6.4**.

Perimeter Landscaping

Some minor alterations will be made to the existing 2 m high security fence/landscaped mound present along parts of the northern, eastern and western boundaries of the Project site. For example, adjustments to the front fence to accommodate the widened site access driveway.

The extended site boundaries will be treated in a similar manner. There is an existing 2 m high fence along the western boundary with the rail corridor which will remain in place. Along the southern site boundary a new 2 m high fence will be constructed with a swale drain constructed just within the fence and site boundary. To prevent stockpiled material from entering the swale drain, a row of concrete blocks will be placed on top of each other forming a physical barrier against which stockpiled material may be placed.

Along the extended eastern (front) boundary there will be a 2 m high landscaped earth bund forming both a visual screen and a flood mitigation barrier to prevent potential 1 in 100 year flood waters entering the green waste area. Behind this earth bund the two metre high security fence will continue from the southern boundary.

3.1.3 Traffic, Access and Car Parking

Transportation of Material

The waste material types currently received and distributed by Concrush will generally remain consistent with current operations (see **Section 2.4.3** and **2.4.4** for a list of products received and produced by Concrush). An additional waste type, washed and crushed glass will be received, processed and sold as part of the Project. The quantity of waste material recycled is proposed to increase to a maximum of 250,000 tpa.

Waste and recycled waste products will continue to be received and distributed via road. The key transport route to and from the north of the site is via Racecourse Road/The Weir Road/Northville Drive to George Booth Drive providing access to the M1 Motorway and the western suburbs of Newcastle (refer **Figure 3.3**). The key route to and from the south of the site is via Racecourse Road/York Street/Toronto Road/Five Islands Road providing access to the western and eastern sides of Lake Macquarie (refer **Figure 3.3**). No changes to existing traffic routes will occur as the result of the Project. The proposed increase to throughput capacity would result in an increase in the number of heavy vehicles accessing the facility. The potential impacts on traffic and transport as a result of the Project are discussed in **Section 6.3**.

Site Access

Access to the Project site will continue to be via Racecourse Road. There will be staged changes to site access as part of the Project. Stage 1 will include widening the site access point. Stage 2 will include constructing a new exit onto Racecourse Road from the retail area for light vehicles (less than 2 t) only (refer **Figure 3.2**). Management of vehicles on site will be improved by using a one-way traffic flow to enable safety and efficiency on site, particularly during peak operational periods.

Car Parking

There are 11 existing light vehicle car parking spaces at the Concrush facility. Seventeen car parking spaces will be established as part of Stage 1 of the Project, increasing to 20 car parking spaces in Stage 2 (refer **Figures 3.1** and **3.2**).

3.1.4 Utilities and Services

The Project site is currently serviced by electricity and telecommunications. The Project will include an underground extension of the internal power from the north east corner of the site to the south western portion of the site. This will allow for power supply to the production compound at the rear of the Project site.

Operational staff numbers are proposed to increase by two individuals representing a small increase in demand on the on-site chemical toilet facility. No changes to this system are proposed.

Plant and machinery on site will continue to operate using a diesel fuel source.

The option of connection to the water mains supply and upgrade to existing electrical connection may be explored by Concrush in the future if there was to be a substantial change to requirements or operating conditions, however, this is not part of this Project.

3.1.5 Workforce

The Concrush facility currently employs 7 full time staff and 4 casual staff. The Project proposes to increase staff numbers by 2, for a total of 9 full time employees when at full capacity.

3.1.6 Hours of Operation

The general Project operating hours will be 7am to 5pm Monday to Friday and 7am to 4:00pm Saturdays, closed Sunday. The Project is seeking approval for operation on a 24 hour, 7 days per week basis to meet short term project campaign needs on an as required basis, such as construction material required for night time projects, or if required in emergency situations.

3.1.7 Construction Activities

Construction will be a relatively minor phase of the Project and will predominantly utilise the plant and equipment that is already on site as part of the existing operations. The key construction activities for the Project would be undertaken over a total period of approximately 12 weeks covering both stages. Construction work hours will be within standard construction hours; 7.00 am to 6.00 pm Monday to Friday and 8.00 am to 1.00 pm on Saturdays.

The key construction tasks to be undertaken are:

Stage 1

- Establishment of hardstands – areas for hardstands will be constructed appropriately to accommodate site drainage. The hardstands will consist of 200 mm of compacted road base material produced on-site by Concrush.
- Installation of 0.5 m capping layer across southern portion of the Project site.
- Formation of walls and product bays – 1 m³ concrete blocks that are received as waste by Concrush will be used to form a 2 m high wall along part of the southern site boundary. This wall will prevent stockpiled material from moving on site. The concrete blocks will also be used to form the product bays in the retail area part of the site.
- Construction of wheel wash – the truck wheel wash bay will be constructed immediately after the exit weighbridge. When the weighbridges are relocated further to the west within the site as part of Stage 2 of the Project, the wheel wash bay will also be relocated to be immediately after the exit weighbridge.
- Relocating maintenance shed and lunch room and toilet – these facilities will be grouped together in the south western portion of the site to form the production compound.
- Formation of sediment basins and constructed wetland – an excavator will be used to form the sediment basins and artificial wetland. The inlets, outlets and bank slopes of the sediment basins and artificial wetland will be constructed in accordance with the detailed design.
- Installation of water tanks.
- Perimeter treatments – fencing, landscape mounds and lighting.

- Two coat seal of internal access roads - the two coat seal will be a road surface treatment consisting of a layer of bitumen with large aggregate that is sealed over with another layer of bitumen with smaller aggregate.

Stage 2

- Relocation and establishment of main weighbridges further west within the site.
- The existing entry weighbridge to remain in its current location and be reconfigured to become the entry/exit retail weighbridge. Existing weighbridge office to remain in current location.
- Construction of the new weighbridge office between the two main weighbridges constructed.
- Construction of a new exit onto Racecourse Road from the retail area for light vehicles (less than 2 t) only.

Plant and Equipment

The construction plant and equipment required will be similar to the existing operational plant and include:

- traxcavator
- grader
- front end loader
- excavator
- rollers (smooth drum and sheep foot)
- water cart
- hand tools.

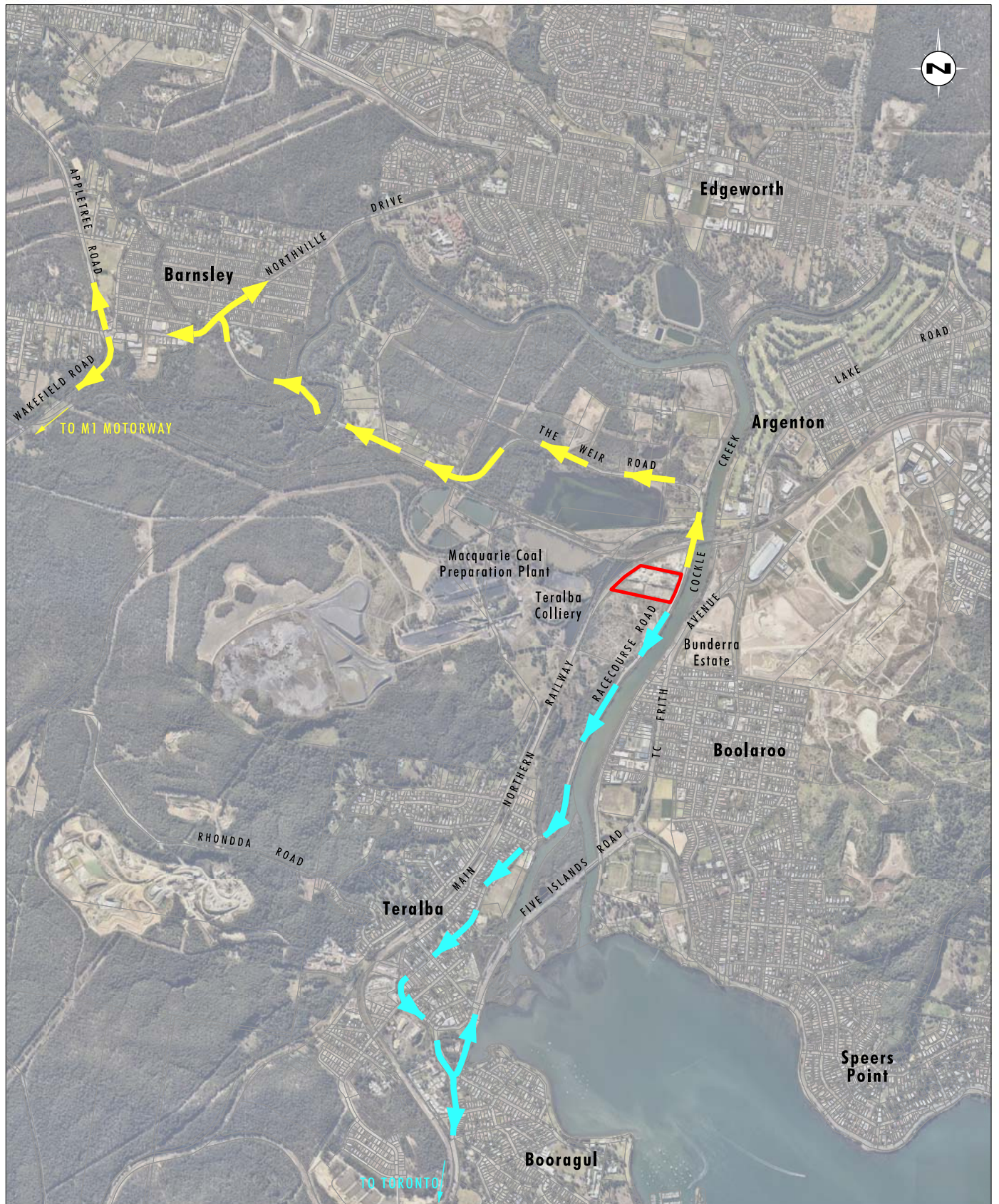


Image Source: Nearmap (May 2017)
Data Source: LPI (2017)

0 0.5 1.0 1.5 km
1:30 000

Legend

- ▭ Project Site
- Key Northern Transport Route
- Key Southern Transport Route

FIGURE 3.3

Transport Route
for Vehicle Access

3.2 Need and Justification for the Project

The NSW government and specifically the EPA currently operate a 5 yearly Waste Avoidance Resource Recovery Strategy (WARR). The WARR outlines future directions and supports investment in infrastructure, encourages innovation and improvements in recycling behaviour (EPA 2017). Two key elements of the WARR that the Project will help achieve are:

- increasing construction and demolition waste recycling to 80%
- increasing waste diverted from landfill to 75%.

Increasing the throughput capacity of the Concrush facility will allow for increased recycling of construction and demolition waste. This will, in turn, result in less waste potentially going to local landfills such as Awaba and Summerhill and will assist in achieving the NSW government goals stated above.

The Newcastle and Lake Macquarie regions are currently experiencing a development and infrastructure boom with substantial construction, and associated demolition works being undertaken. There is therefore a market and community need for construction and demolition waste recycling facilities such as Concrush. Currently Concrush is occasionally required to turn away construction contractors looking to recycle their waste due to the existing site constraints such as available space and the stockpile limit of 40,000 t.

There has been a strong ongoing demand for Concrush's products. With population growth in the region this demand will continue and likely increase. The Project will allow Concrush to continue to service this demand.

As the Project would increase the amount of recycled product available, this would also likely reduce the volume of virgin material required to be quarried to meet the increasing market demand for resources. The facility will also continue to make a contribution to the local and regional economies through employment of 13 people during operations when at full capacity. The capital expenditure during the construction phase will also add to the local and regional economies, further enhancing the economic benefits of the Project.

Local and State government will receive economic benefits, including revenue from taxes and levies. In addition, the Commonwealth government will also receive revenue from the Project, through means including company tax, excise on imported equipment and goods, fuel excise and other taxes such as goods and services tax and income tax.

3.3 Alternatives Considered

Alternatives to the increase in throughput capacity for the Concrush facility were considered in the project planning stage:

- **Option 1** – The 'do nothing' option. This option was not preferred as it does not meet the desired outcomes of increased construction and demolition waste recycling, increased waste potentially diverted from landfill and increased supply to meet demand.
- **Option 2** – An alternative site. This option is not preferred as it would involve introducing potential impacts to a new area. The constraints associated with selecting alternative sites include:
 - Appropriate zoning
 - Land tenure
 - Suitable location to service the area

- Proximity of sensitive receivers
- Access to the road network.
- **Option 3** – Expansion of the existing site. This option was considered most suitable as it involves the utilisation of existing disturbed land adjacent to the current Concrush facility on land zoned as industrial. This option would not require any major infrastructure works, and makes practical and effective use of the existing disturbed land, public and commercial access and proximity to the M1 Motorway.

3.4 Suitability of the Site

The Concrush facility was established in 2002 and has been operating at its Teralba location since that time. The Project would require expansion of the existing site to accommodate an increase to stockpile and processing areas to facilitate the increased throughput. The current site, and hence the expansion of this site for the Project is considered suitable for the following reasons:

- Appropriate industrial zoning
- Good access to the local and regional road network
- Separation distance of approximately 200 m to nearest sensitive receivers
- Use of an existing brownfield site negates the need for potential disturbance of greenfield areas
- Strategic location to service construction contractors and the local community
- A low number of complaints have been received over a long period of time with regards to Concrush's current operations at this location.

Existing Development Consent

The existing Concrush facility operates under development consent (DC/02/00558/1N) from LMCC granted in 2002 and the site EPL (No. 13351). DC/02/00558/1N was granted for the carrying out of concrete crushing, grinding and separating works and included 26 conditions of consent. A copy of DC/02/0058/1N, is provided in **Appendix E**.

Independent Audit of Operations

An independent audit of the operation of the existing facility against the conditions of development consent (DC/02/00558/1N) and EPL (No. 13351) was undertaken by Jacobs (2018). The audit was conducted in general accordance with *ISO19011:2014 Guidelines for auditing management systems*, and DPE's *Post approval requirements for State significant developments – Independent Audit Guideline* (2015).

A review of the consent and EPL conditions noted that Concrush's compliance was reasonable. There were seven issues identified which had 10 non-compliances. In relation to the non-compliances identified the auditor made the following points:

- Site documentation was not available for some of the construction activities. Given the construction occurred over 15 years ago this is understandable
- Two non-compliance items were beyond the control of Concrush who occupy the site but do not own the land.

The non-compliances in relation to the development consent are summarised as follows:

- The existing site layout is not entirely in accordance with the approved plans submitted as part of the 2002 development application
- An occupancy certificate was not identified or on the LMCC database
- 'Work as executed' plans were not identified or on the LMCC database
- There was no acid sulfate soil management plan
- Kerb and guttering was not installed at the front of the premises
- A road levy had not been paid.

As part of this EIS, Concrush has undertaken consultation with LMCC specifically regarding the kerb and guttering and the road levy.

One non-compliance with the EPL was identified: an exceedance of the 30,000 t waste stockpile limit. Following this non-compliance Concrush applied to the EPA and was granted an increase to 40,000 t.

The auditor noted that Concrush staff were knowledgeable and committed to environmental compliance. The key recommendation from the auditor was the development of a comprehensive compliance tracking system. This recommendation has been incorporated into the proposed Project with details provided in **Section 7.0**.

4.0 Planning Context

4.1 Commonwealth Legislation

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

Under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), approval by the Commonwealth Minister for the Environment and Energy is required for any action that may have a significant impact on Commonwealth land or matters of national environmental significance. These matters are:

- World Heritage Properties
- National Heritage Places
- Wetlands of International Importance
- Threatened Species and Ecological Communities
- Migratory Species
- Commonwealth Marine Areas
- The Great Barrier Reef Marine Park
- Nuclear Actions
- A water resource, in relation to coal seam gas development and large coal mining development.

If an 'activity' is likely to have a significant impact on a matter of national environmental significance then it may be a 'controlled action' and should be referred to the Commonwealth Minister for the Environment and Energy for consideration.

The Project will not impact Commonwealth land, is not a coal seam gas or coal mining development and does not involve nuclear actions. The Project is not located in or near Commonwealth Marine Areas or the Great Barrier Reef Marine Park. There are no World Heritage Properties or National Heritage Places within the Project site or nearby areas that could be impacted by the Project. The nearest wetland of international importance is the Hunter Estuary Wetlands which are located only 12 km to the north east of the Project site and are not connected to the Project site via waterways or catchment areas. As such, the only provisions of the EPBC Act which are potentially relevant to the Project relate to potential impacts on migratory species, threatened species and ecological communities and wetlands of international importance.

As discussed in **Section 2.0**, the Project site has been subject to extensive disturbance and is largely cleared of native vegetation. The Project is not predicted to have a significant impact on migratory species, threatened species, or ecological communities listed under the EPBC Act (refer to **Section 6.6**).

For these reasons it is considered that the Project does not require referral to the Commonwealth Minister under the EPBC Act.

4.1.2 Native Title Act 1993

The *Native Title Act* is administered by the National Native Title Tribunal. The Tribunal is responsible for maintaining a register of native title claimants and bodies to whom native title rights have been granted. The Act prescribes that native title can be extinguished under certain circumstances, including the granting of freehold land. The Project is wholly located within freehold land and there are no areas of Crown Land or Commonwealth land located within the Project site.

4.1.3 Regional Forest Agreements Act 2002

Regional Forest Agreements (RFAs) are 20-year plans for the sustainable management and conservation of Australia's native forests. The RFAs seek to balance competing economic, social and environmental demands on forests by setting obligations and commitments for forest management. The Project site is within the area covered by the North East NSW Regional Forest Agreement, however it does not form part of the State Forest or reserve system. As such, the provisions of the RFA Act do not apply to the Project.

4.2 State Legislation

4.2.1 Environmental Planning and Assessment Act 1979

The EP&A Act is administered by DPE and local government. It is the primary legislation governing environmental planning and assessment for NSW.

The objectives of the EP&A Act are:

- To promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources,
- To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment,
- To promote the orderly and economic use and development of land,
- To promote the delivery and maintenance of affordable housing,
- To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats,
- To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage),
- To promote good design and amenity of the built environment,
- To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants,
- To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State,
- To provide increased opportunity for community participation in environmental planning and assessment.

The Project's consistency with relevant objectives is discussed in **Table 4.1**.

Table 4.1 Objectives of the Environmental Planning and Assessment Act 1979

Objective	Comments	Project Consistent with Objective?
The proper management, development and conservation of natural and other resources	The Project will utilise an existing disturbed site that has previously been cleared for industrial use, providing the opportunity to undertake the Project without the need for substantial disturbance of additional land on a greenfield site. The Project will allow for increased recycling of materials which will contribute to the reuse of resources.	Yes
Facilitate ecologically sustainable development (ESD)	The Project proposes to utilise already disturbed land within an industrial zone. The Project would allow for improved sustainability through an increase of the amount of building and construction waste able to be recycled in the Lake Macquarie region and a reduction in the volume of waste going to landfill. Consistency of the Project with the principles of ESD is discussed further in Section 8.4 .	Yes
Promote the orderly and economic use and development of land	The Project will involve expansion of the existing site into the adjacent, vacant industrial land which is considered an appropriate use of the land. The Project does not require disturbance of previously undisturbed land or rezoning. The Project will have minimal impact on other land uses in the vicinity of the Project.	Yes
Encourage the protection of the environment including threatened species, communities and habitats	The Project proposes to utilise an existing disturbed site within land zoned for industrial use. An ecological assessment has been undertaken for the Project (Section 6.6) and identified that there will not be significant impacts to threatened species, communities and habitats.	Yes
Provide opportunity for community participation in the planning and assessment process	Community consultation is discussed in Section 5.0 . Project newsletters were provided in October 2017 and August 2018 to the local community, summarising key aspects of the Project, approvals process timeline and how community members can be involved in the consultation process. The stakeholder engagement included phone calls to local stakeholders to discuss the project and provided the opportunity for face to face meetings to discuss any issues of concern. The Project assessment has included a social and economic impact assessment which is presented in Appendix F .	Yes

4.2.1.1 State Environmental Planning Policy (State and Regional Development) 2011

Schedule 1 of the State and Regional Development SEPP identifies development that is State Significant Development and requires approval under Part 4 of the EP&A Act. Clause 23 (3) of Schedule 1 identifies “development for the purpose of resource recovery or recycling facilities that handle more than 100,000 tonnes per year of waste” as being State Significant Development. As such, the Project is considered to be State Significant Development with the development application to be lodged with the Planning Secretary of DPE.

4.2.2 Protection of the Environment Operations Act 1997

The NSW *Protection of the Environment Operations Act 1997* (POEO Act) and the NSW *Protection of the Environment Operations (General) Regulation 2009* set out the general obligations for environmental protection for development in NSW. The Project is classified as a premises-based scheduled activity under Schedule 1, Clause 34 ‘Resource recovery’ of the POEO Act. Specifically, the Project involves the ‘recovery of general waste’ and would result in more than 2,500 tonnes of waste being on site at any one time and would process more than 12,000 tonnes of waste per year. The operation of the Project will require the existing site EPL No. 13351 to be updated to reflect the increased throughput operation.

Resource recovery exemptions

Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 enables the EPA to issue resource recovery exemptions ‘where the application of a waste material to land, its use as a fuel, or use in connection with a process of thermal treatment is a bona-fide, fit-for-purpose, re-use opportunity rather than a means of waste disposal’ (EPA 2015).

The Concrush specific crushed concrete, concrete washout and recycled materials order 2018 sets requirements that apply to Concrush in relation to the supply of crushed concrete, concrete washout and recycled materials for application to land for the purposes of roadbase material, drainage aggregates and packing fines. The order specifies the sampling requirements, test methods, chemical and material requirements and notification and record keeping that Concrush must comply with in order to supply these materials to consumers.

The Concrush resource recovery exemption 2018 applies to consumers of Concrush recycled concrete materials who intend to apply the material to land. Consumers are exempt from the requirement to obtain a licence under the POEO Act for ‘waste disposal’.

The general pasteurised garden organics order 2016 imposes requirements that must be met by suppliers of pasteurised garden organics that will be applied to land as a soil amendment. The order specifies the general conditions, sampling requirements, test methods and record keeping and reporting that Concrush must adhere to in relation to supply of pasteurised garden organics.

The pasteurised garden organics exemption 2016 applies to consumers of pasteurised garden organics that are, or are intended to be, applied to land as a soil amendment. Consumers are exempt from the requirement to obtain a licence under the POEO Act for ‘waste disposal’.

4.2.3 Environmental Planning Instruments

4.2.4 Lake Macquarie Local Environmental Plan 2014

Under Lake Macquarie Local Environmental Plan 2014 (LMLEP 2014) the site is zoned IN1 – General Industrial (see **Figure 4.1**). The Objectives of this zone are:

- To provide a wide range of industrial and warehouse land uses.
- To encourage employment opportunities.
- To minimise any adverse effect of industry on other land uses.
- To support and protect industrial land for industrial uses.

Under the provisions of LMLEP 2014, the Project is classified as a resource recovery facility, which means a building or place used for the recovery of resources from waste, including works or activities such as separating and sorting, processing or treating the waste, composting, temporary storage, transfer or sale of recovered resources, energy generation from gases and water treatment, but not including re-manufacture or disposal of the material by landfill or incineration. Resource recovery facilities are permitted with consent under the IN1 zone. Therefore the Project is permissible under the IN1 zone with consent. As discussed above, the Project is State Significant Development and as such the development application will be lodged with the Secretary of DPE.

In accordance with the provisions of Clause 11(a) of State and Regional Development SEPP the relevant LMCC development control plans do not apply to State Significant Development.

4.2.5 Other NSW Legislation and Environmental Planning Instruments

The applicability of relevant legislation and environmental planning instruments covering the potential impacts of the Project and the permissibility of the actions included in the Project are shown in **Table 4.2**.

Table 4.2 Other Potentially Relevant Acts and Environmental Planning Instruments

Legislation and application	Comments	Applicable	Permissible
Biodiversity Conservation Act 2016	The purpose of this Act is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development. The Act commenced on 25 August 2017. The Project may require some minor clearing of vegetation. The completed ecological assessment is detailed in Section 6.5 .	✓	N/A
Coastal Management Act 2016	The purpose of this Act is to manage the coastal environment of New South Wales in a manner consistent with the principles of ecologically sustainable development for the social, cultural and economic well-being of the people of the State.	✓	N/A
Roads Act 1993	Consent under section 138 of the Act is required for undertaking works on a road. The Project will involve shifting the current access driveway to the north and establishing a new light vehicle only exit onto Racecourse Road. Consent under the Roads Act will therefore be required.	✓	✓
Mine Subsidence Compensation Act	This Act establishes a scheme under which a person is entitled to compensation for damage to improvements or goods owned by that person from subsidence due to the extraction of coal. The Project is within the 'Lake Macquarie No. 1 Extension' Mine Subsidence District. As such, consultation has been undertaken with Subsidence Advisory NSW (refer to Section 5.1).	✓	N/A

Legislation and application	Comments	Applicable	Permissible
Coastal Management SEPP	The aim of the SEPP is to promote an integrated and co-ordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the <i>Coastal Management Act 2016</i> . The SEPP maps the four coastal management areas that comprise the NSW coastal zone under the <i>Coastal Management Act 2016</i> . The Project is within the mapped Coastal Environment Area which requires the consent authority to consider the potential impacts on coastal environmental values and natural coastal processes, the integrity and resilience of the environment, native vegetation and fauna and Aboriginal cultural heritage. The ecological assessment is presented in Section 6.6 , water impacts are addressed in Section 6.5 and Aboriginal heritage in Section 6.8 .	✓	✓
SEPP 55 – Remediation of Land	The SEPP aims to provide for a state wide planning approach to the remediation of contaminated land. A search of the EPA's contaminated land register confirms that the Project area is within a larger lot that contains an area of existing contamination. The area of known contamination is separated from the Project site by approximately 150 metres. A contamination assessment has been undertaken for the Project and identified that the proposed industrial use is appropriate for the site.	✓	✓
SEPP 33 – Hazardous and Offensive Development	SEPP No. 33 requires the consent authority to consider whether an industrial proposal is a potentially hazardous industry or a potentially offensive industry. A preliminary screening involves identification and assessment of the storage of specific dangerous goods classes that have the potential for significant off-site effects. A preliminary risk screen, as required by the SEARs is presented in Section 6.15 which identified that the Project is not hazardous or offensive.	✓	✓
SEPP 44 – Koala Habitat Protection	There is no core koala habitat within the Project site therefore the further provisions of the SEPP do not apply.	✓	N/A

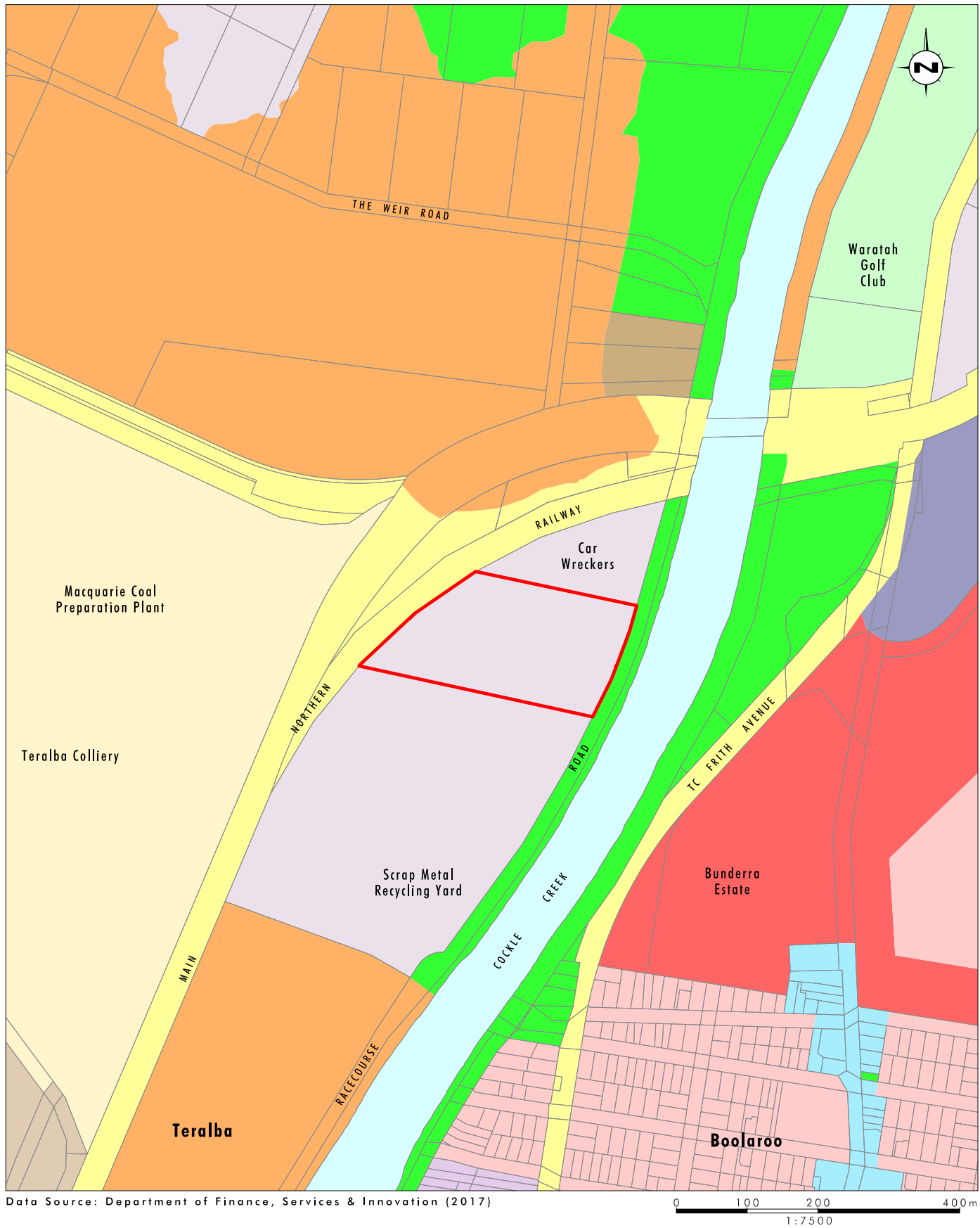


FIGURE 4.1
Land Zoning

5.0 Stakeholder Engagement

Consultation with DPE, LMCC and relevant government authorities has been undertaken during the preparation of the EIS. The details of the agency consultation undertaken are outlined in **Section 5.1**. An overview of the community consultation undertaken for the Project is provided in **Section 5.2**. The key issues identified during the consultation process and where these have been addressed in the EIS is presented in **Section 5.3**.

5.1 Agency Consultation

Consultation with the relevant government agencies has been undertaken during the preparation of the EIS to enable key authority issues to be identified.

SSD applications require the Secretary of the DPE to issue SEARs for the Project. The SEARs outline the specific requirements of relevant government authorities that must be addressed as part of the EIS.

The SEARs required that Concrush consult with the following agencies:

- Ausgrid
- Lake Macquarie City Council
- Department of Primary Industries (DPI)
- Environment Protection Authority (EPA)
- Fire and Rescue NSW
- Hunter Water
- Office of Environment and Heritage
- Roads and Maritime Services (RMS)
- New South Wales Rural Fire Service (NSW RFS)
- Subsidence Advisory NSW
- Sydney Trains
- Transport for New South Wales (TfNSW).

A summary of the agency consultation undertaken during the EIS preparation is provided in **Table 5.1** below.

Table 5.1 Summary of Agency Consultation

Agency	Date	Purpose
DPE	21 September 2017	Meeting for initial Project briefing.
	28 September 2017	Submit Preliminary Environmental Assessment (PEA) as part of request for the SEARs for the Project.
	25 October 2017	DPE provide agency comments and issue SEARs for the Project.
	15 December 2017	DPE re-issue SEARs to reflect the requirements of the <i>Biodiversity Conservation Act 2016</i> .

Agency	Date	Purpose
	8 May 2018	Letter sent to advise DPE of project layout changes and provide offer to discuss further if required.
	26 September 2018	Umwelt met with DPE representatives to discuss the draft EIS report. DPE provided Umwelt with a number of clarifications that were to be included in the final EIS.
LMCC	20 October 2017	Meeting for initial Project briefing.
	20 October 2017	LMCC provided a response to a request for comment in regard to the Project (as required by the SEARs). Refer to Appendix B for a copy of this correspondence.
	8 May 2018	Letter sent to advise LMCC of project layout changes and provide an opportunity to have further input into the preparation of the EIS if desired.
	5 July 2018	Meeting to advise LMCC of proposed site layout changes.
	26 July 2018	Meeting to discuss the issues identified as part of the independent audit. This meeting included detailed discussion regarding the proposed road levies that LMCC would be seeking as part of the project should the project be approved.
	31 August 2018	Meeting to discuss outcomes of environmental assessment. In this meeting the likely approach to road levies were discussed with Concrush providing additional information directly to LMCC to assist with the formulation of the road levies.
EPA	11 October 2017	EPA provided a response to a request for comment in regard to the Project (as required by the SEARs). Refer to Appendix B for a copy of this correspondence.
	27 September 2017	Meeting for initial Project briefing to discuss the approach to the air quality and noise impact assessments.
	8 May 2018	Letter sent to advise EPA of project layout changes and provide an opportunity to have further input into the preparation of the EIS if desired.
	1 June 2018	Letter from EPA indicating they had no further comments and do not require further input or information at this stage.
	22 August 2018	Umwelt contacted EPA to discuss appropriate management of water in the green waste area.
OEH	20 October 2017	OEH provided a response to a request for comment in regard to the Project (as required by the SEARs). Refer to Appendix B for a copy of this correspondence.
	8 May 2018	Letter sent to advise OEH of project layout changes and provide an opportunity to have further input into the preparation of the EIS if desired.
	30 May 2018	OEH indicated they had no further comments and do not require further input or information at this stage.

Agency	Date	Purpose
Natural Resources Access Regulator (NRAR) (formerly DPI)	20 October 2017	NRAR provided a response to a request for comment in regard to the Project (as required by the SEARs). Refer to Appendix B for a copy of this correspondence.
	8 May 2018	Letter sent to advise NRAR of project layout changes and provide an opportunity to have further input into the preparation of the EIS if desired.
	23 May 2018	NRAR had no further comments and do not require further input or information at this stage.
Hunter Water	20 October 2017	Hunter Water provided a response to a request for comment in regard to the Project (as required by the SEARs). Refer to Appendix B for a copy of this correspondence.
	8 May 2018	Letter sent to advise Hunter Water of project layout changes and provide an opportunity to have further input into the preparation of the EIS if desired.
	14 May 2018	Email from Hunter Water indicating they had no further comments and do not require further input or information at this stage.
Heritage Council	20 October 2017	Heritage Council provided a response to a request for comment in regard to the Project (as required by the SEARs). Refer to Appendix B for a copy of this correspondence.
	8 May 2018	Letter sent to advise Heritage Council of project layout changes and provide an opportunity to have further input into the preparation of the EIS if desired.
	12 June 2018	Heritage Council indicated they had no further comments and do not require further input or information at this stage.
NSW RFS	20 October 2017	NSW RFS provided a response to a request for comment in regard to the Project (as required by the SEARs). Refer to Appendix B for a copy of this correspondence.
	8 May 2018	Letter sent to advise NSW RFS of project layout changes and provide an opportunity to have further input into the preparation of the EIS if desired.
	8 June 2018	Phone conversation – NSW RFS identified they had no further comments and do not require further input or information at this stage.
	2 October 2018	Umwelt consulted with NSW RFS, by phone and follow up email to clarify that the bushfire assessment could be part of the EIS rather than a separate report and that the requirement for a bushfire emergency plan could be required as a condition of consent. NSW RFS responded indicating that the bushfire assessment needed to be in accordance with the Planning for Bushfire Protection and did not require a separate report and that a bushfire emergency plan could be required as a condition of consent which would need to be completed prior to operations.

Agency	Date	Purpose
Roads and Maritime (RMS)	20 October 2017	RMS provided a response to a request for comment in regard to the Project (as required by the SEARs). Refer to Appendix B for a copy of this correspondence.
	8 May 2018	Letter sent to advise RMS of project layout changes and provide an opportunity to have further input into the preparation of the EIS if desired.
	23 May 2018	Email from RMS indicating they had no further comments and do not require further input or information at this stage.
TfNSW	20 October 2017	TfNSW provided a response to a request for comment in regard to the Project (as required by the SEARs). Refer to Appendix B for a copy of this correspondence.
	8 May 2018	Letter sent to advise TfNSW of project layout changes and provide an opportunity to have further input into the preparation of the EIS if desired.
	24 July 2018	Email from TfNSW indicating they had no further comments and do not require further input or information at this stage.
Fire and Rescue NSW	8 May 2018	Letter sent to advise Fire and Rescue NSW of the proposed Project and provide an opportunity to have input into the preparation of the EIS if desired. Fire and Rescue NSW requested a meeting to discuss the Project.
	13 June 2018	Meeting to provide project briefing and understand Fire and Rescue NSW's issues and requirements. Fire and Rescue NSW's key issues were access to the potentially combustible green waste stockpiles and access and connection to on-site water supply. Meeting minutes which were reviewed and agreed to by both parties are provided in Appendix G .
Sydney Trains	20 October 2017	Sydney Trains provided a response to a request for comment in regard to the Project (as required by the SEARs). Refer to Appendix B for a copy of this correspondence.
	8 May 2018	Letter sent to advise Sydney Trains of project layout changes and provide an opportunity to have further input into the preparation of the EIS if desired. Sydney Trains requested a meeting to discuss the Project.
	13 June 2018	Meeting to provide project overview and understand Sydney Trains' key issues to be addressed in the EIS. Sydney Trains' key issues were site drainage and work in proximity to high voltage overhead lines. Meeting minutes which were reviewed and agreed to by both parties are presented in Appendix G .
Ausgrid	9 May 2018	Letter sent to advise Ausgrid of the project and provide an opportunity to have input into the preparation of the EIS if desired.
	24 May 2018	Follow up email sent requesting any input to the Project from Ausgrid.

Agency	Date	Purpose
	24 May 2018	Ausgrid email acknowledging receipt of project information and advising that request for input will be actioned.
Subsidence Advisory NSW	15 June 2018	Letter sent to advise Subsidence Advisory NSW of the proposed Project and provide an opportunity to meet or discuss any Project requirements.
	25 June 2018	Phone conversation – Subsidence Advisory NSW identified they had no further comments and does not require further input or information at this stage.

Umwelt has considered the assessment requirements raised by the above agencies during the preparation of this EIS.

5.2 Community Consultation

Consultation with community stakeholders has included telephone calls, emails and the distribution of Project Information Sheets summarising the key aspects of the Project, approvals process timeline and how stakeholders can be involved in the consultation process. In October 2017 Project Information Sheets were provided to approximately 475 local residents and commercial stores in Boolaroo, Teralba and along the transport route.

Four local residents responded to the Information Sheet via email and telephone to outline their concerns with the Project. In total 13 concerns were raised with the most common concern related to the increase in traffic. Other issues raised included noise, dust, water quality and road design.

In October 2017 interviews were undertaken with a local business and two schools in proximity to the Project. These community groups had previously had some form of contact with Concrush, with the schools noting the company was approachable and they had received in-kind support. The local business also noted they had a good relationship with the company which provided them work.

These stakeholder groups indicated they had no issues with Concrush's current operations. With regards to the Project, one concern was raised by a school on the transport route in relation to the safety of the children when crossing the roads due to the proposed increase in traffic. The intersection at York Street and Anzac Parade was identified by the nearby school and a resident/small business owner as requiring additional measures to slow traffic speed. The local schools and business identified that the Project Information Sheet was a good way to provide information about the Project.

In August 2018 a second Project Information Sheet was distributed to the community. The purpose of this consultation was to communicate the results of the environmental assessment process, to provide details of the exhibition period and to outline the Project assessment process and the ways in which the community could provide input to the Project assessment process. Further consultation included one on one interviews with the two noise affected residents and follow up phone calls with the four residents who responded to the first community information sheet.

5.3 Key Stakeholder Issues

The identification of key environmental and community issues for assessment as part of the EIS for the Project is based on consideration of:

- The planning and environmental context for the locality (refer to **Sections 2 and 4**)

- Outcomes of the agency and community consultation process (refer to **Section 5.1** and **5.2**)
- The Project risk assessment undertaken (refer to **Appendix G**)
- Baseline studies completed as part of the preparation of the EIS
- The Secretary's environmental assessment requirements for the EIS (refer to **Appendix B**).

Table 5.2 identifies the key issues identified through those processes and provides reference to the section of the EIS in which these issues have been addressed.

Table 5.2 Key Environmental and Community Issues

Issue	EIS Reference
Traffic and Transport	Section 6.4
Noise	Section 6.2
Air Quality	Section 6.3
Water Quality	Section 6.5
Drainage	Section 6.5
Contamination	Section 6.12
Waste	Section 6.13
Heritage	Section 6.8 and 6.9
Visual	Section 6.11
Biodiversity	Section 6.6
Hazard and Risk	Section 6.15

6.0 Environmental Assessment

6.1 Preliminary Environmental Risk Assessment

A preliminary environmental risk analysis was undertaken for the Project to identify the environmental aspects that could potentially be impacted as a result of the Project and which required further detailed assessment as part of this EIS. The preliminary environmental risk assessment is included in **Appendix G** with the key environmental issues identified presented in **Table 6.1**. All environmental issues potentially impacted by the Project are discussed further in this section of the EIS.

Table 6.1 Key environmental issues identified in the Project risk assessment

Issue	Impact	Key Issue	
		Construction	Operation
Noise	Noise generation impact to sensitive receivers	X	✓
Air quality	Dust generation – impact to sensitive receivers and degradation of local air quality	X	✓
Traffic and transport	Increased traffic as a result of increased throughput	X	✓
Soil and Water	Erosion and sediment runoff	X	✓

6.2 Noise Impact Assessment

A NIA has been prepared for the Project by RCA and is summarised in this section of the EIS. The full report is presented in **Appendix H**.

6.2.1 Existing Noise Environment

The land uses surrounding the Project site include roads, the main northern rail line, industry including a car wrecking yard and the existing Macquarie Coal Preparation Plant. Existing and future residential areas are located within proximity the Project Site with the closest existing resident located approximately 230 m away (refer to **Section 2.2**). These land uses influence the existing noise environment in the vicinity of the Project site.

Sensitive receivers were identified and grouped into 5 general noise catchment areas (NCA) for the purposes of quantifying the existing ambient acoustic environment (refer **Figure 6.1**). NCA 1 includes the nearby residences north of the Project site. NCA 2 includes the residences south and east of the Project site, including Bunderra Estate and the associated aged care facility which are currently being constructed. NCA 3 represents a recreational area adjacent to Cockle Creek, NCA 4 represents potential future residences to the east of the Project site and NCA 5 represents an industrial receiver to the west.

Noise monitoring was undertaken as part of the noise impact assessment in 3 representative locations (refer **Figure 6.1**) from 15 to 28 November 2017, to quantify the existing ambient acoustic environment. The noise loggers continuously recorded statistical noise data over 15-minute integration periods. The calibration of the noise loggers was checked before and after the monitoring period, and was found to be compliant. To supplement the unattended monitoring, attended measurements were taken at each monitoring location on 3 November 2017. The recorded data was filtered to remove weather effects, and then rating background levels (RBL) were calculated for each monitoring position in accordance with the Noise Policy for Industry (NPI).

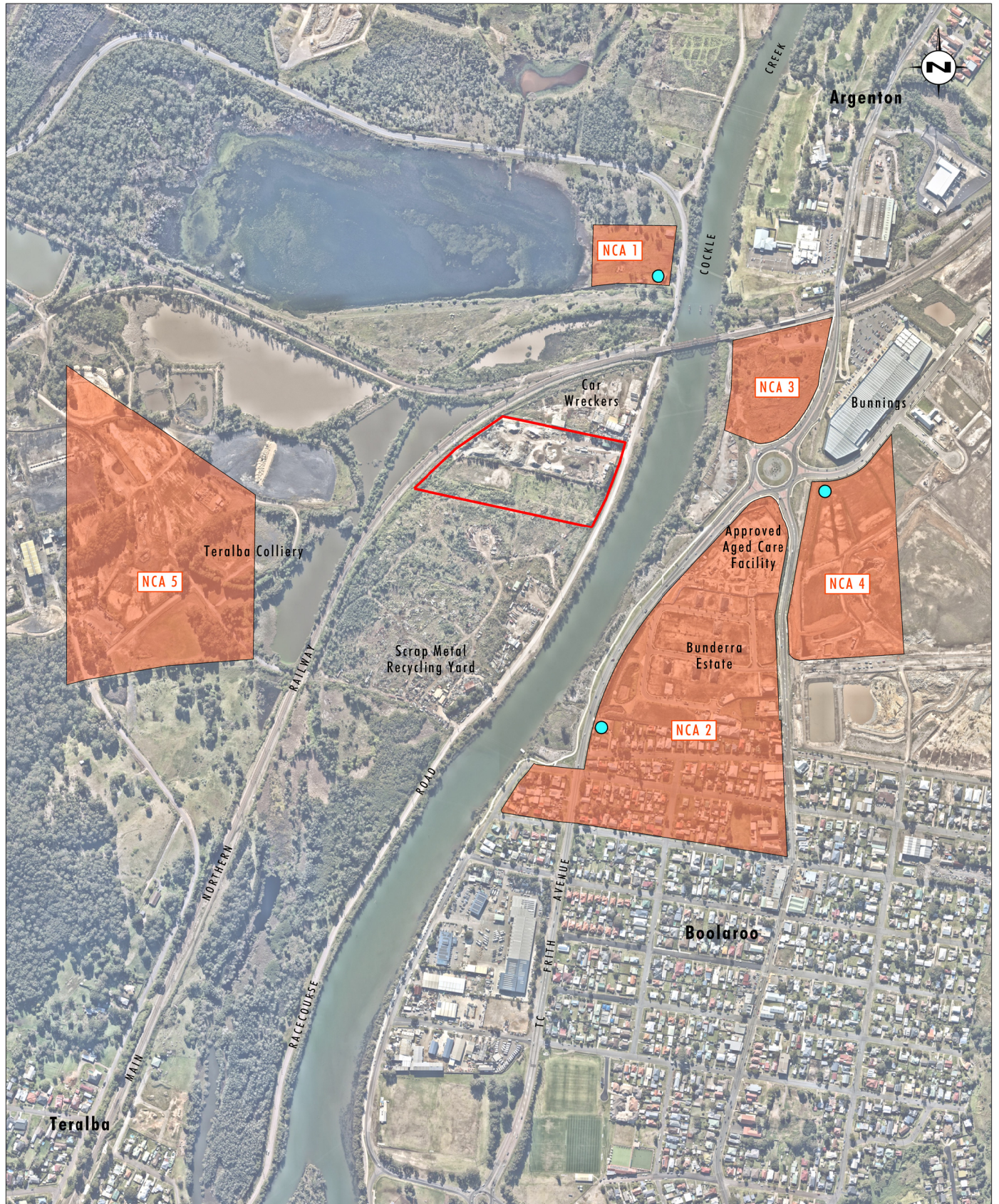


Image Source: Nearmap (Jun 2018)
Data Source: RCA Acoustics (2018)

0 100 250 500m
1:10 000

Legend

- Project Site
- Noise Catchment Area
- Noise Monitoring Location

FIGURE 6.1

Noise Catchment Areas
and Noise Monitoring Locations

The rating background level (RBL) and overall LAeq for the time periods of day, evening and night for the three representative locations where monitoring was undertaken is presented in **Table 6.2**. The monitoring locations within NCA 1 and 2 were existing residential properties while NCA 4 represents an area of potential future housing. The monitoring location was selected to adequately measure noise from the major roundabout on TC Frith Ave, which is the dominant noise source for the area.

Table 6.2 Existing noise summary of NCAs

NCA	Parameter	Day	Evening	Night
1	RBL	42	41	31
	Overall LAeq	60	57	54
2	RBL	49	42	32
	Overall LAeq	67	67	62
4	RBL	49	45	37
	Overall LAeq	58	56	53

6.2.2 Noise Criteria

Noise assessment criteria for the Project have been determined in accordance with the most up to date guidelines at the time of the assessment:

- NPI (EPA 2017)
- NSW Road Noise Policy (RNP) (DECC 2011)
- Interim Construction Noise Guide (ICNG) (DECC 2009).

Operational Noise

The NPI requires consideration of 2 types of criteria: amenity noise criteria and intrusive noise criteria. The purpose of the amenity noise criteria is to set reasonable cumulative industrial noise levels for an area based on the receiver land use. The NPI states that to enable industrial noise levels (existing plus new) remain within the recommended amenity noise levels for an area, a project amenity noise level applies for each new source of industrial noise, where the project amenity level is 5 dB less than the recommended amenity level. Amenity noise levels for the Project are presented in **Table 6.2**.

The amenity categories in **Table 6.3** have been assigned based on the RBL levels at the monitoring locations.

Table 6.3 Amenity noise criteria from the NPI

Receiver	Amenity Category	Time of day	Amenity noise level LAeq (dB)	Project Amenity noise level LAeq (dB)
Residential	Suburban (NCA 1)	Day	55	50
		Evening	45	40
		Night	40	35
	Urban (NCA 2 and 4)	Day	60	55
		Evening	50	45
		Night	45	40
Active recreation (NCA 3)		When is use	55	50
Industrial receiver (NCA 5)		When is use	70	65

The purpose of the intrusiveness criteria is to limit the degree of change a new noise source introduces to an existing environment by limiting the $L_{Aeq, 15 \text{ min}}$ of the new noise source to 5 dB above the measured RBL. The intrusiveness criteria only apply to residential receivers and are presented in **Table 6.4**.

Table 6.4 Intrusiveness noise criteria

NCA	Intrusiveness criteria $L_{Aeq, 15 \text{ min}}$ (dB)		
	Day	Evening	Night
NCA 1	47	46	36
NCA 2	54	47	37
NCA 4	54	50	42

The Project specific criterion at each receiver location then becomes the lower (more stringent) of the amenity and intrusiveness criteria. As the intrusiveness criteria is determined over a 15 minute period and the amenity criteria over the assessment period (day, evening or night) a conversion factor is applied whereby 3 dB is added to the amenity criteria. The project specific criteria are presented in **Table 6.5**.

Table 6.5 Project specific criteria

Receiver	Project specific criteria, $L_{Aeq, 15 \text{ min}}$ (dB)		
	Day	Evening	Night
NCA 1	47	43	36
NCA 2	54	47	37
NCA 3	53	53	53
NCA 4	54	48	42
NCA 5	68	68	68

Road Noise

The Project has the potential to cause road noise impacts due to an increase in vehicles using public roads. The RNP sets two criteria for road traffic noise increases due to development: an upper bound criterion and a 'relative increase' criterion. As outlined in the Traffic assessment, refer to **Section 6.4**, Racecourse Road is considered a sub arterial road for the purposes of this assessment.

Table 6.6 RNP criteria for residential land use

Road category	Type of project	Assessment criteria (dB)	
		Day	Night
Sub-arterial roads	Existing residences affected by additional traffic on existing local roads generated by land use developments	$L_{Aeq, (15 \text{ hour})}$ 60 dB (external)	$L_{Aeq, (9 \text{ hour})}$ 55 dB (external)

In addition to the criteria identified in **Table 6.6** above, the RNP application notes state that where the existing road noise exceeds, or is within 2 dB of the relevant noise criterion, the total road noise after the development should be limited to an increase of 2 dB. If it can be shown that the total road noise will increase by 2 dB or less due to the new development, it follows that the RNP objectives have been met.

Construction Noise

Construction noise criteria depend on the time of day. The 'Noise Affected Level' is the RBL + 10 dB while the 'Highly Noise Affected' level is set at 75 dB. Management threshold levels for nearby residences are presented in **Table 6.7**. According to the ICNG, the 'Noise Affected' level is the level where there may be some community reaction to the noise. The 'Highly Noise Affected' level is where communities may react strongly to noise.

Table 6.7 Construction noise criteria – management levels

NCA	Standard Hours, $L_{Aeq,15min}$ dB		Out of Hours, $L_{Aeq,15min}$ (dB)		
	Noise Affected	Highly Noise Affected	Day	Evening	Night
NCA 1	52	75	47	46	36
NCA 2	59	75	54	47	37
NCA 3	59	-	54	50	42
NCA 4	59	75	54	50	42
NCA 5	75	-	75	75	75

Note: The ICNG defines "Standard Hours" to be between 7am-6pm on weekdays and 7am-1pm on Saturday. All other times are out of hours. Day, evening and night periods are defined as per the NPI.

All construction activities will be undertaken during standard construction hours.

6.2.3 Assessment Methodology

Noise impacts during construction were assessed using computer software CadnaA (version 2017). The ISO 9613-2 algorithm was implemented, which incorporates the equivalent of a 2 m/s source to receiver wind in all directions or a moderate temperature inversion. The result is that the modelled predictions are made under 'noise enhancing' meteorological conditions. This provides some conservatism in the predictions made.

The operational noise assessment was conducted using a modified version of the CadnaA computational model used for the construction noise assessment. The operational assessment used the same contour data and ground absorption coefficient (0.5) to represent a mixture of ground surfaces, including water and vegetated ground. To account for the effect of relevant noise-enhancing weather conditions during operation the CONCAWE propagation model was used.

For the operational noise assessment modelled meteorological data for the site was generated by applying the TAPM model to measured weather data at the Newcastle Nobbys weather station for the 2014 - 2016 period. These years were selected after review of the long term climate data for the Newcastle Nobbys weather station. This modelled data was then analysed in accordance with Fact Sheet D from the NPI, with relevant noise-enhancing conditions identified for each season. As such, the wind directions considered in the noise assessment are north, north-west, west, south west and east. Temperature inversions were assessed during the night time period.

Sound power data used in the models were taken from a number of sources: the DEFRA 2005 construction equipment database, manufacturer's data, external acoustic reporting, and RCA's site measurements at Concrush and other locations, refer to **Table 6.8**.

6.2.4 Operational Noise Assessment

For the operational noise assessment a list of noise sources on the Project site was developed. These sources were assigned to a number of scenarios based on proposed operations. These modelled scenarios represent typical worst-case 15 minute scenarios for operation, with the maximum amount of plant operating simultaneously. Although the equipment is mobile and will move within the processing area as required, for the purpose of the noise assessment the model assumed that noise sources were located within the site close to the nearest residential receivers as this would represent a worst case scenario for assessment (refer **Figure 6.2**). The operational scenarios are presented in **Table 6.8**. The exception to this is Scenario 6, which predicts maximum levels for the assessment of sleep disturbance.

Table 6.8 Operational noise scenarios

Plant	Adopted sound power data, dBA	Scenario					
		1 Full production and sales	2 Green waste shredding	3 Weekend activities	4 Evening Work	5 Night Work	6 Night Maximum Levels
Trucks entering/ exiting or receiving product	98	4	4	4	-	2	2
Cars entering/ exiting or receiving product	87	4	4	4	-	-	-
Grinder in maintenance shed	109	1	1	1	-	-	-
Pressure washer in plant storage area	99	1	1	1	-	-	-
Wheeled loaders working at stockpiles	111	2	2	1	1	1	1
Small loader loading cars	102	1	1	1	-	-	-
Excavators working at stockpiles	105	3	3	3	-	-	-
Concrete pulveriser heads on excavators	80	2	2	2	-	-	-
Jaw crusher crushing concrete	108	1	1	1	-	-	-
Impact crusher crushing concrete	107	1	1	1	-	-	-
Cone crusher crushing concrete	116	1	-	1	-	-	-

Plant	Adopted sound power data, dBA	Scenario					
		1 Full production and sales	2 Green waste shredding	3 Weekend activities	4 Evening Work	5 Night Work	6 Night Maximum Levels
Screens sorting crushed concrete	110	2	2	2	1	-	-
Vacuum pumps serving the cone crusher and one screen	92	2	2	2	2	-	-
Pug mill operating	106	1	1	1	-	-	-
Water cart running a circuit around stockpiles	98 (line source – spread over circuit)	1	1	1	-	-	-
Trommel Screen screening green waste	102	-	1	-	-	-	-
Ballast wash operating	110	1	1	1	-	-	-
Shredder processing green waste (assumed 50% active time)	Processing – 111 Idle - 97		1				
Tipping Truck	118	-	-	-	-	-	1
Fans in green waste area	82	4	4	4	4	4	4

Modelling showed that westerly wind was a worst-case direction for NCAs 1-4, and easterly wind was the worst case for NCA 5. During the night, noise impacts were found to be greater with a temperature inversion and 2 m/s wind. A summary of the modelling results for these conditions is presented in **Table 6.9**. These results are inclusive of the mitigation measures discussed below with exceedance of the criteria indicated in bold (with the exceedance margin in brackets). Noise contours for each modelling scenario are shown in **Appendix H**.

Whilst Concrush is seeking approval to have the ability to undertake night works, the Concrush facility is primarily a day time operation only. The need for undertaking night works will be based on market demand and it is not anticipated to be operating every night. Concrush have committed to only operating the minimum fleet required to undertake unloading and loading and will not be undertaking any processing at night.

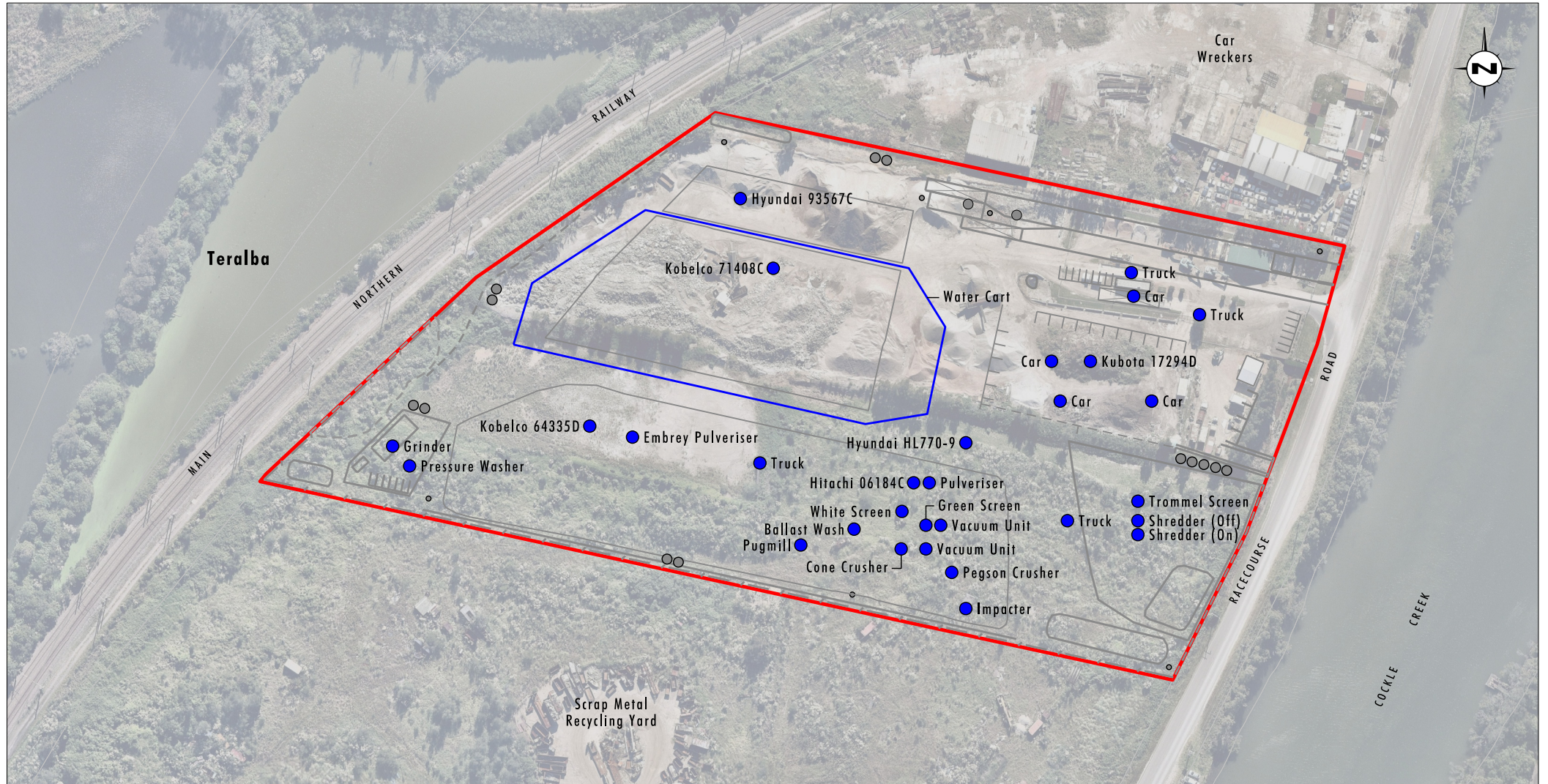


Image Source: Nearmap (May 2017)
Data Source: Concrush (2018)

0 25 50 100m
1:2 000

Legend

- Project Site
- Noise Source

FIGURE 6.2

Location of Noise Sources
in Operational Noise Assessment

Table 6.9 Operational noise results

Receiver	Project specific criteria, dB(A)			Sleep Disturbance screening criteria, dB(A)		Predicted noise level, dB(A)						
	Day L _{Aeq,15min}	Evening L _{Aeq,15min}	Night L _{Aeq,15min}	Night L _{Aeq,15min}	Night Maximum L _{AMax}	Scenario 1 – Full production and sales (day)	Scenario 2 – Green waste shredding (day)	Scenario 3 – Weekend activities (day)	Scenario 4 – Evening Work (evening)	Scenario 5 – Night Work (night)	Scenario 6 – Night Maximum Levels (night)	Scenario 7 – Fans (night)
NCA 1	47	43	36	40	52	51 (4 dB)	50 (3 dB)	50 (3 dB)	40	44 (8 dB)	49	18
NCA 2	54	47	37	40	52	55 (1 dB)	56 (2 dB)	55 (1 dB)	45	42 (5 dB)	51	30
NCA 3	53	53	53	-	-	53	53	52	42	40	50	24
NCA 4	54	48	42	42	52	51	51	50	39	38	46	24
NCA 5	68	68	68	-	-	46	45	46	36	32	44	12

In preparing the noise assessment, several possibilities for mitigation were considered and evaluated in terms of their reasonableness and feasibility. These mitigation options are presented in **Table 6.10**.

Table 6.10 Analysis of reasonable and feasible mitigation

Mitigation item	Applicable to	Is it feasible?	Is it reasonable?	Is the item recommended?
Undertake work during standard hours	Construction noise	Yes	Yes	Yes
Turn off plant when not in use	Construction noise	Yes	Yes	Yes
Ensure plant is regularly maintained, and repair or replace plant that becomes noisy	Construction and operational noise	Yes	Yes	Yes
Arrange work site to minimize the use of movement alarms on vehicles and plant	Construction noise	Yes	Yes	Yes
Avoid dropping materials from a height	Construction noise	Yes	Yes	Yes
Bund around northern side of Raw Material Stockpile and Processing Area	Operational noise	No – would impede traffic movement through site	Yes	No
Bund along eastern side of Raw Material Stockpile and Processing Area	Operational noise	Yes	Yes	Yes

Mitigation item	Applicable to	Is it feasible?	Is it reasonable?	Is the item recommended?
Barrier installed immediately north of crushing plant	Operational noise	No – crushing plant relocates throughout the processing area and barriers would obstruct use of equipment	Yes	No
Temporary barrier installed around crushing plant in evening	Operational noise	No – barriers would obstruct use of equipment	Yes	No
Wall along south side of Raw Material Stockpile and Processing Area	Operational noise	Yes	Yes	Yes
Operate cone crusher and green waste shredder at different times	Operational noise	Yes	Yes	Yes
Do not operate crushers in evening	Operational noise	Yes	Yes	Yes
Control position of loading operations at night	Operational noise	Yes	Yes	Yes
Positive driver behavior training	Road noise	Yes	Yes	Yes
Consult community regarding noise impacts	All	Yes	Yes	Yes
Conduct noise monitoring if a complaint is received	All	Yes	Yes	Yes

With the implementation of the above mitigation measures some limited exceedances above the Project specific criteria are anticipated. Where there are exceedances above the noise criteria these were assessed and categorised in accordance with Section 4 of the NPI. The Project specific criteria are exceeded at select receiver points in NCA 1 and NCA 2 for operational scenarios 1, 2 and 3.

For NCA 1 the predicted 4 dB exceedance of the Project specific criteria during the day does not exceed the amenity noise level and under the NPI is considered a marginal exceedance. This affects two residences in NCA 1, immediately north of the Project site.

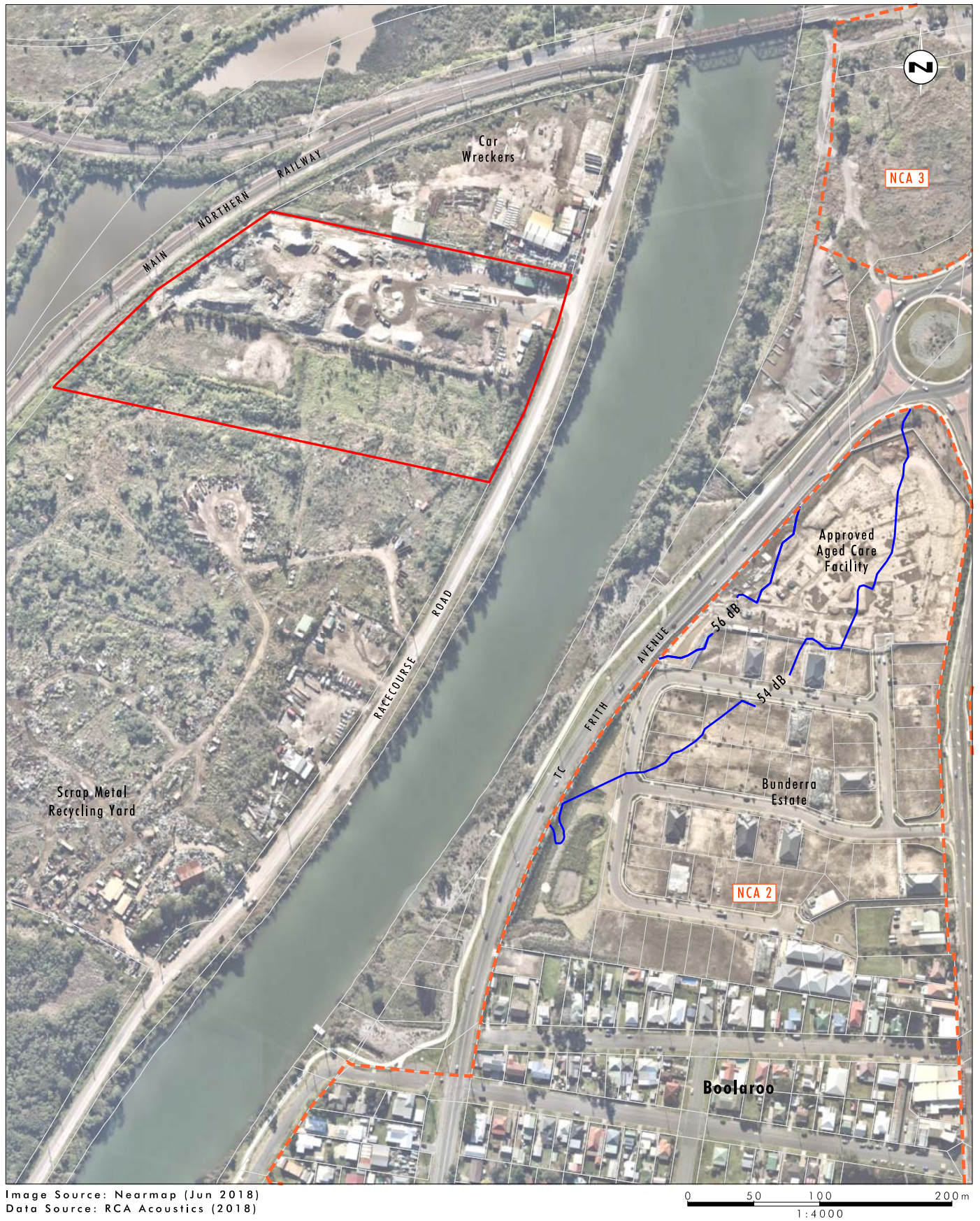
For select sensitive receivers in NCA 2, refer to **Figure 6.3**, the predicted exceedance during the day is 1 dB for scenario 1 and 3 and 2 dB for scenario 2. According to the NPI, an exceedance of less than 2 dB is considered negligible, as the difference would not be discernible by the average listener. This exceedance occurs during the day on the western edge of NCA 2. The area identified within NCA 2 that would be subject to these negligible exceedances would already be affected by existing road traffic noise as they are located adjacent to a busy road that provides one of the primary routes for residents of western Lake Macquarie to access the Glendale and Wallsend areas.

Evening operations are proposed to be scaled back in comparison to day operations and include less machinery operating. Accordingly during the evening the Project would comply with the Project specific noise criteria for all NCAs.

At night, a portion of NCA 2 will experience an exceedance of 5 dB, however this does not exceed the amenity level and is therefore considered a marginal exceedance in accordance with the NPI. For night time operations a noise contour representing the criteria level of 37 dB is shown on **Figure 6.4**.

At NCA 1, the night time exceedance is predicted to be 8 dB, and exceeds the recommended amenity noise level which is considered a significant exceedance. There are two residences within NCA 1 and night time works would only be undertaken if Concrush was supplying material to a project being undertaken during night time. Previously, night time works have occurred infrequently, in the order of two to three night times over a period of several years. To minimise noise impacts, any night time operations required would be restricted to trucks tipping waste material and being loaded with stockpiled material. Concrush would not be undertaking any processing works during the night time period and would prepare materials for any night operations during the day so that the number of plant items operating during the night time period is kept to a minimum. As the modelling was undertaken on worse case conditions of temperature inversion and 2m/s wind, it is proposed to undertake noise monitoring during the first two nights of operation. If the monitoring program identifies exceedances of the relevant criteria further mitigation measures would be explored including engineering controls or treatments or negotiated agreements with affected residents.

The night time predicted $L_{Aeq,15min}$ exceeds the trigger level for a sleep disturbance assessment to be undertaken at NCA 1 and NCA 2. In accordance with the NPI, impacts from the maximum noise level have been considered. The maximum noise level L_{Amax} that will occur at night will come from trucks tipping out waste. Residences in NCA 1 are predicted to have a maximum level of 49 dB L_{AFMax} and NCA 2 would receive 51 dB L_{AFMax} . The RNP advises that internal noise levels of 55 dB or less are unlikely to awaken people from sleep. The highest external level received (51 dB at NCA 2) is less than 55dB.

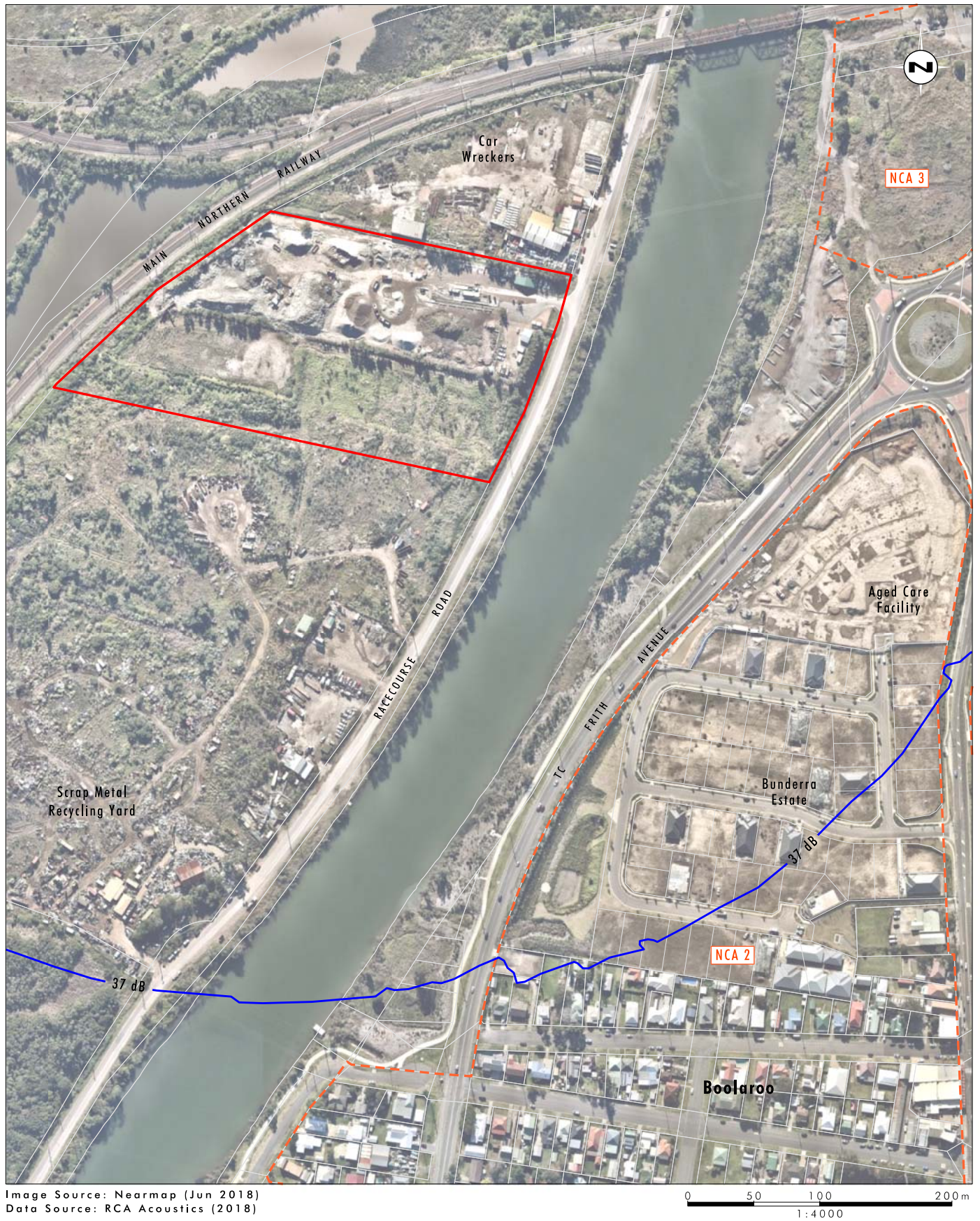


Legend

- Project Site
- - - Noise Catchment Area
- Noise Contour

FIGURE 6.3

Day Time Noise Contour
In Noise Catchment Area 2



Legend

- ▬ Project Site
- - - Noise Catchment Area
- 37 dBA Contour

FIGURE 6.4

Night Time Noise Contour
in Noise Catchment Area 2

6.2.5 Road Traffic Noise Assessment

An assessment of road traffic noise was undertaken in accordance with the RNP. The assessment assumed all Project traffic was to and from the south of the Project site along Racecourse Road and York Street in Teralba. This is due to the height restriction on the rail bridge to the north of the Project which restricts larger vehicles from accessing the Project site from the north and is in accordance with the traffic assessment. This also provides a conservative road noise assessment as the nearest residents are located within the suburb of Teralba.

Attended measurements of individual vehicle passbys were undertaken on York Street to determine sound exposure levels (SEL). The SEL of a light vehicle passby was 67 dB(A) and a heavy vehicle passby was 76 dB(A). Traffic noise was then determined for both current and future traffic and is presented in **Table 6.11**.

Table 6.11 Total traffic noise levels

	Day ($L_{Aeq,15hr}$)	Night ($L_{Aeq,9hr}$)
Current traffic noise	56	49
Future traffic noise	59	53

The predicted traffic noise is less than the relevant RNP criteria for both day (60 dB) and night (55 dB) periods. The predicted traffic noise is therefore considered to comply with the RNP.

6.2.6 Construction Noise Assessment

Four construction activity noise scenarios were modelled. In each scenario noise sources were clustered near the eastern border of the Project site closest to the residential receivers, representing a conservative assessment. All construction activities are to be undertaken during standard daytime hours only. The construction noise scenarios modelled are identified in **Table 6.12**.

Table 6.12 Construction noise scenarios

Plant	Sound power level (dBA)	Scenario 1: Site clearing	Scenario 2: Road and hardstand construction	Scenario 3: Pipe and pole installation	Scenario 4: Fencing construction
Trucks idling with material	98	1	1		1
Excavator clearing land or digging	105	1	-	1	-
Wheeled loader loading/unloading truck	111	1	-	-	-
Traxcavator clearing land	105	1	-	-	-
Water cart suppressing dust at work site	98	1	1	-	-
Compactor compressing road base	114	-	1	-	-
Roller smoothing and compacting road	105	-	1	-	-
Grader smoothing road	115	-	1	-	-
Plate compactor compacting filled areas	108	-	-	1	-
Grinder cutting metal for fence	109	-	-	-	2

Predicted noise levels at each NCA are compared against the management levels for standard construction hours in the ICNG in **Table 6.13**. Based on the predicted noise levels, no residences will experience noise levels above the criteria during construction.

Table 6.13 Predicted noise levels at residences from construction work

NCA	Standard Hours Criteria LAeq,15min, dB		Predicted Noise Level LAeq,15min, dB			
	Noise Affected	Highly Noise Affected	Site Clearing	Road & Hardstand	Pipes & Poles	Fencing construction
NCA 1	52	75	43	47	41	34
NCA 2	59	75	51	56	47	43
NCA 3	65	-	50	54	48	41
NCA 4	59	75	49	51	45	39
NCA 5	75	-	38	42	33	26

6.2.7 Construction and Operational Vibration

Vibration can cause annoyance among sensitive receivers. Vibration limits in order to reduce such impacts are provided in Assessing Vibration: A technical guideline (DEC, 2006). Construction and operational vibration is expected to be negligible at distances greater than 100 m. Given that the nearest sensitive receiver is further than this (230 m from site), impact from vibration are not anticipated.

6.2.8 Mitigation and Management Measures

The following mitigation and management measures will be implemented for the Project:

Construction

- Undertake work during standard hours (7am to 6pm weekdays, 7am to 1pm Saturday).
- Turn off plant when not in use.
- Ensure plant is regularly maintained, and repair or replace plant that becomes noisy.
- Arrange work site to minimize the use of movement alarms on vehicles and plant.
- Avoid dropping materials from a height.

Operation

- Concrush will undertake a noise monitoring program to assess the effectiveness of the proposed mitigation measures in achieving the predicted noise levels.
 - Routine quarterly noise monitoring will be conducted by an experienced noise consultant during the day time to monitor and report on operational noise. Two 15-minute measurements will be conducted at the most impacted receiver in NCA 1 and a representative location within NCA 2.
 - Night time operational noise will be monitored during the first two nights that operations occur. Recommended monitoring will consist of a combination of attended monitoring, and the use of an unattended noise logger that will be deployed at the most impacted residence to continuously record audio, pending land owner agreement. Site noise levels will be determined from observations made during attended monitoring and by reviewing the unattended audio. If the monitoring program identifies exceedances of the relevant criteria further mitigation measures would be explored including engineering controls or treatments or negotiated agreements with affected residents.

- Construct a bund to 3.5 m above finished ground level along the eastern side of the 'Raw Material Stockpiles and Processing Area'. The bund is required to block line of sight. The bund can be formed from stockpile material, but the stockpile must be continuous and a minimum 3.5 m high at all points. Crushers and screens (except for the trommel screen used for green waste) will not be used outside this area. The bund should meet the wall along the southern boundary described below.
- Construct a wall to 3 m above finished ground level along the southern boundary of the 'Raw Material Stockpiles and Processing Area'.
- Crushers will not be used after 6pm.
- The cone crusher will not be used when green waste shredding is occurring. If new green waste shredding technology becomes available which can operate at reduced noise levels then this operational restriction could be reviewed.
- After 10pm, only truck loading and tipping operations will occur. Loading will only occur from the westernmost stockpiles, and the front end loader used for loading should remain to the west of these stockpiles at all times. Truck engines should be turned off while waiting on or off site.

6.3 Air Quality Impact Assessment

An AQIA has been prepared for the Project by RCA and is summarised in this section of the EIS. The full report is presented in **Appendix I**.

6.3.1 Existing Air Quality Environment

The air quality in the Teralba local area is influenced by the surrounding land uses including industrial activities such as the Macquarie Coal Preparation Plant and Metromix Quarry and the Project site. Other land uses in the vicinity of the project site such as road and rail transport, residential areas and bushland are likely to have less influence on local air quality.

Background air quality data was obtained from the OEH Wallsend air quality monitoring site for particulate matter 10 micrometres or less (PM₁₀) and particulate matter 2.5 micrometres or less (PM_{2.5}) for both maximum 24 hour and annual averages. The background air quality is presented along with the results of the predicted Project contributions in **Section 6.3.4**.

6.3.2 Air Quality Criteria

The potential for air quality impacts from the Project are determined by the level of compliance with the air quality criteria set by the EPA as part of its *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (Approved Methods) (EPA, 2016). These criteria apply to existing and potential sensitive receivers (refer **Figure 6.5**) such as residences in the vicinity of the Project. The assessment criteria relate to the total concentration of pollutant in the air rather than only the contribution from project-specific sources.

The relevant air quality assessment criteria for the Project are presented in **Table 6.14**.

Table 6.14 Air quality criteria relevant to the Project

Pollutant	Averaging period	Concentration
Particulate matter (PM ₁₀)	24-hour	50 µg/m ³
	Annual	25 µg/m ³
Particulate matter (PM _{2.5})	24-hour	25 µg/m ³
	Annual	8 µg/m ³
Total Suspended Particulates (TSP)	Annual	90 µg/m ³
Depositional dust	Annual	2.0 g/m ² /month (maximum increase above background)
Odour	NA	2.0 odour units ¹

Note 1: criteria applies at nearest sensitive receptors, and is based on population of the community (more than 2,000 people in the Teralba Area)

6.3.3 Assessment Methodology

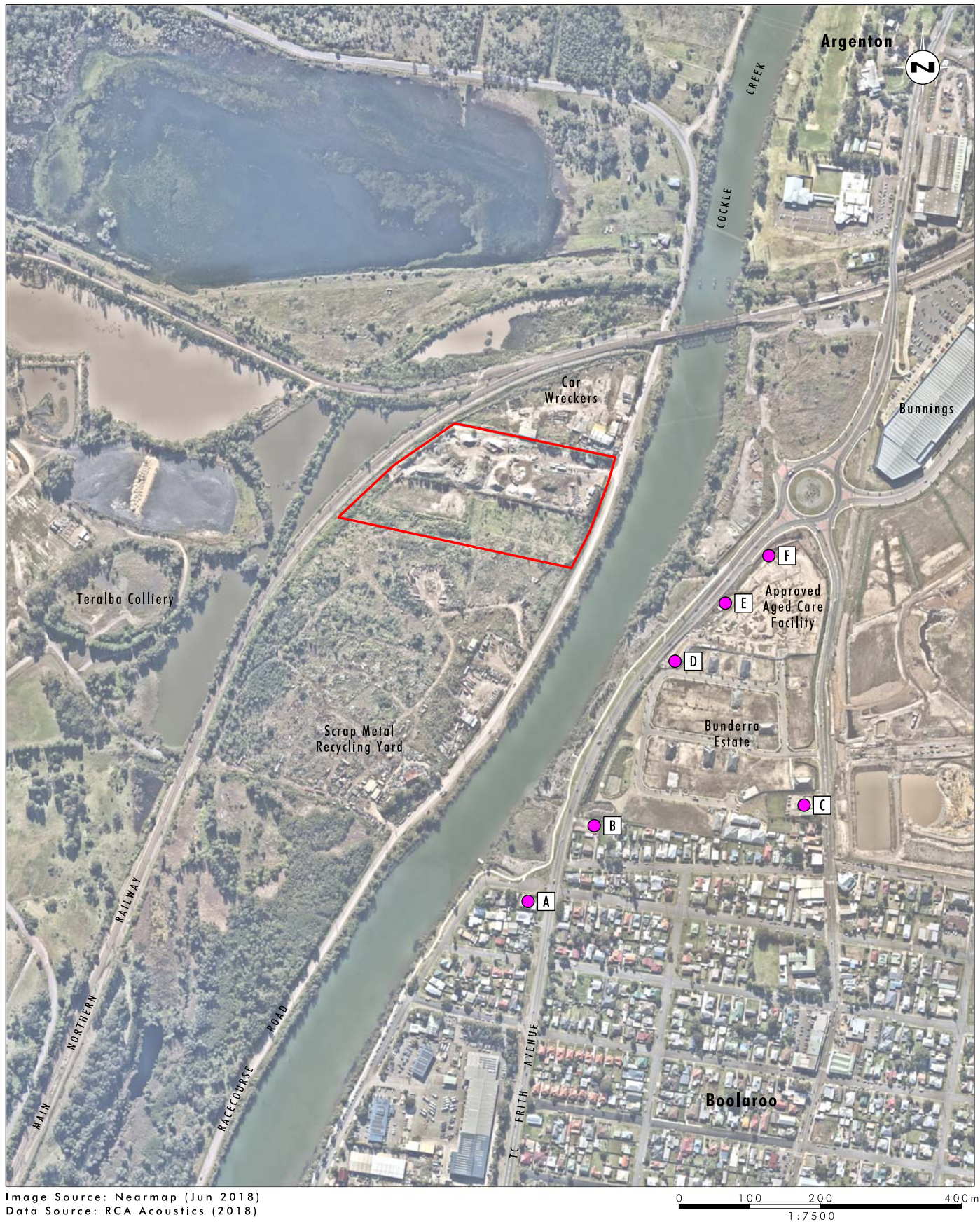
The AQIA has followed the EPA (2016) Approved Methods. A ‘Level 2’ air quality impact assessment has been carried out involving the use of site representative meteorological data. AUSPLUME (version 6.0), a computer-based air dispersion model has been used to predict ground-level concentrations and deposition levels due to the identified emission sources, and the model predictions have been compared with relevant air quality criteria. The dispersion model was based on 100th percentile average predictions for dust (particulates) performance criteria; and on a 99th percentile nose response time average predictions for odour performance criteria.

For the odour assessment, specific odour emission rates were applied to the following sources: front end loader working at green waste stockpiles, odour from green waste stockpiles, shredding of green waste, screening of green waste and pasteurisation activities. All of these sources were located within the green waste area of the Project site which is the south east corner closest to nearest receivers. No odour controls were used in the modelling of odour sources. The odour emission rates for pasteurisation activities were adjusted for best practice methods.

For the dust assessment the following area sources were considered: crushing and screening units for non-green waste, shredding and screening of green waste, stockpile areas, open areas and the pug mill. The emission rates applied were in accordance with the NPI emissions factors from *NPI Emission Estimation Technique Manual for Mining and Processing of Non-Metallic Minerals (1999)*.

Modelled meteorological data for the Project site was generated by applying the TAPM model to measured weather data at the Newcastle Nobbys weather station for the 2014 to 2016 period. These years were selected after review of the long term climate data for the Newcastle Nobbys weather station. The 2015 year was chosen as the most representative data set for modelling purposes because the weather patterns in 2014 and 2016 were less stable than the weather patterns in 2015. The meteorological data includes: wind speed, wind direction, ambient temperature, atmospheric stability class and mixing height.

For the proposed Concrush operations, particulate emissions will have greatest impact downwind during stable conditions, reducing to a minimum impact during unstable conditions. The highest wind speeds have the potential to create wind erosion but this also results in greater dispersion of air emissions.



Legend

- Project Site
- Approximate Location of Receivers

FIGURE 6.5

Sensitive Receiver Locations
for Air Quality Assessment

6.3.4 Air Quality Impact Assessment

The Project was reviewed to determine sources of air emissions and the proximity of sources to sensitive receptors. Emissions to air from the Project are predominately related to stockpiled materials, handling of stockpiled materials and material processing. The data collected from the nearest OEH air quality monitoring station at Wallsend for 2015, the modelled year, were applied.

All dispersion modelling results presented below incorporate the relevant mitigation measures outlined in **Section 6.3.5**.

Odour

The main potential for odour impacts as a result of the Project is the presence of green waste stockpiles. **Table 6.15** presents the odour level concentration at the nearest receivers for the maximum Project production rate of 250,000 tpa. For pasteurization activities, turning of the stockpile was assumed to occur on a cycle of four times every year (i.e. once every 3 months) with three turning activities within those times, i.e. 12 turning events every year.

Table 6.15 99th percentile Peak to Mean Ground level odour concentration modelling results

Receiver	Project specific contribution (OU)	Criteria (OU)
A	0.7	2.0
B	0.7	2.0
C	0.6	2.0
D	1.5	2.0
E	1.6	2.0
F	1.6	2.0

The modelling results indicate that the ground level odour concentrations will not exceed the odour impact criteria of 2.0 odour units for the closest receivers.

PM₁₀ results

The highest predicted incremental ground level concentrations for PM₁₀ are presented in **Table 6.16**.

Table 6.16 Maximum predicted PM₁₀ impacts

Receiver	Background	Project specific contribution	Total	Criteria
24 hour average PM₁₀ (µg/m³)				
A	27.3	8.6	35.9	50.0
B	17.2	11.5	28.7	50.0
C	18.1	7.8	25.9	50.0
D	15.0	19.0	34.0	50.0
E	19.4	21.2	41.6	50.0
F	17.3	17.6	34.9	50.0
Annual average PM₁₀ (µg/m³)				
A	17.0	0.2	17.2	25.0
B	17.0	0.2	17.2	25.0
C	17.0	0.2	17.2	25.0
D	17.0	0.5	17.5	25.0
E	17.0	0.7	17.7	25.0
F	17.0	0.7	17.7	25.0

With the inclusion of the detailed mitigation measures identified in **Section 6.3.5**, PM₁₀ for both the 24-hour and annual average impact assessment criteria are predicted to be met at the maximum production rate of 250,000 tpa.

PM2.5 results

The highest predicted incremental ground level concentrations for PM2.5 are presented in **Table 6.17**.

Table 6.17 Maximum predicted PM2.5 impacts

Receiver	Background	Project specific contribution	Total	Criteria
24 hour average PM2.5 (µg/m ³)				
A	3.8	2.4	6.2	25.0
B	5.9	3.3	9.2	25.0
C	16.2	2.2	18.4	25.0
D	5.9	5.4	11.3	25.0
E	17.2	6.1	23.3	25.0
F	4	5.1	9.1	25.0
Annual average PM2.5 (µg/m ³)				
A	7.30	0.06	7.36	8.00
B	7.30	0.06	7.36	8.00
C	7.30	0.05	7.35	8.00
D	7.30	0.15	7.45	8.00
E	7.30	0.20	7.50	8.00
F	7.30	0.17	7.47	8.00

With the inclusion of the detailed mitigation measures identified in **Section 6.3.5**, PM2.5 for both the 24-hour and annual average impact assessment criteria are predicted to be met at the maximum production rate of 250,000 tpa.

TSP results

TSP annual modelling results for the highest predicted incremental ground level concentrations are presented in **Table 6.18**. There is no TSP impact assessment criterion for 24-hour averaging and therefore only annual TSP modelling was conducted. RCA adopted a background TSP level based on a worst case conversion factor from PM10 (background) to TSP (background) of 2.

Table 6.18 TSP Modelling Results – Annual Averaging Period

Receiver	Estimated Background	Project specific contribution (µg/m ³)	Total	Criteria (µg/m ³)
A	34.0	0.7	34.7	90
B	34.0	0.8	34.8	90
C	34.0	0.6	34.6	90
D	34.0	1.8	35.8	90
E	34.0	2.4	36.4	90
F	34.0	2.0	36.0	90

With the inclusion of the detailed mitigation measures identified in **Section 6.3.5**, TSP for the annual average impact assessment criteria are predicted to be met at the maximum production rate of 250,000 tpa.

Depositional dust results

Depositional dust annual modelling results for the highest predicted incremental ground level concentrations are presented in **Table 6.19**. There is no depositional dust impact assessment criterion for 24-hour averaging and therefore only annual depositional dust modelling was conducted. Deposited dust is required to not exceed 2g/m²/month above the background level, therefore only the incremental dust load is assessed.

Table 6.19 Depositional dust Modelling Results – Annual Averaging Period

Receiver	Project specific contribution (g/m ² /month)	Criteria (maximum increase) (g/m ² /month)
A	0.1	2.0
B	0.1	2.0
C	0.2	2.0
D	0.5	2.0
E	0.7	2.0
F	0.6	2.0

The dispersion modelling results show that with the inclusion of the detailed mitigation measures identified in **Section 6.3.5**, the assessment criteria are predicted to be met for the future operations at the maximum capacity of 250,000 tpa.

Material Handling Systems

The air quality impact assessment has been undertaken on the basis of continuing the current outdoor material handling processes with the implementation of management measures such as sealing haul roads and continuation and expansion of dust suppression activities. The air quality impact assessment has predicted compliance with all relevant operational criteria for both dust and odour at the proposed maximum production rate of 250,000 tpa. These results indicate that the Project can proceed with the current outdoor material handling processes with acceptable impacts to the community and environment. Therefore it is considered that there is no requirement to enclose the material handling processes for this Project. Further, the proposed processing and stockpile areas are large and it would not be economically feasible to enclose these areas.

Construction Activities

The construction impact assessment analyses dust emissions but not odour. Potential odour emissions such as vehicle exhausts are intermittent, readily dispersed and of a low enough initial concentration so as to be negligible close to the sources. The construction activities that may generate dust emissions during construction are:

- Heavy vehicles and machinery creating wheel generated dust
- Front end loaders working at stockpiles
- Machinery working to establishing the Project infrastructure
- Wind erosion from stockpiles.

The highest predicted incremental ground level concentrations for PM₁₀ 24 hour for the construction period are presented in **Table 6.20**.

Table 6.20 Construction phase maximum predicted PM₁₀ impacts

Receiver	Background (µg/m ³)	Project construction contribution (µg/m ³)	Total (µg/m ³)	Criteria (µg/m ³)
A	17.0	5.8	22.8	50.0
B	27.9	8.5	36.4	50.0
C	20.4	8.0	28.4	50.0
D	14.3	17.0	31.3	50.0
E	13.4	19.9	33.3	50.0
F	26.7	17.5	44.2	50.0

The construction assessment modelling results show that the 24 hour impact assessment criteria of 50 µg/m³ are predicted to be met for the nearest receivers.

6.3.5 Mitigation and Management Measures

The following mitigation and management measures will be implemented for the Project:

General

Update the existing AQMP to reflect the Project changes.

Odour

Continue to implement the existing controls within the AQMP which include:

- Avoid conducting potential odour generating activities when the wind direction is blowing towards nearby residential areas (normally south westerly or westerly)
- Avoid conducting potential odour generating activities during early morning periods under low wind speed conditions
- Cover transported loads leaving the Project site to aid in the control of fugitive emission of odours during transport of potential odour generating products
- Turning of windrows during pasteurisation
- Odour monitoring
- Odour complaint investigation and response
- Investigative odour monitoring and adapt operations as required.

Dust

- The use of atomising water sprays on crushing and screening equipment. These shall be attached to the crushing point and conveyor belt discharge point to control point source dust emissions
- Two coat seal on haul roads
- Minimisation of the drop heights between the excavator or loader bucket and trailers/truck during loading to reduce dust generation.

- Dust suppression of stockpiles by water spraying on an as needed basis or when the following meteorological conditions occur:
 - An average wind speed greater than 18km/h is recorded continuously over a 15 minute period from a north or north westerly direction.
- Maintenance of clean entry drive as required to minimise dry dust on road.
- The use of a water cart to water roads and hardstand areas to assist in the control of fugitive dust emissions on an as needed basis, or when the following meteorological conditions occur:
 - An average wind speed greater than 18km/h is recorded continuously over a 15 minute period from a north or north westerly direction.
- Cessation of dust emitting activities shall occur during the following conditions:
 - An average wind speed greater than 36km/h is recorded continuously over a 15 minute period from a north or north westerly direction; or
 - Dust suppression measures appear visually ineffective.

The monitoring for deposited dust and PM₁₀ emissions will be undertaken at three strategic and representative locations. PM₁₀ monitoring will be undertaken using a 'dustrak' low volume monitor. Monitoring will be undertaken for at least a period of 24 months following the commencement of the expanded operations. This will allow the following:

- Comparison of monitoring results with compliance levels and the dust modelling predictions
- Review of the effectiveness of the mitigation measures.

6.4 Traffic

A Traffic Impact Statement has been prepared for the Project by Better Transport Futures and is summarised in this section of the EIS. The full report is presented in **Appendix J**.

6.4.1 Assessment Methodology

The Traffic Impact Assessment has been undertaken to investigate the range of traffic and transport aspects of the Project site and its surrounds with specific reference to the requirements of the Guide to Traffic Generating Developments (Version 2.2, RTA October 2002). The specific tasks undertaken included:

- Site inspection – Consideration of the existing form and features of the road system surrounding the Project site.
- Traffic counts - Traffic counts for three consecutive days (Thurs, Fri, Sat) at the intersections along the approach routes from the site to the main road network, at:
 - Wakefield Road/Northville Road
 - Northville Road/The Weir Road
 - York Street/Short Street.
- Confirming AM and PM peak periods.
- Monitoring any local queuing, and the presence of industrial (truck) traffic.

- Use of automatic counter on Racecourse Road in the vicinity of the Project site from Saturday 16 to Saturday 23 September 2017.
- Design review - review of the proposed site access design and layout, from a technical capacity, movement and also road safety perspective including swept path analysis for light and heavy vehicles.

6.4.2 Road Network

The roads leading from the Project site are identified as Collector Roads in LMCC's road hierarchy.

Access for trucks carrying raw materials to the Project site and product from the Project site will be via Racecourse Road, then proceed to the main road network at Five Islands Road/Toronto Road via York Street and Toronto Road North (refer **Figure 3.3**). Smaller vehicles may access the site via a northern route comprising Racecourse Road, The Weir Road, Northville Drive and then Wakefield Road to the west which leads to a connection with the M1 Motorway (refer **Figure 3.3**). Vehicle movements north of the Project site entrance are restricted by the low clearance bridge (4.2 m) under the Main Northern Railway.

Roads used to access the main road network include:

- For Five Islands Road
 - Racecourse Road
 - York Street
 - Toronto Road
- For M1 Motorway and Newcastle Link Road
 - Racecourse Road
 - The Weir Road
 - Wakefield Road.

Each of these roads/local streets are described below.

Racecourse Road

Racecourse Road is built as a rural standard two lane two way road, with no kerb and gutter and a signposted speed of 80 kph near the Project site. Truck movements on Racecourse Road are generally restricted to south of the Project site. Movements north of the Project site are restricted by the low clearance (4.2 m) under the Main Northern Railway, but there is no weight restriction noted on the road. Larger vehicles such as semi-trailers and truck and dog combinations typically don't use this section of road. There is also flood warning signage on Racecourse Road to alert drivers to closure of the weir crossing of Cockle Creek to the west on The Weir Road.

York Street, Toronto Road

The local urban street system within Teralba allows access to the main road network at the Five Islands Road/Toronto Road roundabout. There is a mixture of abutting land use, with detached residential dwellings, the Teralba village, and some industrial land uses on Toronto Road close to Five Islands Road. Within the Teralba local street system, both William Street south of Short Street, and Anzac Parade south-east of York Street have vehicle weight restrictions (5 t limits) to prevent intrusion of heavy vehicles into these streets.

The Weir Road

The Weir Road is effectively a continuation of the road connecting Racecourse Road to Northville Drive at Barnsley to the west of the Project site. It is built to the same general standard as Racecourse Road. It has a series of guard rail treatments for safety reasons due to the curvilinear nature of the road alignment. Weir Road is so named because of the low level concrete weir crossing of Cockle Creek, which is subject to flooding and closure by emergency services during significant rain events.

Wakefield Road

Wakefield Road is a two lane two way rural standard road that is capable of accommodating heavy vehicles, should the Weir Road route be utilised. Whilst this is considered unlikely, it is available as an alternate route to the M1 Pacific Motorway via the Palmers Road interchange to the south.

Cycling Facilities

Within the Teralba urban limits no specific cycling facilities have been noted. The nearest specific cycling facility is along the eastern side of Five Islands Road as part of the Lake Macquarie cycle path. The transport route to the north (Racecourse Road, The Weir Road, and Northville Drive to Wakefield Road) is rural in character and requires cyclists to utilise shoulder space on each road.

Public Transport Services

The locality of Teralba is served by both rail and bus public transport. Teralba Railway Station is located on Railway Street approximately 3.2 km from the Project site. The nearest available bus service is the 271 Glendale – Teralba – Toronto service operated by Hunter Valley Buses. This service passes through Teralba via York Street and Anzac Parade and does not pass by the Project site.

6.4.3 Existing Daily Traffic Volumes

Monitoring of traffic movements was conducted over the AM and PM peak for three consecutive days outside of the school holiday period. Traffic data for the York Street/Short Street junction was collected on 4 to 6 May 2017 and for the intersections on the northern route from 19 to 21 September 2017. The intersections surveyed were (refer to **Figure 6.6**):

- York Street/Short Street (May 2017)
- Wakefield Road/Northville Drive (Sep 2017)
- The Weir Road/Northville Drive (Sep 2017).

The purpose of the surveys was to confirm the AM and PM peak periods, monitor any local queuing, and determine the presence of industrial (truck) traffic. An automatic counter was also placed on Racecourse Road in the vicinity of the Concrush site from 16 to 23 September 2017.

A summary of traffic data is presented in **Table 6.21**. The results presented are drawn from the urban flow conditions and Levels of Service definitions as presented in the Guide to Traffic Generating Developments (NSW RTA 2002).

Table 6.21 Existing Traffic Volumes

Road	Location	Peak Period	Peak flow ⁽¹⁾	Mid-Block Road Capacity	Level of Service
Appletree Road	North of Northville Drive	AM peak	96 N/B 177 S/B	200 (one-way) ⁽²⁾ 200 (one-way) ⁽²⁾	A A
		PM peak	191 N/B 225 S/B	200 (one-way) ⁽²⁾ 380 (one-way) ⁽²⁾	A B
Charlton Street	West of Wakefield Rd	AM peak	29 E/B 19 W/B	200 (one-way) ⁽²⁾ 200 (one-way) ⁽²⁾	A A
		PM peak	21 E/B 42 W/B	200 (one-way) ⁽²⁾ 380 (one-way) ⁽²⁾	A B
Northville Drive	East of Wakefield Road	AM peak	266 E/B 212 W/B	380 (one-way) ⁽²⁾ 380 (one-way) ⁽²⁾	B B
		PM peak	178 E/B 279 W/B	200 (one-way) ⁽²⁾ 380 (one-way) ⁽²⁾	A B
Northville Drive	West of The Weir Road	AM peak	326 E/B 240 W/B	600 (one-way) ⁽²⁾ 380 (one-way) ⁽²⁾	C B
		PM peak	270 E/B 322 W/B	380 (one-way) ⁽²⁾ 600 (one-way) ⁽²⁾	B C
Northville Drive	East of The Weir Road	AM peak	295 E/B 306 W/B	380 (one-way) ⁽²⁾ 380 (one-way) ⁽²⁾	B B
		PM peak	295 E/B 326 W/B	200 (one-way) ⁽²⁾ 200 (one-way) ⁽²⁾	B B
The Weir Road	South of Northville Drive	AM peak	109 N/B 206 S/B	200 (one-way) ⁽²⁾ 380 (one-way) ⁽²⁾	A B
		PM peak	211 N/B 190 S/B	380 (one-way) ⁽²⁾ 200 (one-way) ⁽²⁾	B A
Racecourse Road	South of Concrush site	AM peak	110 N/B 169 S/B	200 (one-way) ⁽²⁾ 200 (one-way) ⁽²⁾	A A
		PM peak	184 N/B 180 S/B	200 (one-way) ⁽²⁾ 200 (one-way) ⁽²⁾	A A
York Street	North of Short Street	AM peak	210 N/B 221 S/B	380 (one-way) ⁽²⁾ 380 (one-way) ⁽²⁾	B B
		PM peak	203 N/B 190 S/B	380 (one-way) ⁽²⁾ 200 (one-way) ⁽²⁾	B A
York Street	South of Short Street	AM peak	319 N/B 381 S/B	380 (one-way) ⁽²⁾ 600 (one-way) ⁽²⁾	B C
		PM peak	301 N/B 333 S/B	380 (one-way) ⁽²⁾ 380 (one-way) ⁽²⁾	B B

Notes: 1. Peak flow from 11th May and 19th September 2017 traffic survey results by TTS for Mark Waugh Pty Ltd
2. RTA 2002, Urban Road Conditions, One Lane, Level of Service (refer **Table 4.1** above).

Table 6.21 demonstrates that the roads serving as the main access routes for the Project site currently operate well within their technical, functional and environmental capacity levels as described by Austroads and NSW Roads and Maritime guidelines. The road traffic flows are well within Level of Service (LoS) 'C' operations, many segments as high as LoS 'A'. York Street is generally operating at an acceptable LoS 'B' or 'C' range, and on Racecourse Road near the Project site road service levels were observed as being within the LoS 'A' range. Overall, the local road network serving the Project site is operating well within the technical lane capacity at very satisfactory performance levels.



Image Source: Nearmap (May 2017)
Data Source: LPI (2017)

0 0.25 0.5 1.0 km
1:20 000

Legend

- ▭ Project Site
- Intersection Survey Locations
- Traffic Count Location

FIGURE 6.6

Traffic Survey Locations

6.4.4 Existing Intersection Performance

There are a number of intersections and local access streets serving the Project site. Intersections of and with the local streets all operate under priority control. This reflects the relatively low traffic volumes of these roads and intersections.

The Austroads (2009) *Guide to Traffic Management - Part 3 Traffic Studies and Analysis* identifies threshold levels for intersection capacity under uninterrupted flow conditions below which intersection analysis is considered unnecessary. Where traffic flows fall within these limits intersection performance is essentially operating with little or no delay for approaching drivers other than to obey the requisite road rules.

Intersection traffic volumes were surveyed at the following locations:

- The Weir Road/Northville Drive intersection
- Wakefield Road/Northville Drive intersection
- Short Street/York Street intersection.

At each of these locations the existing peak combined intersection traffic volumes were below the threshold in the Austroads (2009) guideline indicating that intersection analysis modelling was not required. At each of these locations traffic is required to slow down to negotiate turns with little if any delay for the through traffic movements. This is consistent with the site observations during the intersection surveys.

6.4.5 Traffic Impact Assessment

Operation

Data collected at the Concrush weighbridge for known production levels were used to derive average daily forecast vehicle numbers, based on the existing vehicle profiles, such as car, utility, rigid truck, semi-trailer, truck and dog, and then applying a pro rata increase in throughput from the current production to the projected 250,000 tpa. In addition to average daily vehicle numbers, peak daily forecast vehicles numbers were derived to represent busy periods. The existing and forecast vehicle numbers are presented below.

Table 6.22 Daily Traffic Generation

Vehicle	Existing Flows (Daily)						Average weekday
	Mon	Tue	Wed	Thu	Fri	Sat	
Heavy	90	111	86	93	80	57	92
Light	39	42	30	41	44	45	39
Average forecast flows (daily)							
Heavy	208	257	200	252	184	103	222
Light	86	96	69	91	103	108	89
Peak forecast flows (daily)							
Heavy	275	278	271	326	213	130	276
Light	93	111	90	100	113	106	101

At a production rate of 250,000 tpa the forecast traffic numbers assumed for impact assessment are:

- 100 car movements per day, 5 light vehicles into the site and 5 light vehicles out of the site per hour.
- 260 truck movements per day 13 trucks into the site and 13 trucks out of the site per hour.

If the peak flows are used rather than average weekday flows the forecast traffic numbers assumed for impact assessment are a maximum of:

- 112 car movements per day, 6 light vehicles into the site and 6 light vehicles out of the site per hour.
- 368 truck movements per day, 18 trucks into the site and 18 trucks out of the site per hour.

For the purposes of the traffic assessment a conservative assumption was made that all (100%) site traffic would use the southern route to/from Five Islands Road due to the height restriction of the rail bridge on the northern route. It is also assumed that any laden truck entering the site to deliver waste is not also picking up product for delivery.

The proposed traffic generation levels from the Project are 10 car movements per hour and 26 truck movements per hour into and out of the site per hour. A total of 36 vehicles trips per hour. If this level of traffic is added to every road segment on the approach and departure routes presented in **Table 6.23**, and with an allowance for conversion of truck volumes to passenger car units (PCU's) at an average of 2.5 (2 for rigid and 3 for articulated vehicles), Level of Service remains high and generally in the Austroads B/C range for mid-block performance along the approach/departure routes.

Table 6.23 Forecast Mid-Block Traffic Volumes

Road	Location	Peak Period	Peak flow ⁽¹⁾	Mid-Block Road Capacity	Level of Service
Appletree Road	North of Northville Drive	AM peak	136 N/B 217 S/B	200 (one-way) ⁽²⁾ 200 (one-way) ⁽²⁾	A A
		PM peak	231 N/B 265 S/B	200 (one-way) ⁽²⁾ 380 (one-way) ⁽²⁾	A B
Charlton Street	West of Wakefield Road	AM peak	69 E/B 59 W/B	200 (one-way) ⁽²⁾ 200 (one-way) ⁽²⁾	A A
		PM peak	61 E/B 82 W/B	200 (one-way) ⁽²⁾ 380 (one-way) ⁽²⁾	A B
Northville Drive	East of Wakefield Road	AM peak	306 E/B 252W/B	380 (one-way) ⁽²⁾ 380 (one-way) ⁽²⁾	B B
		PM peak	218 E/B 319 W/B	200 (one-way) ⁽²⁾ 380 (one-way) ⁽²⁾	A B
Northville Drive	West of The Weir Road	AM peak	366 E/B 280 W/B	600 (one-way) ⁽²⁾ 380 (one-way) ⁽²⁾	C B
		PM peak	310 E/B 362 W/B	380 (one-way) ⁽²⁾ 600 (one-way) ⁽²⁾	B C
Northville Drive	East of The Weir Road	AM peak	335 E/B 346 W/B	380 (one-way) ⁽²⁾ 380 (one-way) ⁽²⁾	B B
		PM peak	295 E/B 366 W/B	200 (one-way) ⁽²⁾ 200 (one-way) ⁽²⁾	B B
The Weir Road	South of Northville Drive	AM peak	149 N/B 246 S/B	200 (one-way) ⁽²⁾ 380 (one-way) ⁽²⁾	A B
		PM peak	251 N/B 230 S/B	380 (one-way) ⁽²⁾ 200 (one-way) ⁽²⁾	B A

Road	Location	Peak Period	Peak flow ⁽¹⁾	Mid-Block Road Capacity	Level of Service
Racecourse Road	South of Concrush site	AM peak	150 N/B 209 S/B	200 (one-way) ⁽²⁾ 200 (one-way) ⁽²⁾	A A
		PM peak	224 N/B 220 S/B	200 (one-way) ⁽²⁾ 200 (one-way) ⁽²⁾	B B
York Street	North of Short Street	AM peak	250 N/B 261 S/B	380 (one-way) ⁽²⁾ 380 (one-way) ⁽²⁾	B B
		PM peak	243 N/B 230 S/B	380 (one-way) ⁽²⁾ 380 (one-way) ⁽²⁾	B B
York Street	South of Short Street	AM peak	359 N/B 421 S/B	380 (one-way) ⁽²⁾ 600 (one-way) ⁽²⁾	B C
		PM peak	341 N/B 373 S/B	380 (one-way) ⁽²⁾ 380 (one-way) ⁽²⁾	B B

Notes: 1. Peak flow from 11th May and 19th September 2017 traffic survey results by TTS for Mark Waugh Pty Ltd
2. RTA 2002, Urban Road Conditions, One Lane, Level of Service

Table 6.23 demonstrates that the roads surrounding the Project site will continue to operate well within their technical and functional lane capacity levels as described by Austroads and NSW RMS guidelines. The changes to mid-block traffic volume LoS as a result of the Project are shown in bold in **Table 6.23**. On Racecourse Road south of the Project site during the PM peak, the LoS would change from the existing LoS 'A' to a LoS 'B' for both north bound and south bound lanes as a result of the Project. The only other change to mid-block traffic volume LoS is for York Street north of Short Street for the south bound lane during the PM peak which would change from LoS 'A' to LoS 'B'. LoS B represents an acceptable level of service that is defined in the Guide to Traffic Generating Developments (Version 2.2, RTA October 2002) as the zone of stable flow where drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream, although the general level of comfort and convenience is little less than that of LoS A.

Similarly, there would be little change to intersection performance. Overall the traffic assessment has determined that the road network will continue to operate at acceptable levels. Even if all the predicted traffic were to access the site via this Racecourse Road/York Street/Toronto Road corridor the level of flows is such that there would be no discernible change in operations.

A swept path analysis was undertaken to assess turning manoeuvres for light and heavy vehicles accessing the Project site as well as internal circulation through the Project site (refer **Appendix J**). For light vehicles the assessment assumed a standard car with a 5 m trailer and for heavy vehicles assessment was undertaken for both semi-trailer and truck and dog. All turning manoeuvres into and out of the site for light and heavy vehicles can be undertaken successfully with allowance for two way passing. The site layout allows for all vehicle types to manoeuvre through the site in a forward direction.

In the event of several vehicles arriving at the Project site at the same time, the Stage 1 site layout (refer **Figure 3.1**) allows for vehicles to enter the site and pull over and wait, if required, before proceeding to the weighbridge. There is adequate space for several truck and dogs to be at or waiting to enter the weighbridge without queuing outside the site on the public road system. At Stage 2 the site layout (refer **Figure 3.2**) has the weighbridges located approximately 50 m further west within the Project site which allows adequate space for several large vehicles to queue along the access driveway within the site, if required, before proceeding onto the weighbridge.

Background Growth

To assess the potential traffic impact of the Project in the future, consideration was given to 'background growth' in traffic volumes for the road network. This is required to take into account additional traffic flows from sources other than the Project that add to the base traffic flows. A conservatively high background growth level of 30% (i.e. 3% per annum over 10 years) was used for this assessment. Currently intersection performance of the surveyed intersections is at LoS 'A' to 'C' and after consideration of background growth it was determined that intersection performance would still remain at satisfactory service levels.

Construction Traffic Management

As with operational traffic it is proposed that construction traffic be directed to use the Racecourse Road/ York Street/Toronto Road route to access the main road network. The proposed construction program will not require mobilisation of a major construction workforce. Rather the work will be completed in stages by small teams to suit equipment availability. Construction activities for the Project are planned to be undertaken between the hours of 7:00 am to 6:00 pm Monday to Friday and 8:00 am to 1:00 pm Saturdays.

As such, construction traffic impacts are not expected as a result of the Project.

Cumulative Impacts

Traffic flows were last recorded by NSW RMS on Five Islands Road north of the Toronto Road roundabout in 2010 at a weekday flow of 40,000 vehicles per day, with just over 20,000 travelling in the northbound direction. Allowing a factor for background growth at 2% would mean this daily flow would currently be around 46,000 vehicles per day. With peak hour flows typically in the range of 8% to 12% of total vehicles per day and with a fairly even 50/50 directional split, this places the peak hour flows at around LoS 'D' conditions Austroads (2009).

The forecast level of cumulative growth from the Project and including the proposed Teralba Asphalt Plant project is only around 60 vehicles in the peak hour representing only 1.5% which is considered to be well within the limits of normal fluctuations that occur in the traffic stream from day to day or hour to hour. If a growth rate is applied at the same rate as above for background growth this means the portion of flow is closer to 1%.

Based on the site observations, recorded existing peak traffic volumes and the conservative assumption that all traffic will use the southern transport route, the Short Street/York Street intersection remains below free flow thresholds (the combined flows at each intersection are less than the capacity levels below which intersection analysis is unnecessary as per the Austroads Guidelines. (AustRoads 2009). As such, no intersection analysis modelling was required.

6.4.6 Mitigation and Management Measures

No additional mitigation and management measures are required for the Project.

6.5 Soil and Water Management

A soil and water impact assessment has been prepared for the Project and is summarised in this section of the EIS. The full report is presented in **Appendix K**.

6.5.1 Surface Hydrology

The Project site is located in the Cockle Creek Estuary catchment that forms part of the broader Lake Macquarie catchment and is classified as having a high flood risk based LMCC flood risk mapping. The Project site is flat with the majority of stormwater runoff draining to the west naturally or via a central collection drain (refer **Figure 6.7**). This central collection drain flows to a vegetated surface drain running along the northern site boundary to discharge into a drainage depression at the north eastern corner of the Project site which in turn drains to the south prior to discharging into Cockle Creek approximately 1.5 km downstream. A relatively smaller section at the eastern end of the site catchment drains to the local stormwater system along Racecourse Road.

The Project site is situated in the Lower Cockle Creek Floodplain (the Floodplain) with lower portions of the Project site within the 1% Average Exceedance Probability (AEP) flood extent as determined by the Winding Creek and Lower Cockle Creek Floodplain Risk Management Study and Plan (BMT WBM, 2016).

6.5.2 Topography and Soils

The Project site is located on the alluvial flats of Cockle Creek with slope gradients of 0 to 2% (Soil Conservation Service of NSW, 1991). Landform ranges from moderately broad (<500 m) alluvial flats to broad (up to 1 000 m) deltaic deposits on lower Cockle Creek, with some relict terrace and levee deposits and point bar deposits (local relief up to 3 m, 5 to 10 m in width) (Soil Conservation Service of NSW, 1991).

Soils are deep (>200 cm), imperfectly to poorly drained yellow Soloths and Yellow Podzolic Soils on floodplains and deep (>200 cm), moderately well to poorly drained Yellow Earths, and Grey Earths on delta and fan deposits, with deep (>200 cm) imperfectly drained, to well-drained Yellow Podzolic Soils (Soil Conservation Service of NSW, 1991). Soils have a moderate to high erodibility and a moderate to high erosion hazard under concentrated flows.

Acid Sulfate Soils

Acid sulphate soils (ASS) mapping (Lake Macquarie City Council, 2014) shows that the Project site is located in a Class 2 zone where ASS is likely to be encountered. Online Office of Environment ASS risk maps classify the Project site as HAp1 - High Probability of occurrence; Alluvial process; Plain; 1 - 2 m. Works that may present an environmental risk on Class 2 lands include works below the natural ground surface and works by which the water table is likely to be lowered.

RCA undertook a contamination assessment (including an assessment of acid sulphate soils) for the Project site. The field pH of tested samples indicates that the soils are not actual acid sulphate soils. However, following oxidation with 30% hydrogen peroxide the soil samples had a significant drop in pH and as such net acid generating ability is considered likely. Therefore, the natural soils on the Project site should be considered potential acid sulfate soils (PASS) and, if exposed, they are likely to generate acid leachate which may cause potential environmental harm. If excavation or earthworks into natural soils to depths near to the groundwater table (approximately 3.0 - 5.0 m below ground level) are required an Acid Sulfate Soils Management Plan (ASSMP) will be developed for the Project.

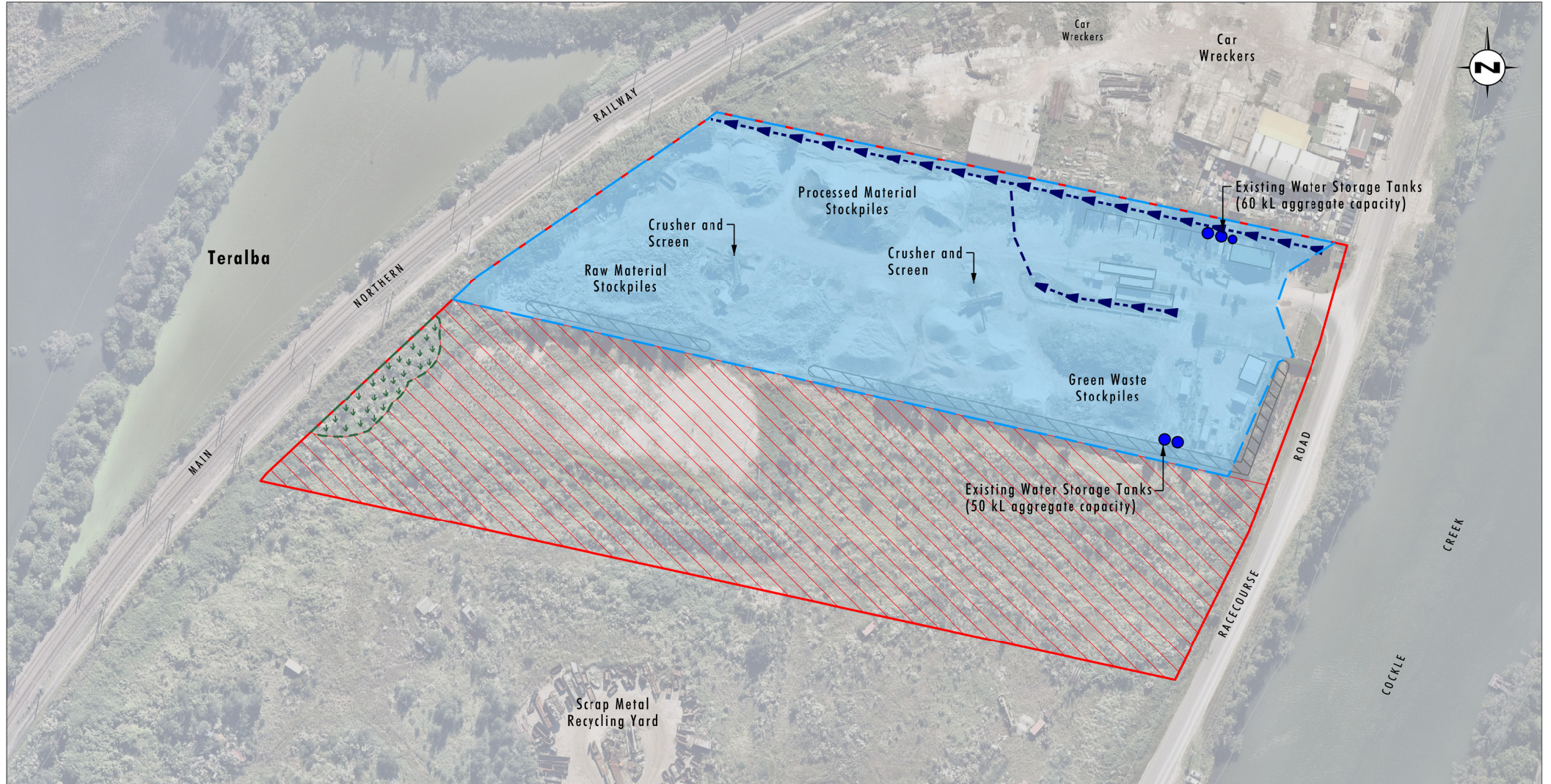


Image Source: Nearmap (May 2017)
Data Source: Concrush (2018)

0 25 50 100m
1:2 000

Legend

- Project Site
- Proposed Extension Area
- Existing Wetland Area with Buffer
- Northern Catchment Boundary
- Drain Pipe
- Surface Drain
- Existing Storage Water Tank

File Name (A4): R03/3972_069.dgn
20180831 14.12

FIGURE 6.7

Existing Surface Water
Management System

6.5.3 Water Quality

Cockle Creek Estuary

Turbidity levels and chlorophyll-a concentrations are monitored by LMCC in the Cockle Creek estuary to provide an indication of ecosystem health. The results are used to prepare a lake health scorecard that is published in the annual LMCC State of the Environment Report. In the 2016 - 2017 LMCC State of the Environment Report turbidity and chlorophyll-a concentrations continued to be highly variable on both long and short time scales with ecological health remaining the same as the previous year. Chlorophyll-a was the indicator of greatest concern, with concentrations exceeding the trigger value most frequently (LMCC, 2017). The concentration of chlorophyll-a in the water column is a biological indicator reflecting phytoplankton biomass, and typically reflects the nutrient load (OEH, 2017). That is, high chlorophyll-a concentrations indicate elevated nutrient loads in the waterway.

Five rounds of water quality monitoring have been undertaken in Cockle Creek upstream and downstream of Concrush in 2018. The water samples were analysed for a range of nutrients, pH, electrical conductivity (EC) and total suspended solids (TSS). The monitoring results were compared with the NSW Water Quality Objectives for Aquatic Ecosystems which are based on the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (Australian and New Zealand Environment and Conservation Council (ANZECC), 2000) default trigger values for slightly disturbed aquatic ecosystems (estuarine).

The health scorecard for the Cockle Creek Estuary (LMCC, 2017), in conjunction with the water quality monitoring undertaken by Concrush, indicate that the estuary has an existing high level of disturbance. However, this level of disturbance in the estuary is not unexpected given the historical industrial land use (e.g. the former Pasminco smelter and Incitec fertiliser manufacturing facility) and present land use activities (light industrial, commercial and urban) in the catchment.

Site Water Quality

Site stormwater samples at the existing Concrush site were collected at three locations across the existing site in November 2017, February 2018, May 2018 and June 2018 and analysed for a range of nutrients, pH, EC, TSS and turbidity. Statistics for the aggregated monitoring results is presented in **Table 6.24**.

Table 6.24 Concrush Site Water Quality, November 2017 to February 2018

Analyte	Units	Minimum	Average	Maximum
pH	-	6.95	8.20	9.72
EC	µS/cm	188	1,298	2,541
TSS	mg/L	9	145	608
Ammonia as Nitrogen (N)	mg/L	0.04	0.15	0.46
Nitrite as N	mg/L	0.08	4.61	17.6
Nitrate as N	mg/L	0.06	13.02	70
Nitrate + Nitrate	mg/L	0.06	17.12	76.7
Total Nitrogen	mg/L	1.0	21.7	87.3
Total Phosphorus	mg/L	0.07	0.62	1.77

The site water quality results exhibit elevated concentrations of TSS and nutrients in addition to a wide range of pH values. Green waste processing is the primary source of nutrients in water sampled within the WMS. The implementation of the conceptual proposed WMS incorporating additional stormwater storage for reuse, a constructed wetland and improved operational management practises (refer to **Section 6.5.5**) will ensure nutrient concentrations in site runoff will be significantly reduced for the Project.

Processing and handling of concrete, bricks and tiles is the primary source of TSS in site runoff. The implementation of the proposed site WMS incorporating improved erosion and sediment controls and additional stormwater storage for reuse (refer to **Section 6.5.5**) will ensure TSS concentrations in site runoff will be significantly reduced for the Project.

Elevated pH levels may primarily be attributed to concrete agitator wash out. The proposed site WMS will incorporate a separate wash out bay which will be designed with a minimal catchment with all runoff from this area being contained so that it does not discharge to the site stormwater system (refer to **Section 6.5.5**). Concrush have an exemption to receive concrete washout. Reclaimed water from the wash out bay will be reused as a first priority in the production of road base products.

6.5.4 Water Users

Water use downstream of the Project site in Cockle Creek and Lake Macquarie is primarily for recreational purposes including fishing, boating and swimming. No water is abstracted from Cockle Creek or Lake Macquarie for industrial or agricultural purposes.

6.5.5 Surface Water Management

Existing Water Management

The majority of the existing site catchment drains to the northwest of the property boundary either directly, or via the central stormwater collection pit that is piped to a vegetated swale running along the northern boundary (refer to **Figure 6.7**). Runoff from the central area of the site which incorporates the green waste storage and processing area reports to a central drainage pit (refer to **Figure 6.7**). The central drainage pit contains a submersible pump that discharges to an irrigation system to water the vegetated areas of the property. In periods of high rainfall excess water from the central drainage pit drains via an underground pipe to the vegetated swale running along the northern boundary. Stormwater runoff from the vegetated swale drains to south in a drainage depression running south along the Main Northern Railway Line until it joins Cockle Creek approximately 1.5 km downstream. Runoff from a small section of catchment at the eastern end of the site drains via the driveway to the off-site stormwater system adjacent to the north east corner of the site on Racecourse Road.

Water for material processing and dust suppression is sourced from either captured stormwater that is stored in 5 tanks with an aggregate capacity of 110 kL or from the reticulated Hunter Water Corporation (HWC) potable supply. The majority of the potable water is collected in Concrush's 8.5 kL water cart via a standpipe adjacent to Teralba Oval on York Street, Teralba, approximately 2 km to the south east of Concrush.

Proposed Water Management

The conceptual proposed WMS for the Project will comprise of three main catchments as presented in **Figure 6.8**. **Figure 6.9** presents a schematic of the conceptual proposed WMS.

The overall water management strategy is to retain as much runoff from catchments with a higher likelihood of elevated contaminants in runoff for on-site reuse in material processing and dust suppression. Primary controls will comprise sediment dams, a Leachate Dam and a Constructed Wetland. Site water storage tank capacity will be increased by at least 200 kL to 310 kL. The maximum quantity of green waste to be stored and processed at the Project will be unchanged from the existing operation. Green waste storage inventories will be maintained below 200 tonnes and the processing rate will be approximately 3,000 tonnes per annum. As such the green waste storage and processing component of the Project is below the inventory and processing thresholds in Schedule 1 of the POEO Act.

In addition to the three primary catchments, the Project site will have two isolated catchments: the Concrete Agitator Washout Bay and the Wheel Wash (refer to **Figure 6.8**). Concrete washout water will have a high proportion of fine solids and an elevated pH. Wheel wash water will have a high concentration of sediment. Concrete agitator washout water and wheel wash water will be contained on site and used as a first priority for operating demands.

Runoff and seepage from the green waste catchment will be contained in the leachate dam which will be lined with a flexible membrane liner with a permeability of less than 10^{-14} m/s and will be sized to accommodate the runoff from a 1 in 10 year, 24 hour duration storm event in accordance with the *Environmental Guidelines for Composting and Related Organics Processing Facilities* (NSW Department of Conservation, 2004). Water captured in the leachate dam will be transferred to the constructed wetland (which will also incorporate a membrane liner with a permeability of less than 10^{-14} m/s) for nutrient and sediment removal. Discharge from the leachate dam to the constructed wetland will be at a rate to enable the design capacity (i.e. runoff from a 1 in 10 year, 24 hour duration storm event) to be restored within 5 days of a rainfall event. Treated water from the constructed wetland will be transferred by pump to water storage tanks for reuse.

The green waste storage and processing catchment will also be designed and constructed in accordance with the *Environmental Guidelines for Composting and Related Organics Processing Facilities* (NSW Department of Conservation, 2004). The green waste storage and handling area will incorporate a leachate barrier equivalent to a 600 mm clay liner with an *in-situ* permeability of less than 10^{-7} m/s and be bunded and graded to ensure all runoff reports to the leachate dam.

Treated runoff containing reduced nutrient concentrations discharging from the constructed wetland will be retained for reuse as a first priority. The constructed wetland is expected to achieve a reduction of approximately 75% in Total Nitrogen (TN) and 50% in Total Phosphorus (TP) concentrations based on the likely green waste catchment runoff water quality to be collected in the leachate dam (refer to **Section 6.5.3**).

Runoff from the Northern Catchment (i.e. the existing portion of the site) will drain to the existing vegetated swale running east to west along the northern site boundary to Sediment Basin 1 which will be constructed as part of the Project. Runoff from the Southern Catchment (i.e. the proposed site extension) will drain to a vegetated swale east to west running along the southern site boundary to Sediment Dam 2. Excess water discharging from the constructed wetland during rainfall events will also drain to the southern vegetated swale and into Sediment Dam 2 and be diluted by runoff from the Southern Catchment. As such, Sediment Dam 2 has been sized to accommodate runoff from the Southern Catchment and green waste catchment. Sediment dams have been sized in accordance with *Managing Urban Stormwater Volume 1* (The Blue Book) (Landcom, 2004).

Water for material processing and dust suppression will be reticulated on site via a new pump and pipe system. A new 12 kL water cart will be used to assist the existing 8.5 kL water cart to supply the increased processing, stockpile dust suppression and internal road dust suppression demands. During dry periods where the Project has a water deficit, the water carts will continue to collect water from the Hunter Water potable supply adjacent to Teralba Oval.

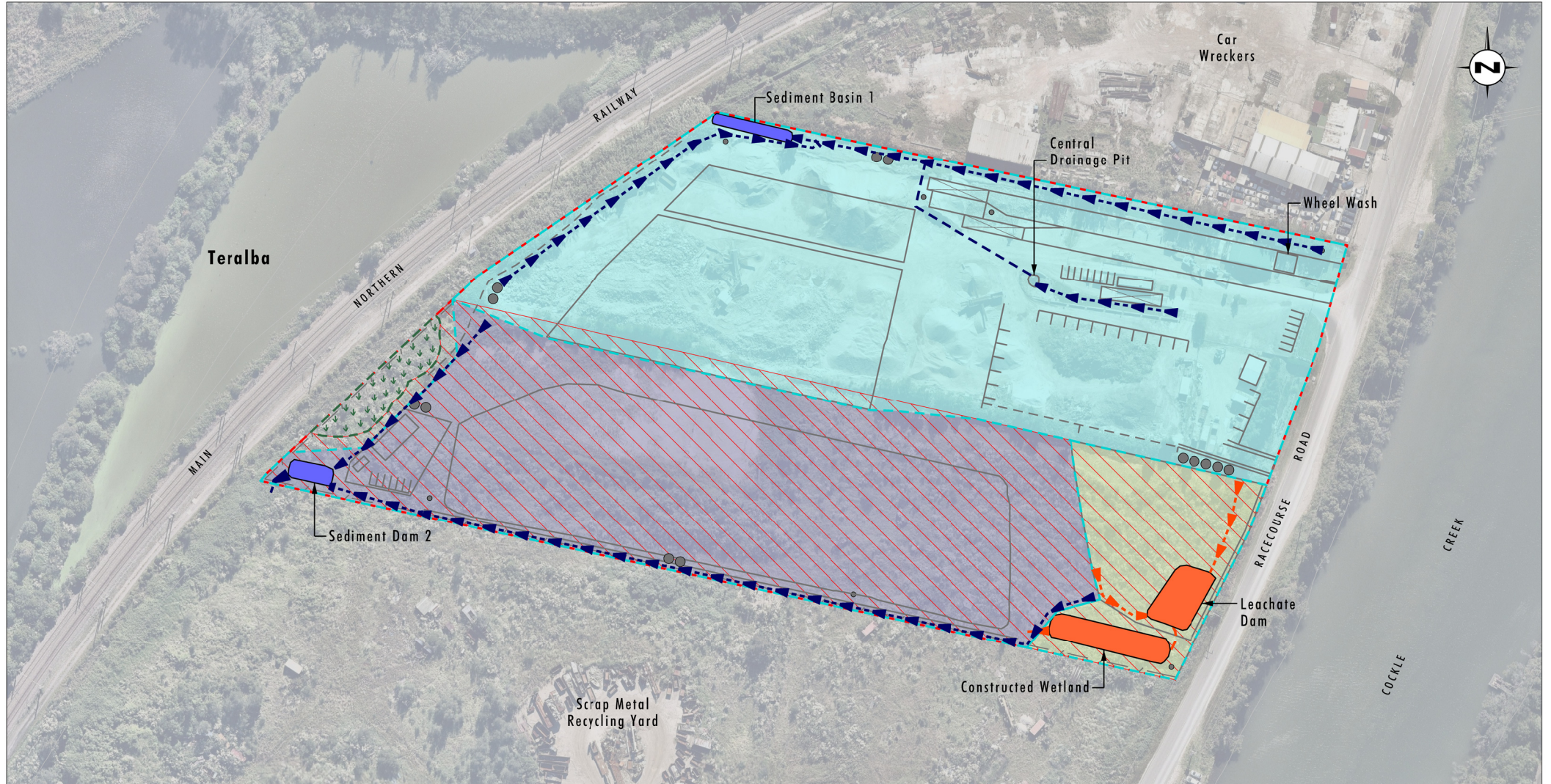


Image Source: Nearmap (May 2017)
Data Source: Concrush (2018)

0 25 50 100m
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Legend

- | | | |
|--|--|---|
| Project Site | Green Waste | Leachate Pipe |
| Proposed Extension Area | Sediment Dam | Leachate Drain |
| Existing Wetland Area with Buffer | Drain Pipe | |
| Northern Catchment Boundary | Surface Drain | |
| Southern Catchment Boundary | Leachate Dam | |

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20181109 9.50

FIGURE 6.8

Conceptual Surface Water
Management System

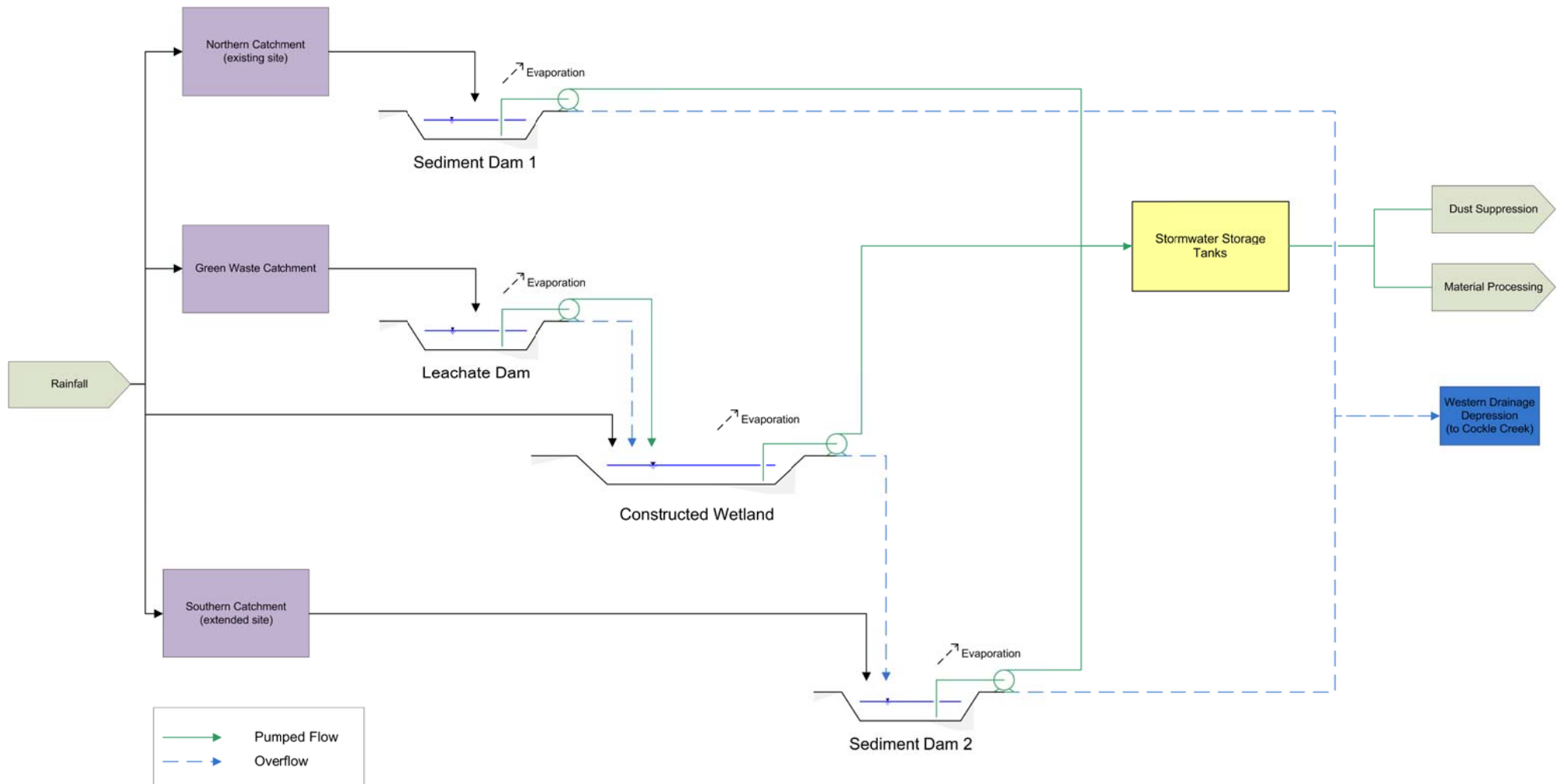


FIGURE 6.9
Conceptual Surface Water
Management System Schematic

6.5.6 Water Balance

A daily time step water balance model (the Model) for the Project was prepared. The model is based on 27 years of daily rainfall data from the BoM Edgeworth WWTW (station 061393) station and mean monthly evaporation from the BoM Williamstown Station (station 61078). The model has been calibrated by adjusting dust suppression demands to match the recorded site water demand.

The existing average operational water demand is approximately 8,000 kL/year with a peak water demand of approximately 100 kL/day during hot and dry weather. This demand will increase as a result of the larger Project catchment area (stockpiles, open areas), increased dust suppression application rates to improve air quality performance and higher material processing rates. Water demands modelled for the Project were:

- Evaporative losses from water storages
- Dust suppression of stockpiles, roads and open areas
- Processing equipment dust suppression
- Losses as product moisture.

Water to supply operational demands will be sourced from captured stormwater runoff on site and the Hunter Water potable supply.

Average water balance results for the existing Concrush operation and the Project are presented **Table 6.25**.

Table 6.25 Average Water Balance Results

	Parameter	Existing Result (kL)	Project Result (kL)
Inflows	Rainfall and Runoff	11,770	31,197
	Imported Potable Water	8,076	53,759
	Total Inflows	19,846	84,976
Outflows	Evaporation from Water Storage Surfaces	-280	-1,576
	Dust Suppression and Product Moisture	-11,655	-68,500
	Off-site Discharge (in periods of high rainfall)	-7,940	-14,965
	Total Outflows	-19,876	-85,041
Change in Storage		-30	-63
Net Water Balance		0	0

The average water balance results (refer to **Table 6.25**) demonstrate an increased rainfall/runoff inflow for the Project as a consequence of the additional catchment area and dam surface area compared to the existing operation as well as a significant increase in Project dust suppression demand. Off-site discharge volumes are also shown to increase by almost 100% which is a result of increase rainfall/runoff inflows.

6.5.7 Potential Impacts

Water Quality

Activities which have the potential to cause erosion and generate sediment include:

- Clearing and stripping ahead of construction activities.
- Construction of hardstand areas and site roads.

- Rainfall/runoff on active work construction areas.
- Runoff flowing across the disturbed areas into drains.
- Runoff flowing across hardstand areas and off material (raw and processed) stockpiles.

Practical erosion and sediment controls will be implemented to minimise the generation of sediment on site and transport of sediment around and off-site, as described in the following sections.

The quality of stormwater discharging to the environment from the Project is expected to improve as a result of the following mitigation measures:

- construction of appropriately designed and managed Type C sediment basins (Sediment Dam 1 and Sediment Dam 2)
- separation of the green waste storage and processing catchment and the construction of the Leachate Dam to capture a 1 in 10 year 24 hour duration storm event from the Green Waste Catchment
- installation of a Constructed Wetland to treat water captured in the Leachate Dam
- roofing the retail area mulch storage bays;
- increased on-site stormwater storage to increase reuse of captured stormwater and the prioritised reuse of water discharged from the Constructed Wetland
- the containment of the concrete wash out bay catchment and reuse of the reclaimed water will minimise the risk of elevated pH in stormwater discharges.

Water collected onsite will be reused for dust suppression and irrigation as a priority. The conceptual proposed WMS incorporating the mitigation measures listed above is expected to result in off-site discharges, during periods of high rainfall with lower concentrations of nutrients and TSS. **Table 6.26** presents the estimated water quality at the point of discharge from the Project.

Table 6.26 Estimated Project Discharge Water Quality

Parameter	Units	Value
pH	-	7.0 – 8.5
TSS	mg/L	<50
TN	mg/L	1.14 ¹
TP	mg/L	0.19 ²

Notes:

1. Based on average measured TN concentration in site water and 75% reduction from treatment in the Constructed Wetland and dilution with runoff from the Southern Catchment
2. Based on average measured TP concentration in site water and 50% reduction from treatment in the Constructed Wetland and dilution with runoff from the Southern Catchment

The estimated average discharge nutrient concentrations presented in **Table 6.26** are comparable with baseline nutrient water quality results measured in Cockle Creek during rainfall events. Stormwater discharging from Sediment Dam 1 and Sediment Dam 2 will then flow south along the drainage depression adjacent to the Main Northern Rail Line toward Cockle Creek. This 1.5 km vegetated drainage path will result in additional sediment and nutrient removal prior to any discharged stormwater from the Project entering Cockle Creek. Given the prioritised reuse of treated leachate for site operational demands and the increase in operational water demands, site discharges containing treated leachate are expected to be infrequent. It is expected that discharges containing treated leachate will only occur in significant rainfall events where substantial dilution of the treated leachate will occur.

Groundwater

Incorporation of a leachate barrier system for Project green waste storage and handling area and the lining of the Leachate Dam and Constructed Wetland in accordance with the Environmental Guidelines for Composting and Related Organics Processing Facilities (NSW Department of Conservation, 2004) will enable the Project to have a very low risk of impacting groundwater water quality.

Flooding

The Project site is situated in the Lower Cockle Creek Floodplain (the Floodplain) with lower portions of the Project site within the 1% Average Exceedance Probability (AEP) flood extent as determined by the Winding Creek and Lower Cockle Creek Floodplain Risk Management Study and Plan (BMT WBM, 2016). The maximum flood depth for the 1% AEP based on the existing site landform is presented in **Figure 6.10**.

The 1% AEP flood levels as quoted in the Lake Macquarie Council's Property Enquiry tool quote the following levels:

- 2.35 mAHD for catchment flooding (Winding Creek and Lower Cockle Creek Flood Study, 2013), and
- 1.50 mAHD for Lake flooding (Lake Macquarie waterway Flood Study).

Most of the Project site is above RL 1.50 mAHD (LiDAR survey dated by September 2014) and hence not subject to Lake flooding. The applicable flooding envelope is therefore RL 2.35 mAHD.

Through levelling and placement of a 0.5 m capping layer (refer **Section 6.12**) over the majority of the expanded portion of the Project site, the 1% AEP flood standard RL of 2.35 mAHD will be met. It is not proposed to place a capping layer over the wetland area in the south western portion of the Project site.. The levelling and capping represents a loss of flood storage of approximately 1 ML, mostly located on the eastern boundary of the site.

The proposed Leachate Dam and Sediment Dams to be constructed will provide an on-site stormwater detention capacity of approximately 0.3 ML which offsets approximately 30% of the flood storage loss. The remaining 0.7 ML storage loss is considered insignificant in comparison with the broader catchment flood volume from the 1% AEP flood of approximately 35,640 ML (when assuming a hypothetical 36 hour triangular flood hydrograph). The Project site is also located outside the Cockle Creek conveyance area thereby assuring that hydraulic effects of any filling are not significant.

Water Users

Given the expected improvements in the water quality of water discharged from the Project during periods of high rainfall, no impact on Lake Macquarie water users is expected.

Soils

As outlined in **Section 6.5.2** the southern section of the Project site is underlain by PASS. During Project development some excavation will be required to allow the construction of dams and drains leading to potential exposure of PASS. If excavation or earthworks into natural soils to depths near to the groundwater table (approximately 3.0 to 5.0 m below ground level) are required an ASSMP will be prepared for the Project to manage potential environmental impacts associated with acid generation from any excavated PASS. It is anticipated that the ASSMP will include measures to neutralise the PASS on site for reinstatement in areas of the site requiring filling.

As identified in the contamination assessment for the Project (refer to **Section 6.12**) a clean fill layer of 0.5 m depth will be placed across the southern part of the Project site. A marker layer such as geotech fabric is to be established to distinguish the clean fill layer from the existing soils beneath.

The Project is not expected to have any impacts on soil salinity.

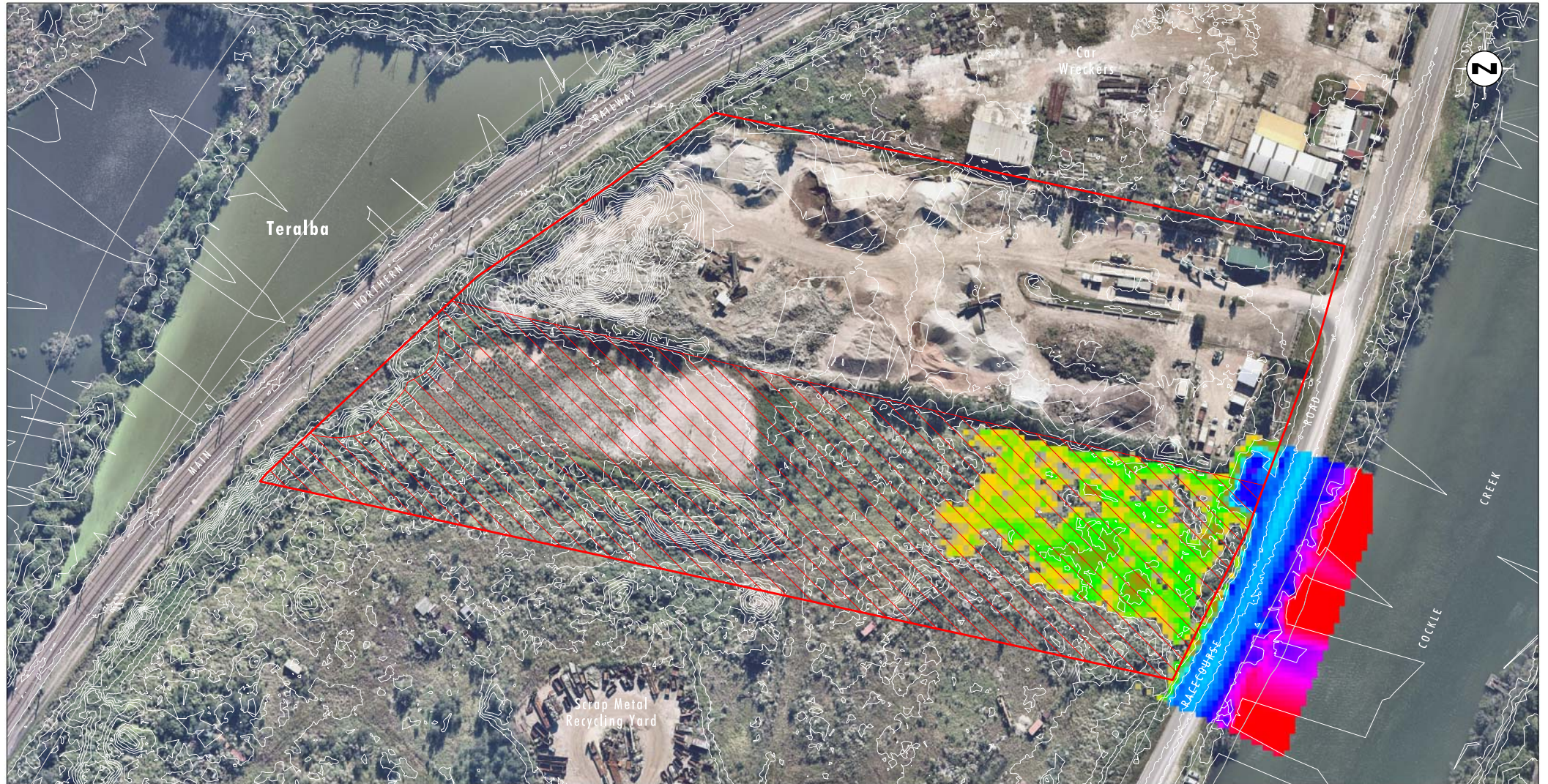


Image Source: Nearmap (May 2017)
 Data Source: Lidar Survey (Sept. 2014)
 Note: Contour Interval 0.5m

0 25 50 100m
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Legend		Depth (metres)		
	Project Site	 1.9	 1.1	 0.3
	Proposed Extension Area	 1.7	 0.9	 0.1
	Contours, Existing Landform	 1.5	 0.7	 0.001
		 1.3	 0.5	

FIGURE 6.10

Proposed Development Site, 1% AEP Flood Max Depth

6.5.8 Mitigation and Management Measures

The following mitigation and management measures will be implemented for the Project:

Water quality measures will be implemented for the Project to minimise impact on the surrounding environment. These controls are designed and constructed to a standard consistent with:

- Managing Urban Stormwater – Soils and Construction, Volume 1 (the Blue Book) (Landcom, 2004)
- Managing Urban Stormwater – Soils and Construction, Volume 2E: Mines and Quarries (DECC, 2008).

Construction

A construction erosion and sediment control plan (ESCP) will be developed in accordance with the Blue Book for detailing the specific erosion and sediment controls, rehabilitation, monitoring and maintenance requirements for the construction phase of the Project. The construction ESCP will:

- Be prepared on relevant copies of drainage drawings for:
 - Different construction stages
 - Areas of high erosion hazard.
- Show sizing and design details for all sediment basins and erosion and sediment controls (such as diversion drains).
- Be revised when required by changing circumstances, if the site conditions change or if installed controls are not operating effectively.
- Be integrated with work procedures, construction method statements, activity statements and their scheduling.
- Be site specific.

The measures are designed to minimise erosion and transport of sediment around and off-site and include:

- Clearly identifying and delineating areas required to be disturbed and ensuring that disturbance is limited to those areas
- clearing as little vegetation as required and minimising machinery disturbance outside of these areas
- Installing appropriate erosion and sediment controls prior to stripping topsoil or disturbing areas;
- limiting the number of roads and tracks established
- Stabilising site entry/exit points to ensure sediment is not tracked onto sealed roadways
- construction of drains upslope of areas to be disturbed to convey clean runoff away from most disturbed areas where required
- construction of sediment dams where required to capture and treat runoff from disturbed catchment areas
- During construction all temporary controls will be inspected:
 - Daily for high risk controls such as within drainage lines
 - Weekly for all other controls

- Prior to forecasted rainfall events great than or equal to 10 mm
- After rainfall events greater than or equal to 10 mm in a 24 hour period.

All construction erosion and sediment control measures will be maintained in a functioning condition until all construction activities are completed.

Operation

An operational ESCP will be incorporated into an updated version of the Concrush Site Water Management Plan and include:

- construction of appropriately designed and managed Type C sediment basins (Sediment Dam 1 and Sediment Dam 2)
- separation of the green waste storage and processing catchment and the construction of the Leachate Dam to capture a 1 in 10 year 24 hour duration storm event from the Green Waste Catchment
- installation of a Constructed Wetland to treat water captured in the Leachate Dam
- roofing the retail area mulch storage bays
- increased on-site stormwater storage to increase reuse of captured stormwater and the prioritised reuse of water discharged from the Constructed Wetland
- Incorporation of a leachate barrier system for Project green waste storage and handling area and the lining of the Leachate Dam and Constructed Wetland
- containment of the concrete wash out bay catchment and reuse of the reclaimed water
- Monthly inspections of long-term erosion and sediment controls will be undertaken as well as inspections prior to and after forecasted rainfall events greater than or equal to 10 mm.

All erosion and sediment control measures, including drainage control measures, will be maintained in proper working order at all times during their operational lives.

Monitoring

Concrush will undertake monthly surface water quality monitoring of the constructed wetland, sediment basins and upstream/downstream Cockle Creek. The following parameters will be tested: TSS, EC, pH, TN, TP, NO_x, NH₄.

Monitoring bores will be installed up and down the hydraulic gradient from the green waste storage and processing area in accordance with the *Environmental Guidelines for Composting and Related Organics Processing Facilities* (NSW Department of Conservation, 2004). Water quality samples will be collected from the monitoring bores on a monthly basis and analysed for TSS, EC, pH, TN, TP, NO_x and NH₄.

Concrush will monitor the following water volumes:

- Monthly potable water imported via water cart
- Monthly water storage inventories.

6.6 Ecology

As the Project is SSD it requires a Biodiversity Assessment Method (BAM) assessment under the *BA Act*. A Biodiversity Development Assessment Report (BDAR) has been prepared to assess the potential biodiversity impacts of the Project in accordance with the BAM. The BDAR is summarised in this section of the EIS with the full report presented in **Appendix L**.

6.6.1 Methods

The biodiversity assessment involved literature and database reviews, site surveys, BAM floristic and vegetation integrity surveys and habitat assessments.

Literature and Database Review

A review of previous documents and reports relevant to the Project was undertaken. This included regional vegetation mapping reports, site-specific surveys, ecological surveys undertaken in the vicinity of the site and also relevant ecological database searches. The information obtained was used to inform survey design, and was also used to assist in the assessment of potentially occurring threatened and migratory species, endangered populations (EPs) and Threatened Ecological Communities (TECs).

Relevant documents included:

- Vegetation Mapping of Lake Macquarie LGA: Stages 1-3 (Bell and Driscoll 2012)
- VIS Classification Database (OEH 2018c), accessed January 2018
- Threatened Biodiversity Data Collection (OEH 2018b) reporting for known/predicted threatened communities in the Wyong IBRA subregion
- DoEE Protected Matters Search Tool for known/predicted EPBC Act-listed TECs, accessed January 2018.

Digital Aerial Photograph Interpretation

Digital imagery (aerial photographs) of the Development Footprint was viewed prior to and after vegetation survey to identify any spatial patterns in vegetation, existing land use and landscape features. These informed field survey design and implementation, ecological assessment and vegetation community mapping of the Development Footprint.

Site Survey

A preliminary site inspection of the Project site was undertaken on 6 October 2017 to confirm the vegetation communities and habitats present. The focus of this survey was to confirm the presence or otherwise of native vegetation and habitats for threatened and migratory species, populations and TECs and their potential habitats listed under the BC Act, EPBC Act and the FM Act. Eight rapid vegetation assessments were undertaken across the Project Site.

Based on the outcomes of the initial site inspection, two floristic plots and vegetation integrity surveys were undertaken to determine whether the vegetation meets the minimum vegetation integrity threshold for the BAM.

6.6.2 Results

The Project site is primarily dominated by exotic vegetation that has invaded previously disturbed areas. While there are minor occurrences of colonising native species (such as common couch (*Cynodon dactylon*), black wattle (*Acacia decurrens*) and regenerating swamp oak (*Casuarina glauca*)) the majority of the site consists of exotic species including coastal morning glory (*Ipomoea cairica*), groundsel bush (*Baccharis halimifolia*), lantana (*Lantana camara*), crofton weed (*Ageratina adenophora*), purpletop (*Verbena bonariensis*) and lambs tongues (*Plantago lanceolata*). Dense exotic grasses include guinea grass (*Megathyrsus maximus*), pampas grass (*Cortaderia selloana*), kikuyu (*Pennisetum clandestinum*) and Coolatai grass (*Hyparrhenia hirta*).



Plate 6.1 Exotic Vegetation dominating the Project site

© Umwelt, 2018

While the majority of the Project site is dominated by exotic vegetation there are some areas that contain native flora species. These include the landscape bunds (refer to **Figure 2.1**) which have been planted with swamp oak (*Casuarina glauca*) and some adjacent areas within the exotic vegetation that contain regenerating swamp oak. No threatened ecological communities listed under the BC Act or EPBC Act were recorded within the Project site.

A small area of degraded freshwater wetland occurs on the western boundary of the site (refer **Figure 3.1**). This wetland is likely to have been created following the construction of the adjacent rail line and the bund within the Project site. While this area is also highly degraded and infested with weed species, the habitat in this area is considered more likely to comprise fauna habitat than other areas of the Project site. The Project design has been developed to avoid this habitat area.

The Project site contains very few habitat features (no hollow-bearing trees, few fallen logs and minimal vegetation cover). Due to its highly disturbed nature, no threatened fauna species were considered likely to occur within the Project site.

6.6.3 Impacts

The Project would require the removal of native vegetation associated with some of the planted landscape bunds. Approximately 0.07 ha of native vegetation which provides marginal fauna habitat would be removed.

The Project would not result in any substantial indirect impacts on the biodiversity values of surrounding lands such as connectivity, corridors, habitat fragmentation or light emissions. There is the potential for some minor indirect impacts associated with noise, dust and weeds during the construction and operation of the Project, however, these will be managed through mitigation and management measures applied for both construction and operational phases of the Project.

Following the application of the BAM calculator and appropriate avoidance measures, the BAM assessment identified that the plant community types occurring did not meet the minimum vegetation integrity score to require offsetting under the BAM.

6.6.4 Mitigation and Management Measures

The Project design has taken into account the wetland area in the western part of the site which will not be disturbed. Mitigation and management measures for other environmental aspects such as soil and water and air quality will minimise the potential for indirect offsite impacts such as sedimentation of waterways, nutrient discharge and dust impacts.

The following mitigation and management measures will be implemented for the Project:

- Areas to be protected during construction works including the wetland area will be cleared marked
- Landscape planting will consist of native species.

6.7 Bushfire

The Project site is predominantly cleared of any significant vegetation with the southern portion of the site supporting some groundcover vegetation with isolated shrubs. Larger areas of vegetation are present to the south of the Project site and the adjacent scrap metal yard (refer to **Figure 2.2**). Some vegetation also exists along the western boundary of the site associated with the railway corridor. Racecourse Road runs along the eastern boundary and the property adjoining the northern boundary of the site is cleared of vegetation and currently supports a car wrecking yard.

The Project site is not identified as bush fire prone land in the LMCC Bush fire Prone Land mapping system. Land to the west and southwest of the site is mapped as bush fire buffer land (refer to **Figure 6.11**). The existing vegetation immediately to the west is generally sparse, the existing vegetation to the south of the site and to the southwest beyond the railway corridor represents a fuel load which could be capable of sustaining and promoting a bush fire and is the most significant threat to the site.

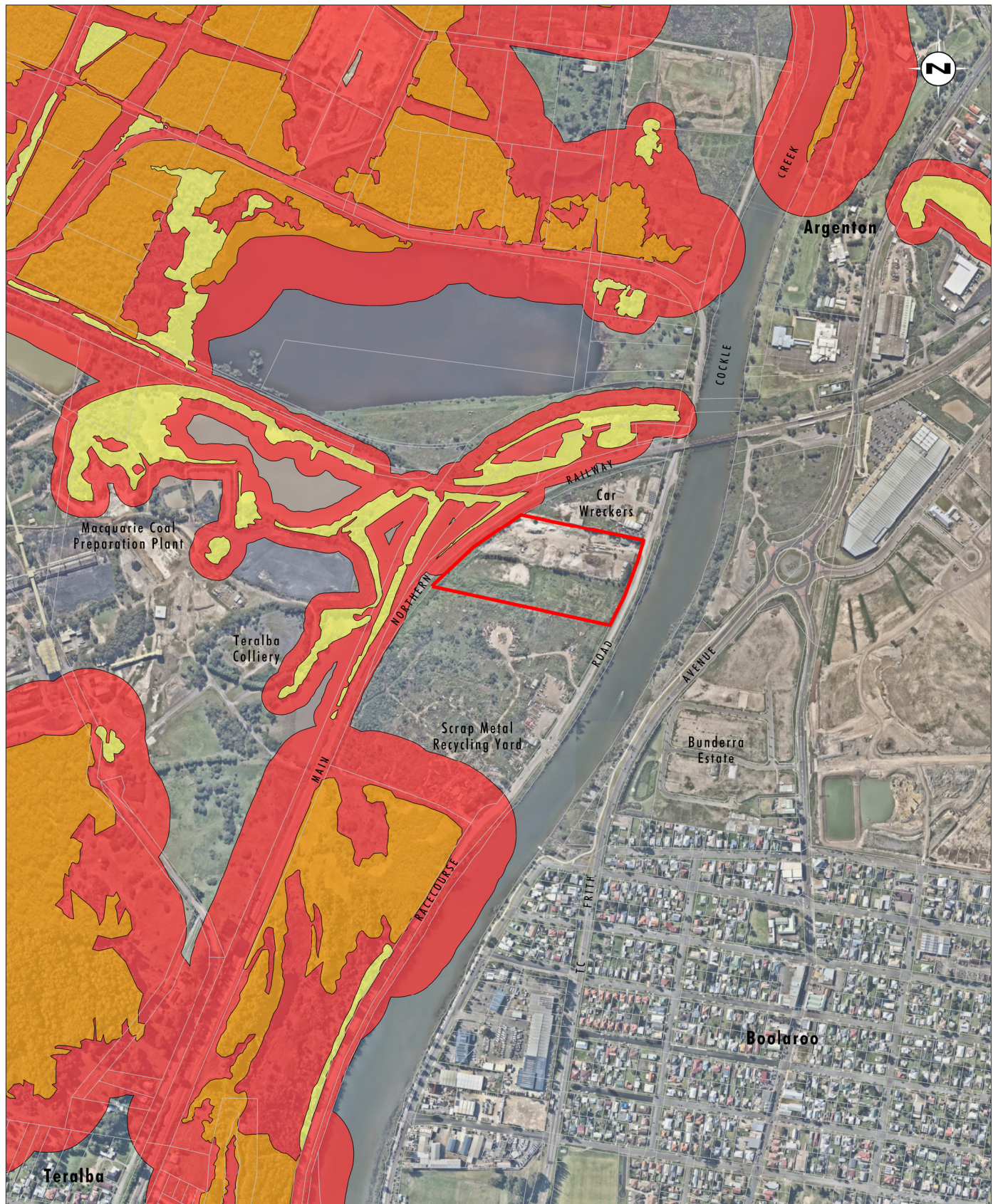


Image Source: Nearmap (Jun 2018)
Data Source: LPI (2017), NSW Rural Fire Service (2016)

0 100 250 500m
1:10 000

Legend

- ▬ Project Site
- Bush Fire Vegetation Category 1
- Bush Fire Vegetation Category 2
- Bush Fire Vegetation Buffer (100m and 30m)

FIGURE 6.11

Bush Fire Prone Land

6.7.1 Bushfire Threat Assessment

A bushfire threat assessment identifies the bushfire threat across a site based on the likely response of fire to fuel loads, slope and aspect. This involves assessing the vegetation formations and the slope of the land to determine the appropriate Asset Protection Zones (APZs) for the Project as required in accordance with the methods prescribed in *Planning for Bush fire Protection 2006* (PBP 2006). It is noted that PBP 2006 was developed to provide a guide to the necessary planning considerations when developing areas for residential use which are likely to be affected by bushfire. No specific set back distances are prescribed for industrial development in bushfire prone areas, nor does the Building Code of Australia (BCA) provide any bushfire performance requirements for Class 5 – 8 and 10 buildings. Notwithstanding, all development is required to be consistent with the aims and objectives of PBP 2006. While the requirements of PBP 2006 do not specifically apply to a Project of this nature, the methods in PBP 2006 for calculating APZs have been used as a guide in the assessment for the Project.

Vegetation Formations

Vegetation formations play a key role in bushfire behaviour. Woodland and forest vegetation formations represent large fuel loads due to the presence of understory vegetation, leaf litter and for forest vegetation, the connection of the trees within the canopy.

The Project site is located at the northern end of Lot 2 DP 220347. The majority of the southern end of this lot supports grassland with scattered shrubs. The adjoining lot to the south supports larger areas of woodland/forest vegetation however this vegetation is over 400 m from the Project site. The western boundary of the Project site supports a stand of vegetation which acts as a windbreak/screen. The site adjoining the Concrush site to the north has been predominately cleared of vegetation (refer to **Figure 2.2**).

Slope Analysis

Slope plays an important role in the rate a bushfire can spread. As a bushfire spreads it pre-heats the fuel source through radiation and convection and as a consequence of this heat transfer, fire accelerates when travelling uphill and will decelerate when travelling downhill.

The site is relatively low lying located in close proximity to Cockle Creek. The site and the surrounding land is predominantly flat.

Asset Protection Zones

An APZ is a fuel reduced area surrounding a built asset or structure. While PBP 2006 has been developed for residential development, the method for the development of an APZ provided by PBP 2006 can be used as a guide for all developments which may be affected by bush fire.

The required APZs comparing grassland, woodland and forest vegetation on upslope/flat land (the predominant slope surrounding the site) **are 10, 10 and 20 m**. The proposed design of the site layout allows for the forward traffic movement around the site and the separation of material stockpile areas (refer **Figure 3.1**), this layout provides for a separation distance of greater than 20 m from the vegetation along the western boundary and approximately 600 m from the bush fire prone land to the north west of the Project site (refer **Figure 2.2**). The Project site is located at the northern end of the Lot, separated from the southern boundary by a large cleared area and the existing scrap metal yard which provides a separation distance of approximately 400 m between the site and the bushfire prone land and vegetation to the south. The Project site is also separated from the bushfire prone land that adjoins the Lot to the north by the existing car wreckers yard.

The main access to the site is from Racecourse Road which provides good access for emergency vehicles. Access to and around the site will always be maintained throughout the operation of the site.

Green Waste Stockpiles

Prior to providing recycled green waste products for sale, Concrush undertakes a pasteurisation process to eliminate a number of potential plant and soil pathogens. During the pasteurisation process there is the potential for combustion of the green waste stockpiles. Concrush actively manage the pasteurisation process to minimise this potential by measuring the temperature within the middle of the pasteurisation stockpiles on a daily basis in accordance with the Pasteurised Garden Organic Materials Management Plan.

6.7.2 Bushfire Management

Concrush have an existing Pollution Incident Response Management Plan (PIRMP) which includes the relevant evacuation procedure for staff and the public in relation to bushfire threat. Threat of the combustion of product on site is managed through appropriate storage of materials and implementation of separation distances between stockpiles. During hot conditions stockpiles are wetted down and all operators are trained in firefighting techniques.

The following specific bushfire management measures are to be implemented at the site to manage the risk associated with the bushfire hazard:

- installation of Fire and Rescue NSW compatible fittings on the water storage tanks near the green waste area
- Management of the pasteurisation process within green waste stockpiles
- Ensure machinery is available on site to break up green waste stockpiles in the event of combustion during pasteurisation
- continued management of vegetation across the site to manage fuel loads and prevent the spread of bushfire across the site
- continued provision of fire extinguishers on all machinery
- ensuring access to the site is maintained at all times.

With the effective implementation of the existing and proposed bushfire management measures, it is considered that bushfire risk can be appropriately managed at the Project site.

6.8 Aboriginal Cultural Heritage

Environmental Context

The Project site is located on the western bank of Cockle Creek between Racecourse Road and the Great Northern Railway at Teralba. The Project site falls within the Cockle Creek Soil Landscape where the topography consists of narrow alluvial flats up to 500 m wide to wider drainage plains up to 1 km wide with some relict terrace and levee deposits in proximity to lower Cockle Creek. The geology consists of Quaternary alluvial sediment derived from sandstone, siltstone, conglomerate, shale and tuff from the upper catchment. Slopes are generally 0 to 2%. The lower Cockle Creek area consists of predominantly cleared woodland of *Angophora costata* (smooth-barked apple), *Angophora floribunda* (rough-barked apple) and *Corymbia gummifera* (red bloodwood). *Casuarina glauca* (swamp-oak) commonly occurs along drainage channels.

The Project site forms part of a low lying swampy landscape located between two primary transportation routes. The Project site has been subject to modern industrial uses with little historical development across the site (**Plate 6.1** and **6.2**). The Project site is currently situated within an industrial area. Due to its location adjacent to Cockle Creek the site would historically have been subject to flooding and have high water tables with periodic waterlogging. To make it suitable for industrial use the site has previously been filled.

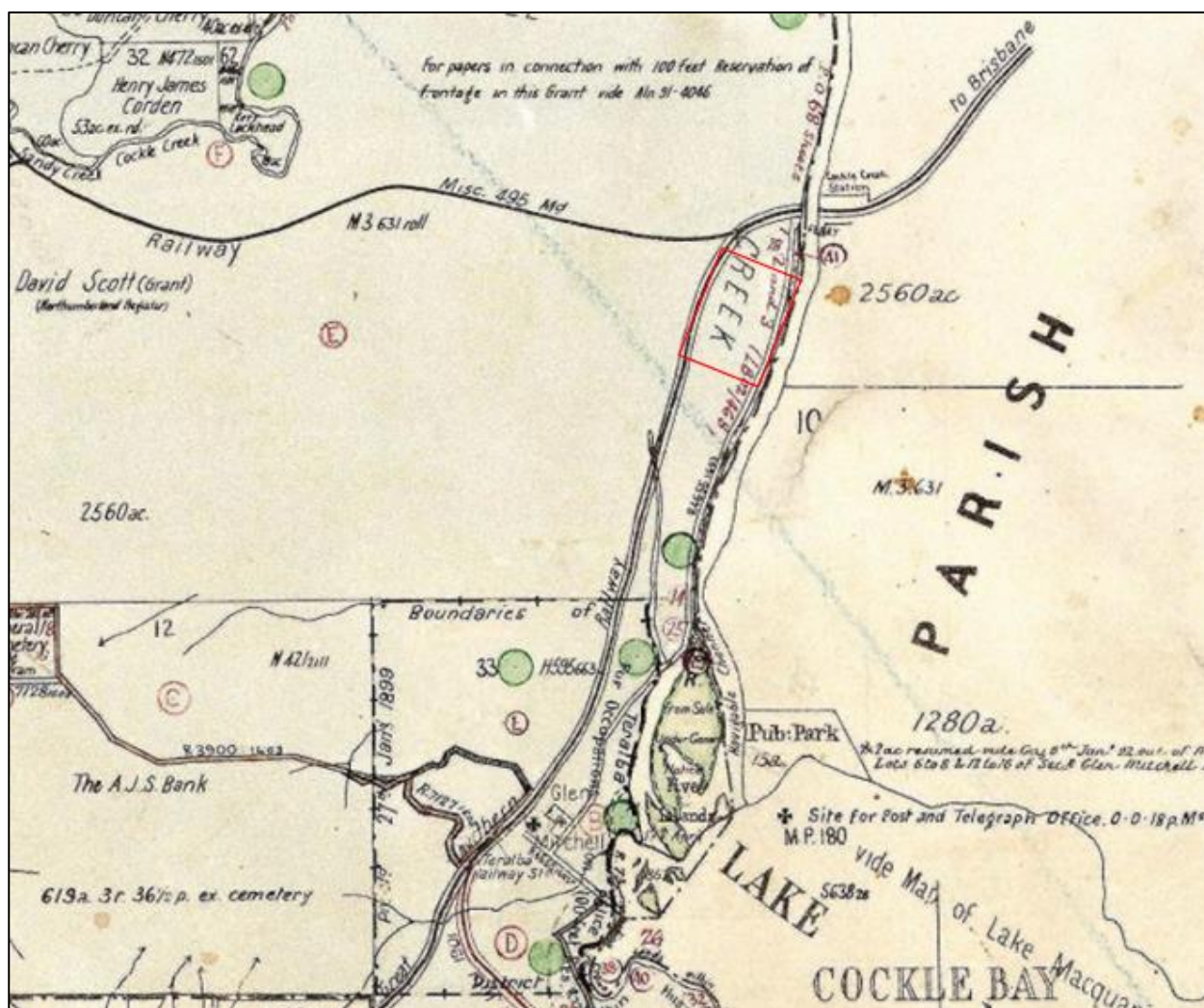


Plate 6.1 1897 Teralba Parish map (red outline is approximate location of study area)

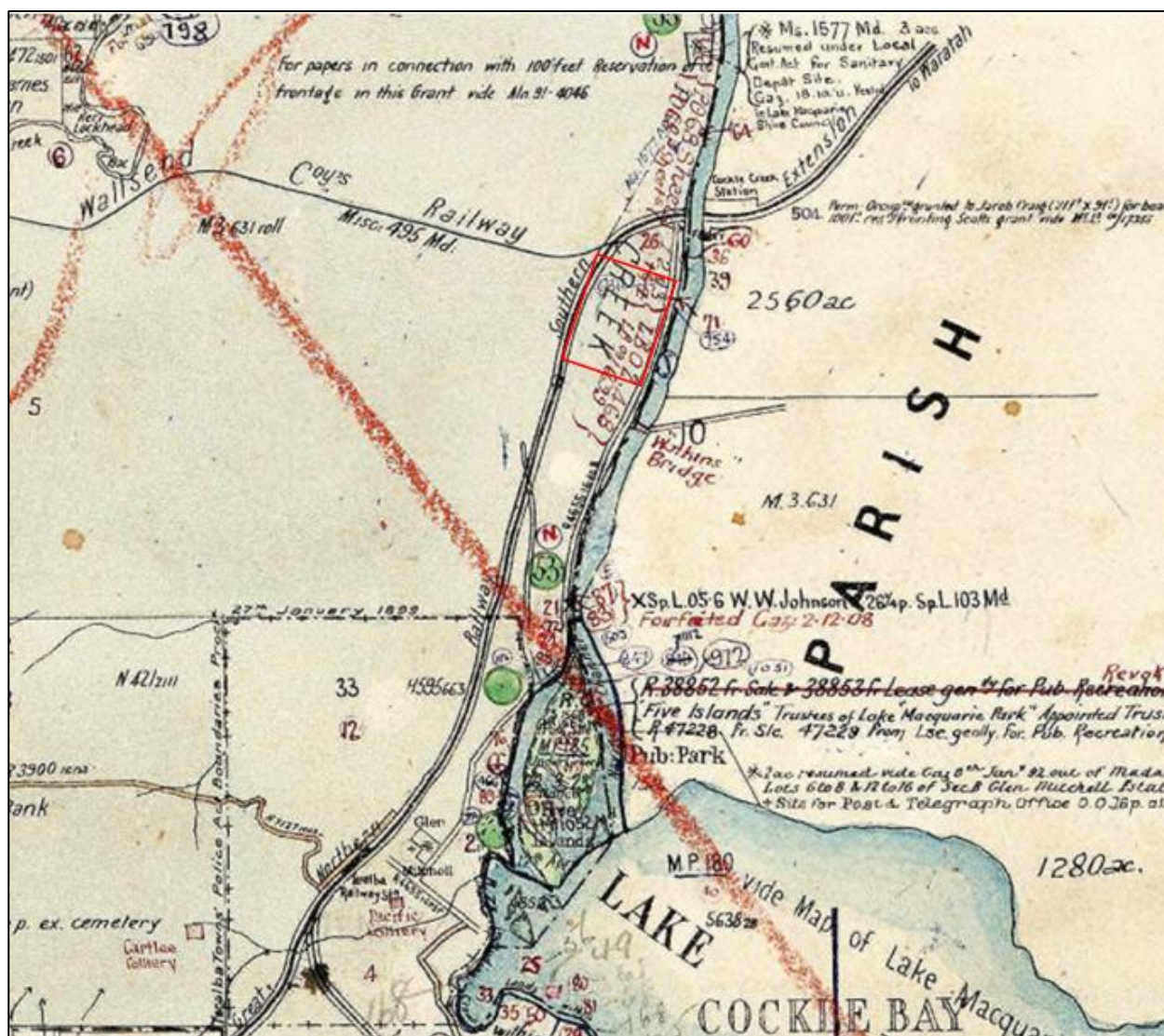


Plate 6.2 1903 Teralba Parish map (red outline is approximate location of study area)

The Project site is located on land that has been clearly disturbed by past approved land use developments and the Project does not involve any ground disturbance within areas not subject to previous disturbance.

Archaeological context

An extensive search of the OEH Aboriginal Heritage Information Management System (AHIMS) was undertaken on the 18 July 2018. The results of this search indicate that there are 95 recorded Aboriginal sites or places recorded within a 4 km radius of the Project site. A basic search of the AHIMS register was undertaken for the Project site on 18 July 2018 confirming that no known items or places of Aboriginal heritage significance are located in or within 200 metres of Lot 2 DP 220347. The eastern portion of the site is mapped as 'Sensitive Aboriginal Landscape Area' under LMLEP 2014 Sensitive Aboriginal Landscape Map. This mapped area appears to correlate with the western bank of Cockle Creek.

The closest known Aboriginal sites to the Project site are shown on **Figure 6.12**. These are AHIMS# 38-4-0080 (Teralba 4) approximately 520 m to the west which is a valid grinding groove site, AHIMS# 38-4-0116 (Site 2) approximately 940 m to the north-east which is an artefact scatter listed as destroyed and AHIMS# 38-4-1382 (Five Islands Midden) approximately 850 m to the south on an island in Cockle Creek which is a valid midden site with potential archaeological deposit.



Image Source: Nearmap (Jun 2018)
Data Source: LPI (2017), AHIMS (2018)

0 100 250 500m
1:10 000

Legend

- Project Site
- Artefact Scatter (Open Camp Site)
- ▲ Axe Grinding Groove
- Potential Archaeological Deposit and Shell

FIGURE 6.12
AHIMS Sites

Context of the Project Site

Those parts of the Project site within 200 m of Cockle Creek, would historically have contained a range of resources that would have been utilised by Aboriginal people. The Project site is likely to have formed part of a wider low lying landform adjacent to Cockle Creek and Lake Macquarie. Although likely to have been an area exploited by past Aboriginal peoples for its rich resources, it is likely that the Project site was highly swampy and as such was not an ideal location for long-term habitation.

The majority of the Project site has been subject to high levels of disturbances related to historical and modern land use including:

- Vegetation clearance
- Earthworks and filling
- Vehicular tracks and movement
- Erosion
- Emplacement of service infrastructure

The Project would be undertaken within an area subject to extensive previous disturbances. As such, it is assessed that there is a low likelihood of impact to Aboriginal objects.

6.8.1 Aboriginal Heritage Impacts

The OEH *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011) identifies that the NPW Act requires proponents to exercise 'due diligence' to determine if a proposed activity/development could harm Aboriginal objects or declared Aboriginal places. This assessment has followed the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (OEH 2010) (due diligence code). The *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* specifies the requirements for a detailed investigation if the due diligence code identifies that this is required.

Consideration of the Due Diligence Code

Section 8 of the Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (due diligence code) outlines the process to guide due diligence assessments, summarised below in relation to the proposed works.

1: *Will the activity disturb the ground surface or any culturally modified trees?*

Yes. As discussed, the Project would involve ground disturbance in specific sections of the site. However, all works would be undertaken within the footprint of previously extensively disturbed areas.

2: *Are there any:*

a) *Relevant confirmed site records or other associated landscape feature information on AHIMS*

There are no relevant AHIMS records within 200 m of Lot 2 DP 220347 which contains the Project site.

b) *Any other sources of information of which a person is already aware?*

There are no other relevant sources of information of which Umwelt is aware for the Project site.

c) *Landscape features that are likely to indicate the presence of Aboriginal objects?*

The due diligence code identifies landscape features that indicate the likely existence of Aboriginal objects as including areas within 200 m of waters. Lot 2 DP 220347 is likely to have been utilised by Aboriginal people accessing the resources of both Cockle Creek and Lake Macquarie as demonstrated by the presence of registered sites in the wider area. The Project site is unlikely to have been used for long term habitation due to its swampy nature. No sites exist within or extend into the Project site, which has been subject to clear and observable disturbance.

4: *Desktop assessment*

Despite the proximity of the Project site to Cockle Creek and its possible use by Aboriginal people in the past, the due diligence code specifies 'Land is disturbed if it has been the subject of a human activity that has changed the land's surface, being changes that remain clear and observable.' During the desktop study it was identified that the Project site and majority of the broader allotment have been subject to clear and observable disturbance caused by historic land use activities including; vegetation clearance, filling, industrial uses, the construction of multiple vehicular tracks and the emplacement of various services.

The proposed works would be undertaken within areas that have previously been disturbed and as such, it is assessed that there is a low likelihood that the proposed works will result in harm to Aboriginal objects. In accordance with the provisions of the due diligence code there is no requirement for further archaeological assessment.

6.8.2 Mitigation and Management Measures

The following mitigation and management measures will be implemented for the Project:

- Concrush will ensure that its employees and contractors are aware that it is an offence under Section 86 of the *National Parks and Wildlife Act 1974* to harm or desecrate an Aboriginal object unless that harm or desecration is the subject of an Aboriginal Heritage Impact Permit.
- In the unlikely event that an Aboriginal object or objects are uncovered during the proposed construction works, ground disturbance works should cease within 20 m of the object and an archaeologist, OEH and the local Aboriginal parties should be contacted to determine an appropriate management strategy.

6.9 Historical Heritage

6.9.1 Heritage Impact Statement

The following Heritage Impact Statement (HIS) has been prepared to assess the potential built heritage impacts of the Project on the identified heritage significance of listed heritage items and/or areas located in the vicinity of the Project site.

6.9.1.1 Relevant Heritage Listings

The Project site is not a listed heritage item, does not contain any listed heritage items, and is not located within any listed heritage conservation areas or precincts.

A search of relevant heritage databases and a review of the LMLEP 2014 show that there are five heritage items/areas located within 400 m of the Project site; the identified items are presented below in **Table 6.27**.

In addition to the items shown in the below table, the Project site is located 1.2 km north of the Teralba Heritage Conservation Area (HCA) (ID C2), as defined under Schedule 5 of the LMLEP 2014.

Vehicles accessing the Project site will travel through the HCA, with the key southern transport route shown in **Figure 3.3** extending through the HCA.

Table 6.27 Heritage items/areas located within 400 metres of the Project site

Item Name	Distance from Project Site	Listing Type/Level
Former Cockle Creek Railway Bridge	400 m	LMLEP 2014, Item ID 3 (Local) Railcorp Section 170 Register (State Agency)
Cockle Creek Railway Bridge	300 m	LMLEP 2014, Item ID 4 (Local)
Seaham, West Wallsend, Fairley and Killingworth Railway	250 m	LMLEP 2014, Item ID 10 (Local)
Great Northern Railway	Adjacent	LMLEP 2014, Item ID 189 (Local)
Cockle Creek Railway Underbridge	400 m	Railcorp Section 170 Register (State Agency)

6.9.2 Built Heritage Impact Assessment

Assessment of Physical Impacts

As noted above, the Project site is not a listed heritage item, does not contain any listed heritage items, and is not located within any listed heritage conservation areas or precincts. The Project will therefore not result in any direct physical impacts to any items, elements or fabric of identified heritage significance.

With regards to indirect physical impacts, it is acknowledged that the Project will result in an increase in traffic along the Key Southern Transport Route shown in **Figure 3.3**, which extends through the Teralba HCA. However, based on the Traffic Impact Assessment presented at **Section 6.4** it is assessed that the roads surrounding the Project site will continue to operate well within their technical and functional lane capacity levels as described by Austroads and NSW RMS guidelines.

With regards to potential for vibration impacts to the HCA and listed heritage items located therein as a result of an increase in traffic associated with the Project, it is noted that there is currently no Australian Standard that sets the criteria for the assessment of building damage caused by vibration as a result of traffic. Potential vibration impacts to structures such as buildings associated with traffic are typically realised through a single event or 'pass by' of a vehicle. Teralba is an industrial suburb with a number of heavy vehicles using the key southern access route. Whilst the project is proposing to increase the number of trucks using the key southern haul route, the Project would not increase the size of trucks to that currently operating.

Based on the above, as well as the results of the Traffic Impact Assessment, it is considered unlikely that the increase in traffic associated with the Project will result in vibration impacts of a discernible level to the HCA and listed heritage items located therein. Both Racecourse Road and York Street will continue to operate within appropriate and measureable capacity levels, strongly suggesting that the existing roadways are able to accommodate for the projected increase in traffic with no anticipated associated physical impacts to adjacent buildings or built structures.

Assessment of Visual Impacts

With the exception of the Great Northern Railway, all of the listed heritage items or areas located in the vicinity of the Project site are situated more than 250 m from the Project site. The only items or area which is visible from the Project site, or from which the Project site is visible, are the Great Northern Railway and the Cockle Creek Bridge. With regards to potential visual impacts associated with the Project, it is therefore assessed that:

- With the exception of the Great Northern Railway and the Cockle Creek Bridge, none of the listed heritage items or areas located in proximity to the Project site will be subject to any identified visual impacts as a result of the Project.
- With regards to the Great Northern Railway, which is an at-grade railway line, no significant views or vistas are identified. The significance of the railway line is derived from its historical value, remnant fabric, and maintained alignment. As the railway line will be in no way physically impacted by the Project, no impacts to its heritage significance (including its aesthetic significance and setting) are identified.
- Significant views and vistas of the Cockle Creek Bridge include:
 - Views east from Lake Road, Creek Reserve Road and Cockle Creek Station
 - Views north and south within Cockle Creek
 - Views north and south along Racecourse Road.
- Of these identified views and vistas, the Project site will only be visible within views north and south along Racecourse Road. It is noted that:
 - The visibility of the Project site within these view lines will, however, be negligible
 - The Project site, being located on the opposite side of the road from the Bridge, will in no way interfere with, detract from or obscure existing view lines to or from the Bridge
 - These views will essentially be maintained without discernible change.
- It is also noted that the Project site and surrounding properties already present as industrial development within existing views north and south along Racecourse Road. As the existing use of the Project site will be maintained, the Project will not result in any discernible changes to the existing character of development along the western side of Racecourse Road (and therefore within existing view lines to and from Cockle Creek Bridge).

Reference should also be made to **Section 6.11** of this EIS for further discussion regarding the established visual character of the Project site and surrounds, as well as the visual impact assessment that has been undertaken for the Project. As demonstrated in **Figures 6.14 to 6.17**, the proposed additional stockpile areas at the Project site will have only minimal visibility, from within the surrounding landscape.

6.9.2.1 Conclusion and Recommendations

Based on the above assessment, the Project will not result in any physical or visual impacts to built heritage items or areas of significance. As such, no recommendations or mitigation and management measures are required with regards to built heritage.

6.9.3 Baseline Historical (non-Aboriginal) Archaeological Assessment

This baseline historical (non-Aboriginal) archaeological assessment has been prepared to assess the potential impacts of the Project on historical (non-Aboriginal) heritage.

6.9.3.1 Land Use History

As noted in **Section 2.0** of the EIS, the Project site has operated as a concrete and demolition recycling facility since 2002. Prior to 2002, the Project site formed part of the scrap metal yard, Lucky's Scrap Metals. Lucky's Scrap Metals was established in 1972 and continues to operate but on a reduced site area on the land adjoining the south of the Concrush site.

As noted at **Section 6.8**, the Project site forms part of a low lying swampy landscape located between two primary transportation routes, and has been subject to modern industrial uses with little historical development across the site (**Plate 6.1** and **6.2**). To make it suitable for industrial use, the Project site has previously been substantially disturbed, including the importation of fill.

6.9.3.2 Assessment of Historical (non-Aboriginal) Archaeological Potential

As the above land use history demonstrates, no known development occurred within the Project site until the mid-21st century. Since that time, the Project site has been disturbed, particularly through the importation of fill. Being located within a landscape that is naturally low lying and swampy, it is unlikely that the Project site would have been suitable for the development or construction of any buildings or structures (including dwellings) that are not evidenced in the historical record.

Based on the above, the historical (non-Aboriginal) archaeological potential of the Project site is assessed to be very low to nil. There is no evidence in the historical record to suggest that the Project site was subject to any development prior to the mid-21st century; irrespective, the site has been substantially disturbed, and this disturbance is likely to have removed and/or severely disturbed any potential historical (non-Aboriginal) archaeological resource that may have been previously deposited within the site.

6.9.3.3 Conclusion and Recommendations

Based on the above assessment, the Project is highly unlikely to result in any impacts to any potential historical (non-Aboriginal) archaeological resource. In accordance with best practice, a 'stop-work' management measure is recommended for the Project, as outlined below.

If during the course of proposed works previously unknown historical archaeological material or heritage items are discovered, all work in the area of the item(s) shall cease immediately and Heritage Division, OEH and a qualified heritage consultant will be consulted, in accordance with Section 146 of the Heritage Act, to determine an appropriate course of action prior to the recommencement of work in the area of the item.

6.10 Socio-economic

A SIA has been prepared for the Project by Umwelt and is summarised in this section of the EIS. The full report is presented in **Appendix F**.

6.10.1 Methodology

SIA is an approach to predicting and assessing the likely consequences of a proposed action in social terms, and developing options and opportunities to improve social outcomes. Best practice SIA is participatory, and involves understanding impacts from the perspectives of those involved in a personal, community, social or cultural sense to provide a complete picture of potential impacts, their context and meaning.

The SIA for the Project has involved a number of key phases:

- Developing a profile of social and economic context in which Concrush is located, at a local and regional scale, and summarising the social and community issues of relevance to the communities of interest.

- Identifying the impacts and opportunities that are most important to the local community in relation to the Project, through engagement and consultation with near neighbours and other key stakeholders within the Lake Macquarie LGA.
- Assessing and predicting the significance of impacts associated with the Project through the application of a 'risk-based approach'; integrating both perceived and technical assessments of risk. Where available, relevant data sets have been used to inform the assessment of impacts associated with the Project and to explore perceptions raised in consultation with the community. This approach affords greater integration with the broader environmental assessment work so that impacts of relevance to technical specialists and community members are adequately discussed and considered in the impact assessment process.
- Developing strategies that address and manage the predicted social impacts associated with the Project and those which may enhance opportunities in a manner that values existing community aspirations and assets.
- Identifying what will require monitoring should the Project be approved and how any unanticipated social impacts that may result from the Project will be identified.

6.10.2 Project Stakeholders

As part of the SIA for Concrush, a number of key stakeholders have been identified and involved in the program. These stakeholders are identified in **Table 6.28**.

Table 6.28 Stakeholder Groups

Stakeholder Groups	Stakeholder
Local Community	Proximal residents and commercial stores in Boolaroo, Teralba and along the transport route (~475)
Employees	Concrush workforce (10)
State Government	Department of Planning and Environment (DPE) Environment Protection Authority (EPA) NSW Roads and Maritime Services (RMS) NSW Office of Environment and Heritage (OEH) NSW Department of Primary Industries (DPI) Fire and Rescue NSW Rural Fire Service Ausgrid Hunter Water Subsidence Advisory NSW Sydney Trains Transport for New South Wales Other Agencies as required
Local Government	Lake Macquarie City Council (LMCC)
Education and Community Groups	Barnsley Public School Teralba Public School Club Macquarie Function and Accommodation Centre
Industry	Skyline Supplies Lucky's Scrap Metals Bunderra Estate (via Stevens Group / Ferrier Hodgson)

Stakeholder Groups	Stakeholder
Media	Newcastle Herald The Star (Newcastle and Lake Macquarie) ABC News (online and radio, 1233 ABC Newcastle)

Project Information Sheets were provided to approximately 475 local residents and commercial stores in Boolaroo, Teralba and along the Concrush transport route. Four local residents responded to the Information Sheet, via email and telephone, to outline their concerns with the Project. Interviews were also undertaken with industry, education and community groups as part of the SIA including two local businesses and two schools in close proximity to the Project. These stakeholders previously had some form of contact with Concrush, with the schools noting the company was approachable and that they had received previous in-kind support. The local businesses also noted they had a good relationship with the company, with their business utilised by Concrush.

The local schools and businesses identified that the Project Information Sheet was a useful mechanism to provide information about the Project. The schools also noted, with limited businesses in the area, they would continue to work with the company regarding sponsorship and donations support.

Contact was also made with both the Deed Administrators and the developer for the new Bunderra Estate. It should be noted that while there are no occupied dwellings on this site currently, the area is under construction. Neither party raised any issues or concerns with the Project and advised that the information sheet would be forwarded to purchasers in the future.

Figure 6.13 outlines the key concerns raised during consultation. Issues relating to public safety were paramount and linked to traffic impacts along the transport route and road design. Issues of noise and air quality were also noted and to a lesser degree potential issues of water contamination.

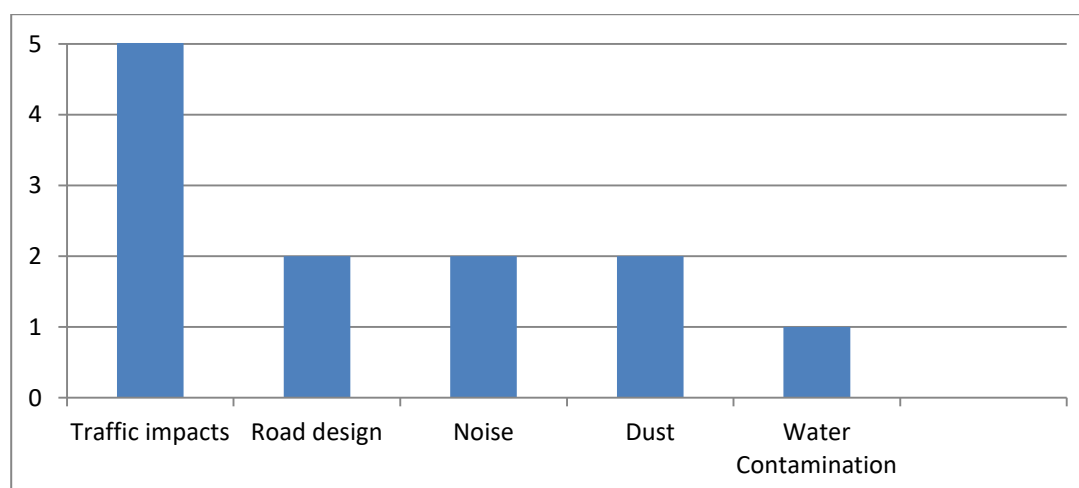


Figure 6.13 Perceived Community Project Concerns

Source: Umwelt, 2018 Note: multiple responses allowed.

6.10.3 Summary of Perceived Community Impacts and Technical Risk

The following table provides a summary of the perceived and predicted social impacts relating to the Project. As outlined, most social impacts that may relate to the project are considered low, with the impact of noise on social amenity considered moderate to the receivers/landholders identified; and moderate (positive) impacts on the local, regional and NSW economy also predicted.

Table 6.29 Summary of Perceived Community Impacts and Technical Risk

SIA Matter	Project Aspect	Social Impact	Affected parties	Duration	What is the extent of impact	Perceived Social Impact/Sensitivity	Social Impact Ranking
People – Access	Increased traffic	Surroundings - Impact on public safety	Road users Pedestrians Local residents local businesses Teralba Public School	Long-term	Suburb of Teralba and through road users	MODERATE	LOW
People – Built environment	Road design	Surroundings and health and wellbeing – Public safety and physical health	Road users Pedestrians Local residents local businesses Teralba Public School	Long-term	Suburb of Teralba and through road users	MODERATE	LOW
Natural environment – Air	Impact of construction and operations on air quality – in particular dust emissions	Surroundings – access to and use of the natural and built environment, and its amenity Health and wellbeing – including physical and mental health	Local Landholders and residents in the local suburb of Teralba and Bunderra Estate (in development)	Construction – Short-term Operations - Long-term	Surrounding residents (200-600 m from the site), impacts less than relevant criteria	MODERATE	LOW
People - Amenity	Noise (daytime)	Way of life – how people live and interact with one another on a daily basis	Bunderra Estate	Long-term	NCA 1 and part NCA 2	MODERATE	MODERATE
People - Amenity	Noise (night)	Way of life – how people live and interact with one another on a daily basis	Racecourse Road	Long-term	NCA 1 and part NCA 2	MODERATE	HIGH
People – Amenity	Visual	Surroundings – the environments aesthetic value	Local Businesses Road Users	Long-term	Two businesses, road users and Bunderra estate	LOW	LOW
Natural environment – Water	Water contamination	Surrounds – access to and use of ecosystems and services	Local residents Recreational users of Cockle Creek	Long-term	Surrounding residents and users of Cockle Creek	LOW	LOW
People - Community	Population change	Community composition	Local community	Long-term	LGA	LOW	LOW

SIA Matter	Project Aspect	Social Impact	Affected parties	Duration	What is the extent of impact	Perceived Social Impact/Sensitivity	Social Impact Ranking
People - Community	Impacts on housing availability and community infrastructure	Community composition	Local community	Long-term	LGA	LOW	LOW
People - Community	Sense of Community	Community and sense of place	Local community	Long-term	LGA	LOW	LOW
People - Community	Recreational and Environmental Values	Community character and how it functions	Local community	Long-term	LGA	MODERATE	LOW
People - Community	Economic impacts	Way of life – how people work, live, play and interact	Local community and City residents	Long-term	Teralba and Lake Macquarie LGA	LOW (Positive)	LOW (Positive)

6.10.4 Mitigation and Management Measures

This section provides a summary of potential strategies that may be implemented in response to the predicted impacts outlined in **Section 6.10.3** namely those ranked as moderate and high.

Table 6.30 summarises the key strategies that could potentially be implemented to either address a potential negative impact or enhance the positive impacts associated with the Project.

Table 6.30 Strategies to address key impacts associated with the Project

Impact / Opportunity area	Strategies
Noise and air quality – impacts on way of life	There are a small number of nearby neighbours that Concrush should work with to monitor the impacts of noise on social amenity
Sense of Community	It is recommended that Concrush: <ul style="list-style-type: none"> Continue to maximise local and regional spend through support for local groups and organisations
Traffic – impacts on social amenity and safety	Traffic was a key issue raised by the community through the SIA. It is recommended that where possible, Concrush implement some proactive tools to encourage their drivers and contractors to adhere to safe driving practices at all times. Mechanisms may include: <ul style="list-style-type: none"> Tool box talks with drivers to reinforce positive driver behaviours and messaging Installation of strategic signage at key locations on the site to remind drivers to ‘drive safely’ and ‘remember our local neighbours’.

A key aspect of any social impact assessment is the development of a framework to monitor a Project’s impact over time – often referred to as a social impact management plan. Concrush will collect social data to monitor commitments made in the social impact assessment namely:

- Key areas of predicted Project impact, including perceived and experienced social impacts, through consultation with neighbouring and other nearby landowners, to determine if experienced impacts are in line with predicted impacts (as outlined in **Section 6.10.3**)
- Evaluation of community contributions to ensure benefits to local stakeholders e.g. Teralba Public School, local community organisations.

6.11 Visual

6.11.1 Existing Environment

The existing Concrush site is approximately 2.4 ha in size and is characterised by stockpiles of materials with machinery and equipment working at the stockpiles as well as heavy vehicles moving throughout the site. The weighbridge office, other demountable site office buildings and a maintenance shed are located within the eastern part of the Project site immediately inside the access driveway off Racecourse Road. The existing site is predominantly devoid of vegetation with the exception of landscaped trees and shrubs planted along parts of the existing site boundaries which act as a visual screen for adjacent properties (refer **Figure 2.1**).

The Project site is bound to the west by the Main North Rail Line and to the east by Racecourse Road and Cockle Creek. A car wreckers yard is located immediately to the north of the Project site with vacant land immediately to the south of the existing site with the scrape metal yard further to the south. The Project site and immediately surrounding areas are distinctly industrial in character strongly reflecting the zoning and land use of the area.

Views to the Project site are available from the rail corridor for passengers on trains travelling north or south as well as vehicles on Racecourse Road. Some intermittent glimpses of the site are also available for vehicles travelling on TC Frith Avenue to the east of the site (refer **Figures 6.14** and **6.15**).



Plate 6.2 The Concrush site showing machinery working at stockpiles with the water cart in the foreground

© Umwelt, 2018



Plate 6.3 View from the eastern portion of the Concrush site looking to the west

© Umwelt, 2018



Plate 6.4 Looking towards existing product bays on the northern boundary of the site

© Umwelt, 2018

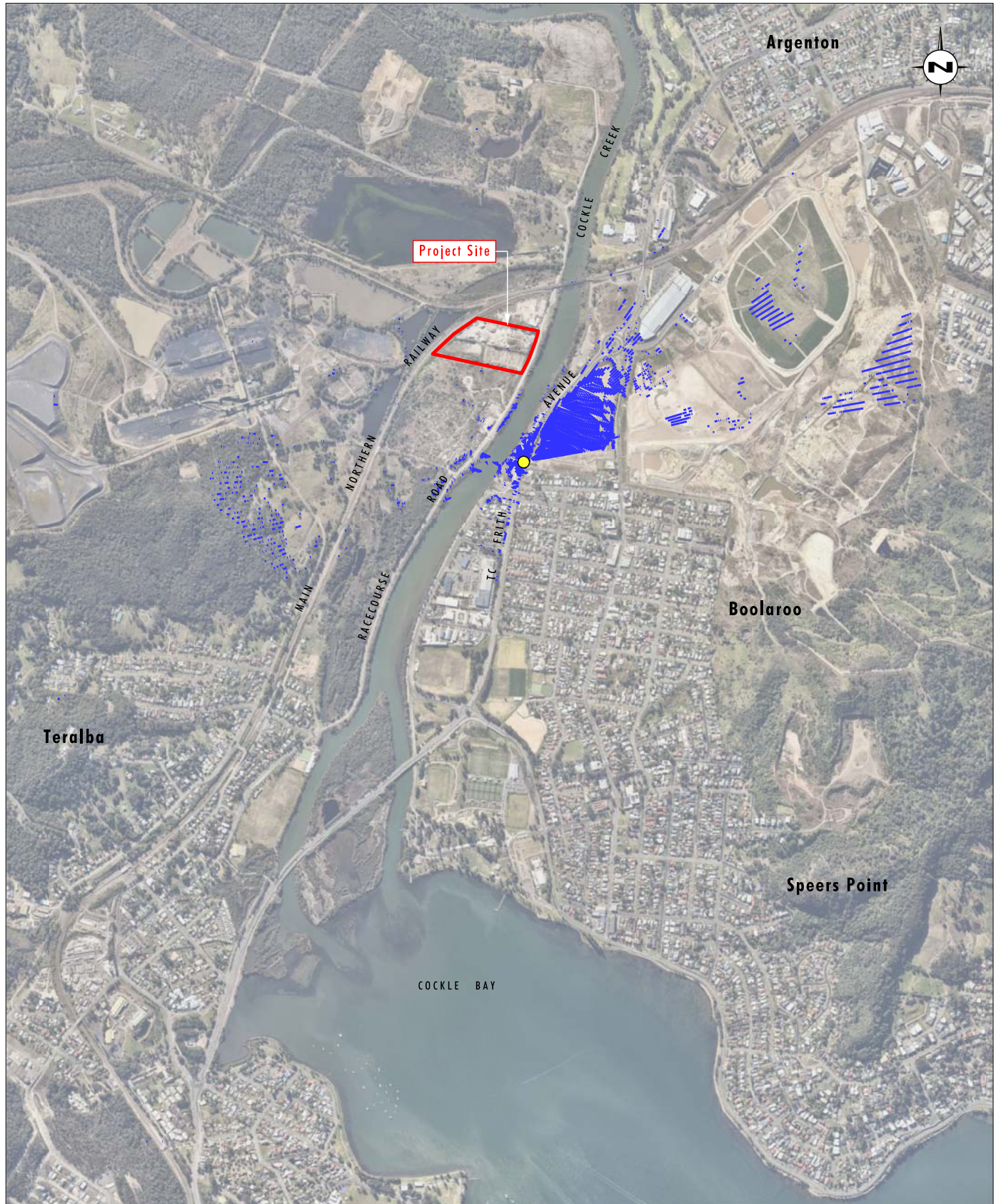


Image Source: Nearmap (May 2017)

0 0.25 0.5 1.0 km
1:20 000

Legend

- ▭ Project Site
- View Point Location 1
- Visible Terrain (From view point location)

FIGURE 6.14

View Point Location 1
TC Frith Avenue

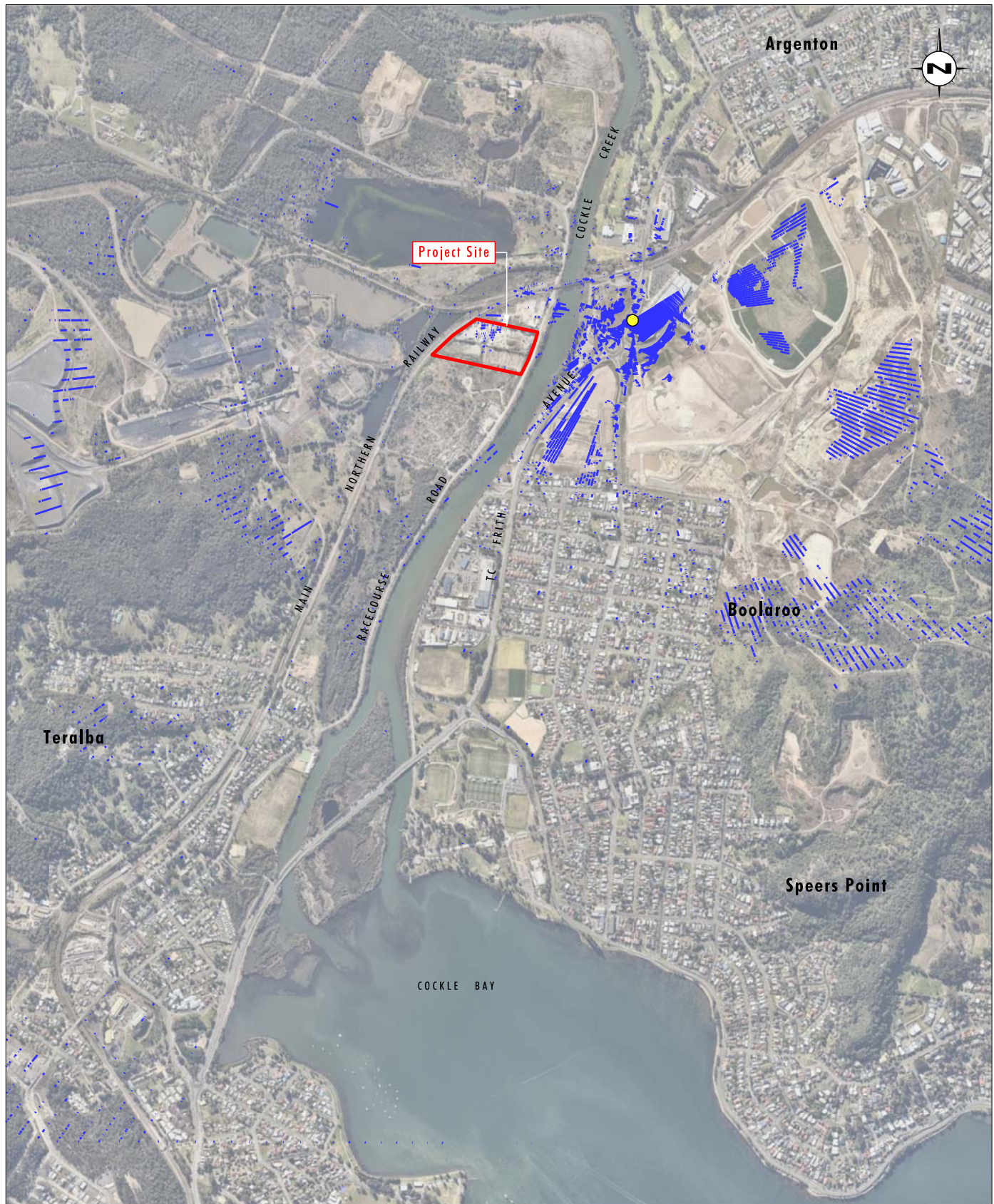


Image Source: Nearmap (May 2017)

0 0.25 0.5 1.0 km
1:20 000

Legend

- ▭ Project Site
- View Point Location 2
- Visible Terrain (From view point location)

FIGURE 6.15

View Point Location 2
TC Frith Avenue

6.11.2 Visual Impact Assessment

The main change to the visual environment as a result of the Project would be the increase in size of the Project site. The activities, plant and equipment, stockpiles and vehicles present at the existing site would generally remain the same but would be present over a larger area as the Project site would increase from 2.4 to 4.8 ha. The increase in size of the Project site would result in a larger stockpile area and increased vehicular activity.

A visual assessment including three dimensional terrain modelling has been undertaken for the Project. The purpose of the assessment was to determine the locations surrounding the Project site from which the Project elements would be visible. The highest feature of the Project site would be the stockpiles at up to 10 m high.

Using LiDAR data a three dimensional digital model 4 x 4 km was created, centred on the Project site. To most accurately determine the points from which the Project stockpiles would potentially be visible, the digital model incorporated a combined terrain (ground surface) and vegetation canopy layer. Using a combined terrain and canopy layer allows the screening afforded by vegetation to be taken into account when determining the line of sight visibility between two points.

The digital model of the area surrounding the Project site was examined to determine potential viewing locations at which to run a detailed radial analysis. The radial analysis identifies the parts of the terrain that are visible (and the Project site if visible) from the selected viewing location. Two publicly accessible locations on TC Frith Avenue (View Points 1 and 2 - refer **Figures 6.14** and **6.15**) were selected where motorists potentially have a view to the Project site. Two potential dwelling locations were also selected to the south east and east of the Project site representing potential viewing locations from Bunderra Estate (View Point 3 – refer **Figure 6.16**) and the proposed aged care facility (View Point 4 - refer **Figure 6.17**).

The radial analysis from the view points is undertaken at a height of 1.7 m above the ground representing the average eye level of a standing person. The portion of the digital model representing the Project site included the entire material stockpile areas shown on **Figure 3.2** at the maximum potential height of 10 m.

Figure 6.14 shows that at View Point 1, on TC Frith Avenue just north of the junction with First Street, with very minor parts of the Project site is visible. This view point location is representative of vehicles travelling north on TC Frith Avenue at a point where the Project Site is almost directly ahead in terms of line of sight for potential drivers and passengers. However, due to the fringing vegetation on both the eastern and western banks of Cockle Creek the Project site is predominately screened from passing motorists.

Figure 6.15 shows that at View Point 2, on TC Frith Avenue just north of the roundabout at the junction with Main Road, there would be some views to the Project site. As this view point is just to the north of the Project site, these views would only be available to motorists travelling south at this location. A relatively small section of the potential stockpile location within the northern portion of the site would be visible. As this view point is on TC Frith Avenue, these potential views to the site would only be temporary as motorists passed this location.

The two sites on TC Frith Avenue were selected as they represented locations where views to the Project site would potentially be available. As not all locations along this stretch of TC Frith Avenue were analysed, it is possible that some relatively fleeting glimpses of the Project site may be available to motorists or cyclists and pedestrians while travelling on TC Frith Avenue in the vicinity of the Project Site.

View Point 3 represents the highest point on the Bunderra Estate at Boolaroo and therefore the potential dwelling location most likely to have views towards the Project site. **Figure 6.16** shows that from View Point 3 views are generally restricted to the north west, which is towards the Project site, however views are partially restricted by vegetation along Cockle Creek. As such, there would only be some views, likely between trees, where stockpiles on the Project site could potentially be seen. It should be noted that the radial analyses from this location did not take into account other houses on the Bunderra Estate that would likely be built between this view point and the Project site which would likely further restrict potential views from this location. There are also landscape plantings on the western boundary of Bunderra Estate, including Casuarina trees, which as they grow will provide further screening of potential views towards the Project site.

View Point 4 is located at the site of an approved age care facility that is directly east of the Project site on the southern side of the roundabout between TC Frith Avenue and Main Road at Boolaroo. It can be seen on **Figure 6.17** that there are no views to the west of this location into the Project site. This is because of the screening vegetation along the eastern side of Cockle Creek.

6.11.3 Mitigation and Management Measures

The following management measures would be implemented as part of the Project:

- A landscaped 2 m high earth bund will be established along the eastern boundary (southern half) of the site to complement the existing landscaped earth bund present along the northern half of the eastern site boundary.

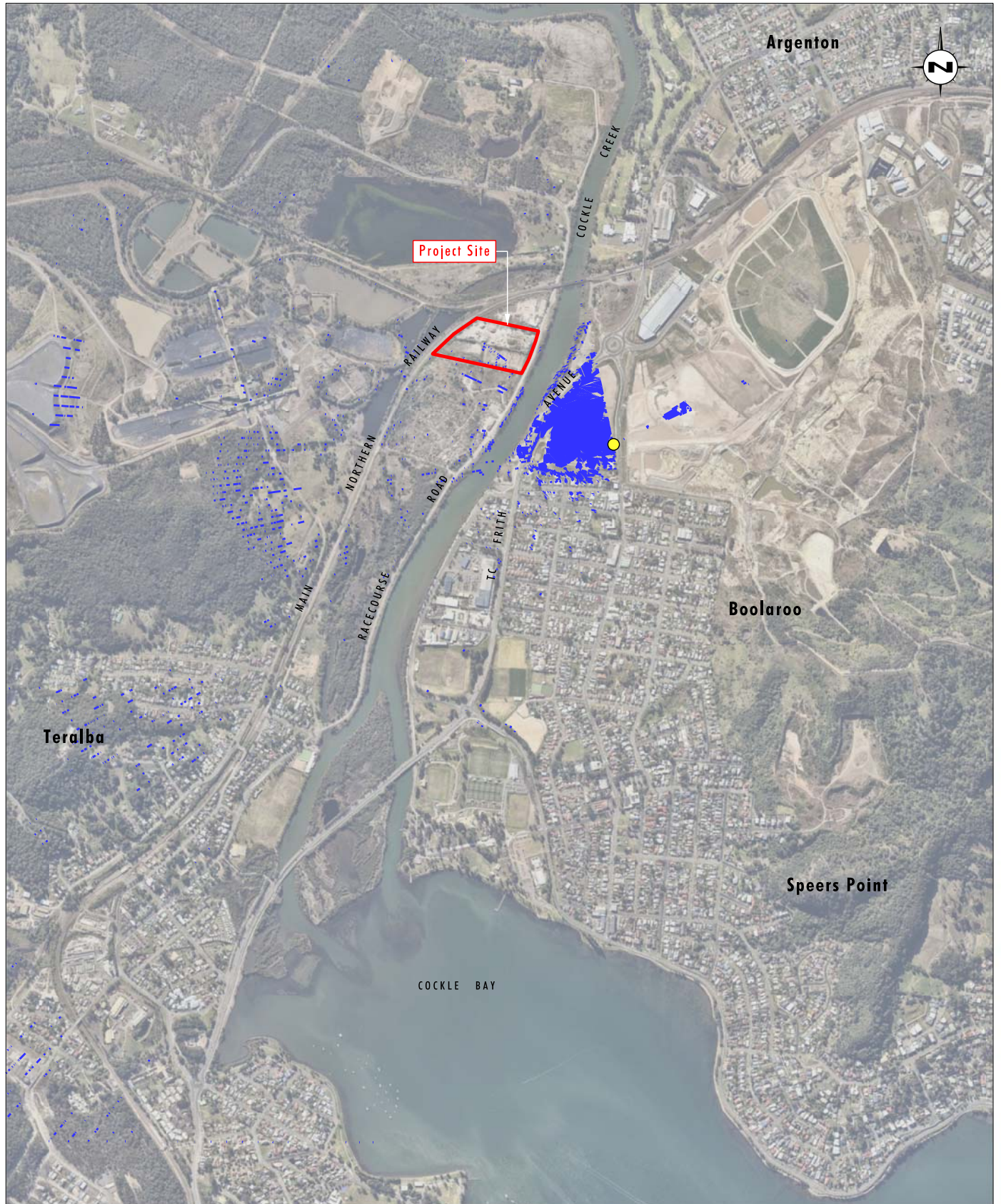


Image Source: Nearmap (May 2017)

0 0.25 0.5 1.0 km
1:20 000

Legend

- ▭ Project Site
- View Point Location 3
- Visible Terrain (From view point location)

FIGURE 6.16

View Point Location 3
Bunderra Estate

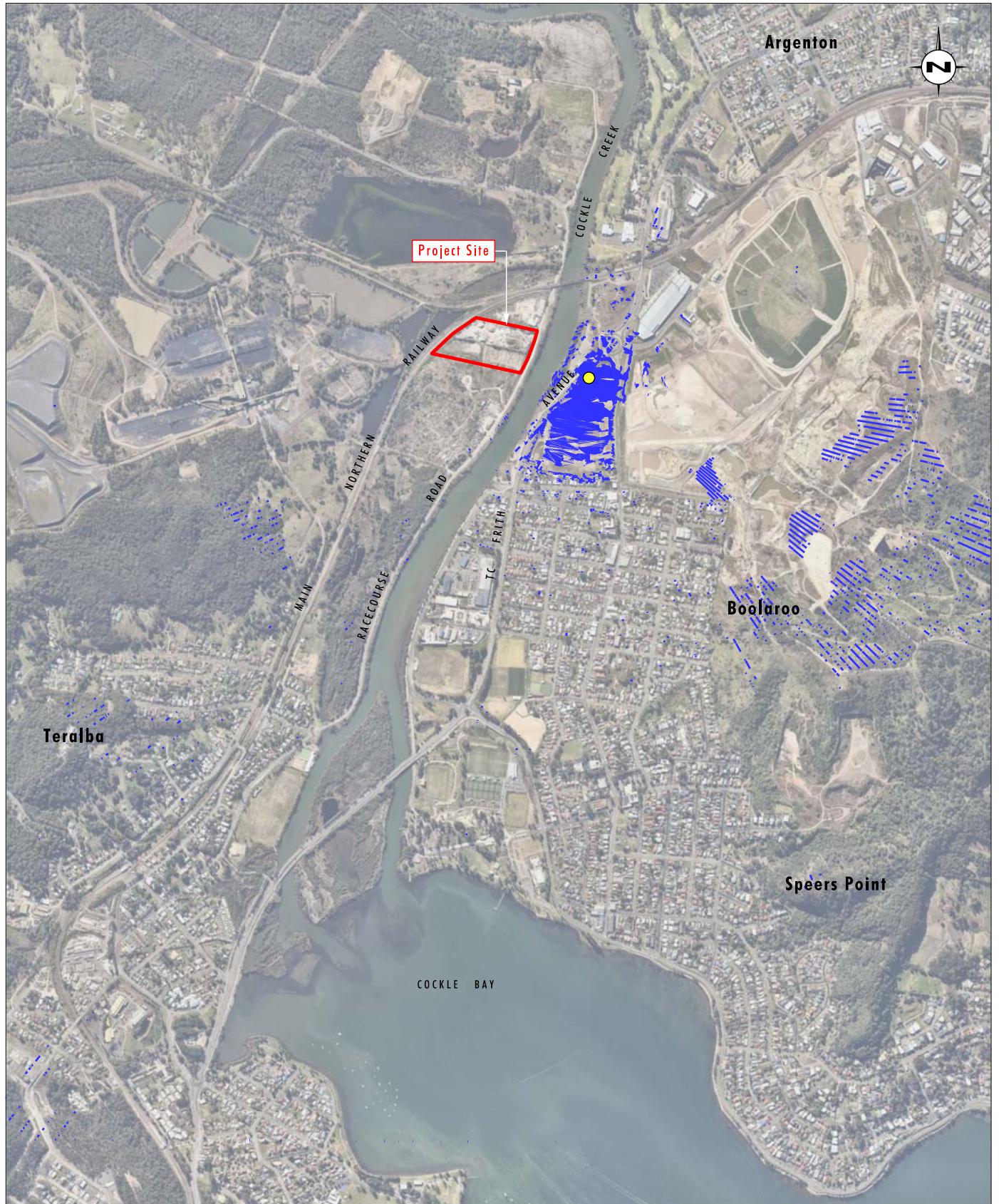


Image Source: Nearmap (May 2017)

0 0.25 0.5 1.0 km
1:20 000

Legend

- ▭ Project Site
- View Point Location 4
- Visible Terrain (From view point location)

FIGURE 6.17

View Point Location 4
Approved Aged Care Facility

6.12 Contamination

A contamination assessment has been prepared for the Project by RCA and is summarised in this section of the EIS. The full report is presented in **Appendix M**.

6.12.1 Assessment Methodology

The contamination assessment has been undertaken to investigate the potential for contamination impacts as a result of the Project and to determine the suitability of the proposed site use in accordance with SEPP 55. The assessment was undertaken on the currently undeveloped southern portion of the Project site (the investigation area). A summary of the specific tasks undertaken in the assessment included:

- Review of existing site data including previous contamination assessments undertaken within the Project site
- Development of a preliminary conceptual site model identifying contaminant sources, pathways and receptors
- Development of a sampling and analytical quality plan
- Fieldwork including test pits (TP), boreholes (BH) and groundwater monitoring wells for collection of soil and groundwater samples
- Laboratory testing and analysis for: benzene, toluene, ethyl benzene, xylenes (BTEX), total recoverable hydrocarbons (TRH), polycyclic aromatic hydrocarbons (PAH), phenols, cyanide, metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), asbestos and acid sulfate soils.

The contamination assessment for the Project has been undertaken through consideration of a previous contamination assessment undertaken by Coffey in 2013 for part of the Project site and the current RCA assessment. The Coffey 2013 assessment area and the RCA 2018 assessment area are shown in **Figure 6.18**.

Contaminated Land Register

Part of Lot 2 DP 220347 is listed on the EPA register of sites declared as contaminated under the Contaminated Land Management Act 1997 (CLM Act). The notified area was occupied by Metal Salvage at the time of the declaration notice in 1998 and is located in the southern portion of Lot 2 DP 220347. The notified area is located approximately 150 m to the south of the nearest point of the Project site.



Image Source: Nearmap (May 2017)
Data Source: Concrush (2018), Coffey (2013), RCA (2018)

0 25 50 100m
1:2 000

Legend

- Project Site
- Current Assessment
- Coffey 2013 Assessment Area
- RCA Test Pit Location
- Coffey Test Pit Location

File Name (A4): R03/3972_067.dgn
20180831 14.28

FIGURE 6.18

Contamination Assessment Area
and Sample Locations

6.12.2 Results

The Assessment of Site Contamination (ASC) National Environment Protection Measure (NEPM) 2013 document has been approved by the EPA for assessing potentially contaminated sites. The criteria from ASC NEPM were used to determine the significance of any contamination found. The ASC NEPM criteria cover human health and ecological health with relevant criteria corresponding to the applicable land use. There are four land use categories identified for the human health criteria being: residential with garden/accessible soil, residential with minimal soil access, public open space and commercial/industrial sites. The ecological health criteria cover three land use settings being: areas for conservation and protection (e.g. National Parks), urban residential areas and public open space, and commercial/industrial land use. This assessment has applied the commercial/industrial land use criteria for both human health and ecological health categories.

SEPP 55 prescribes assessment on the basis of the most sensitive allowable site use. As the Project site is zoned for industrial use and the proposed Project is considered an industrial activity, the criteria defined for commercial and industrial land use as described above is the most appropriate for the Project.

Soil

TRH, BTEX, PAH, phenols, cyanide and metals concentrations were either not detected or were detected at low concentrations below the relevant criteria with the exception of the following:

- One sample in the central part of the investigation area which reported benzo(a)pyrene (B(a)P) at 11.6mg/kg which is in excess of the ASC NEPM ecological screening level (1.4mg/kg)
- Six samples scattered across the investigation area which reported zinc in excess (526mg/kg to 4,150mg/kg) of the calculated ASC NEPM ecological screening level (360mg/kg).

Asbestos was not detected in any soil samples analysed, however, chrysotile asbestos was detected within bonded ACM fragments collected from 0.5 m depth at TP7, TP8 and TP9. The bonded material was in good condition at the time of sampling, with no fibres visible or detected within the soil.

Groundwater

TRH, BTEX, PAH, phenols and metals concentrations were either not detected or were detected at low concentrations below the relevant criteria with the exception of sample BH1 and BH2 which reported arsenic at 0.006mg/L and 0.005mg/L respectively in excess of the ecological criterion of 0.0013mg/L.

Acid Sulfate Soils

No actual acid sulfate soils were identified from the samples collected. However, a comparison of the field pH to the pH after oxidation identified a distinct drop in pH indicating that net acid generating ability is likely. As such, the natural soils are considered to be potential acid sulfate soils (PASS) and if exposed they are likely to generate acid leachate.

6.12.3 Site Contamination Characterisation

The collection of soil samples from 13 locations is in accordance with the ASC NEPM. Taking into consideration the 17 previous sampling locations undertaken by Coffey (2013), it is considered that the sampling density is in accordance with the EPA Sampling Design Guidelines (1995). As such, it is considered that there are sufficient samples to adequately characterise the soil materials of the site for the purpose of this assessment.

The ecological criteria from ASC NEPM apply to soil within 2 m of the surface level, corresponding to the root zone and habitation zone of many species. The exceedance of the ecological screening level criteria for both zinc and B(a)P were in the top 1.0 m. The investigation area is proposed to be used for industrial purposes and requires site levelling which would result in relatively minor disturbance to existing soils. The exceedance of the ecological screening level for B(a)P and zinc in soil is not considered to be significant for the proposed land use. The exceedance of the ecological screening level has no bearing on risk to human health.

The soil samples in which the fragments of bonded asbestos containing material were identified did not indicate the presence of asbestos fibres within the soils collected from the same depth. This indicates that the asbestos within the bonded fragments is stable and not releasing fibres. It is recommended that a clean fill layer of 0.5 m depth be placed across the southern part of the Project site (the investigation area). As no major excavation works are proposed as part of the Project, exposure to bonded ACM fragments would be very limited and it is considered that the presence of random fragments of bonded asbestos in subsurface layers would not present a significant risk to human health as a clean fill capping layer is proposed. A marker layer such as geotech fabric will be placed beneath the clean fill capping layer to clearly delineate the previously disturbed soils beneath the marker layer and the clean fill above it.

PASS are present within the investigation area. This is in alignment with the Wallsend acid sulfate soils risk map which identifies a high probability of acid sulfate soil materials. It is proposed to level the investigation area and establish a clean fill capping layer. The PASS present are not considered to be of concern as they will remain buried. If excavation or earthworks into natural soils to depths near to the groundwater table (approximately 3.0 to 5.0 m below ground level) are required an ASSMP will be developed for the Project.

The proposed industrial use of the land as a waste recycling facility is considered an appropriate use in accordance with SEPP 55.

6.12.4 Mitigation and Management Measures

The following mitigation and management measures will be implemented for the Project:

- A clean fill layer of 0.5 m depth be placed across the southern part of the Project site. A marker layer is to be established to distinguish the clean fill layer from the existing soils beneath
- If excavation or earthworks into natural soils to depths near to the groundwater table (approximately 3.0 to 5.0 m below ground level) are required an ASSMP will be developed for the Project.

6.13 Waste

Concrush is committed as part of its WMP to the management of waste streams in accordance with the principles of the waste hierarchy, where emphasis is placed upon reduce, reuse, recycle prior to disposal of wastes.

The NSW Waste Avoidance and Recovery Strategy 2014-21 (EPA, 2014) provides a framework for waste management over the next seven years, aligning with the NSW Government's waste reforms in NSW 2021: A Plan to Make NSW Number One. The Strategy identifies the following waste avoidance and resource recovery goals:

- Avoid and reduce waste generation
- Increase recycling
- Divert more waste from landfill
- Manage problem wastes better

- Reduce litter
- Reduce illegal dumping.

As discussed in **Section 4.2.2** the Protection of the Environment Operations (Waste) Regulation 2014 enables the EPA to issue resource recovery exemptions ‘where the application of a waste material to land, its use as a fuel, or use in connection with a process of thermal treatment is a bona-fide, fit-for-purpose, re-use opportunity rather than a means of waste disposal’ (EPA 2015). Concrush receive waste concrete and green waste which are subject to resource recovery exemptions. These materials will be managed on site in accordance with the conditions and requirements of the relevant exemption.

The full list of waste types received by Concrush is presented in **Section 2.4.2** with details of Concrush’s waste tracking system provided in **Section 2.4.3**.

6.13.1 Predicted Waste Streams

Under the Waste Classification Guidelines (DECC, 2009b), waste can be classified into 6 different classes based on risks to the environment and human health, these classes are:

1. Special waste
2. Liquid waste
3. Hazardous waste
4. Restricted solid waste
5. General solid waste (putrescible)
6. General solid waste (non-putrescible).

Construction

Given the nature of the Project where a large part of construction will be the creation of hardstands from material obtained from the current Concrush operations, minimal waste will be generated during the construction phase. Potential waste streams include:

- General Solid Waste (putrescible and non-putrescible) including limited construction waste and general waste from construction personnel.

Construction wastes will be separated and recycled where possible and facilities will be provided for general wastes generated by construction staff. Any construction waste that cannot be recycled will be collected by an appropriately licensed contractor and disposed of at an appropriately licensed facility.

Operation

The wastes likely to be generated during operation of the Project include:

- General solid waste (putrescibles), associated with food waste and waste from litter bins from employees
- General solid waste (non-putrescible), associated with recyclable products such as glass, paper, plastic and cardboard.

Limited quantities of general domestic and office waste will be generated by staff and will be disposed of through an appropriately licenced waste and recycling services.

6.13.2 Mitigation and Management Measures

The following management measures would be implemented as part of the Project:

- Waste streams will be managed in accordance with the principles of the waste hierarchy, with emphasis on reduce, reuse, recycle prior to disposal of its wastes.
- All material used will be in accordance with the relevant requirements and conditions of the exemptions outlined above.
- General waste generated by site personnel during operation of the Project will be accommodated through the use of a 240 litre municipal waste bin to be collected by Council or a licensed contractor for disposal/recycling at an appropriate waste management facility.

6.14 Greenhouse Gas Assessment

A greenhouse gas and energy assessment (GHGEA) to meet the requirements of the EP&A Act is presented below. The GHGEA includes a quantitative assessment of the potential Scope 1, 2 and 3 emissions associated with the Project, and an assessment of the potential impacts of these emissions on the environment.

6.14.1 Methodology

The GHGEA was prepared using an assessment framework consistent with the internationally recognised Greenhouse Gas (GHG) Protocol (WBCD/WRI 2004) and the most recent Australian emission factors published in the National Greenhouse Accounts (NGA) Factors (DoEE 2017).

The GHG Protocol defines three distinct emissions classes (Scopes) for GHG accounting and reporting purposes. The emission scopes are defined as:

- Scope 1 emissions are direct emissions which occur from sources owned or controlled by the reporting entity, over which they have a high level of control (such as fuel use).
- Scope 2 emissions are those generated from purchased electricity consumed by the reporting entity, which can be easily measured and can be influenced through energy efficiency measures. Scope 2 emissions physically occur at the facility where electricity is generated, that is, the power station.
- Scope 3 emissions are indirect emissions that are a consequence of the activities of the reporting entity, but occur at sources owned or controlled by another reporting entity (e.g. outsourced services).

Diesel use associated with transport was calculated based on average consumption rates published in the National Greenhouse Gas Inventory: Analysis of Recent Trends and Greenhouse Gas Indicators (AGO 2007).

6.14.2 Assessment Boundary

The assessment boundary for the GHGEA includes:

- Consumption of construction materials
- On-site fuel use
- On-site electricity consumption
- Product delivery

- The extraction, production and transport of diesel (as per the NGA Factors)
- The generation and transmission of electricity (as per the NGA Factors).

The GHG Protocol requires inventory data and methodologies to be relevant, consistent, complete, transparent and accurate. The relevance principle states that the greenhouse gas inventory should appropriately reflect greenhouse gas emissions and serve the decision-making needs of users – both internal and external to the Project (GHG Protocol 2004).

A construction and demolition waste recycling facility has a number of potential emission sources, however, the dominant emission sources, often targeted by mitigation measures and of key interest to stakeholders, can be summarised as:

- diesel use
- electricity use
- product transport.

The completeness principle states that all relevant emission sources within the chosen inventory boundary need to be accounted for so that a comprehensive and meaningful inventory is compiled (GHG Protocol 2004). The following potential emission sources were excluded from the GHGEA, as activity data is not readily available, and modelling activity data is unlikely to generate sufficient emissions to materially change impacts or influence the decision making outcomes:

- Recyclable waste delivered to Concrush
- Product use (i.e. emissions associated with the use of Concrush products)
- Incidental on-site fuel consumption (e.g. petrol and LPG)
- Sulphur hexafluoride emissions associated with high voltage switch gear / circuit breakers
- Hydrofluorcarbon emissions associated with air conditioning
- Waste management
- Employees travelling for business purposes
- Employees travelling to and from their residential address and Concrush

6.14.3 Data and Assumptions

The potential impact of the Project can be quantified as the increase in emissions over the existing operations. To provide a baseline from which to assess the impact of the Project, this assessment includes a greenhouse gas assessment of the existing operations.

Table 6.31 includes assumptions used to complete the GHG calculations. The assumptions used for the assessment were selected to represent the potential impact of the Project, and are not meant to describe the exact specifications of the Project. The assumptions used for the existing operations are based on Concrush processing 108,000 tonne of recycled material per year.

Table 6.31 Assumptions used for the greenhouse gas assessment

Activity	Existing Operations	Project
Recycled product processed per annum	108,000 tonne	250,000 tonne
Diesel consumed by Concrush	262 kL	606 kL
Product deliveries made by Concrush owned trucks	0%	0%
Product deliveries made by external contractors	80%	80%
Product picked up from Concrush	20%	20%
Annual electricity use	38,000 kWh	89,000 kWh
Average distance for product delivery	50 Km	50 Km
Product delivered by large articulated trucks	50%	50%
Product delivered by medium rigid trucks	50%	50%
Construction materials (Concrush produced road base)	0	12,000 tonne
Diesel use during construction	0	5,700 litres

6.14.4 Construction Results

The Project requires the construction of a new hard stand areas (approximately 2 ha) to accommodate the expansion of the existing material processing and waste stockpile areas. The Project will also:

- upgrade the existing weighbridge, office, lunch room and maintenance shed;
- develop additional product bays; and
- construct a new wash down bay.

The construction phase of the Project is unlikely to generate significant greenhouse gas emissions. The hard stand area will be developed using approximately 12,000 t of a recycled road base product produced by Concrush. The new product bays and concrete block walls will be developed using recycled concrete blocks received by Concrush as waste. The embedded emissions in recycled construction products produced on site are expected to be very low.

The construction phase of the Project is expected to consume approximately 5,700 litres of diesel. The greenhouse gas emissions associated with consuming 5,700 litres of diesel are approximately 17 t CO₂-e.

6.14.5 Operational Results

Table 6.32 – Table 6.34 provide a summary of the potential annual operating Scope 1, 2 and 3 emissions approved under the existing operations and the Project.

Table 6.32 Potential annual Scope 1 emissions calculated for the existing operations and the Project

Scope 1 source	Currently Approved Facility (t CO ₂ -e)	Project (t CO ₂ -e)	Project Impact (t CO ₂ -e)
Stationary fuel use	709	1,641	932
Transport fuel use	0	0	0
Total Scope 1	709	1,641	932

Table 6.32 demonstrates that the Project is forecast to increase Scope 1 emissions by approximately 940 t CO₂-e per annum. The increase in Scope 1 emissions is due to an increase in on-site diesel demand associated with processing additional product.

Table 6.33 Potential annual Scope 2 emissions calculated for the existing operations and the Project

Scope 2 source	Currently Approved Facility (t CO ₂ -e)	Project (t CO ₂ -e)	Project Impact (t CO ₂ -e)
Electricity use	31	73	42
Total Scope 2	31	73	42

Table 6.33 demonstrates that the Project is forecast to increase Scope 2 emissions by approximately 50 t CO₂-e per annum. The increase in Scope 2 emissions is due to an increase in on-site electricity demand associated with processing additional product.

Table 6.34 Potential annual Scope 3 emissions calculated for the existing operations and the proposed Modification

Scope 3 source	Currently Approved Facility (t CO ₂ -e)	Project (t CO ₂ -e)	Project Impact (t CO ₂ -e)
Energy production and transmission	41	95	54
Outsourced product transport	534	1,237	703
Total Scope 3	575	1,332	757

Table 6.34 demonstrates that the Project will increase Scope 3 emissions by approximately 760 t CO₂-e per annum. The increase in Scope 3 emissions associated with the Project is due to the following factors:

- Purchasing additional diesel
- Purchasing additional electricity
- Engaging third party contractors to deliver additional products.

6.14.6 Impact Assessment

The Project's greenhouse gas emissions will have a disperse impact as they are highly mobile and are generated up and down the supply chain. The accumulation of greenhouse gases or carbon in 'carbon sinks' is the primary impact of greenhouse gas emissions. Since the industrial revolution, anthropogenic greenhouse gas emissions have accumulated in three major carbon sinks - the ocean (30%), terrestrial plants (30%) and the atmosphere (40%) (BOM and CSIRO, 2014).

The accumulation of greenhouse gases in the atmosphere is an important driver of global warming, sea level rise and climate change (IPCC 2013). Sea level rise and climate change may have many ramifications for the natural and built environment. The accumulation of greenhouse gases in the ocean is an important driver of ocean acidification (IPCC 2013).

The Project is forecast to generate approximately 940 t CO₂-e of additional direct emissions per annum.

To put the Project's emissions into perspective, under current policy settings, global greenhouse gas emissions are forecast to reach 56,200,000,000 t CO₂-e per annum by 2025 (UNEP 2016). During operation, the Project will contribute approximately 0.0000017 per cent to global emissions per annum (based on its projected Scope 1 emissions). The Scope 2 and 3 emissions associated with the Project will be generated by greenhouse gas sources outside the operational control of Concrush, and are attributable to other proponents/facilities.

While not quantified within this assessment, Concrush makes a positive contribution towards reduction of CO₂-e emissions as the use of its recycled products such as mulch means that there is a reduction in demand for virgin timber or forest resources to produce similar products.

6.14.7 Mitigation and Management Measures

No mitigation or management measures are required for the Project.

6.15 Hazard and Risk

Under *SEPP 33 – Hazardous and Offensive Development* (DoP, 1992) (SEPP 33), a preliminary risk screening of a proposed development is required to determine the need for a Preliminary Hazard Analysis (PHA). The preliminary screening involves identification and assessment of the storage of specific dangerous goods classes that have the potential for significant off-site effects. If, at the proposed location, and in the presence of controls, the risk level exceeds the acceptable criteria for impacts on the surrounding land use, the development is classified as a 'hazardous' and/or 'offensive' industry as appropriate and may not be permissible within certain land zones in NSW.

A 'hazardous industry' under SEPP 33 is one which, when all locational, technical, operational and organisational safeguards are employed continues to pose a significant risk. An 'offensive industry' is one which, even when controls are used, has emissions which result in a significant level of offence e.g. odour or noise emissions. A proposal cannot be considered either hazardous or offensive until it is firstly identified as potentially hazardous or potentially offensive and subjected to the assessment requirements of SEPP 33. A PHA is required if a proposed development is potentially hazardous.

A proposed development may also be potentially hazardous if the number of traffic movements for the transport of hazardous materials exceeds the annual or weekly criteria outlined in Table 2 of *Applying SEPP 33* (DoP 2011). If these thresholds are exceeded a route evaluation study is likely to be required.

6.15.1 Preliminary Risk Screening

Preliminary risk screening is undertaken to determine if a PHA is required. The preliminary risk screening compares the Project hazardous material storage quantities that have the potential to create off site impacts as well as transport quantities and frequency with SEPP 33 trigger values. **Table 6.35** provides a list of the hazardous materials to be stored at the Project site, the dangerous goods class of the material, storage quantity and the respective SEPP 33 threshold quantity.

Concrush store only minor quantities of dangerous goods with relevant SEPP 33 screening thresholds on site (e.g. Class 3 flammable liquids, Class 2.1 flammable gas and Class 5.1 oxidising substances). Larger inventories of Class C1 and C2 combustible liquids are stored on site, however, these materials are not subject to SEPP 33 screening thresholds unless stored with Class 3 flammable liquids or at temperatures above their flash point. As the Class 3 flammable liquids (solvents and aerosols) and Class C1 and C2 combustible liquids (diesel) will be separated by an adequate distance (> 7 m), in accordance with AS1940 – 2004 *The storage and handling of flammable and combustible liquids* (AS1940), the flammable and combustible liquids may be considered separately. Concrush will store all flammable and combustible liquids in accordance with the requirements of AS1940.

Table 6.35 demonstrates that none of the hazardous materials to be stored at the Project site are above SEPP 33 screening thresholds and therefore a PHA is not required.

The number of transport movements for Class 3 (II) and Class 2.1 materials will not exceed either the weekly or screening thresholds and therefore a route evaluation study is not required for the Project.

Table 6.35 Hazardous Materials Inventory

Material	Storage Location	ADG Code ¹ Class (PG)	Estimated Project Storage Capacity (kg)	Screening Threshold (kg)	Trigger SEPP 33
Flammable Liquids (solvents and aerosols)	Maintenance shed	3 (II)	2,000	5,000	No
Acetylene	Maintenance shed	2.1	15	100	No
Compressed Oxygen	Maintenance shed	2.2, subsidiary risk 5.1	10	5,000	No
Diesel	Maintenance shed	C1	4,000	- ²	NA

1. ADG Code – Australian Dangerous Goods Code

2. No SEPP 33 quantity screening thresholds for these materials

6.15.2 Safety Management

Concrush has safety management system documents and procedures including a PIRMP. The PIRMP will be applied to ensure that all foreseeable emergency events are considered and adequate site specific systems are put in place to ensure site personnel and equipment are ready and able to deal with an emergency situation.

Concrush will store all flammable and combustible liquids in accordance with the requirements of AS1940 *The storage and handling of flammable and combustible liquids*.

7.0 Summary of Management Measures

Prior to any construction activities associated with the Project, Concrush will prepare a Construction Environmental Management Plan (CEMP). Concrush will also update their existing environmental management documentation for the site through revision and updating of current procedures in the OEMP. The OEMP will detail the management measures and any monitoring requirements relevant to the operation of the Project. The CEMP and OEMP will include details of all of the management and monitoring commitments outlined in this section of the EIS as well as detailing the timing and responsible person. Concrush will develop and implement a compliance tracking system as part of the update to the OEMP. The CEMP and OEMP would be submitted to LMCC for approval prior to any works occurring at the Project site.

7.1.1 Noise

The following mitigation and management measures will be implemented for the Project:

Construction

- Undertake work during standard hours (7am - 6pm weekdays, 7am - 1pm Saturday).
- Turn off plant when not in use.
- Ensure plant is regularly maintained, and repair or replace plant that becomes noisy.
- Arrange work site to minimize the use of movement alarms on vehicles and plant.
- Avoid dropping materials from a height.

Operation

- Concrush will undertake a noise monitoring program to assess the effectiveness of the proposed mitigation measures in achieving the predicted noise levels. Concrush will undertake initial noise monitoring of day, evening and night time activities to compare the actual noise levels against the predicted noise levels. Concrush is committed to looking to improve noise performance across its operations to minimise potential disturbance to the community.
- Construct a bund to 3.5 m above finished ground level along the eastern side of the 'Raw Material Stockpiles and Processing Area'. The bund is required to block line of sight. The bund can be formed from stockpile material, but the stockpile must be continuous and a minimum 3.5 m high at all points. Crushers and screens (except for the trommel screen used for green waste) will not be used outside this area. The bund should meet the wall along the southern boundary described below.
- Construct a wall to 3 m above finished ground level along the southern boundary of the 'Raw Material Stockpiles and Processing Area'.
- Crushers will not be used after 6pm.
- The cone crusher will not be used when green waste shredding is occurring.
- After 10pm, only truck loading and tipping operations will occur. Loading will only occur from the westernmost stockpiles, and the front end loader used for loading should remain to the west of these stockpiles at all times. Truck engines should be turned off while waiting on or off site.

7.1.2 Air Quality

The following mitigation and management measures will be implemented for the Project:

General

Update the existing AQMP to reflect the Project changes.

Odour

Continue to implement the existing controls within the AQMP which include:

- Avoid conducting potential odour generating activities when the wind direction is blowing towards nearby residential areas (Normally south westerly or westerly).
- Avoid conducting potential odour generating activities during early morning periods under low wind speed conditions.
- Cover transported loads leaving the Project site to aid in the control of fugitive emission of odours during transport of potential odour generating products.
- Turning of windrows during pasteurisation.
- Odour monitoring.
- Odour complaint investigation.
- Investigative odour monitoring.

Dust

- The use of atomising water sprays on crushing and screening equipment. These shall be attached to the crushing point and conveyor belt discharge point to control point source dust emissions.
- Two coat seal on haul roads.
- Minimisation of the drop heights between the excavator or loader bucket and trailers/truck during loading to reduce dust generation.
- Dust suppression of stockpiles by water spraying on an as needed basis or when the following meteorological conditions occur:
 - An average wind speed greater than 18km/h is recorded continuously over a 15 minute period from a north or north westerly direction.
- Maintenance of clean entry drive as required to minimise dry dust on road.
- The use of a water cart to water roads and hardstand areas to assist in the control of fugitive dust emissions on an as needed basis, or when the following meteorological conditions occur:
 - An average wind speed greater than 18km/h is recorded continuously over a 15 minute period from a north or north westerly direction.
- Cessation of dust emitting activities shall occur during the following conditions:
 - An average wind speed greater than 36km/h is recorded continuously over a 15 minute period from a north or north westerly direction, or
 - Dust suppression measures appear visually ineffective.

The monitoring for deposited dust and PM10 emissions will be undertaken at strategic and representative locations (e.g. the four site boundaries). Monitoring will be undertaken for at least a period of 24 months following the commencement of the expanded operations. This will allow the following:

- Comparison of monitoring results with compliance levels and the dust modelling predictions.
- Review of the effectiveness of the mitigation measures.

7.1.3 Traffic

No mitigation and management measures are required for the Project.

7.1.4 Soil and Water Management

The following mitigation and management measures will be implemented for the Project:

Water quality measures will be implemented for the Project to minimise impact on the surrounding environment. These controls are designed and constructed to a standard consistent with:

- Managing Urban Stormwater – Soils and Construction, Volume 1 (the Blue Book) (Landcom, 2004).
- Managing Urban Stormwater – Soils and Construction, Volume 2E: Mines and Quarries (DECC, 2008).

Construction

A construction erosion and sediment control plan (ESCP) will be developed in accordance with the Blue Book for detailing the specific erosion and sediment controls, rehabilitation, monitoring and maintenance requirements for the construction phase of the Project. The construction ESCP will:

- Be prepared on relevant copies of drainage drawings for:
 - different construction stages
 - areas of high erosion hazard.
- Show sizing and design details for all sediment basins and erosion and sediment controls (such as diversion drains).
- Be revised when required by changing circumstances, if the site conditions change or if installed controls are not operating effectively.
- Be integrated with work procedures, construction method statements, activity statements and their scheduling.
- Be site specific.

The measures are designed to minimise erosion and transport of sediment around and off-site and include:

- Clearly identifying and delineating areas required to be disturbed and ensuring that disturbance is limited to those areas.
- Clearing as little vegetation as required and minimising machinery disturbance outside of these areas.
- Installing appropriate erosion and sediment controls prior to stripping topsoil or disturbing areas.

- Limiting the number of roads and tracks established.
- Stabilising site entry/exit points to ensure sediment is not tracked onto sealed roadways.
- Construction of drains upslope of areas to be disturbed to convey clean runoff away from most disturbed areas where required.
- Construction of sediment dams where required to capture and treat runoff from disturbed catchment areas.
- During construction all temporary controls will be inspected:
 - Daily for high risk controls such as within drainage lines
 - Weekly for all other controls
 - Prior to forecasted rainfall events great than or equal to 10 mm
 - After rainfall events greater than or equal to 10 mm in a 24 hour period.

All construction erosion and sediment control measures will be maintained in a functioning condition until all construction activities are completed.

Operation

An operational ESCP will be incorporated into an updated version of the Concrush Site Water Management Plan and include:

- construction of appropriately designed and managed Type C sediment basins (Sediment Dam 1 and Sediment Dam 2)
- separation of the green waste storage and processing catchment and the construction of the Leachate Dam to capture a 1 in 10 year 24 hour duration storm event from the Green Waste Catchment
- installation of a Constructed Wetland to treat water captured in the Leachate Dam
- roofing the retail area mulch storage bays
- increased on-site stormwater storage to increase reuse of captured stormwater and the prioritised reuse of water discharged from the Constructed Wetland
- Incorporation of a leachate barrier system for Project green waste storage and handling area and the lining of the Leachate Dam and Constructed Wetland
- containment of the concrete wash out bay catchment and reuse of the reclaimed water
- Monthly inspections of long-term erosion and sediment controls will be undertaken as well as inspections prior to and after forecasted rainfall events greater than or equal to 10 mm.

All erosion and sediment control measures, including drainage control measures, will be maintained in proper working order at all times during their operational lives.

Monitoring

Concrush will undertake monthly surface water quality monitoring of the constructed wetland, sediment basins and upstream/downstream Cockle Creek. The following parameters will be tested: TSS, EC, pH, TN, TP, NO_x, NH₄.

Monitoring bores will be installed up and down the hydraulic gradient from the green waste storage and processing area in accordance with the *Environmental Guidelines for Composting and Related Organics Processing Facilities* (NSW Department of Conservation, 2004). Water quality samples will be collected from the monitoring bores on a monthly basis and analysed for TSS, EC, pH, TN, TP, NO_x and NH₄.

Concrush will monitor the following water volumes:

- Monthly potable water imported via water cart
- Monthly water storage inventories.

7.1.5 Ecology

The Project design has taken into account the wetland area in the western part of the site which will not be disturbed. Mitigation and management measures for other environmental aspects such as soil and water and air quality will minimise the potential for indirect offsite impacts such as sedimentation of waterways, nutrient discharge and dust impacts.

The following mitigation and management measures will be implemented for the Project:

- Areas to be protected during construction works including the wetland area will be clearly marked
- Any landscape planting will consist of native species.

7.1.6 Bushfire

Concrush have an existing Pollution Incident Response Management Plan (PIRMP) which includes the relevant evacuation procedure for staff and the public in relation to bushfire threat. Threat of the combustion of product on site is managed through appropriate storage of materials and implementation of separation distances between stockpiles. During hot conditions stockpiles are wetted down and all operators are trained in firefighting techniques.

The following specific bushfire management measures are to be implemented at the site to manage the risk associated with the bushfire hazard:

- installation of Fire and Rescue NSW compatible fittings on the water storage tanks near the green waste area
- management of the pasteurisation process within green waste stockpiles
- ensure machinery is available on site to break up green waste stockpiles in the event of combustion during pasteurisation
- continued management of vegetation across the site to manage fuel loads and prevent the spread of bushfire across the site
- continued provision of fire extinguishers on all machinery
- ensuring access to the site is maintained at all times.

With the effective implementation of the existing and proposed bushfire management measures, it is considered that bushfire risk can be appropriately managed at the Project site.

7.1.7 Aboriginal Archaeology and Cultural Heritage

The following mitigation and management measures will be implemented for the Project:

- Concrush will ensure that its employees and contractors are aware that it is an offence under Section 86 of the *National Parks and Wildlife Act 1974* to harm or desecrate an Aboriginal object unless that harm or desecration is the subject of an Aboriginal Heritage Impact Permit.
- In the unlikely event that an Aboriginal object or objects are uncovered during the proposed construction works, ground disturbance works should cease within 20 m of the object and an archaeologist, OEH and the local Aboriginal parties should be contacted to determine an appropriate management strategy.

7.1.8 Historic Heritage

The following mitigation and management measures will be implemented for the Project:

- If during the course of proposed works previously unknown historical archaeological material or heritage items are discovered, all work in the area of the item(s) shall cease immediately and Heritage Division, OEH and a qualified heritage consultant will be consulted, in accordance with Section 146 of the Heritage Act, to determine an appropriate course of action prior to the recommencement of work in the area of the item.

7.1.9 Visual

The following management measures would be implemented as part of the Project:

- A landscaped 2 m high earth bund will be established along the eastern boundary (southern half) of the site to complement the existing landscaped earth bund present along the northern half of the eastern site boundary.

7.1.10 Contamination

The following mitigation and management measures will be implemented for the Project:

- A clean fill layer of 0.5 m depth be placed across the southern part of the Project site. A marker layer is to be established to distinguish the clean fill layer from the existing soils beneath
- If excavation or earthworks into natural soils to depths near to the groundwater table (approximately 3.0 to 5.0 m below ground level) are required an ASSMP will be developed for the Project.

7.1.11 Waste

The following management measures would be implemented as part of the Project:

- Waste streams will be managed in accordance with the principles of the waste hierarchy, with emphasis on reduce, reuse, recycle prior to disposal of its wastes.
- All material used will be in accordance with the relevant requirements and conditions of the exemptions outlined above.

- General waste generated by site personnel during operation of the Project will be accommodated through the use of a 240 litre municipal waste bin to be collected by LMCC or a licensed contractor for disposal/recycling at an appropriate waste management facility.

7.1.12 Greenhouse Gas Assessment

No mitigation or management measures are required for the Project.

7.1.13 Hazard and Risk

Concrush has safety management system documents and procedures including a PIRMP. The PIRMP will be applied to ensure that all foreseeable emergency events are considered and adequate site specific systems are put in place to ensure site personnel and equipment are ready and able to deal with an emergency situation.

Concrush will store all flammable and combustible liquids in accordance with the requirements of AS1940 *The storage and handling of flammable and combustible liquids*.

8.0 Conclusion

8.1 Environmental Impacts

The potential environmental impacts of the Project have been identified through a process involving:

- Assessment of site characteristics
- Consultation with government agencies and community
- Expert technical assessments.

The key issues identified were the subject of comprehensive assessment to determine the potential impacts of the Project on the existing environment and community. The results of these assessments are detailed in **Section 6.0**. The environmental and social impacts of the Project have been minimised through appropriate site selection (extending the existing Project site in an existing industrial area), careful project design to avoid and minimise impacts, and implementation of appropriate control measures.

With the proposed measures to mitigate, minimise and manage impacts it is anticipated that the Project can proceed in a manner that minimises impacts to the environment and community, while realising the benefits of providing increased capacity to recycle construction and demolition waste.

8.2 Suitability of the Site

The existing Concrush site would be expanded to incorporate a portion of the adjacent vacant industrial land. The Project is classified as a resource recovery and recycling facility which is permissible under the existing industrial land use zone. The Project site is located on Racecourse Road providing good access to the local and regional road network. All traffic movements for the Project can be undertaken within the existing road network capacity.

Land uses in the vicinity of the Project site include industrial uses, rail and road corridors, coal preparation plant and residential areas. The Project plant can be operated within the relevant air quality criteria. The project would result in some negligible and marginal exceedances of noise criteria during daytime operations, with two residents predicted to experience significant exceedances (as defined by the NPI) during night operations, however, it is important to note that night time operations are based on market demand only and are anticipated to be relatively infrequent. Concrush has undertaken specific consultation with these residents and is proposing a series of specific mitigation measures including a commitment to monitoring during the first two nights of operations and based on the outcomes of the monitoring entering into a negotiated agreement with the two land owners for future night operations.

Vegetation within the Project site is dominated by exotic species and would require the removal of a small number of planted native trees and shrubs only, which will not result in a significant impact on biodiversity. Further, the Project would not substantially increase visual impacts above the existing situation, is not potentially hazardous or offensive and will not result in any impact to Aboriginal sites or historic heritage.

As discussed in **Section 3.3**, the location of the Project site is considered appropriate compared to potential alternatives on the basis of zoning, land tenure, access to the road network, proximity of sensitive receivers and suitability to service the local area. The ongoing use of the existing site and an extension to this area is considered an appropriate use of an already disturbed, brownfield site that has been operating in a similar nature for approximately 16 years.

The comprehensive environmental impact assessment undertaken for the Project demonstrates that the environmental and social impacts of the Project can be effectively managed.

8.3 Benefits of the Project

The Newcastle and Lake Macquarie regions are currently experiencing a development and infrastructure boom with substantial construction and associated demolition works being undertaken. The Project will assist in servicing the need for increased construction and demolition waste recycling.

Additionally, the *NSW Waste Avoidance and Recovery Strategy 2014-21* (EPA, 2014) provides a framework for waste management over a seven year period, aligning with the NSW Government's waste reforms in *NSW 2021: A Plan to Make NSW Number One*. The Strategy identifies the following waste avoidance and resource recovery goals:

- Avoid and reduce waste generation
- Increase recycling
- Divert more waste from landfill
- Manage problem wastes better
- Reduce litter
- Reduce illegal dumping.

The Project would directly contribute to achieving some of the key goals including increasing recycling and diverting waste from landfill.

The key benefits associated with the Project are summarised below:

- Increased capacity for recycling of construction and demolition waste
- Opportunity for less waste going to local landfills such as Awaba and Summerhill
- Servicing the ongoing demand for Concrush's products
- Continued and increased employment of local people at the site
- Appropriate use of an existing brownfield site negating the need for impact to a greenfield site
- Can be undertaken in an environmentally acceptable manner.

8.4 Ecologically Sustainable Development

The EP&A Act aims to encourage ecologically sustainable development (ESD) within NSW. As outlined in **Section 4.0**, the Project requires approval under Part 4 of the EP&A Act. As such, the approval authority needs to be satisfied that the Project is consistent with the principles of ESD. This section provides an assessment of the Project in relation to the principles of ESD.

To justify the Project with regard to ESD principles, the benefits of the Project in an environmental and socio-economic context should outweigh any negative impacts. The ESD principles encompass the following:

- the precautionary principle

- inter-generational equity
- conservation of biological diversity
- valuation and pricing of resources.

Essentially, ESD requires that current and future generations should live in an environment that is of the same or improved quality to the one that is inherited.

8.4.1 The Precautionary Principle

The EP&A Regulation defines the precautionary principle as:

- (a) namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.*

In the application of the precautionary principle, public and private decisions should be guided by:

- (i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and*
- (ii) an assessment of the risk-weighted consequences of various options,*

In order to achieve a level of scientific certainty in relation to potential impacts associated with the Project, this EIS has undertaken an extensive evaluation of the key potential environmental impacts. Detailed assessment of all key issues and necessary management procedures has been conducted and is documented in this EIS.

The assessment process has involved a detailed study of the existing environment and the use of scientific modelling and study to assess and determine potential impacts as a result of the Project. To this end, there has been careful evaluation to avoid, where possible, irreversible damage to the environment.

The decision making process for the operational design, impact assessment and development of management processes has been transparent in the following respects:

1. Relevant government authorities and nearby residents were consulted during EIS preparation (refer to **Section 5.0**). This enabled comment and discussion regarding potential environmental impacts and proposed environmental management procedures.
2. The EIS has been undertaken on the basis of the best available information about the Project site. Where uncertainty in the data used in the assessment has been identified, a conservative worst case analysis has been undertaken and contingency measures have been identified to manage that uncertainty.
3. Concrush will establish construction and operational environmental management plans to manage Project impacts.

8.4.2 Intergenerational Equity

The EP&A Regulation defines intergenerational equity as:

- (a) that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.*

Intergenerational equity refers to equality between generations. It requires that the needs and requirements of today's generations do not compromise the needs and requirements of future generations in terms of health, biodiversity and productivity.

Concrush propose to increase the capacity of the existing recycling facility which will mean that more waste can be received and processed into usable products. Increasing the capacity of the Concrush facility would also allow the flow on effect of less waste going to landfill. Increased recycling and less waste to landfill are both positive contributions that the Project would make towards intergenerational equity.

The environmental management measures discussed in **Section 7.0** have been developed to minimise the impact of the Project on the environment and community to the extent reasonably practicable.

The management of environmental issues as outlined in this EIS will maintain the health, diversity and productivity of the environment for future generations.

8.4.3 Conservation of Biological Diversity

The conservation of biological diversity refers to the maintenance of species richness, ecosystem diversity and health and the links and processes between them. All environmental components, ecosystems and habitat values potentially affected by the Project are described in this EIS. As outlined in this EIS, the Project will require removal of some vegetation dominated by exotic species as well as approximately 0.07 ha of native species associated with the planted landscaped bunds. The Project site layout has been designed to conserve and avoid impact to an area containing native wetland species in the south western part of the Project site. The Project is not predicted to result in adverse biological diversity outcomes within the local area nor will it result in a significant impact.

8.4.4 Valuation and Pricing of Resources

The goal of improved valuation of natural capital is detailed in Schedule 2 Clause 7(4)(d) of the EP&A Regulation 2000 and has been included in Agenda 21 of Australia's Intergovernmental Agreement on the Environment. The principle of improved valuation and pricing refers to the need to determine proper values of services provided by the natural environment. The objective is to apply economic terms and values to the elements of the natural environment. This is a difficult task largely due to the intangible comparisons that need to be drawn in order to apply the values.

The Project involves recycling waste material into reusable products. This places a value on the waste material and increases the life cycle value of the original resource. The valuation of resources occurs twice within the Concrush facility as the waste material delivered to site is assigned a dollar value as are the recycled products sold by Concrush.

The cost of integrating effective management measures to minimise potential environmental and social impacts of the Project have also been included in Project feasibility considerations.

8.5 Conclusion

The Project provides an opportunity for Concrush to increase the volume of construction and demolition waste material recycled in the local and regional area. Associated with the increased volume of waste recycled by Concrush would be the opportunity for diversion of waste from local landfills such as Awaba and Summerhill. The Project would make use of a suitably zoned brownfield site with good access to the road network and avoid the need for impacts to a greenfield site. The Project provides benefits for the local community including increased local employment as well as providing a facility at which they can recycle domestic building and green waste.

The increased traffic numbers associated with the Project can be accommodated by the existing road network without the need for any road or intersection upgrades. The implementation of mitigation measures will ensure that potential air quality impacts would be managed and remain within relevant criteria. Concrush has committed to a range of reasonable and feasible noise mitigation measures to reduce their noise impacts and will continue to seek ways to reduce noise.

It is considered that with the implementation of all mitigation measures the Project could proceed in a manner that minimises impacts to the environment and community, while allowing the significant benefits of increased recycling and reuse of construction and demolition waste material to be realised.

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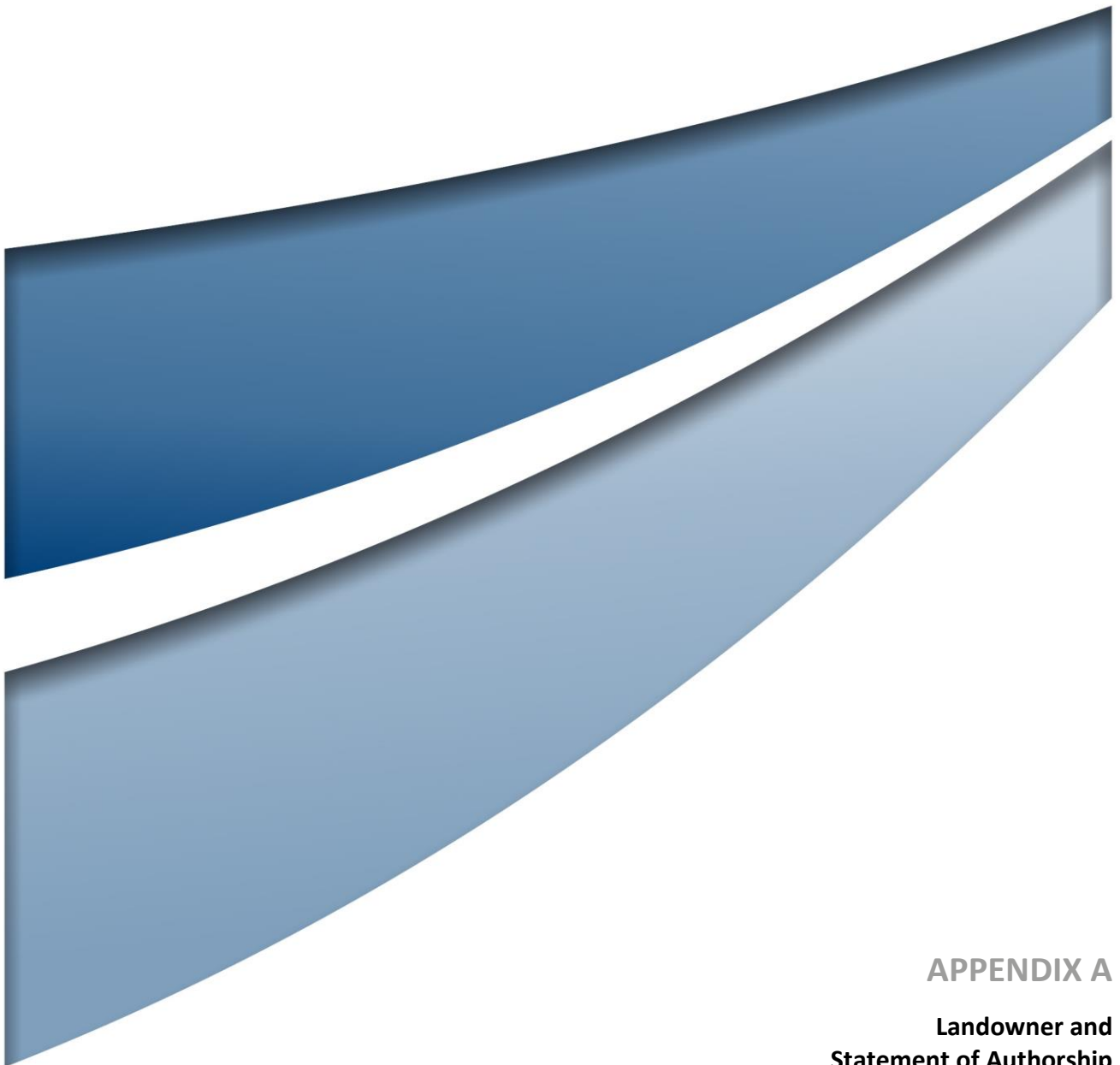
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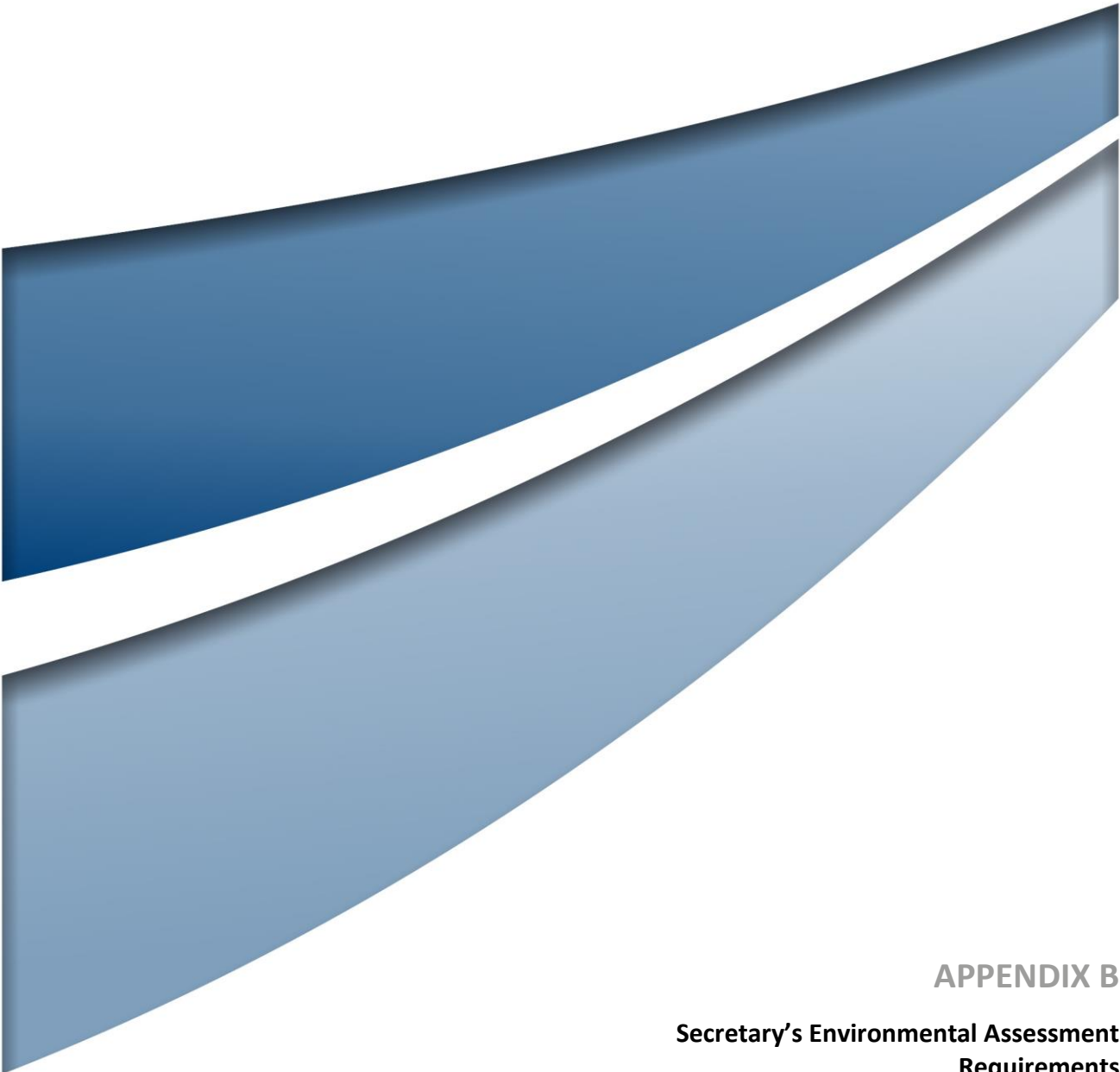
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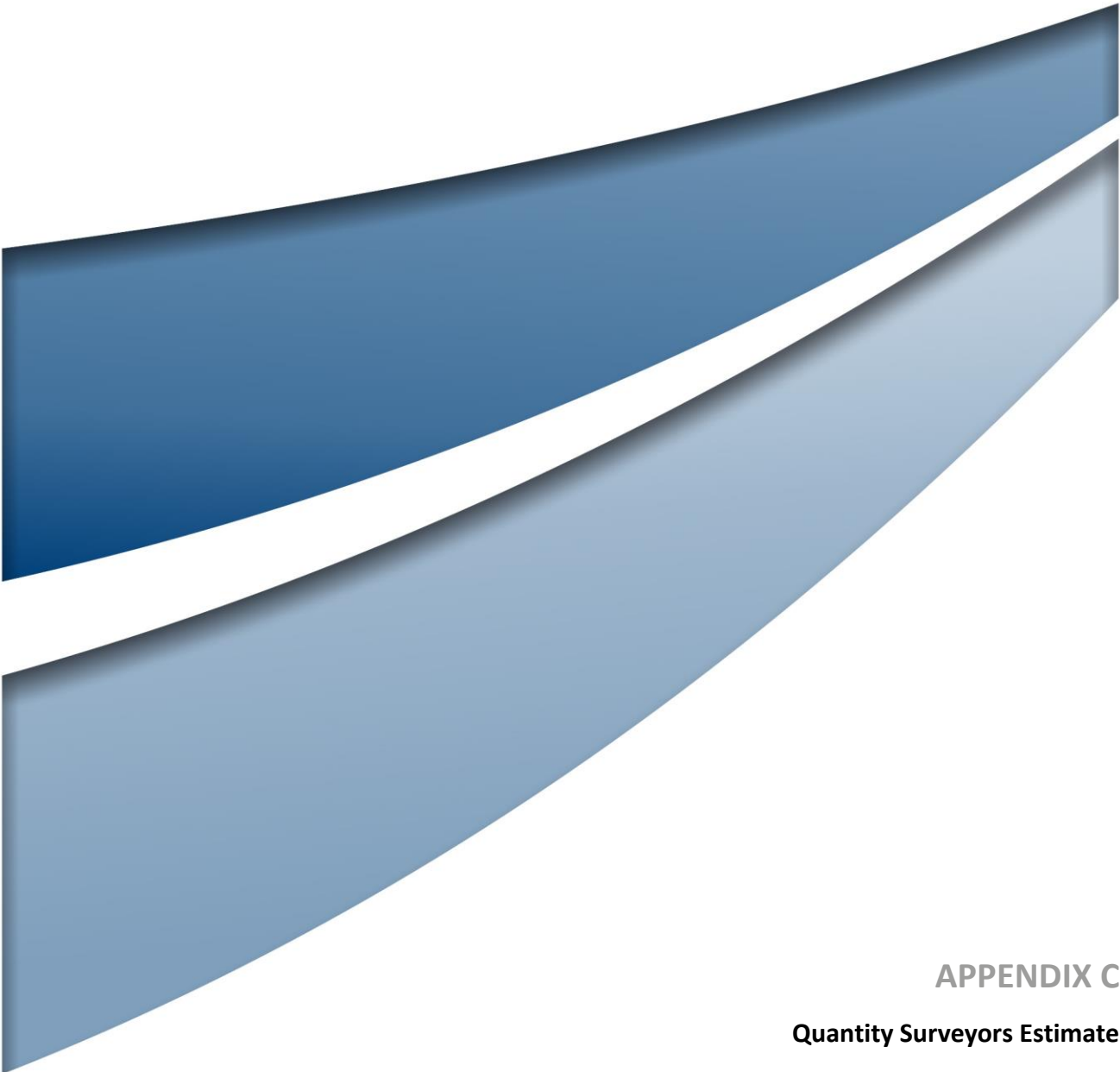
APPENDIX A

**Landowner and
Statement of Authorship**



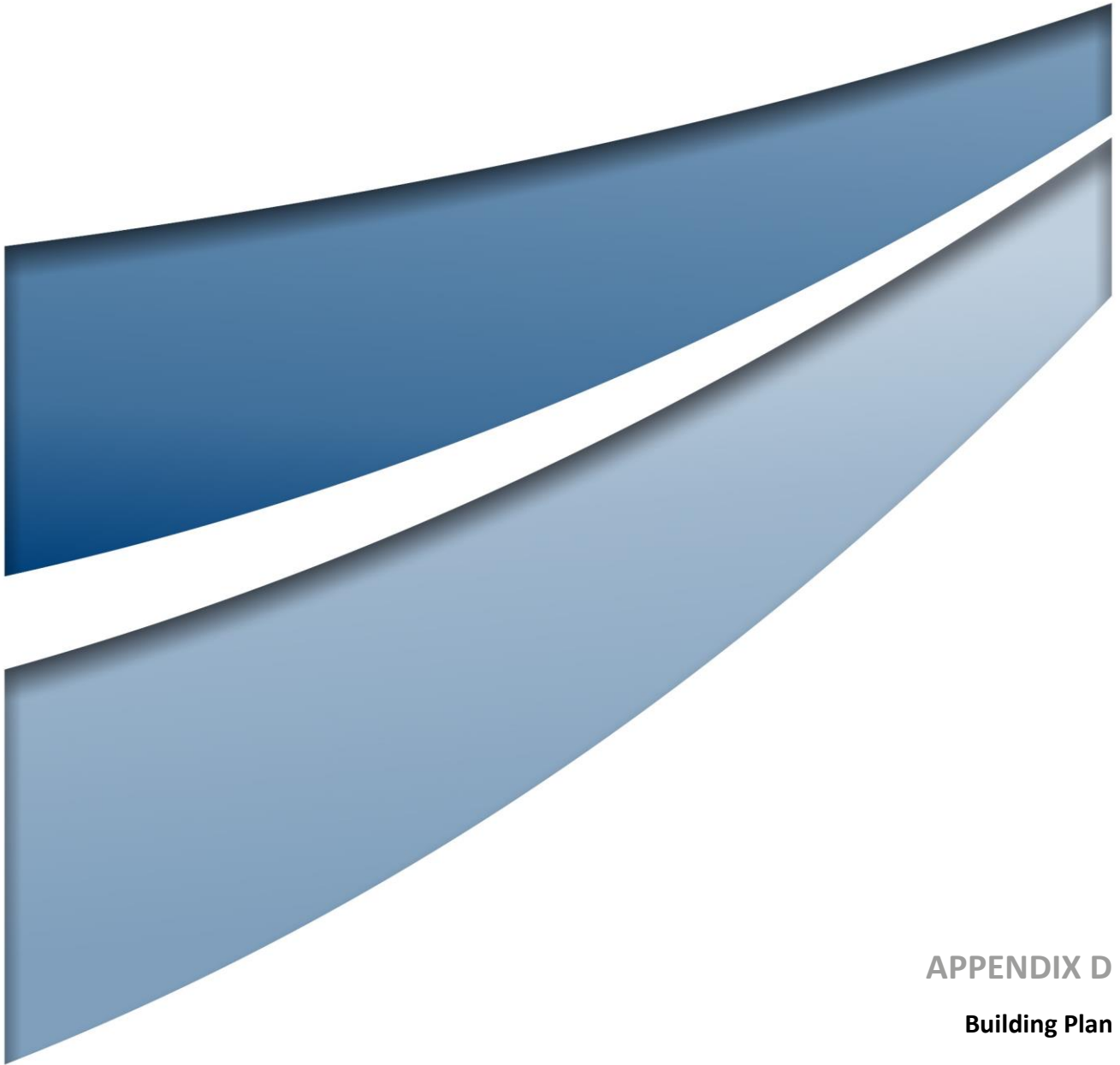
APPENDIX B

Secretary's Environmental Assessment Requirements



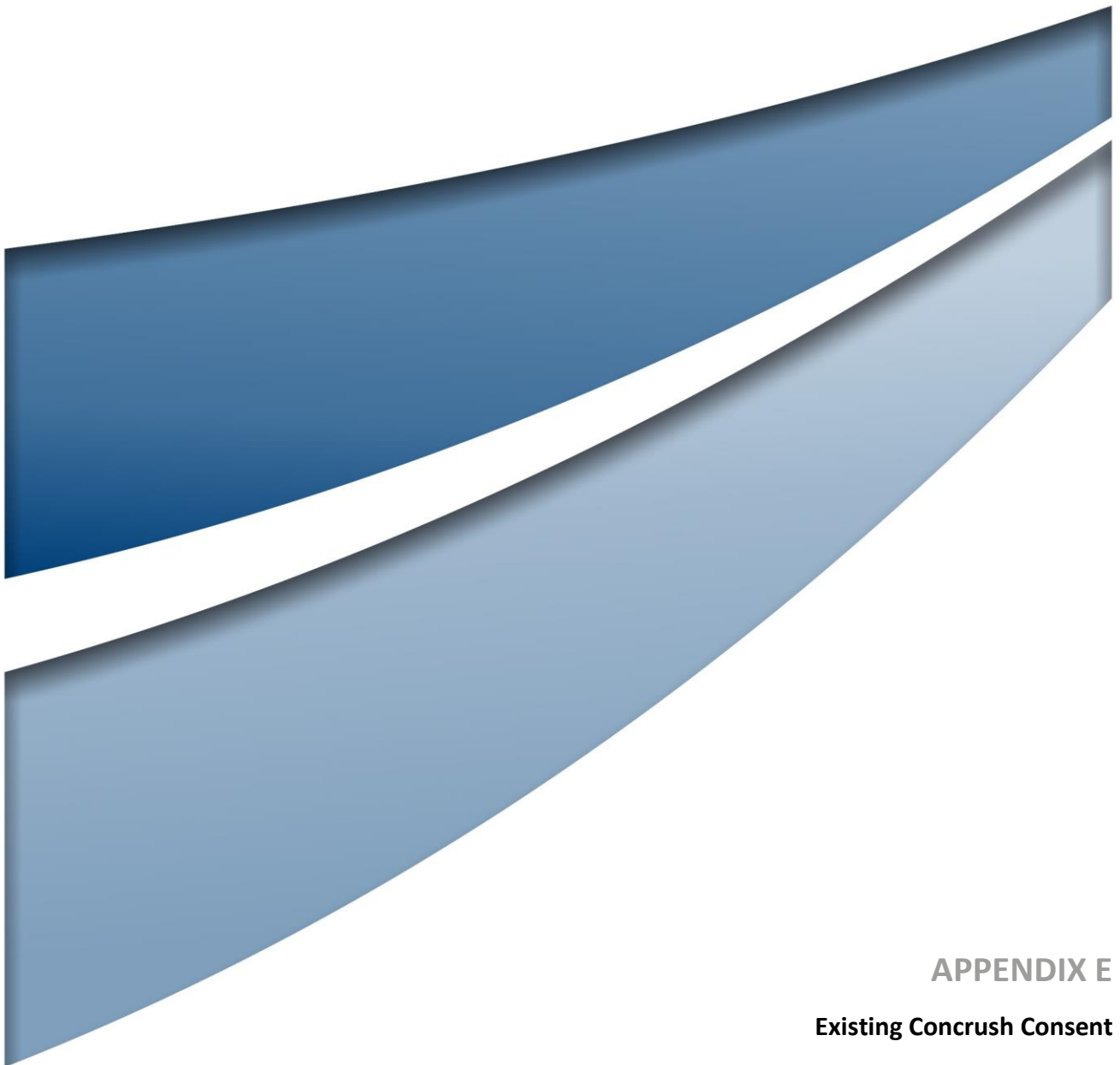
APPENDIX C

Quantity Surveyors Estimate



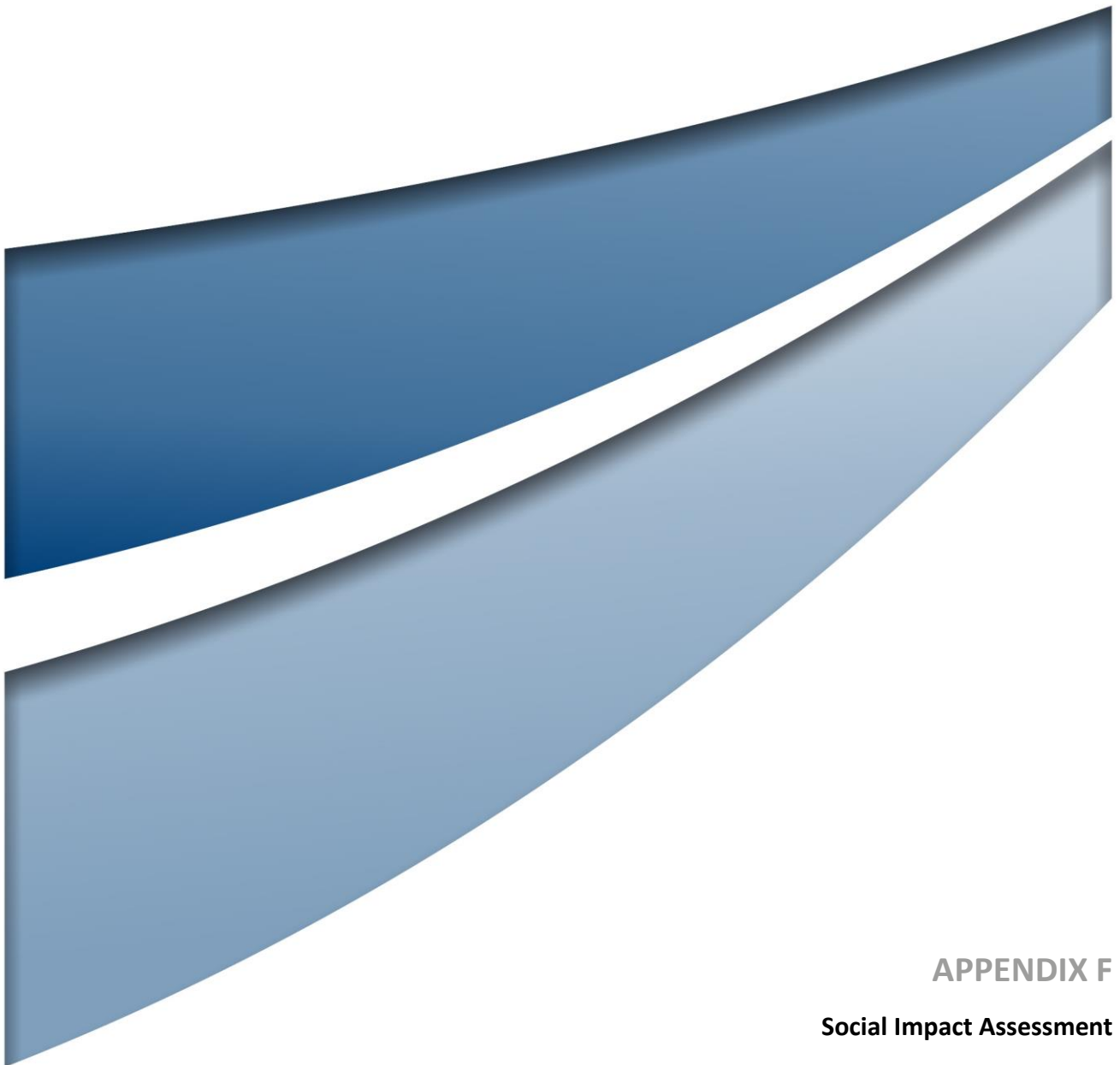
APPENDIX D

Building Plan



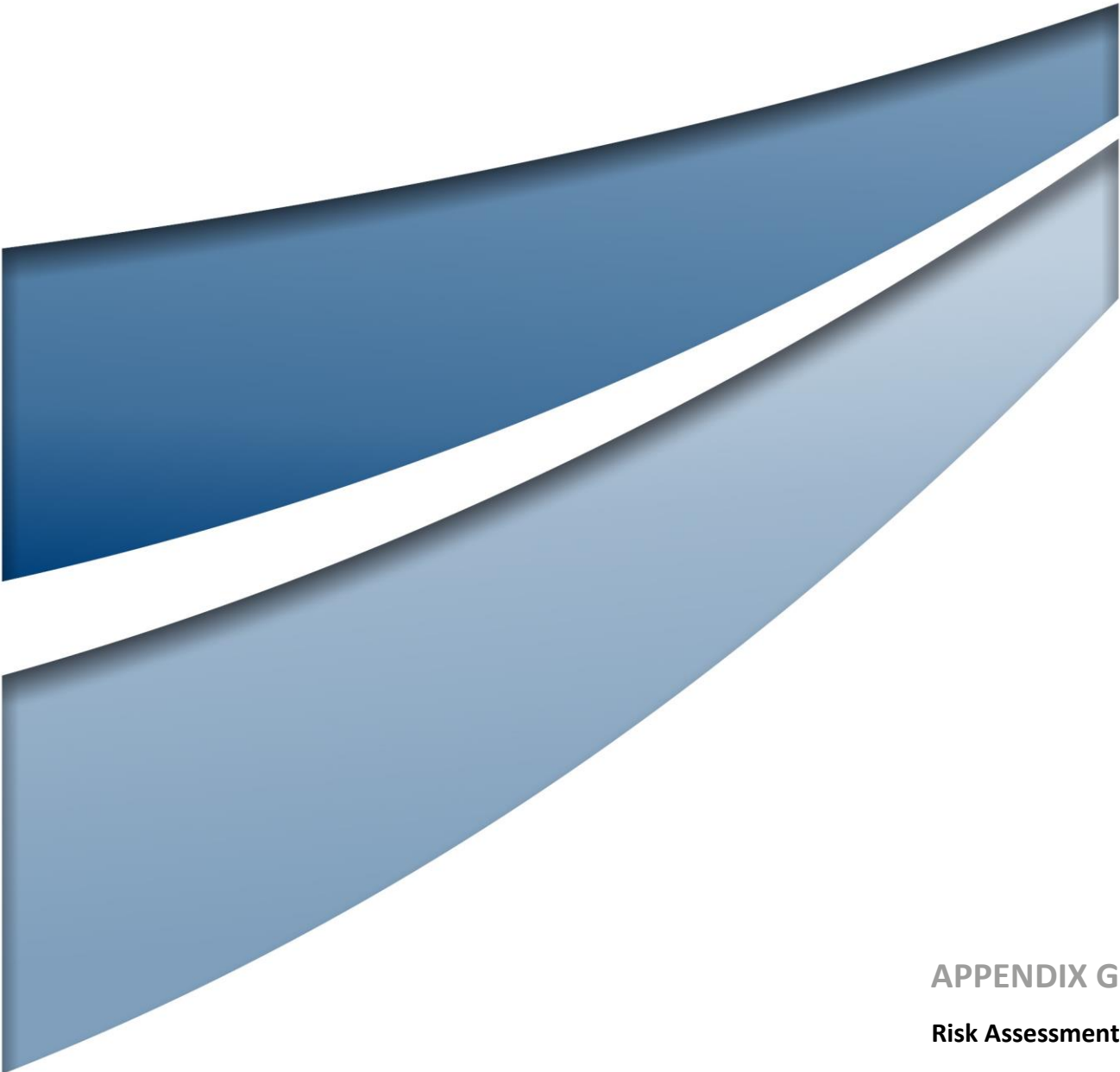
APPENDIX E

Existing Concrush Consent

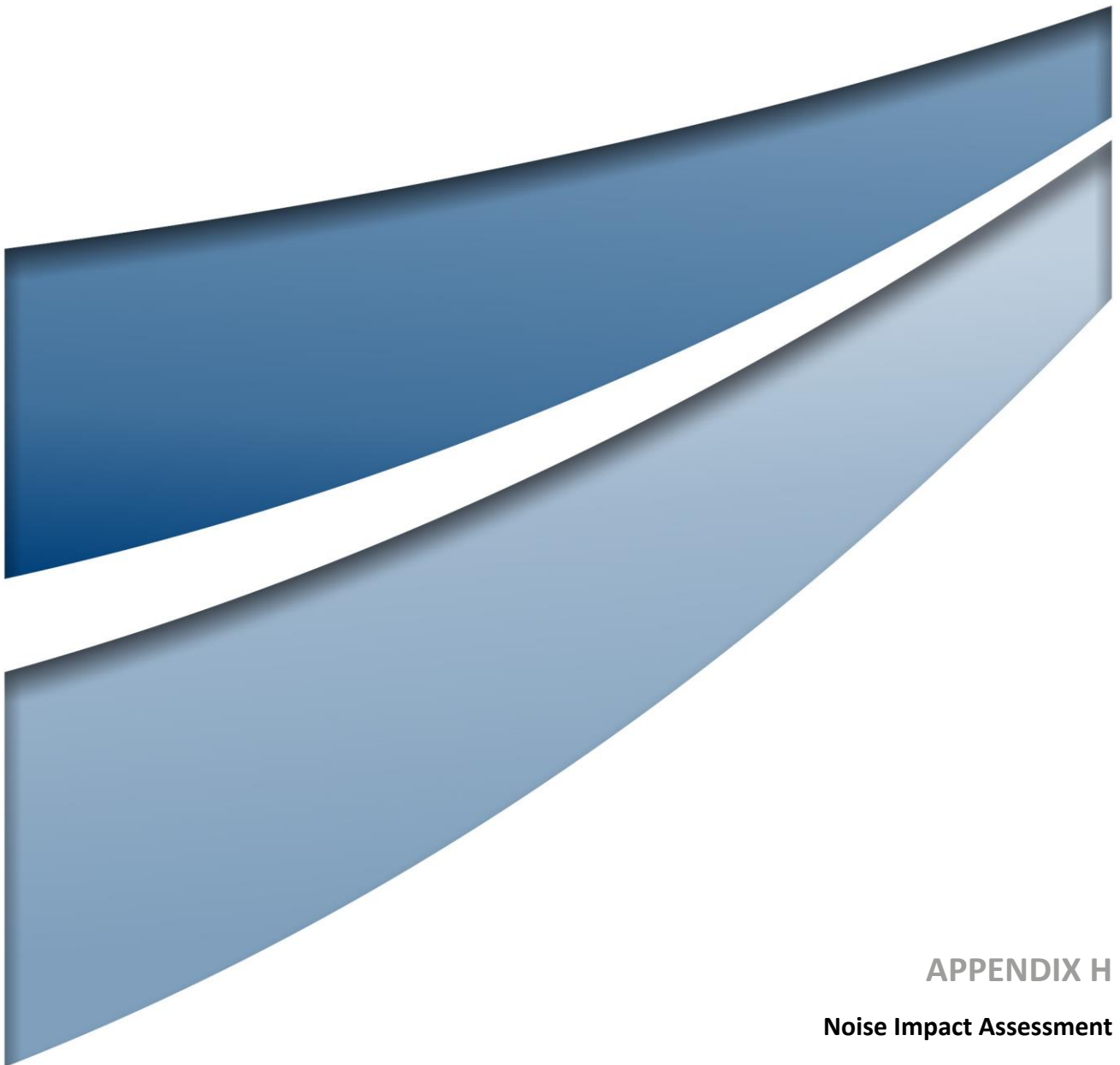


APPENDIX F

Social Impact Assessment

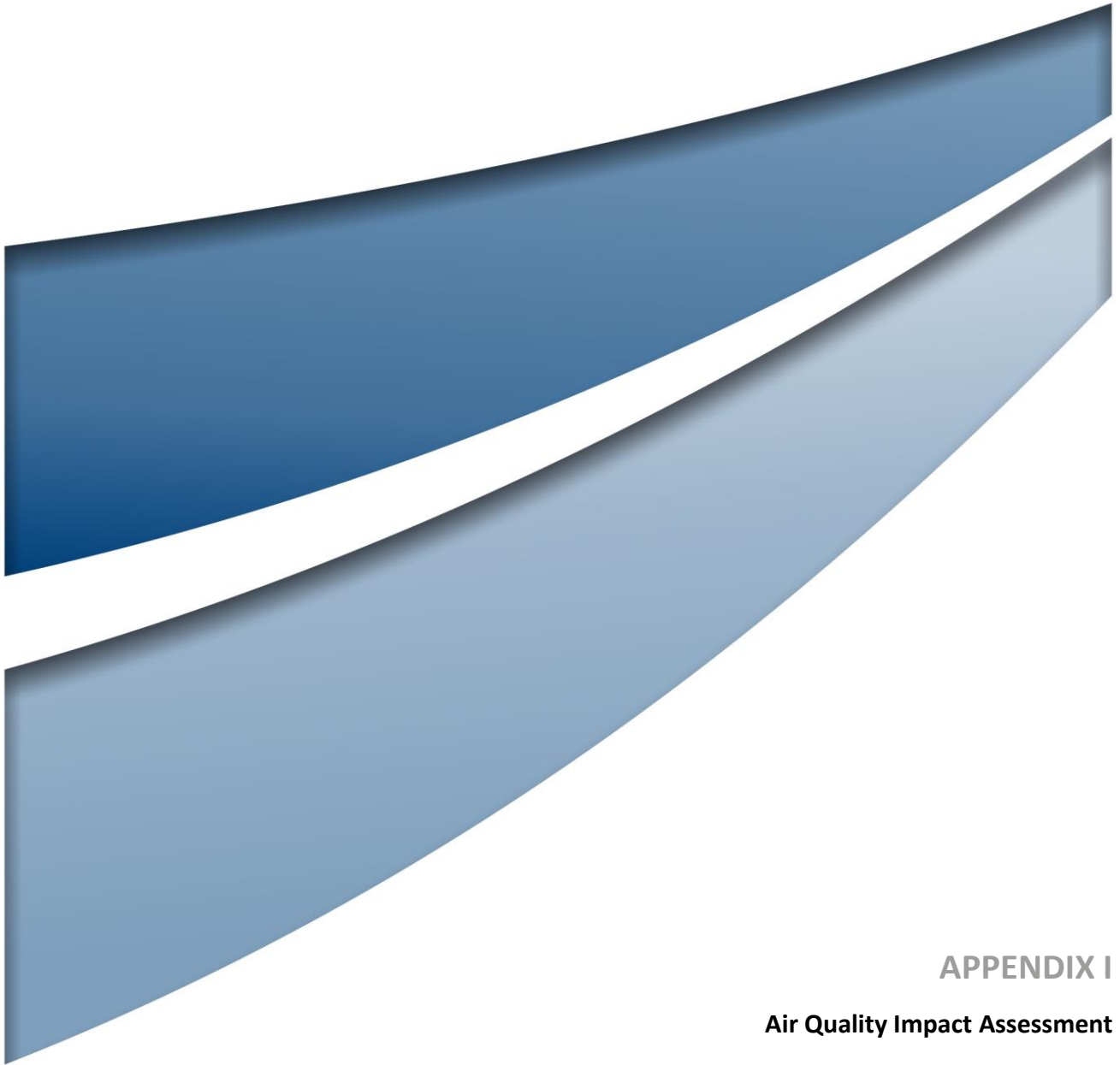


APPENDIX G
Risk Assessment



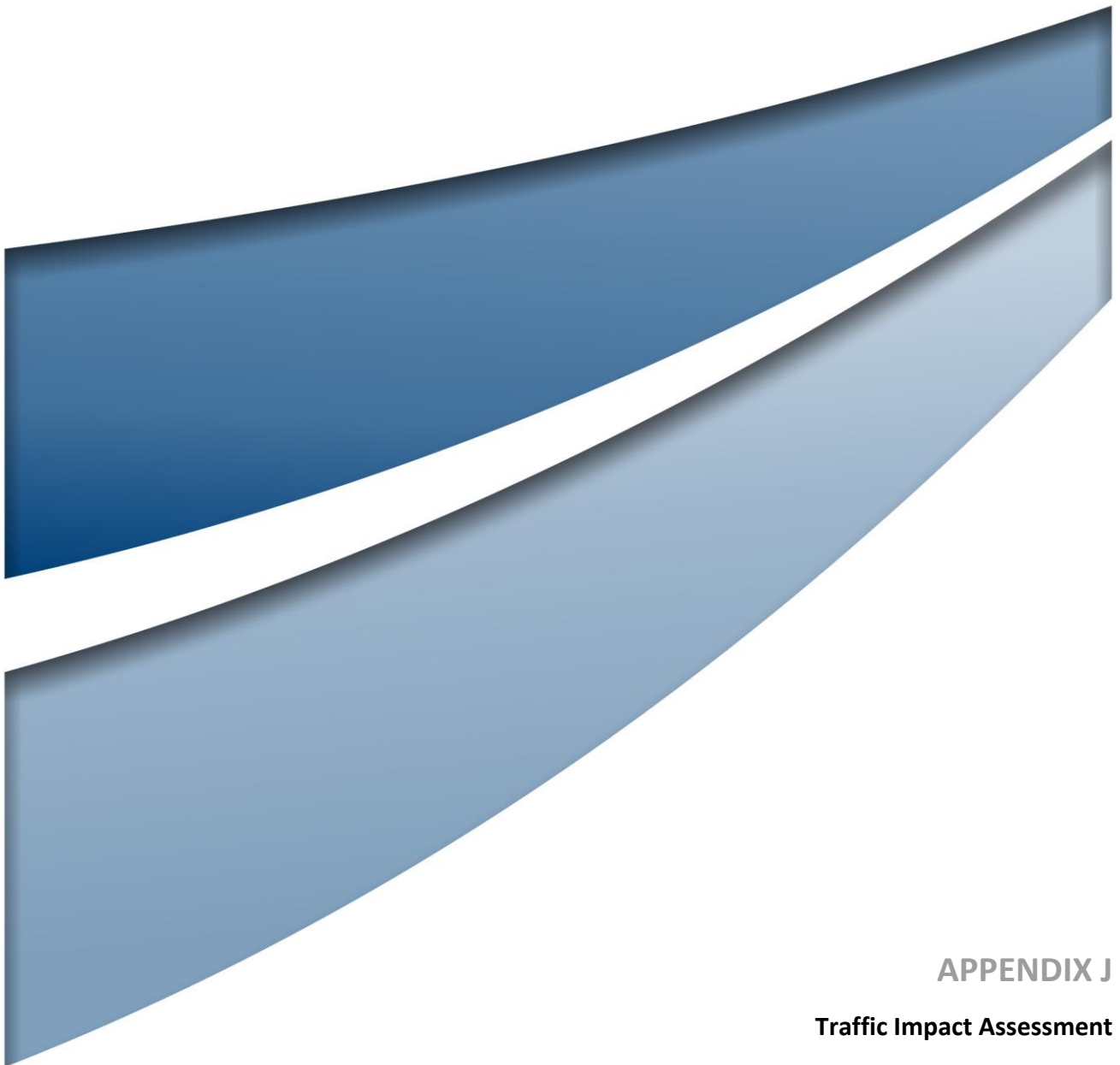
APPENDIX H

Noise Impact Assessment



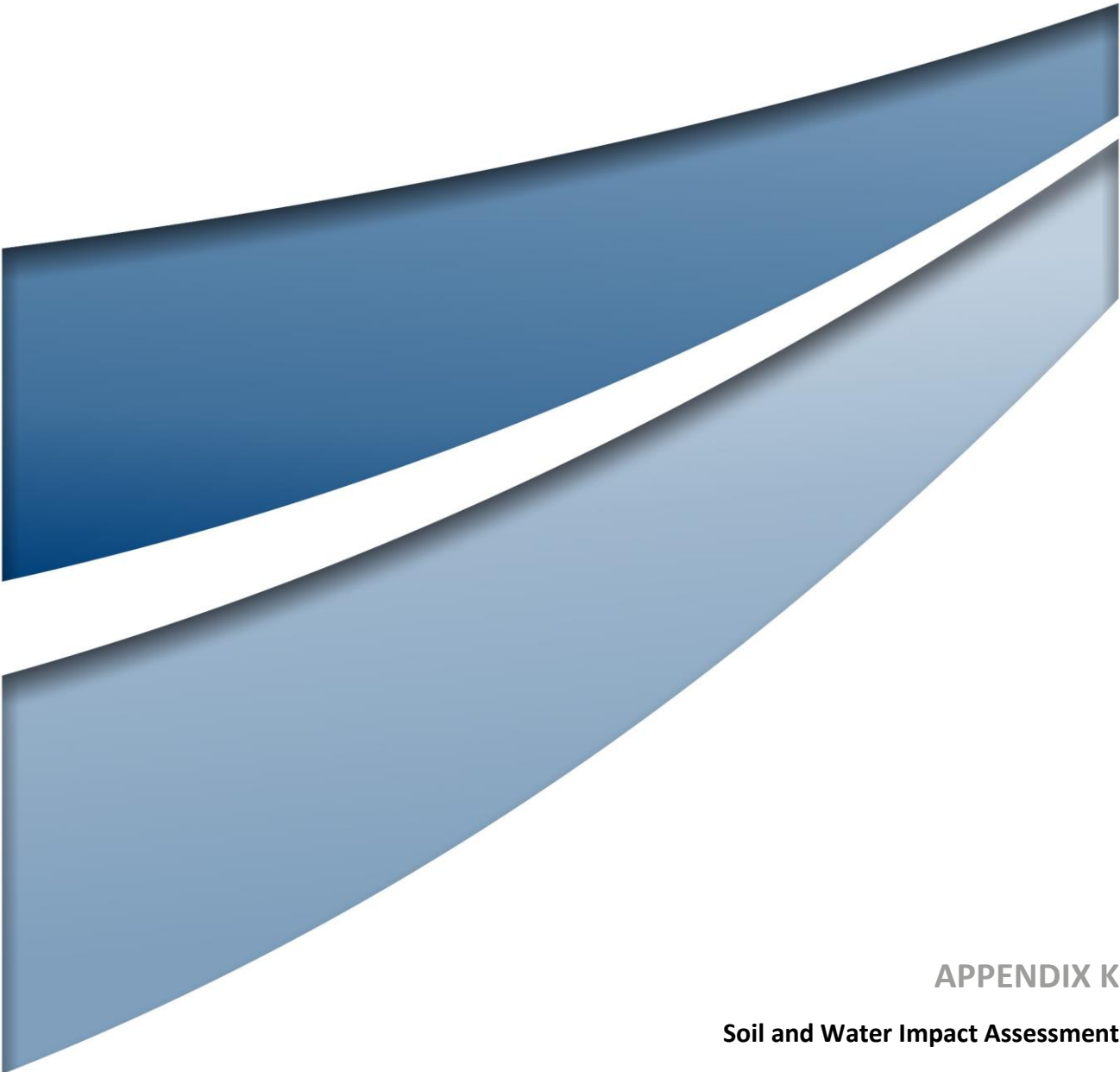
APPENDIX I

Air Quality Impact Assessment



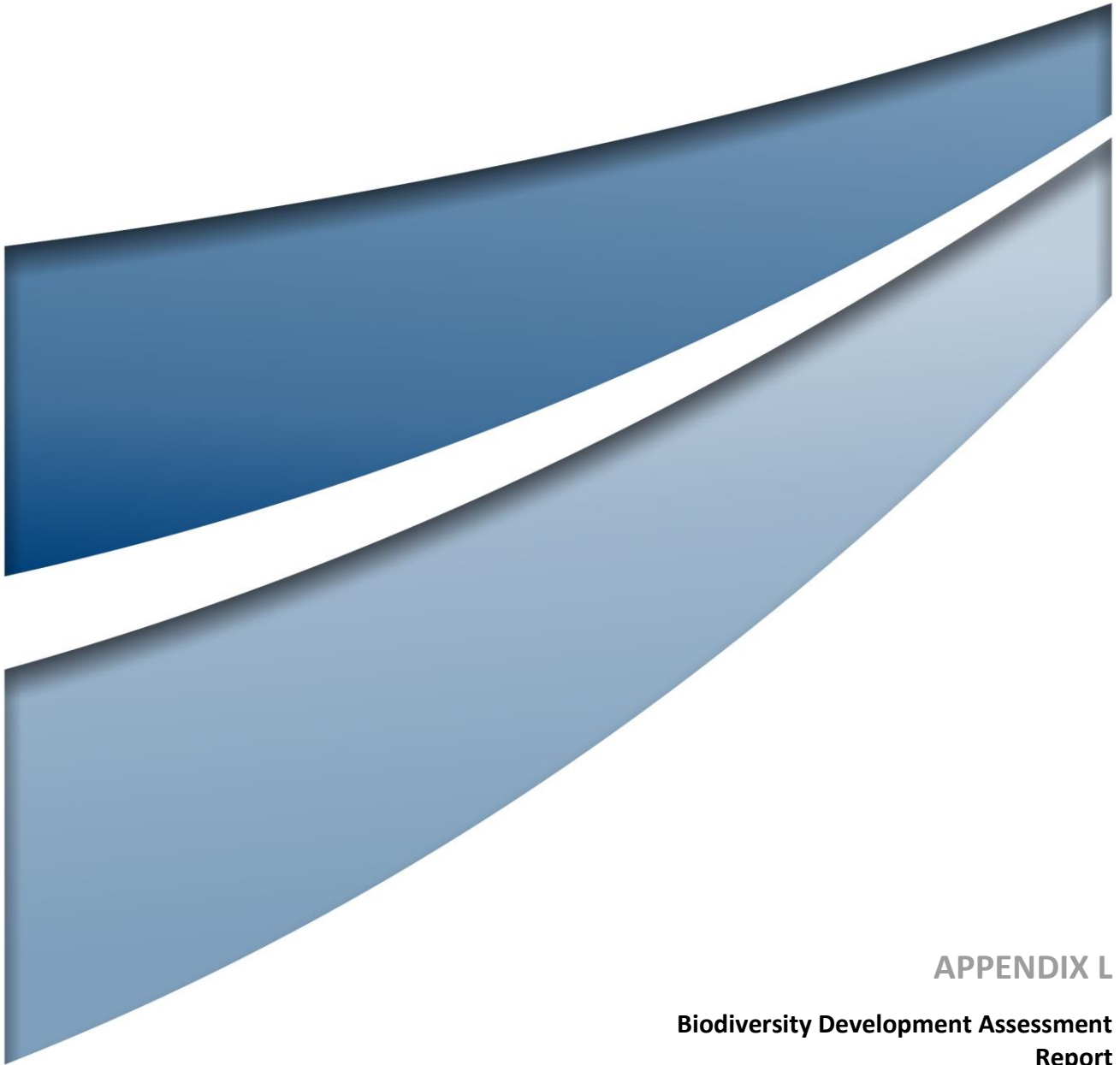
APPENDIX J

Traffic Impact Assessment



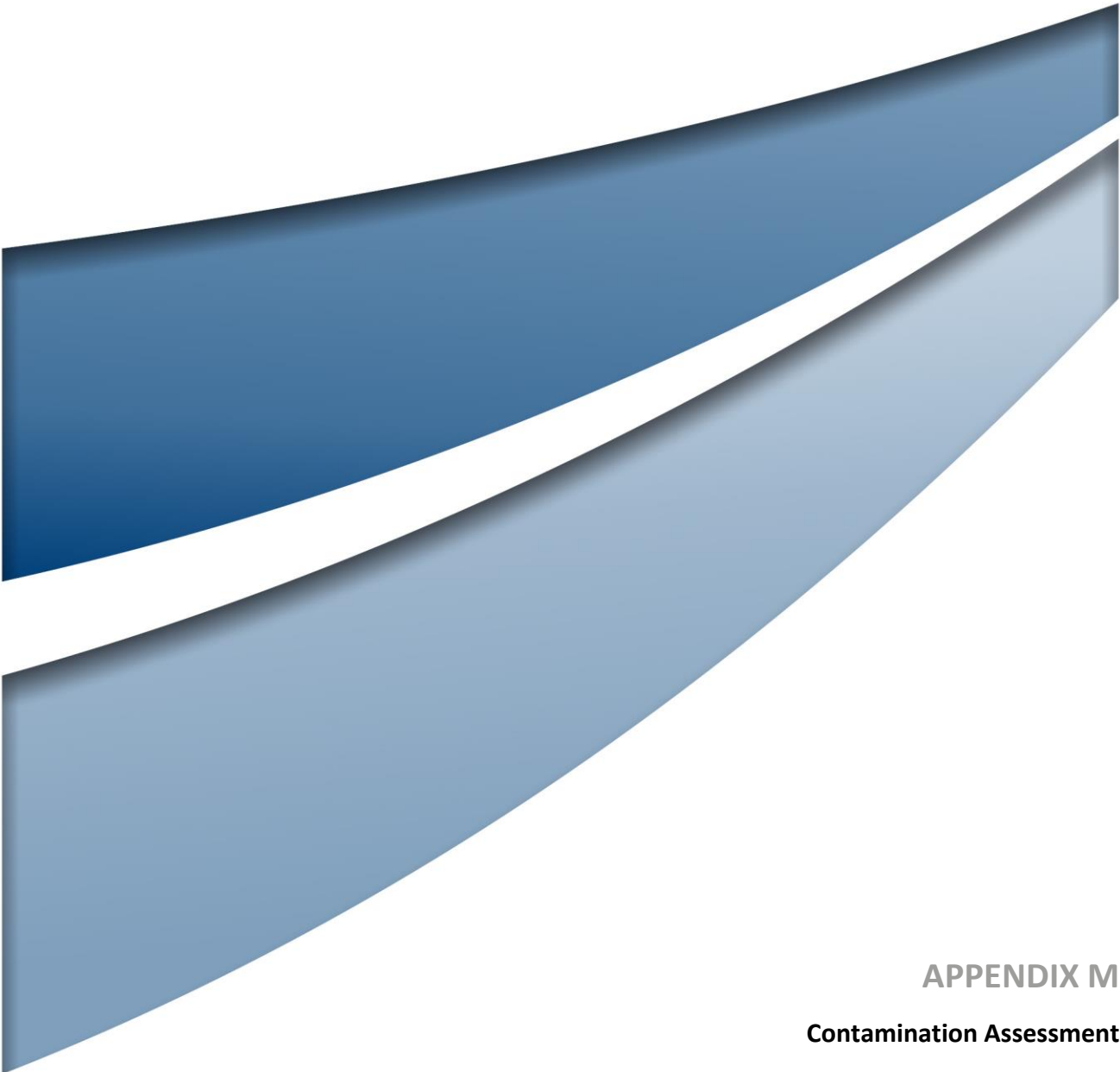
APPENDIX K

Soil and Water Impact Assessment



APPENDIX L

Biodiversity Development Assessment Report



APPENDIX M

Contamination Assessment

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