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Tweed Shire Council

Report for Eviron Road Quarry and Landfill Proposal - Part 3A Environmental Assessment

Response to Submissions Report

May 2012

INFRASTRUCTURE | MINING & INDUSTRY | DEFENCE | PROPERTY & BUILDINGS | ENVIRONMENT

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1. Introduction

1.1 Background

Tweed Shire Council (Council) is seeking approval to develop new infrastructure to provide for the waste management requirements of the Tweed Shire in the short term, as well as broader concept approval for the development of waste infrastructure and extractive industries to meet the needs of the Shire in the longer term.

An overall Concept Plan has been developed for the site, which is situated at Eviron Road in Eviron, and includes Lot 1 DP 34555, Lot 1 DP1159352 and Part Lot 602 DP 1001049. The Concept Plan outlines the proposed staged project. In summary, it is proposed to develop a waste disposal facility for residual wastes (i.e. after separate collection of recyclables, organics and composting), within the existing void created by Quirks Quarry. Further to this two extractive industries would be developed to be used as waste disposal facilities after exhaustion of the quarry resource. Necessary operational infrastructure such as a haul road and other minor associated facilities would also be developed. Through adopting a staged approach, Council would have the opportunity in the interim to consider and develop alternative waste collection methods, including food organics as well as investigate and potentially introduce alternative waste technologies (AWT).

The project outlined in the Concept Plan was declared by the then NSW Department of Planning (DoP)[1] in July 2008, to be a Major Project in accordance with Part 3A of the *Environmental Planning and Assessment Act, 1979* (EP&A Act). Under the Part 3A process, the targeted assessment regime for the environmental assessment has been defined by the Director-General of the DoP in the Director-General's Requirements (DGRs), which were issued on the 31st July 2008. The DGR's encompassed both the Concept Plan and Stage 1 Project Application. Council subsequently engaged GHD Pty Ltd (GHD) to prepare an Environmental Assessment to meet the DGR's.

As of May 2011, the NSW State Government announced the repealing of Part 3A of the EP&A Act. As part of the transitional arrangements announced, applications for project types including mining and significant infrastructure proposals that are already in the Part 3A system will continue to be assessed and determined under Part 3A pending its legislative repeal. The assessment of this project continues on this basis.

1.2 Purpose of this Report

During exhibition of the Environmental Assessment between 16 November and 19 December 2011, members of the public and public authorities were invited to make submissions to the Department of Planning and Infrastructure. A total of six submissions were received within the exhibition period and a further two were received after the exhibition period.

The purpose of this report is to address the following requirements of the Director General:

- Submit a response to the issues raised in the submissions; and

[1] Currently known as the Department of Planning and Infrastructure

- Provide the finalised statement of commitments for the project which were provided in draft in the Environmental Assessment.

1.3 Overview of the Concept Plan and Stage 1 Project Approval

1.3.1 Concept Approval

Council, as the proponent, is seeking concept approval under Section 75M of the EP&A Act for the concept plan (Application Number MP 08_0067) to develop the following infrastructure in stages:

- Two extractive industries (quarries): North Valley and West Valley;
- Three waste disposal facilities (landfills): Quirks Quarry, North Valley and West Valley; and
- Associated infrastructure.

Stage 1 of the Concept Plan (Application Number P08_0068) includes:

- Construction of a haul road from Stott's Creek Resource Recovery Centre;
- Development of a landfill within the Quirks Quarry void; and
- Development of a quarry within the West Valley site.

Subsequent stages may include:

- Landfill at West Valley;
- Quarrying at North Valley; and
- Landfill at North Valley.

1.3.2 Project Approval

Council is seeking project approval under Section 75E of the EP&A Act for Stage 1. As indicated above, the project includes:

- Extraction, processing, and transportation of up to 200,000 tonnes of extractive material a year from a quarry established at West Valley;
- Disposal of up to 75,000 tonnes of putrescible waste a year in a landfill developed within the Quirks Quarry void;
- Development of associated infrastructure, including a haul road from Stotts Creek RRC; and
- Rehabilitation of both sites.

1.4 Approvals Process

As noted above the Eviron Road Quarry and Landfill Project requires approval under Part 3A of the EP&A Act, with the Minister for Planning as the approval authority. Following declaration as a Major Project, Tweed Shire Council proceeded with an Environmental Assessment aimed at addressing the DGR's for the project. Since a single set of DGR's was issued for the Concept Plan and Stage 1 Project Application, all government agencies who provided input to the DGR's were consulted at the commencement of the assessment process to seek agreement on the required scope of the technical studies required to support the overall Environmental Assessment. At that time, a formal response from

the then Roads and Traffic Authority (RTA) was received, together with verbal confirmation from the then Department of Environment and Climate Change (DECC). Other agencies did not provide a response at this time.

GHD then undertook the required technical studies and developed the Environmental Assessment, which was submitted for an initial adequacy assessment in November 2010. Following receipt of comments from agencies additional work was undertaken and further detail provided before resubmitting in June 2011 for a second adequacy assessment.

Once relevant comments from the agencies had again been incorporated into the assessment report, it was placed on exhibition between 16 November and 19 December 2011. A total of eight submissions were received following exhibition and this document details Tweed Shire Council's response to the submissions.

The Department of Planning and Infrastructure will evaluate the Environmental Assessment and this Submissions Response Report giving consideration to the issues raised in submissions raised during the exhibition period.

Tweed Shire Council may then proceed with the project if it is approved by The Minister.

1.5 Structure of this Report

This submissions response report is structured as follows:

- Section 1: Introduction and background to the report
- Section 2: Overview of the project that is described in the Environmental Assessment;
- Section 3: Responses to the issues raised in submissions received during and subsequent to the exhibition period
- Section 4: Final Statement of Commitments that have been revised to incorporate the issues raised in the submissions, where relevant; and
- Section 5: Conclusion.

2. Overview of the Project

2.1 Project Staging

As indicated previously, the project will be undertaken in stages. The Concept Plan outlines the intention for progressive development of landfills within quarry voids across the site:

- Stage 1 (Project Application):
  - Construction of a haul road from Stott's Creek RRC to the site;
  - Landfill within the Quirks Quarry site; and
  - Quarrying at the West Valley site.
- Future Stages:
  - Landfill within the void formed by West Valley quarry;
  - Quarrying at North Valley; and
  - Landfill within the void formed by North Valley.

It is noted that the activities forming this overall Concept Plan include shared infrastructure and access with Council's Stotts Creek RRC. Based on the Quirks Quarry Landfill concept design (Appendix B), it is anticipated that an operational period of approximately 10 years can be achieved, based on the forecast resource recovery and waste acceptance rates detailed in the concept design.

Similarly, based on projected extraction rates of 200,000 tonnes per annum for West Valley Quarry an approximate operational period of 11 years has been assumed. Taking into account the potential void created by the West Valley Quarry, and forecast waste acceptance ratesit is possible that in the order of 12 years of landfilling may be achieved, however this will be subject to design at a later stage in the quarries' life and also take into consideration advances in waste disposal techniques and the potential maximum filling height to optimise the available space for waste disposal.

Based on preliminary estimates to date, taking into account the limited geological information, but considering topographical features and environmental constraints and an extraction rate of 200,000 tonnes per annum, the quarry in the North Valley may only operate for 3.5 years. However significantly more information is required to provide more confidence around this figure particularly in regards to localised geological features and therefore likely quarry products. Taking these initial parameters for the quarry, and the forecasted waste acceptance rates indicates that a landfill in the North Valley may operate for greater than 10 years from 2034, subject to waste acceptance at the time, advances in landfill operational procedures and the success of alternative waste technologies. For the purposes of this study, it is assumed the landfill would operate between 2034 and 2045.

It is noted that there is no overlap of landfilling activities and quarrying activities, in that it is intended that there will only ever be a single landfill and a single quarry operating at any one time.

3. Consideration of the Issues Raised in Submissions

3.1 NSW Roads and Maritime Services (RMS)

RMS advised that that it considered the traffic impact assessment supporting the environmental assessment had adequately addressed the likely impacts of the proposal.

3.2 Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS) – Mineral Resources Branch

DTIRIS (Mineral Resources Branch) advised that they had no issues of concern regarding the suitability of the revised geological and resource assessment in regards to the State's mineral and extractive resources. This comment follows significant rework conducted on the geological description of the West Valley Quarry, together with additional assessment of pyrite concentrations, revisions to layer densities adopted in the quarry design and development of a program of additional investigations that will be required during detail design.

3.3 Department of Primary Industries – NSW Office of Water

The submission received from the Office of Water asserts that the majority of the Environmental Assessment focussed on the Concept Plan and Quirks Quarry Landfill, and that only a preliminary assessment has been presented for the West Valley Quarry. The submission states that the lack of detailed assessment for the West Valley Quarry does not allow the Office of Water to complete its assessment of the Stage 1 Project Application.

Specific issues highlighted are summarised below, however it is noted that Recommended Conditions for the Approval of Quirks Quarry Landfill were provided by the Office of Water to which Council has no objection.

- Legislation/Licencing
  - The EA does not address how the proposed project complies with the rules for the water source in the *Water Sharing Plan for the Tweed River Area Unregulated and Alluvial Water Sources 2010*.
  - The EA must detail the licence requirements to enable assessment of all surface water extraction, including any incidental taking of water from the water courses in the project area.
  - The EA must detail the licence requirements to enable assessment of all groundwater extraction, including any incidental taking of groundwater from the alluvium and hard rock aquifers.
- Groundwater
  - Clarification required on the extent of permeability testing is required.
  - Dewatering volumes for the quarry operations have not been identified or quantified, therefore impacts to users of this resource has not been assessed.
  - Limited water quality and level data was collected, and only a summary provided without establishing any responses to climatic conditions. Significantly more data must be collated and presented to the Office of Water.
- Site Water Balance

– A predictive site water balance for the West Valley Quarry was not presented, and the Office of Water is unable to complete its assessment.

Response

This report will not deal with each of these statements in detail as Council's position is that these issues will be addressed during the detail design process. Upon receiving the submission from the Office of Water, Council immediately sought to engage with the Department of Planning and Infrastructure and the Office of Water to discuss the nature of the comments, some of which require information that was not included in the Director General's Requirements for the Environmental Assessment. The former Department of Water and Energy was advised in January 2011 of the proposed scope of the Environmental Assessment to address the Director General's Requirements and no response was received. Furthermore the Office of Water (and the former Department of Water and Energy) had not at any other time during the assessment process and adequacy review indicated the degree of concern presented in the formal submission.

Council acknowledges that much of the information requested by the Office of Water will be required to receive an Environmental Protection Licence, and Council had only ever intended to undertake Concept Design for the Stage 1 activities during the Environmental Assessment process. For a number of budgetary and logistical reasons the extent of geological and hydrogeological investigations particularly for the West Valley Quarry has been limited. However Council has made a significant investment in the investigations to date and maintains that they are suitable for the concept design.

Council proceeded with the scope of the investigation as it stood at the time. In summary this has included the following with respect to issues raised by the Office of Water:

Groundwater

Potential impacts on local and regional groundwater environment were assessed by the following:

- A review of relevant existing information including existing data, monitoring networks, published geological and acid sulfate soil maps, land classification maps, regional monitoring network databases and reports to help characterise the geology, soils and hydrogeology of the site;
- Review the draft acid sulfate soils management plan referred to in the Stage 1 Concept Plan (Tweed Shire Council 2008);
- Identify any data gaps and provision of recommendations for future investigations during detail design.

This included a review of data from 39 drilling locations installed prior to the assessment, which included 17 groundwater monitoring wells. A further 15 boreholes were drilled throughout the North and West Valley to assist with developing an understanding of the geological and hydrogeological conditions.

The impact of the proposed development on groundwater has been based on the information available from the data set available at the time of the report and it was stated in the report that the information would be supplemented by further monitoring data during detail design to further confirm the potential impacts associated with the Concept Plan and Stage 1 Project Application.

The potential need for dewatering in the West Valley Quarry was acknowledged, however it was beyond the scope of the assessment to develop a dewatering management plan. The assessment noted that additional laboratory testing, analysis and monitoring including hydraulic conductivity, permeability testing

and real time data logging would be required to quantify the potential groundwater impacts to facilitate the development of appropriate management plans for the Quarry.

It was acknowledged in the assessment report that further groundwater investigations would be required. The draft Statement of Commitments provided in the Environmental Assessment has now been updated to include the detail requested in the submission provided by the Office of Water and can be found in Section 4 of this report.

Hydrology and Drainage

Elements of hydrology and drainage for the two key activities constituting the Stage 1 Project Application were addressed in the Quirks Quarry Landfill Concept Design Report, Draft Landfill Environmental Management Plan and to a lesser extent in the West Valley Quarry Preliminary Study. In addition to the assessment contained in those documents, the following was also undertaken for the West Valley Quarry and the remainder of the Concept Plan:

- Catchment Delineation and Site Hydrology Review:
  - Delineation of external and internal catchments;
  - A review of flood levels;
  - Assessment of site hydrology utilising XP Storm for the pre and post development case (hydrology and hydraulics of stormwater drainage systems, generating flow hydrographs, flood levels, pollutant loads or concentrations and analyses water quality control devices); and
  - Preliminary sizing requirements for culverts beneath the haul road.
- Conceptual Erosion and Sediment Control Plan including:
  - Topography, staging for works, erosion risk mapping and drainage, proposed treatment train and concept design of sediment basins.
- Conceptual Stormwater Management Plan for the North and West Valley:
  - MUSIC modelling for the pre and post development scenarios (North and West Valley);
  - Review of water sensitive urban design requirements for the proposed activities with a view to minimising environmental impacts from stormwater discharges;
  - Overview of maintenance requirements for the water quality control features and devices.

This information is presented in Appendix H of the Environmental Assessment, with key issues being discussed in Section 9.1 of Volume 1 of the Environmental Assessment. The draft Statement of Commitments provided in the Environmental Assessment has been updated to include requirements for a site water balance for the current and proposed quarry operations as requested in Attachment C of the submission provided by the Office of Water.

Summary

Council has held a number of discussions with senior officers from the Department of Planning and Infrastructure and the Office of Water since receiving the formal submission, and considers that a valid response to the submission would be to include the additional studies recommended by the Office of Water as a condition of the approval for the Stage 1 Project Application.

On May 3 2012, the Department of Planning and Infrastructure supplied Council with draft conditions of approval for the West Valley Quarry component of the Stage 1 Project Application which outline requirements for water licencing, surface water discharges, a groundwater study, groundwater

management plan and surface water management plan as a condition of approval of the Stage 1 Project Application. These conditions are consistent with the in-principle agreement Council had reached with the Department during the discussions, and are acceptable to Council. The Statement of Commitments provided in Section 4 includes these new provisions.

3.4 Environmental Protection Authority (EPA)

3.4.1 Air Quality Assessment

The comments provided by the EPA note that the air quality assessment contains sufficient information to allow approval conditions to be recommended. However the following issues reported as minor were noted:

- Cumulative impact assessment did not include sugar cane crop harvesting and burning
- A reported error with calculation of blasting emissions, although this is not specified
- The leachate management process may result in significant odour emissions.

Response

During detail design the blasting emissions will be reviewed in detail as more information comes to hand, together with odour emission modelling. Furthermore the modelling will be verified through monitoring during the initial stages of the project.

A dust management plan will be prepared for the project which will include a reactive management strategy and real time monitoring. This will be part of the air quality management plan which will include mitigation measures for control of odours, dust and particles and detail the required monitoring programs. This was previously included as part of the Draft Statement of Commitments within the Environmental Assessment and remains within the final Statement of Commitments provided in Section 4 of this report.

Air quality management can typically be a sensitive issue for residents living in close proximity to facilities, Council reiterates its commitment to best practice environmental management and will proactively engage with the community in respect of any actual or perceived air quality issues, especially in terms of compliance with the conditions of approval (eg real time monitoring programs and implementation of a complaints management system including a 24 hour community information and complaints line).

3.4.2 Noise Assessment

The EPA has provided recommended conditions of approval in relation to Noise and Meteorological Conditions following their review and input to the noise assessment. In addition they state that the mitigation measures included in the report should be incorporated into the Environmental Management Plan for the site.

Response

GHD and Council have reviewed the recommended conditions of approval and accept all conditions, however we recommend an alternative to the requirements of conditions L7.7 (a) which requires the following:

To determine compliance with condition(s) L7.1 to L7.4:

a) *Airblast overpressure and ground vibration levels experienced at the noise sensitive locations identified in condition L6.1 must be measured and recorded for all blasts carried out on the premises;*

Conditions L7.1 to L7.4 specify the airblast overpressure and ground vibration level limits for sensitive receivers, Condition L6.1 identifies seven sensitive receivers surrounding the project site.

Condition L7.7 requires that monitoring of blast events be undertaken at all identified receivers (seven in total) for all blasts. It is our opinion that this condition is not appropriate given the number of receivers and therefore the amount of monitoring equipment and personnel required to undertake simultaneous monitoring at all seven locations for the single blast event (blasting is expected to be required once per month on average). As such, an alternative approach to blast monitoring has been provided below.

A review of publically available Environmental Protection Licence requirements for similar facilities currently operating indicates that blast monitoring is typically required only at the nearest or most likely impacted sensitive receiver[2]. It is expected that if the conditions specified in L7.1 to L7.4 are met at the most likely impacted receiver, then they will be met at all identified receivers. The location of this monitoring will depend on the size, location, nature and the proximity of the blast within the project site.

A blast management plan would also be developed, which includes the requirement to notify all identified receivers of the details of the blast (including the time of blast, location and expected impacts) and provide a site contact phone number. In addition, if the results of blast monitoring indicate that Conditions L7.1 to L7.4 have been exceeded at the selected monitoring location, then a revision of the monitoring requirements would take place to encompass other potentially impacts receivers.

We consider that this approach is suitable for the project and should be considered before issue of the Environmental Protection Licence.

3.4.3 Soil and Water Management

EPA had expressed concern during the adequacy assessment that the stormwater detention pond in the West Valley Quarry had been sized using an incorrect assumption. Tweed Shire Council, contacted EPA during the adequacy assessment period to discuss this matter, however no response was received. Since EPA has stated that the issue can be addressed in the recommended conditions of approval no further comment/response is made on this matter.

Response

The recommended conditions of approval provided by EPA relating to stormwater management, water pollution and a soil, water and leachate management plan have been reviewed and Council confirms that these are acceptable.

[2] Referenced: EPL 3142, Australian Rail Track Corporation Limited (Jan 2012), EPL 4460 Xstrata Mt Owen Pty Limited (Nov 2011), EPL 299, Cleary Bros (Bombo) Pty Ltd (Mar 2011).

3.4.4 Remaining Recommended Conditions of Approval

Recommended conditions of approval for the following issues addressed by the EPA have been reviewed:

- Leachate Collection System – Landfill
- Storage and Handling – Waste and Products
- Litter Control
- Pest, Vermin and Noxious Weed Management
- Fire Management
- Rehabilitation and Closure
- Community Information and Complaints
- Aboriginal Cultural Heritage

Response

The requirements outlined for each of these issues are agreed to by Council and are largely consistent with the draft Statement of Commitments presented in the Environmental Assessment. Details will be provided with the application for an Environmental Protection Licence. The Statement of Commitments has however been revised where necessary to provide additional detail not previously included and is provided in Section 4 of this report.

3.5 Tweed Shire Council

Tweed Shire Council's Development Assessment Unit provided a submission after closure of the exhibition period with specific regard to matters affecting the Council from an asset perspective. Comments were provided on the following matters:

- Geotechnical/Earthworks
- Roads – road network, intersections, traffic generation from Quirks Quarry Landfill and West Valley Quarry
- Impacts on Surface Water Quality
- Services/Utilities – water supply, effluent disposal, electricity, telecommunications
- Environment/Amenity – noise impacts and sediment control
- Natural Hazards - flooding

In general the comments concluded that Council's requirements have been met through the information presented in the Environmental Assessment. However additional information was requested on electricity supply. The Development Engineer noted that the Stotts Creek Resource Recovery Centre (RRC) is currently serviced by a satisfactory electrical supply and an extension of this service to the project site could be undertaken. They require that the location of the supply extension be determined and included in this report.

Response

Council's Waste Management Coordinator engaged NJ Construction Pty Ltd to provide a design to extend the existing electrical supply from Stotts Creek RRC. The proposed power supply easement

traverses Lot 1 DP 34555, Lot 1 DP 1159352 and Lot 602 DP 1001049 as shown on Sheet 1 in Appendix A. Subsequently Council's ecologist undertook an environmental assessment of the proposed power supply alignment including an assessment of environmental impacts associated with the construction and operation. A summary of the proposed extension works and environmental assessment is provided below, full details are contained in Appendix A and B.

Description of Easement and Extension Works

The proposed power supply will be extended from the existing 11kV line in the south western corner of Lot 1 DP34555 approximately 710m on a north easterly alignment terminating at the existing site office at Quirk's Quarry. Notably this alignment utilised the existing clearing between forested vegetation and follows a spur extending from the Condong Range ridge.

A combination of underground and overhead cabling is proposed as follows:

- Underground: 555m in the southern section, along the spur. Undergrounding the cable in this section maintains the visual amenity values for the long term post closure use of the site for the Regional Botanic Gardens. Traditional shallow trenching will be used to install the underground cable, within a 2m wide easement. The trench itself would be approximately 450mm wide and up to 900mm deep.
- Overhead: 155m of overhead 11kV line requiring installation of two new poles, a transformer and cable. A 20 m cleared easement is required within the overhead section to maintain safe function of the power supply.

Environmental Considerations

A review of the existing environment and potential impacts associated with the construction and operation of the electrical supply was undertaken for the following environmental elements:

- Soils
  - Soil landscapes
  - Acid sulphate soils
- Topography and drainage
- Amenity
- Internal traffic and access
- Noise
- Air Quality
- Flora and Fauna
  - Existing vegetation communities
  - Threatened flora assessment
  - Existing fauna habitats
  - Threatened fauna assessment
- Hazards
  - Bushfire
  - Flood
- Heritage

- European cultural heritage
- Aboriginal cultural heritage

- Contaminated Land

Conclusion

Overall the assessment concluded that the proposed easement footprint, infrastructure design and construction methodology is not expected to result in a significant environmental impact provided the documented mitigation measures are implemented. The mitigation measures are provided in Table 3.1 of the Tweed Shire Council report in Appendix B. These will be incorporated into a Construction Environmental Management Plan for the electrical supply.

3.6 Submissions from Members of the Public

Four submissions were received from individual members of the public. Each of the four are local residents living within 1 km of the project site. A summary of each issue raised in the individual submissions together with a response is provided below.

3.6.1 Dixon

The submission received from Paul Dixon of 292 Farrants Road, Condong raised two key issues:

1. Incompatibility of the development with local zoning and financial and cultural impact on nearby residents.
2. Increased exposure to leachate contamination in the Tweed River, surrounding canefields and water table based on observable long term leachate containment problems at Stotts Creek landfill.

Response to Issue 1: Incompatibility with local zoning and financial and cultural impact on nearby residents

As noted in Section 2.4 of the Environmental Assessment, the following zoning applies to the project site as per the Tweed Local Environment Plan 2000:

- Lot 1 DP 34555, part Lot 1 DP1159352 and part Lot 602 DP 1001049 are in Zone 5(a) Special Uses (Garbage Depot);
- The areas outside of Zone 5(a) in Lot 1 DP1159352 and Lot 602 DP 1001049 are zoned 1(b) Agricultural Protection; and
- The eastern portion of Lot 1 DP 1159532 is currently zoned 1(a) Rural.

Furthermore Section 2.4 of the EA notes the permissibility of this type of development in this zone under the Local Environment Plan.

The waste disposal facility component of the project is considered to be permissible with consent under the LEP**.** The extractive industry component is not individually listed as permitted with consent but may be regarded as permitted as an ancillary use to the primary use of a waste disposal facility. In addition, under S*tate Environmental Planning Policy (Infrastructure) 2007* ('the Infrastructure SEPP'), the haul road component would be permissible without consent, and the quarries and landfills would be permissible with consent.

It is also noted that under the Tweed Shire Council Draft LEP 2010 the following zoning will apply to the site:

- Lot 1 DP 34555, part Lot 1 DP1159352 and part Lot 602 DP 1001049 are zoned SP1 Special Activities – Waste Management Facilities (area previously zoned 5a Special Purposes);
- The areas outside of the SP1 zone in Lot 1 DP1159352 and Lot 602 DP 1001049 are zoned RU1 Primary Production (previously zoned 1(b2) Agricultural Protection); and
- The north western portion of Lot 1 DP1159352 is zoned RU2 Rural Landscape.

Roads are permitted without consent in the RU1 and RU2 zones and are an ancillary use and therefore permitted in the SP1 zone. Extractive industries are permitted in the RU1 and RU2 zones and are in this case an ancillary use to the waste disposal facility and therefore permitted in the SP1 zone. Waste disposal facilities are permitted in the SP1 zone but are prohibited in the RU1 and RU2 zones.

It is considered that the proposed activities are therefore permissible under both LEP's.

An assessment of the financial and cultural impact of this development on those who live nearby was not required by the Director General's Requirements for the Environmental Assessment. However Council, by its commitment to best practice environmental management, together with the strict conditions that will be imposed in any Environmental Protection Licence issued for the landfills and quarries is committed to minimising any potential negative impacts on nearby landholders.

Response to Issue 2: Increased exposure of canefields and local waterways to leachate contamination

The concept design for the Quirks Quarry Landfill includes measures to manage and contain landfill leachate, which are consistent with current day industry requirements and represent best practice landfilling techniques. In summary the following key elements form part of the landfill design which are intended to address potential risks associated with leachate migration:

- Sequencing of the cell construction and subsequent landfilling operations in all stages to enable progressive capping to be undertaken as each stage is completed. This is aimed at facilitating efficient management of the disturbed areas and minimisation of rainfall infiltration into the landfill and thus generation of leachate.
- Fully engineered liner at the base of the landfill cells designed in accordance with NSW EPA guidelines as follows:
  - 0.9 m thick compacted clay liner placed vertical to the base and perpendicular to internal batters;
  - The liner will need to achieve a permeability of less than 1×10^{-9} m/s;
  - 1.5 mm thick high density polyethylene (HDPE) liner to the base of the landfill only, to an approximate RL 7 m ;
  - 0.3 m leachate drainage aggregate layer over the base of the liner to achieve a permeability of greater than 1×10^{-3} m/s and associated leachate collection pipework;
  - Excavated internal batter slopes will where possible be" 1:3 for constructability of the liner; and
  - For slopes > 1:3, the liner will need to be placed in lifts.
- The liner will be installed in accordance with a Construction Quality Assurance (CQA) plan that will be reviewed and approved by the EPA.

- After considering seven different options for leachate management, the following option has been adopted which will be further refined during detail design:
  - A leachate drainage layer capable of maintaining the level of leachate over the uppermost layer of the liner at not greater than 300 mm.
  - Leachate will be managed via a network of perforated pipes which will discharge to a leachate sump located at the lowest point of each stage. The leachate will be conveyed from the sump by use of pumps via a leachate riser pipe which will then be tankered off site, irrigated or treated.
  - A leachate sump will be located at the low point of each stage. The sump will be recessed below the level of the liner to ensure the leachate collection pumps are always covered with some liquid to prevent them from becoming damaged.
  - A full drainage layer and pipework across the base of the landfill has been incorporated into the concept design. During detailed design these pipes will need to be spaced and sized to ensure that the level of leachate over the uppermost layer of the liner is not greater than 300 mm.

As noted in Section 3.4 of this report the Environment Protection Authority (the key regulator for landfill approvals and operations), has only made minor comment regarding the landfill concept design and has provided recommended conditions of approval for the landfill component, which indicates their acceptance of the concepts adopted to date. The key objective with the detail design of the leachate management system, together with the landfill liner is to reduce the risks of contamination of groundwater and waterways by landfill leachate.

3.6.2 Mitchell and White

The submission received from Alex Mitchell and Judith White of 657 Eviron Road, Condong raised five key issues:

1. Legal Issues – potential buyers in the area are legally entitled to know that they are buying into an area containing a landfill and quarry. The authors state that they have taken legal steps to protect their rights and the value of their property.
2. Landfill Objections – the proposed landfill is contrary to Council's own environmental regulation and its stated planning strategy for the locality. The authors state they have no confidence in the design of the landfill, based on previous performance at other landfills in the Shire.
3. Pollution Audit Needed – before any decision is taken to establish the landfills at Eviron Road, an audit of landfill contamination at the existing Stotts Creek site should be undertaken.
4. Floodplain Hazard Ignored – the three proposed landfill are situated on a flood plain, which floods at least twice a year. Locating landfills here has the potential to cause environmental damage to the canefields and Tweed River.
5. Quarry site at West Valley – the West Valley quarry is located on the same ridge line as the authors' properties. Concern is raised regarding noise and dust impacts associated with quarry activities.

Response to Issue 1: Legal Issues

The issues raised in this section of the submission do not directly relate to the contents of the Environmental Assessment, and as such cannot be responded to.

Response to Issue 2: Landfill Objections

The landfill is contrary to Council's environmental regulations and stated planning strategy

As discussed in Section 2.4 of the Environmental Assessment the Tweed Local Environment Plan 2000(the key environmental planning instrument for the shire) identifies that most of the site is zoned 5A) – Special Uses (Garbage Deport). The northern most portion of Lot 602 DP 1001049 and the eastern and north western portions of Lot 1 DP 1159352 are zoned 1(b2) Agricultural Protection.

It is important to note that Council are not seeking approval to conduct any waste or quarry related activities in any of the areas zoned Rural 1(a) or Rural 1(b2). Similarly no landfilling or quarrying will take place on Lot 1 DP 34555.

Furthermore as discussed in Section 3.6.1 above, the development is considered to be permissible under the Tweed LEP. The Department of Planning and Infrastructure, Tweed Shire Council Development Assessment Unity and the Environment Protection Authority have not raised concerns regarding the permissibility of the development in their submissions on the project.

As described in Section 4.1 of the Environmental Assessment, Council's *2011/2021 Tweed Community Strategic Plan* is a whole of Council document which follows the NSW Government Integrated Planning and Reporting Framework, which provides the primary strategic planning framework for the Tweed Shire. Council, through detailed consultation with the community, has developed this 10 year plan, together with a four year Delivery Program and an Annual Operational Plan. These planning instruments are supported by a 10 year financial plan and resourcing strategy. Notablity, the development of the landfill infrastructure at Eviron Road is detailed in both the Delivery Program and the Annual Operational Plan. This demonstrates that the development is consistent with Council's strategic planning.

No confidence in liner, leachate and gas management

The landfill concept design is in accordance with current regulatory requirements and industry practice across the state of New South Wales. Section 3.6.1 provides a summary of the key design elements for landfill liner and leachate management. In regards to landfill gas management, once again the concept design is consistent with the current requirements of the NSW EPA.

The submission notes issues at the Murwillumbah and Stotts Creek landfills, which are much older facilities which were established at a time when regulation was less stringent than current day requirements. Therefore comparison to these sites is not valid. Council reiterates its commitment to best practice environmental management for its current operations, and the future landfill at Eviron Road. The Environmental Protection Licence when issued will contain detailed requirements for the operation and management of the landfill which are legally enforceable.

Response to Issue 3: Pollution Audit Needed

An audit of land contamination at Stotts Creek landfill is outside the scope of this environmental assessment and is outside the planning approval process for the Eviron Road Quarry and Landfill Proposal.

Response to Issue 4: Flood Plain Hazard Ignored

A review of flood levels was undertaken during the environmental assessment, together with modelling of predicted stormwater flows during various flood events. The concept design for the landfill and quarry, has located all proposed activities above the 1 in 100 year regional flood level (ie 4m AHD). Furthermore the haul road has been designed to to act as a levee bank preventing back water from the Tweed River from entering the quarry sites.

A full investigation of the regional flood inundation affects were not part of the scope of this report and will be assessed during detail design, however regional flood levels have been shown in Figures 20 and 21 in the Environmental Assessment and backwater conditions at the discharge points have been assessed through hydraulic modelling for drainage adequacy. Weir levels of the detention areas have been set 300mm above the regional flood level and therefore can drain adequately and are unaffected by the regional flood event tail water effects.

Response to Issue 5: Quarry Site at West Valley

The submission raised concerns about noise and dust impacts on the property at 657 Eviron Road. The environmental assessment has included the development of predictive noise and air quality (including dust) models for three different stages of the development, which included the 657 Eviron Road as a sensitive receiver:

- Configuration 1: Quirks Landfill and West Valley Quarry (Stage 1 of the proposed Concept Plan).
- Configuration 2: West Valley Landfill and North Valley Quarry (Stage 2 of the proposed Concept Plan)
- Configuration 3: North Valley Landfill only

The models factored in emissions from truck traffic on the haul road (15 vehicles per hour), as well as the landfilling and quarrying activities themselves (including blasting, excavation, crushing and loading).

Configuration 1 is most relevant to the property at 657 Eviron Road. The air quality modelling results (including particulate matter or dust) indicated that all constituents assessed over the typical averaging periods were below the respective assessment criteria at the nearest sensitive receptors for the modelled emission rate characteristics.

The noise modelling results indicated that the combined noise levels from normal operations of the West Valley Quarry and Quirks Landfill are expected to meet the daytime criteria at all identified residential receivers, except for at Receiver 3 (a Council owned property at 656 Eviron Road) where a potential 2 dB exceedance is predicted. Analysis of the noise contribution data shows the quarry processing plant to be the dominant source of noise at this receiver. Road traffic noise associated with the Stage 1 activities is expected to comply with the relevant criteria. On the basis of the quarry blast design and site parameters provided ground vibration and airblast overpressure criteria are also met at nearest sensitive receivers.

With Council's commitments to best practice environmental management, measures to further reduce the impact of noise, dust and vibration have been included in the Statement of Commitments, including details of a proposed monitoring program.

3.6.3 Owen

The submission received from Denis and Teresa Owen of 751 Eviron Road, Condong whose property directly abuts Quirks Quarry, raised three key issues:

1. Landfill Objections - the proposed landfill is contrary to Council's own environmental regulation. The authors state they have no confidence in the design of the landfill, based on previous performance at other landfills in the Shire.
2. Flood Plain – the authors indicate that they have witnessed flooding of the project site after heavy rainfall.

3. Quarry Site – concerns raised about the current operations at Quirks Quarry and the impact on their day to day activities.

Response to Issue 1: Landfill Objections

The landfill objection issues raised by Denis and Teresa Owen are consistent with those raised by Alex Mitchell and Judith White. Therefore please refer to Section 3.6.2 for a detailed response.

Response to Issue 2: Floodplain

The floodplain issues raised in the submission are consistent with those raised by Alex Mitchell and Judith White, therefore please refer to Section 3.6.2 for a detailed response.

Response to Issue 3: Quarry Site

The Owen's property directly abuts Quirk's Quarry. The issues related to the current operations of the quarry are noted, but are not directly relevant to the environmental assessment. It is noted that in November 2011, Council entered into a contract with South East Excavations to operate Quirks Quarry, with a view to optimising operations and improving environmental management at the site.

As part of Council's Statement of Commitments for the Concept Plan and Stage 1 Project Application the following will be undertaken which is aimed at alleviating pressures on nearby residents:

- Development and implementation of a complaints management system that includes:
  - A hotline for receiving complaints/feedback about the development and to provide the community with information;
  - A commitment to investigate the source of all complaints and take the required immediate action to reduce the impact where valid, and to communicate this to the complainant;
  - A record of complaints and responses/actions which is readily accessible to the community and regulatory authorities
  - A system for providing feedback to the community
- A dynamic dust and noise management plan, that includes a detailed real time monitoring program and annual reporting requirements to the EPA.
- A range of onsite noise and dust management measures to minimise the impacts on nearby residents, refer to Section 4 of this report.

3.6.4 Foster and Harrold

The submission received from Mark Foster and Julie Harrold of 355 Farrants Hill Road, Eviron, raised five key issues:

1. Missing correspondence related to the project – the authors state that they have only received correspondence from Council regarding the project on 1 November 2011, and had not received previous information updates.
2. Zoning – when the authors purchased the property in February 2003, they maintain that property serach on the land did not reveal the Zone 5(a) zoning for the project site.
3. Visual impact of the project – the authors have shown Council staff that their property has a view of the project site which was not considered in the visual assessment to date.
4. Pollution containment associated with the landfill – including odour and vermin.

5. Noise impacts of the quarry - concerns regarding disruption to the peace and aesthetic of the local area due to the extraction of 200,000 tonnes of quarry material per annum.

Response to Issue 1: Correspondence related to the project

It appears that this property was overlooked in previous Council mail outs of project updates. This situation has now been rectified.

Response to Issue 2: Zoning

As noted in the response to similar issues raised in all other submissions, the Zone 5(a) Special Uses (Garbage Depot) has been applied to Lot 1 DP 34555, part Lot 1 DP1159352 and part Lot 602 DP 1001049 since the implementation of the Tweed Local Environmental 2000.

Council is not in a position to comment on the results of property searches conducted or commissioned by Mr Foster and Ms Harrold prior to their purchase.

Response to Issue 3: Visual Impact

Council will revisit the visual impact modelling during detail design including a more detailed review of terrain modelling and where necessary develop mitigation measures similar to that already detailed in the environmental assessment, such as screening planting where feasible. The Statement of Commitments in Section 4 has been updated to reflect this.

Response to Issue 4: Pollution containment associated with the landfill

The management of environmental elements related to the landfill's operation will be guided by the Landfill Environmental Management Plan which will include provision for dealing with pests and vermin, together with the Environmental Protection Licence issued by the EPA. These documents provide a legally enforceable basis upon which the landfill must be operated and include reporting mechanisms for information that must be provided by Council to the EPA on an annual basis. Environmental Protection Licence's are freely available online (http://www.environment.nsw.gov.au/prpoeoapp/) for all members of the public to view and are written in plain English.

Response to submission made by Paul Dixon in Section 3.6.1 outlines some of the key landfill design concepts aimed at protection of the environment. The Statement of Commitments provided in Section 4 provides further detail of the measures Council will be required to implement.

Response to Issue 5: Noise Impact of the Quarry

The submission raised concern regarding noise issues related to the extraction of 200,000 tonnes per annum from the quarry sites. Whilst the submission made by Alex Mitchell and Judith White raised similar noise concerns, it is worth noting here that the 200,000 tonnes per annum is an upper limit for total quarried material including soil, overburden, weathered rock and hard rock. Blasting and crushing of hard rock is acknowledged as the activities producing the greatest noise impacts, and production of hard rock will peak between Year 7 and 11 of the West Valley Quarry operation. However noise modelling at three different stages in the project, with assumptions that included greater hard rock extraction than what will eventuate has indicated that the only property that records a minor exceedance of the assessment criteria is a Council owned property at 656 Eviron Road.

Furthermore as noted in the Statement of Commitments provided in Section 4, Council will be required to implement additional noise mitigation measures, a noise and blast monitoring program and establish a community information and complaints management system.

4. Statement of Commitments

The Director General's requirements indicated that in accordance with Section 75E(6) of the EP&A Act, the Proponent is required to prepare a Statement of Commitments with respect to environmental management and mitigation measures for the project . In accordance with this requirement, this section provides an outline of the commitments that Council commits to for the entire Concept Plan and specifically the Stage 1 Project Application which have been updated following a review of the submissions received.

The fundamental principles outlined in these commitments will carry over to future applications associated with the Concept Plan for Eviron Road. However with changes to the regulatory framework and technological advances these commitments will be revisited to ensure they are current at the time, reflect best practice and community expectations and are relevant to activities proposed as part of the future applications.

Issue	Commitment
Environmental Management Plans	Environmental management plans would be prepared and implemented to guide environmental management and monitoring activities during establishment and operation of all landfills and quarries. This will take the form of an LEMP for Quirks Quarry Landfill and a Plan of Management for West Valley Quarry. Council is committed to best practice environmental management for both the quarry and landfill activities. A draft LEMP has already been prepared for the Quirks Quarry Landfill which outlines environmental management requirements for the waste disposal activities, including conceptual leachate management. The final LEMP will be developed in conjunction with the detail design of the landfill and will include a Soil, Water and Leachate Management Plan. It will address the EPA's requirements outlined in the recommended conditions of approval provided on 19 January 2012, and will include a surface water, groundwater and leachate response plan providing protocols to investigate and respond to potential surface or groundwater contamination associated with the development. The Office of Water and EPA will be consulted in the development of the LEMP which will be undertaken in conjunction with the detailed landfill design, particularly regarding the monitoring and management of stormwater, groundwater, leachate and landfill gas. The quarry plan of management will include the following sub-plans: ◗ Surface Water management and response plan – The plan would include a site water balance, the measures to retain and re-use the maximum amount of water on-site and ensure the surface run-off water is maintained at acceptable levels. The plan would also include erosion and sediment mitigation measures. ◗ Groundwater management and response plan – the plan would include baseline groundwater data, impact assessment criteria, trigger levels, a program to monitor, assess and report on groundwater inflows and impacts on regional aquifers and surrounding watercourses.

Issue	Commitment
Environmental Management Plans (cont).	◗ Air quality management plan – The plan would include mitigation measures for control of odours, dust and particles and monitoring undertaken.Noise management plan – The noise management plan will include noise and vibration control measures and the required monitoring activities. ◗ Traffic management plan – The plan will include parking and access requirements, safety signage and training of personnel in traffic management. ◗ Fire management plan – The plan would include details of sources of water for firefighting, the need for fire extinguishers on all mobile equipment and suitable training for site-based personnel as well as a fire response plan.
Surface Water	Specific measures to maintain the quality of onsite and downstream surface water quality for the Stage 1 Project Application have been outlined in the Quirks Quarry Landfill Concept Design Report and draft Landfill Environmental Management Plan. General concepts for the West Valley Quarry have been provided in the Preliminary Quarry Study and include the following (note that a Soil, Water and Leachate Management Plan will accompany the application for an Environmental Protection Licence which will include further detail): ◗ A site water balance for quarrying and landfilling activities will be undertaken which will provide details of water sources and security of water supply, site water use and water management, off site water transfers, measure to minimise reuse of contaminated water ◗ Clean stormwater runoff from undisturbed or areas upstream of the quarry and landfill activities will be diverted around the activities to minimise the quantity of stormwater required to be stored (and potentially treated) onsite. ◗ Stormwater runoff generated from active areas of the quarry and landfill will be captured in sediment basins and reused onsite wherever possible (for example for dust suppression). Concept designs for sediment basins associated with the Stage 1 Project Application have been developed and devices have been sized to minimise the opportunity for uncontrolled discharge from the site. Sizing and location of the stormwater management devices will be further refined during detail design. ◗ A perimeter bund will be established around the northern end of the Quirks Quarry Landfill to a minimum RL of 6.5m AHD to address flooding in a 100 yr ARI regional flood event. In addition, the base of the landfill in Stage 3 will be raised by between 1m and 3m (based on the finished quarrying levels) such that the base of the landfill will fall towards the eastern end of the cell to reduce the impacts of potential overflowing of the perimeter bund. ◗ The haul road from Stotts Creek has been designed to provide flood immunity to activities in the North and West Valley areas in 100 yr ARI regional flood event. ◗ Any works within 40 m of a watercourse will be undertaken in a manner consistent with the NOW (2008) *Guidelines for Controlled Activity Approvals.*

Issue	Commitment
Surface Water (continued)	◗ Leachate generated by the landfill activities and any stormwater which comes into contact with waste will initially be stored within the waste cell and once characteristics such as quantity, quality and generation rates are determined a leachate treatment process will be established. Prior to the establishment of a leachate treatment process, leachate levels within the landfill will be closely monitored to ensure that the storage capacity of the waste is not exceeded and if necessary leachate can be pumped out and appropriately disposed of to avoid impacts on surface water quality. ◗ Should any of the sediment basins proposed, be classified as dams under SEPP 52 *Farm Dams,* they will be constructed and operated in accordance with this policy and with any Harvestable Right Order published under section 54 of the *Water Management Act 2000.* ◗ The baseline surface water monitoring program will continue in the lead up to the establishment of the landfill and quarry such that site specific water quality objectives/trigger values can be established. During quarry and landfill operations surface water monitoring will be conducted in accordance with the conditions of the Environmental Protection Licence (including specified frequencies and analytical suite). ◗ Following completion of landfilling, sediment basins used for stormwater detention will be converted to wetlands.
Groundwater	Minimisation of potential impacts to groundwater resources will be ensured by the following commitments: ◗ Preparation of a Soil, Water and Leachate Management Plan including details of planned responses and proposed measures to investigate potential groundwater contamination associated with the development. ◗ Further geotechnical and hydrogeological investigations will be undertaken during detail design of the landfills and quarries to address potential issues associated groundwater management such as dewatering during quarrying and hydraulic conductivity and connectivity between alluvial deposits and bedrock. ◗ The additional groundwater investigations for West Valley Quarry will be undertaken in consultation with the Office of Water and will include installation and monitoring of groundwater bores to determine groundwater levels, flow direction and quality within the alluvium and hard rock aquifers, bore logs, data logging of groundwater levels and fortnightly sampling data of groundwater quality to establish temporal trends for a minimum period of 12 months, and pump testing to determine hydraulic properties and yield for the alluvium and hard rock aquifers. ◗ A groundwater model for the West Valley Quarry will be prepared that identifies the extent of depressurisation resulting from the project, predicted drawdown or loss of supply to any water courses or groundwater users, and the predicted impacts on any groundwater dependent ecosystems
Groundwater (cont)	◗ No further excavation below the final quarry floor levels will be undertaken for the establishment of the waste cells for Quirks Quarry (and future North and West Valley) landfills. ◗ Council will ensure the proper compaction of the floor of each landfill cell to

Issue	Commitment
	achieve a uniform low permeability equivalent to less than 1 x 10^{-9} m/s for a depth of at least 0.9 m. The in situ permeability of compacted material would be tested by sampling and laboratory testing to ensure the required permeability level has been achieved in accordance with a construction quality assurance (CQA) plan. In addition a high density polyethylene liner will be installed across the base of the landfill to further prevent migration of leachate to the local groundwater environment. ◗ The base of the Stage 3 cell of the Quirks Quarry Landfill will also be raised by between 1m and 3m (based on the finished quarrying levels) to further reduce potential impacts to the local groundwater environment. ◗ Council would continue to undertake a groundwater monitoring program including groundwater level and quality monitoring both for continued baseline data collection prior to commissioning of site activities and will continue the program in accordance with the eventual EPL's for the proposed activities. ◗ In the event that any onsite infrastructure intercepts the water table, or if dewatering is required consultation will be undertaken with NOW officers during detail design to determine licencing issues. ◗ Any required groundwater licenses will be obtained and associated works appropriately authorised prior to works commencing.
Acid Sulfate Soils and Pyritic Materials	Council makes the following commitments to manage acid sulfate soils and pyritic materials: ◗ Additional acid sulfate soils investigations along the haul road during detail design to better characterise potential issues and identify management requirements for construction of the road; ◗ Development of a revised Acid Sulfate Soils Management Plan following completion of additional investigations; ◗ Ongoing groundwater monitoring as described in the groundwater commitments to monitoring acid sulfate soil indicators; and ◗ Vigilant monitoring of any clay imported from offsite sources for the construction of landfill liners.
Acid Sulfate Soils and Pyritic Materials (cont)	◗ If required the design of a management system for pyritic materials site will follow detailed drilling, testing and delineation of PAF material to be conducted as part of the detailed design for the quarry. The key management measure for pyritic materials will be to avoid disturbance or drainage of PAF. Where this is not feasible, typical management options will be based on: – Maintaining saturated conditions to exclude oxygen and prevent oxidisation; – Excluding air to prevent oxidisation; – Capping to exclude water, to prevent leachate generation, by separate cell construction or storage in or beneath post-quarry landfill;

Issue	Commitment
	– Carbonate-rich capping, to develop alkaline infiltration to neutralise leachate and coat sulfide grains to reduce oxidisation (passivation); – Direct neutralisation of potential acidity of excavated PAF material; or – A combination of the above. ◗ Additional soil and rock testing for net acid generation (NAG) and net acid potential (NAPP) and metallic elements will be undertaken during detail design together with geotechnical investigations. Additional hydrogeological assessment will also be performed, based on water level data from all existing monitoring bores and core holes, to assess the final post-operation water table, to determine if significant quantities of PAF will be drained in-situ, leading to additional risk of AMD generation.
Soils and Land Capability	A Soil, Water and Leachate Management Plan will be prepared to the satisfaction of the EPA as part of the application for an Environmental Protection Licence and will include all detailed measures for managing soils and land capability. As a minimum Council will implement the following measures: ◗ Minimise soil erosion and sediment mobilisation to the downstream receiving environment identification of high risk activities and areas, and development of appropriate mitigation and control measures. ◗ Topsoil removed for quarrying would be stockpiled and used later for revegetation and rehabilitation of the final landfill cover. ◗ Care would be taken to ensure that topsoils and subsoils are not stripped when they are too moist. ◗ Topsoil stockpiles would be up to 1 m high and subsoil/overburden stockpiles would not exceed 3 m in height. ◗ Subsoil and topsoil stockpiles would be located within the footprint of the landfill, quarry or on the upper surface of completed landfill stages. ◗ Stabilisation measures would be used until vegetation is established on the stockpiled soil.
Biodiversity	Council makes the following commitments in terms of maintenance and protection of the biodiversity values of the site: **Substantially avoid clearing of areas of higher ecological significance.** ◗ The quarry footprint and haul road have been designed such that they minimise clearing of native vegetation and predominantly avoid areas of higher ecological value vegetation. ◗ Council has realigned the haul road concept to avoid clearing of vegetation type 7, and commits to the avoidance of clearing of an area of this vegetation type that falls within the eastern section of the quarry footprint currently shown. The quarry footprint would be revised to reflect this during detailed design. ◗ Retain and Manage Higher Ecological Value Areas – Council commits to a restriction on use on a portion of Lot 1 DP 1159532 registered on the title imposing a legal obligation in perpetuity to abide by the management actions of a Habitat Management Plan (to be developed by Council). A plan showing the habitat areas on the lot would be registered with the s88B instrument to identify the area burdened by the restriction.

Issue	Commitment
	◗ Areas of higher ecological value will be clearly marked by fencing with high visibility fauna permeable fencing or similar. Include these areas as 'vegetation protection areas' in an approved Environmental Management Plan.
	Maintain and enhance or restore habitat connectivity.
	◗ Retain a vegetated corridor along the ridgeline - the quarry footprints have been designed such that they retain a vegetated corridor along the western ridgeline.
	◗ Develop an east-west movement corridor - To provide future potential habitat and an alternate route for connectivity across the site, planting of suitable riparian / floodplain vegetation will be undertaken adjacent to the watercourse in Lot 1 DP1159352. This will create a vegetated corridor that connects the lowland areas to the ridgeline and effectively connect vegetation adjacent to the eastern side of Quirks Quarry to retained eucalypt open forest in the central western area of the site and link to the ridgeline.
	◗ Restore connectivity along the southern boundary – a vegetated corridor would be developed along the southern boundary of Lot 1 DP 34555 along Eviron Road that would contain species consistent with existing remnant vegetation along the ridgeline.
	◗ Undertake works as per a finalised Restoration Plan. A Preliminary Restoration Plan (refer Appendix L) has been prepared by Council to guide works in the abovementioned corridors.
Biodiversity (continued)	**Minimise impact to conservation significant fauna species.**
	◗ Manage Clearing - all clearing of vegetation will be undertaken in the presence of an experienced fauna spotter-catcher.
	◗ Contractor awareness – all contractors (construction and operation) to be made aware of the potential presence of fauna species.
	◗ Heavy vehicle movements - restricted speed limits to be implemented near to vegetated areas.
	◗ Environmental Management Plans - management plans will include actions for management of potential direct and indirect impacts to fauna species.
	◗ **Locate and translocate threatened plant species.**
	◗ Target surveys for threatened plant species will be undertaken once the final development footprint has been confirmed.
	◗ A 'Preliminary Translocation Plan for Threatened Plants' has been prepared by Council in accordance with the *Guidelines for the Translocation of Threatened Plants in Australia* (Appendix L).
	◗ In the event that any additional threatened species are located in the development footprint, the Preliminary Translocation Plan would be revised to incorporate additional individuals or species.
	Maintain habitat values.
	◗ Environmental Management - implement measures detailed in the approved EMP and undertake site works in general accordance with AS 4970-2009.
	◗ Maintain habitat - nest boxes will be installed in vegetation to be retained and managed on Lot 1 DP 1159532 in order to offset a reduction in hollow

Issue	Commitment
	recruitment. In relation to vegetation protection: ◗ Establish vegetation protection areas prior to construction. ◗ Activities permitted in the vegetation protection area would include weed management, habitat management, and restoration / translocation activities. ◗ Activities prohibited in the vegetation protection areas would include: use of or parking of vehicles and equipment (unless associated with a permitted activity), placement of construction materials, refuse, excavated spoils and stockpiling, use of tree trunks as a winch support.
Cultural Heritage	Council commits to the following actions regarding the management of cultural heritage at the site: ◗ On-going consultation with all registered local Aboriginal representatives to develop a Cultural Heritage Management Plan for the site; ◗ All reasonable efforts will be made to avoid items of Aboriginal and European Cultural Heritage. If impacts are unavoidable, mitigation measures will be negotiated with the EPA and local community. ◗ The Cultural Heritage Management Plan will include as a minimum: – *Procedures for ongoing Aboriginal consultation and involvement.* – *Management of any recorded sites of higher archaeological potential within project footprint.* – *Responsibilities of all stakeholders.* – *Details of proposed mitigation and management strategies of all sites.* – *Procedures for the identification and management of previous unrecorded sites (excluding human remains).* – *Details of an Aboriginal cultural heritage education program for contractors and personnel associated with construction activities.* – *Corrective procedures in the unlikely event that a non compliance with the CHMP is identified.* ◗ A program of site monitoring by representatives of the Aboriginal Party during activities causing ground disturbance for the recognised areas with a higher potential for the presence of unidentified cultural heritage. In the event that additional Aboriginal objects are uncovered during the monitoring program, the objects are to be recorded and managed in accordance with the requirements of the *National Parks and Wildlife Act 1974*. ◗ If human remains are located, all works must halt in the immediate area and the NSW Police must be immediately contacted. No action is to be undertaken until police provide written notification. ◗ An Aboriginal Cultural Education Program will be developed in collaboration with the local Aboriginal community for the induction of all personnel and contractors involved in the construction activities. ◗ The five springboard trees will be retained *in situ* wherever possible and relocated to an appropriate location where they can be preserved and

Issue	Commitment
	displayed along with appropriate interpretation where they cannot be retained *in situ*. ◗ Cultural heritage inductions will be undertaken so that work crews are aware of specific obligations to look for cultural heritage material aiming at informing workers what archaeological materials may look like and give them clear instructions on procedures for inadvertent discoveries
Noise and Vibration	Council will design and operate the facilities to ensure that there are no adverse noise and vibration impacts at sensitive receivers. Follow up noise monitoring will be undertaken at the commencement of the Stage 1 activities. **Specific Control Measures** ◗ Hard rock drill: Although its operation is expected to be limited, it has potential to cause short-term noise impacts at the nearest receivers. Therefore, the use of other quarry equipment, such as the processing plant and dozer will be limited (or ceased) during times when drilling is occurring. ◗ Quarry processing plant: Specific noise mitigation measures will be implemented at West Valley Quarry to reduce the impacts of noise from the processing plant. Potential options include the following, however the feasibility will be reviewed during detail design when the quarry layout is developed, such that the most practical option can be adopted: – Locating the processing plant in locations on site which are naturally shielded by the existing topography will also assist in minimising noise impacts. As a last resort, treating the building facades of affected receivers will assist in minimising internal noise. Building treatments should generally be considered only when other measures, such as noise barriers are impractical or not cost-effective. Approaches to the acoustic treatment of buildings include improved window glazing and insulation to external walls. **Blasting Controls** Blasting will be limited to times when condition are suitable and avoided at times, as outlined below: ◗ Avoid at times of adverse wind condition, as this may promote the impact of blast over pressure. ◗ Avoid at times of temperature inversion. ◗ Avoid overfilling holes with blasting agent. ◗ Avoid firing holes in the front row which have insufficient burden. – All blasting designs should contain considerations to minimise factors such as ground vibration and air blast. The blast design should include an assessment of noise and vibration impacts based on blast specific parameters.

Issue	Commitment
Noise and Vibration (continued)	**General Management Controls** General noise management controls that would be implemented during operation of the quarries and landfills are as follows. ◗ All activities would be undertaken during the approved operating hours only: Monday to Friday 7am – 5pm, Saturday 7am to 12pm noting that blasting can only occur Monday to Friday 9am – 3pm and Saturday 9am – 12pm. ◗ Review available fixed and mobile equipment fleet and prefer more recent and silenced equipment whenever possible. ◗ All equipment, particularly the quarry fleet and waste delivery trucks, will be maintained to a high standard to ensure there are no unnecessary noise emissions. ◗ All vehicles accessing the site will used the designated haul routes and approved access points only. ◗ Neighbouring properties shall be notified of the date and time of blasting activities in advance.
Air Quality and Odour	Council will design and operate the facilities to maintain the existing rural air quality. A dust management plan will be included for both the landfill and quarry activities with the LEMP and Quarry Plan of Management, respectively. The following will be implemented: ◗ Installation of a meteorological station onsite. ◗ High dust-generating activities would be avoided during adverse wind conditions when blowing directly towards the nearest residences. ◗ Cease or reduce operations when prevailing winds are in the direction of sensitive receptors, particularly to the south and south-west of the quarry (northerly or north-easterly winds). ◗ The use of a real-time reactive dust monitoring at locations representative of the nearest sensitive receptors to alert the quarry manager when dust levels exceed the nominated criteria. ◗ Specific dust control measures to increase the moisture content of quarried material. ◗ Use of water sprays/trucks and sprays to wet down access and haul roads. Clean sealed roads at access and egress points regularly to minimise the re-suspension of dust on sealed roads. ◗ Ensure materials are appropriately stored and contained to prevent windborne releases to the atmosphere. ◗ Where material is removed from the site or fill brought to the site, trucks will be covered whenever conditions are such that dust nuisance is occurring. ◗ To address dust generated by crushing and screening, install spray systems on equipment and stabilise working surfaces around the work area.
Air Quality and Odour (continued)	◗ Exposed surfaces, including stockpiles unless revegetated or have a stable surface, would be watered. ◗ Completed areas of the landfill would be progressively rehabilitated and revegetated to minimise dust emissions.

Issue	Commitment
	◗ Odour emissions from the landfill will be minimised by limiting the working face of disposal areas, covering all exposed waste at the end of each day, limiting the disposal of malodorous wastes, planning for receival of malodourous waste to minimise the time such wastes would be exposed and minimising the disturbance of previously filled areas. ◗ Records of any complaints would be kept with respect to odour and dust and correlating with weather conditions and deliveries of particularly odorous wastes.
Traffic and Transport	Council will commit to the following measures: ◗ Cessation of access to the site via Eviron Road; ◗ Design of the haul road in accordance with good practice for heavy vehicle traffic. ◗ Safety audit for the Tweed Valley Way and Leddays Creek Road intersection to ensure safe access to and from the major arterial, especially for heavy quarry traffic. ◗ Maintenance of the Leddays Creek Road access intersection and provision of maintenance for the duration of the operation of the quarry and landfill activities. ◗ Preparation of traffic management plans (as part of the environmental management plans) to ensure safe movement of vehicles into and around each the site. ◗ Requirement that each driver would sign a Code of Conduct (during their first visit to the operational site).
Visual	◗ Review the vantage point analysis conducted in the Environmental Assessment to include the property at 355 Farrants Hill Road. If necessary, undertake additional screening planting where feasible or consider other alternatives. ◗ Council will undertake strategic tree planting for screening purposes, including along a drainage line across Lot 1 DP1159352, which will in the longer term facilitate sheltered movement of species such as koalas across the presently cleared lowland area of the site. ◗ Progressive rehabilitation and revegetation of all landfill sites would be undertaken to visually blend the landfill capping with the surrounding landscape. ◗ The site will be kept clean and tidy at all times as per the LEMP and Quarry Plan of Management (or other site operations plans as relevant).
Greenhouse Gas	◗ Greenhouse gas emissions from landfilling activities will be minimised through active landfill gas management (as per the LEMP). Depending on the quantity of landfill gas generated and captured infrastructure such as a flare will be installed as a minimum, and investigations into the viability and feasibility of tapping into or replicating the Stotts Creek Renewable Energy Facility. ◗ As and when appropriate Council will consider alternative fuels for the onsite plant and equipment as well as more fuel efficient equipment (where cost competitive).

Issue	Commitment
Hazards	Council will implement the following measures to address potential hazards: ◗ Hazard and risk associated with the proposed activities would be managed through development and implementation of a site operations plan which will address safety hazards and develop occupational health and safety procedures and emergency management procedures. ◗ The siltstone present at the site is likely to contain silica, which could potentially be released as respirable crystalline silica in rock dust released during crushing operations. Site-specific data on the mineral composition of the rock resource and the particle size distribution of the rock dust released during crushing operations will be analysed during detail design to facilitate an assessment of potential RCS exposure. ◗ A preliminary assessment of the hazard to building infrastructure and other assets within the lands under the care and control of Council will be undertaken as a priority when the initial activities on site begin as potential sources of ignition may become evident or will be reduced in some areas. ◗ A fire management plan will be included in the site management plans for fires caused by onsite and offsite activities. As part of the management plan, Council will identify risk reduction measures. ◗ Occupational health and safety procedures and appropriate personal protective equipment would be followed during use of plant and equipment as relevant to the particular activity. ◗ Residents would not be permitted to deliver waste to or access any of the landfills. All public access to waste management facilities will be conducted at Stotts Creek RRC. ◗ All landfills will be lined to prevent off-site migration of landfill gas, and a gas management system would be designed in the detailed design phase to prevent methane from being discharged to the atmosphere from closed areas of the landfill. ◗ No dangerous goods would be stored on site, apart from small quantities primarily used for equipment maintenance, and herbicides used for controlling weeds on site.
Hazards (continued)	◗ All chemicals, fuels and oils stored onsite will be contained within an appropriately designed impervious bunded area capable of containing 110% of the largest container stored within the bund. Bunds shall be design and installed in accordance with the requirements of relevant Australian Standards and/or the EPA Environment Protection Manual *Technical Bulletin Bunding and Spill Management*. ◗ Implement suitable measures to manage pests, vermin and declared noxious weeds including regular inspections, monitoring and management.
Revegetation, rehabilitation and post closure management	Council commits to the following: ◗ Preparation and implementation of a Rehabilitation and Closure Plan prepared by a suitably qualified and experience expert in consultation with EPA. ◗ Undertake a program of progressive revegetation in those areas disturbed by the operations taking account of the intended future Botanic Gardens.

Issue	Commitment
	◗ Conversion of stormwater detention areas to wetlands following cessation of landfilling activities. ◗ Continue to manage the site following closure of the landfill facility, in accordance with the commitments and procedures to be documented within the Site Closure plan. This includes long term monitoring of groundwater, leachate, surface water, landfill gas, revegetation success and capping integrity
Community	◗ Council will undertake consultation with relevant community stakeholders including during the site establishment period and will proactively engage with the community during operations. This will as a minimum include residents whose properties directly adjoining Council's landholding. ◗ The waste education facility at Kingscliff Wastewater Treatment Plant – adjacent to the Stotts Creek RRC will continue to be utilised. ◗ Areas not required for project-related activities will be maintained in a manner that enhances their ecological values as described in the Biodiversity and Rehabilitation section. ◗ The site will ultimately be returned as a community asset in the form of the Tweed Shire Botanic Gardens in accordance with the existing Master Plan. ◗ Council will implement a complaints management system that includes: – A hotline for receiving complaints about the development; – A commitment to investigate the source of all complaints and take the required immediate action to reduce the impact where valid, and to communicate this to the complainant; – A record of complaints and responses/actions which is readily accessible to the community and regulatory authorities – A system for providing feedback to the community

5. Conclusions

Tweed Shire Council has reviewed the submissions received on the Environmental Assessment for the Concept Plan and Stage 1 Project Application for the Eviron Road Quarry and Landfill Proposal. This Submissions Report has addressed the issues raised in the submissions that required a response from the proponent. A Preferred Project Report is not required as Council intends to proceed with the current application.

The draft Statement of Commitments provided with the Environmental Assessment has been reviewed and amended where required to address the issues raised in the submissions including recommended conditions of approval provided by the EPA and to ensure that potential environmental impacts area appropriately managed.

Council has made a commitment to best practice in environmental management during construction and operation of all activities forming part of the overall Concept Plan. Whilst it is acknowledged that further investigations will be required during the detail design phase to provide greater surety around the management of some issues (particularly regarding groundwater and surface water management), all activities will be undertaken in accordance with the Landfill Environmental Management Plan and Quarry Plan of Management which will accompany Council's application for an Environmental Protection Licence. Each of these plans will include a suite of sub plans to address both issues associated with both the construction and operation of the activities.

Approval of the Concept Plan and Stage 1 Project Application will provide certainty to the Tweed Shire in terms of long term waste disposal capacity and extractive requirements, however as discussed in the EA and provided for in the Tweed Shire Community Plan, Council has a documented and high level of commitment to identifying measures to reduce waste to landfill and explore alternatives to traditional landfilling practices. On this basis and on the basis of the environmental assessment work to date it is considered that that the Concept Plan and Stage 1 Project Application should be approved, and the Council move towards delivering on the Statement of Commitments.

6. References

Tweed Shire Council (2012) *Electricity Supply for Eviron Road Quary and Landfill, Eviron Environmental Assessment*

GHD (2011) *Report for Eviron Road Quarry and Landfill Proposal, Part 3A Environmental Assessment*

7. Disclaimer

This Report for Eviron Road Quarry and Landfill Proposal Response to Submissions Report ("Report"):

1. has been prepared by GHD Pty Ltd ("GHD") for Tweed Shire Council;
2. may only be used and relied on by Tweed Shire Council;
3. must not be copied to, used by, or relied on by any person other than Tweed Shire Council without the prior written consent of GHD;
4. may be used for the purpose of supporting a Part 3A application for the development of quarry, landfill, haul road and ancillary structures on the subject site and must not be used for any other purpose.

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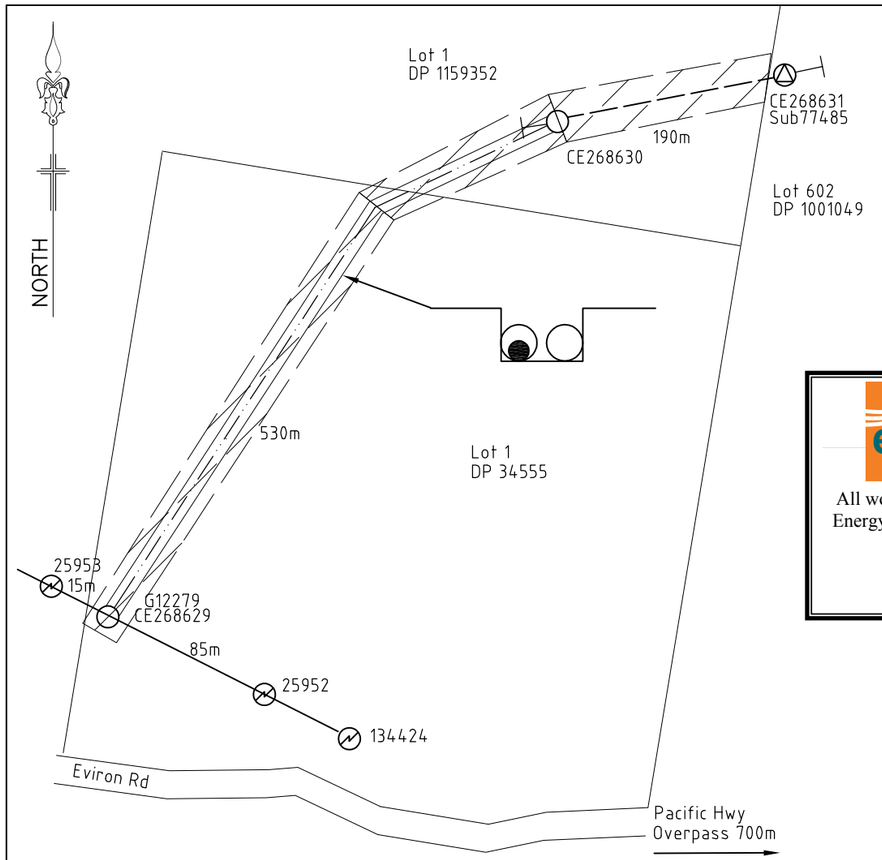
GHD expressly disclaims responsibility for any error in, or omission from, this Report arising from or in connection with any of the Assumptions being incorrect.

Subject to the paragraphs in this section of the Report, the opinions, conclusions and any recommendations in this Report are based on conditions encountered and information reviewed at the time of preparation and may be relied on until such time as construction/establishment activities commence onsite, after which time, GHD expressly disclaims responsibility for any error in, or omission from, this Report arising from or in connection with those opinions, conclusions and any recommendations.

Appendix A

NJ Construction Pty Ltd – Proposed Power Supply Extension Drawings



UNDERGROUND CABLE AND CONDUIT SCHEDULE			
FROM	TO	CABLE AND CONDUIT DETAILS	ROUTE LENGTH
10035	SUB77316	INSTALL 11kV 240mm 3 CORE AL XLPE	530m
10035	SUB77316	INSTALL 2x125mm ORANGE HEAVY DUTY CONDUIT	530m

OVERHEAD CONDUCTOR SCHEDULE				
FROM	TO	CONDUCTOR DETAILS	ROUTE LENGTH	DESIGN TENSION
CE268629	25953	TERMINATE HV AT CE268629, RECOVER EXISTING HV CONDUCTORS TO 25953	15m	N/A
CE268629	25953	ERRECT 3 PH 7/4.50 AAAC 11kV	15m	17%
51450	51451	ERRECT 3 PH 7/4.50 AAAC 11kV	190m	17%

All work is to comply with Essential Energy's Construction Manual CEM 7099 and CEM 7199

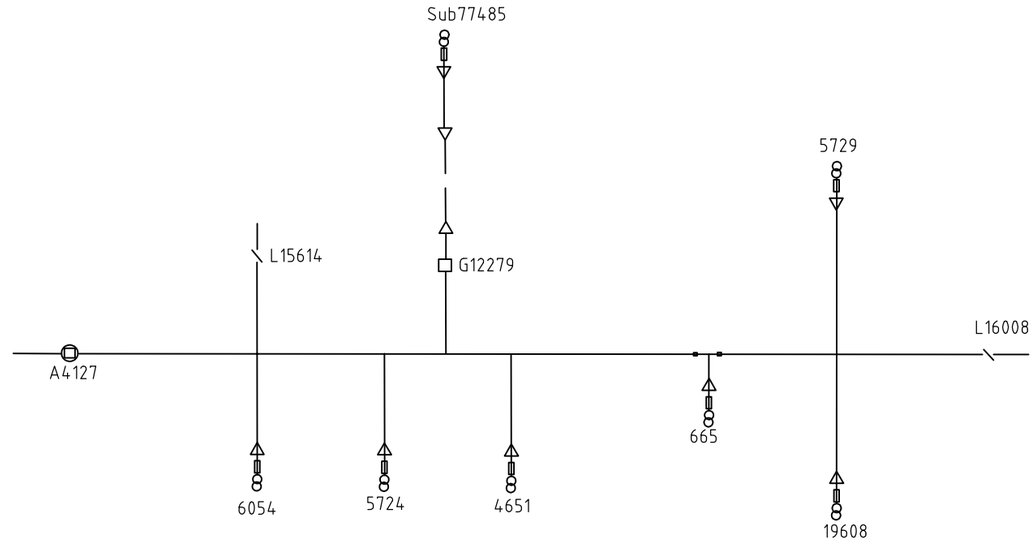
LEGEND

- Existing Power Line
- Proposed Underground Power Line
- Cadastre
- Proposed Overhead Power Line
- Stay
- Existing Pole
- New pole
- New Transformer
- Tree
- Proposed Easement for overhead powerlines 20m undergound powerlines 2m

Notes:

1. ALL INSTALLATIONS TO BE IN ACCORDANCE WITH THE C.E. CONSTRUCTION STANDARD DRAWINGS.
2. CABLE LENGTHS ARE IN METRES AND ARE APPROXIMATE ONLY.
3. ACCURATELY RECORD ALL "AS CONSTRUCTED" INFORMATION.
4. REPRESENTATION OF EXISTING INFORMATION MAY BE SUBJECT TO SITE VARIATIONS. ALL SUCH INFORMATION SHOULD BE CHECKED ON SITE PRIOR TO WORKS COMMENCING &ANY VARIATIONS RECORDED.
5. C.E. STANDARD CONSTRUCTION ASSEMBLY NUMBERS ARE QUOTED WHERE POSSIBLE WHERE STANDARD ASSEMBLIES DO NOT EXIST THE NEAREST ASSEMBLY MAY BE QUOTED AND/OR A FULL DESCRIPTION GIVEN.
6. CHECK AND LOCATE ALL EXISTING UNDERGROUND SERVICES PRIOR TO DIGGING.
7. UNDERGROUND WARNING TAPE.
8. CLEARING TO BE CARRIED OUT BY OWNER.
9. ALL RECOVERED POLES TO BE RETURNED TO NEAREST COUNTRY ENERGY FIELD SERVICE CENTRE FOR DISPOSAL

OVERHEAD CONSTRUCTION SCHEDULE			
ASSET LABEL	DRAWING NUMBER	ASSEMBLY NUMBER	CONSTRUCTION NOTES
CE268629	7103.10	PLAIN	PLAIN FOOTING 2.35m DEEP
	7101.03	13	INSTALL 15.5m 6kN POLE
	7101.21	1	INSTALL 11kV THREE PHASE STRAIN ARM - 2.4m TYPE S5 STEEL XARM
	7101.43	3	INSTALL LV 4 WIRE PIN - 2100 X 100 X 100 TYPE T1 WOOD XARM
G12279	7105.23		11KV ENCLOSED SWITCH TOWARDS NEW UGOH
	7204.36		11kV AERIAL TO UNDERGROUND. TERMINATE ON GAS SWITCH
	7207.08		EARTHING UGOH
	7204.11		FIXING CABLES TO POLES
CE268630	7103.10	PLAIN	PLAIN FOOTING 2.35m DEEP
	7101.03	13	INSTALL 15.5m 6kN POLE
	7204.36		11kV AERIAL TO UNDERGROUND
	7207.08		EARTHING UGOH
	7204.11		FIXING CABLES TO POLES
	7101.20	2	11kV 3PH TERMINATION - 2.4M TYPE S5 STEEL X'ARM
	7106.01		VIBRATION DAMPNERS - 1 PER CONDUCTOR
	7103.01	1	GROUND STAY - 19/2.00 Sc Gz 1 WIRE EYEBOLT GY3 INSULATOR 45 DEG.
	7103.13	4	250mm SINGLE HELIX SCREW ANCHOR
CE268631	7103.10	PLAIN	PLAIN FOOTING 2.2m DEEP
	7101.03	12	ERRECT 14m 12kN POLE
	7101.20	2	11kV 3PH TERMINATION - 2.4M TYPE S5 STEEL X'ARM
	7106.01		VIBRATION DAMPNERS - 1 PER CONDUCTOR
	7104.20	5	11kV 3PH FUSE - SUBSTATION - 80A K TYPE
	7104.05	2	500kVA 3PH SUBSTATION No. Sub77485
	7104.23	4	500kVA 3PH TRANSFORMER - TAP SETTING 11000/433/250
	7104.24	5	3PH LV FUSE - 630A
	7109.11	1	EARTHING - SUBSTATION
	7103.01	1	GROUND STAY - 19/2.00 Sc Gz 1 WIRE EYEBOLT GY3 INSULATOR 45 DEG.
	7103.13	4	250mm SINGLE HELIX SCREW ANCHOR
25953	7101.21	1	RECOVE EXISTING PIN ARM AND INSTALL 11kV THREE PHASE STRAIN ARM - 2.4m TYPE S5 STEEL XARM



No.	AMMENDMENT	BY	DATE
B	Replace links with gas switch	IL	19/10/11
A	Draft plan and profile design only	IL	28/7/11

	NAME	DATE
SURVEYED:		
DESIGNED:	IL	15/2/11
DRAWN:	IL	15/2/11
CHECKED:		

SCALE NTS | Sheet size A3

NJ Construction Pty Ltd
34 Kayslane
Alstonville NSW 2477
Ph: 02 6628 8430
Fax: 02 6628 8450

PROJECT

Underground and overhead HV extension + 500kVA sub
Tweed Shire Council
719 Eviron Rd, Eviron

Design Information No.	Strip Map Details	
102029		
DRAWING No.		REV. B
JOB No. 09/12A/010	Sheet No. 1	No. of Sheets 2

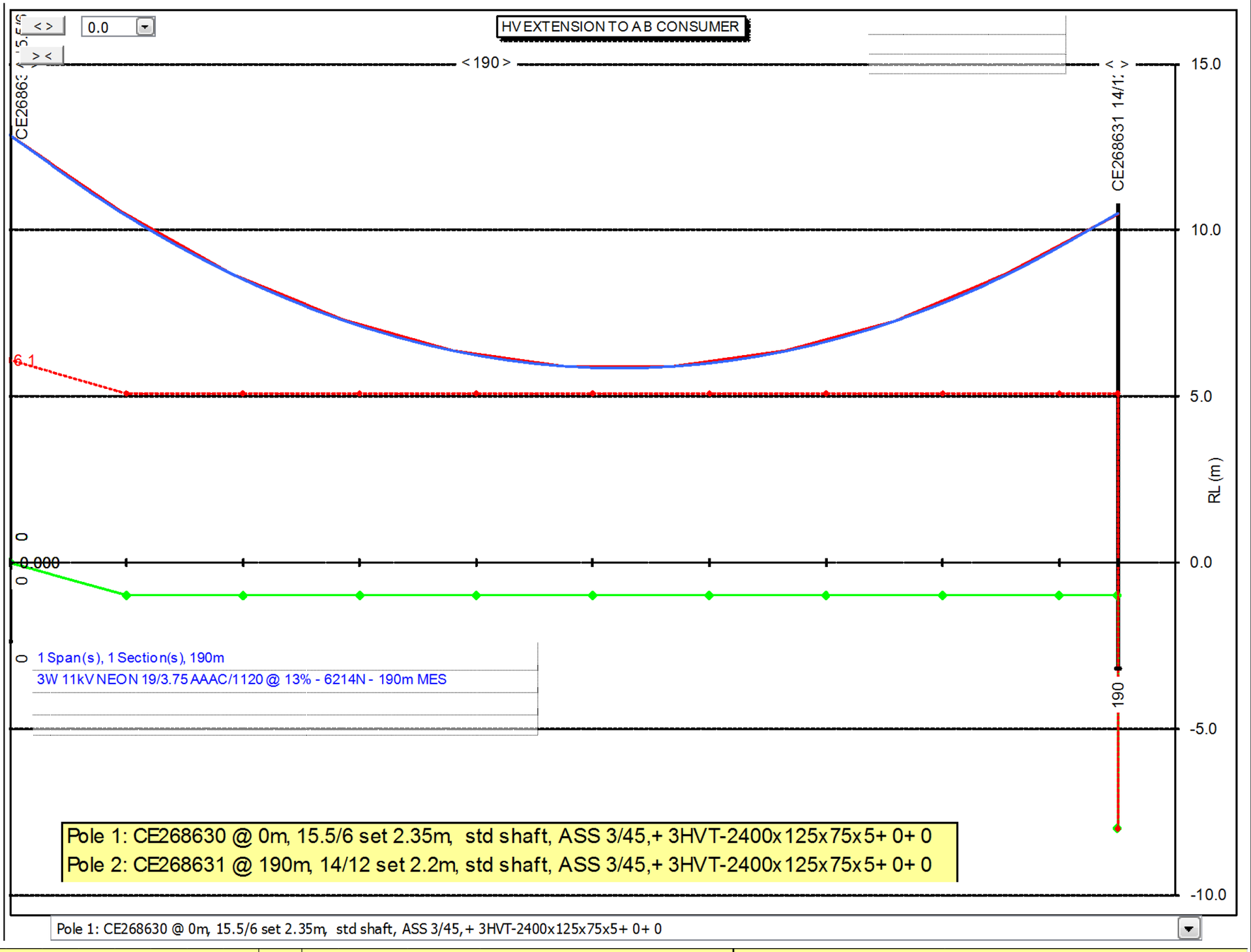
MAIN MENU | SURVEY DATA | DESIGN

Rigid Supports | Wind & Ice Loading

- NEON 19/3.75 AAAC/1120
- 3W Construction
- 11 kV Separations
- B: Pin insulator- armour rods & preform ties
- Custom design
- 13%
- Everyday Load @ 6.3C: 13.0% 6.21kN
- Wind Load @ 15C: 28.2% 13.46kN
- Cold curve at 25C
- Hot curve at 65C
- Show hot

essential energy

All work is to comply with Essential Energy's Construction Manual CEM 7099 and CEM 7199



Pole 1: CE268630 @ 0m, 15.5/6 set 2.35m, std shaft, ASS 3/45,+ 3HVT-2400x125x75x5+ 0+ 0

MAIN MENU

Code	Stranding	Material	Span length (m)	Tensions @ Following Temperatures -5C (N)	0C (N)	5C (N)	10C (N)	15C (N)	20C (N)	25C (N)	30C (N)	35C (N)	40C (N)	45C (N)	50C (N)
NEON	19/3.75	AAAC/1120	190	6,813	6,531	6,275	6,043	5,832	5,638	5,460	5,296	5,145	5,004	4,874	4,752

Span length (m)	Sags @ Following Temperatures -5C (m)	0C (m)	5C (m)	10C (m)	15C (m)	20C (m)	25C (m)	30C (m)	35C (m)	40C (m)	45C (m)	50C (m)
190	3.74	3.90	4.06	4.22	4.37	4.52	4.67	4.81	4.96	5.10	5.23	5.37

Span length (m)	3 Return Wave Timings @ Following Temperatures -5C (s)	0C (s)	5C (s)	10C (s)	15C (s)	20C (s)	25C (s)	30C (s)	35C (s)	40C (s)	45C (s)	50C (s)
190	10.48	10.70	10.92	11.13	11.33	11.52	11.71	11.89	12.06	12.23	12.39	12.55

No.	AMMENDMENT	BY	DATE
A	Draft plan and profile design only	IL	12/9/11

	NAME	DATE
SURVEYED:		
DESIGNED:	IL	12/9/11
DRAWN:	IL	12/9/11
CHECKED:	XX	XX/XX/XX

SCALE 1:XXX | Sheet size A3

NJ Construction Pty Ltd
34 Kayslane
Alstonville NSW 2477
Ph: 02 6628 8430
Fax: 02 6628 8450

PROJECT

Underground and overhead HV extension + 500kVA sub
Tweed Shire Council
719 Eviron Rd, Eviron

Design Information No. 102029 | Strip Map Details

DRAWING No. | REV. A

JOB No. 09/12A/010 | Sheet No. 2 | No. of Sheets 2

Appendix B

Electricity Supply Environmental Assessment

TWEED SHIRE COUNCIL

Electricity supply for Eviron Road Quarry and Landfill, Eviron

Environmental Assessment

March 2012

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1 Introduction

1.1 Background

Tweed Shire Council's Waste Unit has lodged an application for Concept and Stage 1 approval of a staged quarry and landfill at Eviron (MP 08_0067/68). Approval is being sought under Section 75M of the *Environmental Planning and Assessment Act 1979* (EP&A Act), with the NSW Department of Planning (DoP) the consent authority. Council's Development Assessment Unit (DAU) have assessed the application and prepared an official response which is to be forwarded to the DoP. Prior to finalising their assessment, DAU have sought clarification on the location of the proposed electricity supply extension and the nature of the environmental impacts associated with it. This document is intended to address this matter by describing the proposed power supply alignment and the environmental impacts associated with its construction and operation.

It is noted that a detailed assessment of the environmental impacts associated with proposed Eviron Quarry and Landfill (Eviron Q&L) is provided in the Part 3A Environmental Assessment report (EA) (GHD, 2011). The subject assessment of the proposed power supply extension reviews the information provided within the EA and relates it to the electricity supply component of the proposal and, where necessary, seeks to fill any information gaps.

1.2 The site and power supply alignment

The proposed power supply easement traverses Lot 1 DP 34555, Lot 1 DP 1159352 and Lot 602 on DP 1001049 of the proposed Eviron Q&L site at Eviron. It is proposed to extend from the existing 11kV line in the south western corner of Lot 1 DP 34555 approximately 710m on a north-easterly alignment to the location of the existing Quirks Quarry site office. The alignment follows a spur which extends from Condong Range ridge and utilises the existing clearing between forested vegetation.

The proposed power supply alignment is present in Figure 1.

Figure 1: Preferred alignment for electricity supply

Eviron Quarry and Landfill, Eviron

Legend

- Underground_powerline
- Overhead_powerline
- Overhead_20m_easement
- Underground_2m_easement
- Parcel Boundary

0 15 30 60 M

1:2,580

N

Cadastre: 05 April, 2012
© Land and Property Management Authority (LPMA) and Tweed Shire Council.

Boundaries shown should be considered approximate only.

DO NOT SCALE
COPY ONLY - NOT CERTIFIED

GDA

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geodetic Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

Date Printed: 28 March 2012
Author: Sally Cooper, Design Unit

Civic and Cultural Centre
3 Tumbulgum Road
Murwillumbah NSW 2484

PO Box 816
Murwillumbah NSW 2484

T | (02) 6670 2400 | 1300 292 872
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TWEED SHIRE COUNCIL

W | www.tweed.nsw.gov.au
E | planningreforms@tweed.nsw.gov.au

1.3 Description of proposed power supply extension works

The proposed extension comprises approximately 555m of underground cable and 155m of overhead 11kV line. The southern section, along the spur, has been designed as underground cable to conserve the visual amenity in this area of the site which is recognised as a key view line in plans for the future Tweed Regional Botanic Gardens, which are proposed for the site post-quarry and landfill.

The underground component of the power supply requires a disturbance footprint of 2m wide easement with a trench of approximately 900mm deep by 450mm wide. The conduit would be laid first, following which the cable would be drawn through. Trench excavations would advance progressively to enable installation and backfilling within the same day. The trench would not be left open overnight.

The overhead component requires the installation of two new poles, a transformer and overhead cable. Poles would installed by excavated holes using a 500mm diameter auger to a depth of 2.2-2.35m below the surface and then rammed and backfilled. No surplus spoil is expected to require removal from site. A 20m cleared easement is required around the overhead section of the alignment to maintain the safe functioning of the power supply

Construction is expected to take one week to lay conduit and cables and install power poles. Outage and connection would require another day but would likely take place up to three weeks after installation of base infrastructure to allow the necessary period of notification.

Concept design plans are provided in Appendix A.

2 Environmental considerations

2.1 Soils

2.1.1 Soil landscapes

Desktop review of the EA (GHD, 2011) and Morand (1996) has determined the soil landscape through which the electricity easement traverses to be as described below.

2.1.1.1 Burringbar erosional

The underground component of the electricity alignment occurs predominantly within the Burringbar erosional soil landscape. This soil landscape comprises high rolling to steep hills with narrow to moderately broad ridges and crests which is reflective of the topographic character of the site. For this soil landscape group, crests and some slopes are typically comprised of grey earths, upper slopes of moderately well-drained red podsolic soils, and poorly drained yellow podsolic soils with moderately well-drained red earths on lower slopes and footslopes (Morand, 1996). The soil landscape is described as being erodible, strongly acid, hardsetting and dispersive (Morand, 1996).

2.1.1.2 Ophir Glen transferral

At the northern boundary of Lot 1 DP34555 the soil landscape is mapped as Ophir Glen transferral landscape. This soil landscape comprises sheet-flood fans, alluvial fans and valley infills (Morand, 1996). The soils of this landscape are described as poorly drained yellow podsolic soils, moderately well-drained minimal prairie soils and deep poorly drained minimal brown podsolic soils occur on the lower portions of some coastal fans (Morand, 1996). Soil limitations are described in terms of waterlogging, high watertables, flood hazard, high run-on and water erosion hazard (Morand, 1996). They are strongly acidic, highly erodible and hardsetting (Morand, 1996).

2.1.1.3 Tweed estuarine/alluvial

Further along the alignment, in the vicinity of the site office, the soil landscape is mapped as Tweed alluvial. This is an estuarine/alluvial soil landscape comprised of an extensive marine plain comprised of deep Quaternary alluvium and estuarine sediments extending throughout the floodplain of the Tweed River which generally delineates the limits of the soil landscape (Morand, 1996). This soil landscape characteristically has a high water table is prone to waterlogging and flooding, and is known to have extensive occurrences of potential acid sulfate soils.

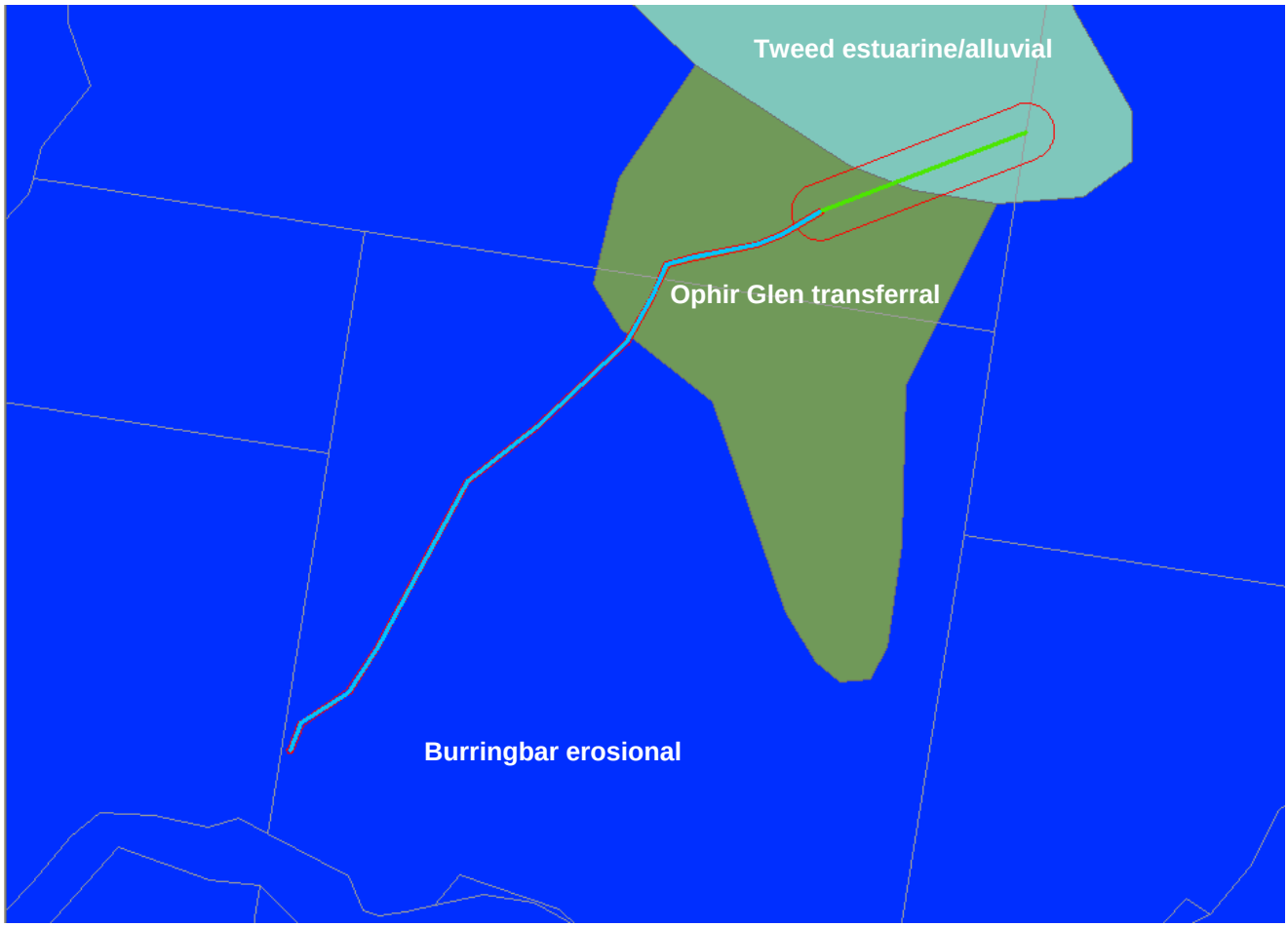

Figure 2: Soil landscape traversed by proposed alignment

2.1.2 Acid Sulfate Soils

2.1.2.1 ASS risk

In assessing the ASS risk associated with the proposed electricity supply works, the Acid Sulfate Soil Risk Mapping (prepared by the Department of Land and Water Conservation (DLWC)) and main document of the EA have been reviewed. In relation to the proposed electricity easement, the mapping shows the majority of the easement occurs outside of ASS risk areas. However, the northern portion of the alignment occurs in close proximity to a Class 2 ASS risk area, which loosely coincides with Tweed alluvial soil landscape. Within this area there is a high probability of occurrence of ASS within 1 m of the ground surface (GHD, 2011). The EA states: the mapping indicates within the alluvial plain environment, at an elevation of 1 to 2 m AHD, there is a 'severe environmental risk if acid sulfate soil materials are disturbed by activities such as shallow drainage, excavation or clearing' (GHD, 2011). According to the ASS Manual (Stone *et. al.*, 1998) and clause 35 of the Tweed LEP 2000, further investigations are required in a Class 2 area, where works are proposed below natural ground surface and/or are likely to lower the watertable.

A preliminary investigation undertaken by Gilbert and Sutherland (2007) assessed three locations for ASS at the site. The locations of these boreholes are not clearly described; however, the EA (GHD, 2011) suggests two of the boreholes coincide with GW06 and GW08. These boreholes occur on the low-lying alluvial plain, north-west of Quirks Quarry,

adjacent the drainage line which runs parallel to the existing northern access track. The Gilbert and Sutherland (2007) investigations indicate actual acid sulfate soil (AASS) and potential acid sulfate soil (PASS) materials in all three boreholes assessed. PASS material was found to be present between ~1.5 and 4.0 m below surface (Gilbert and Sutherland, 2007 in GHD, 2011). The samples analysed had no acid neutralising capacity (ANC) and therefore insufficient capacity to neutralise potential acid generation (Gilbert and Sutherland, 2007 in GHD, 2011). Accordingly, treatment of ASS would require liming rates of between 2.1 and 100.4 kg/t (Gilbert and Sutherland, 2007 in GHD, 2011).

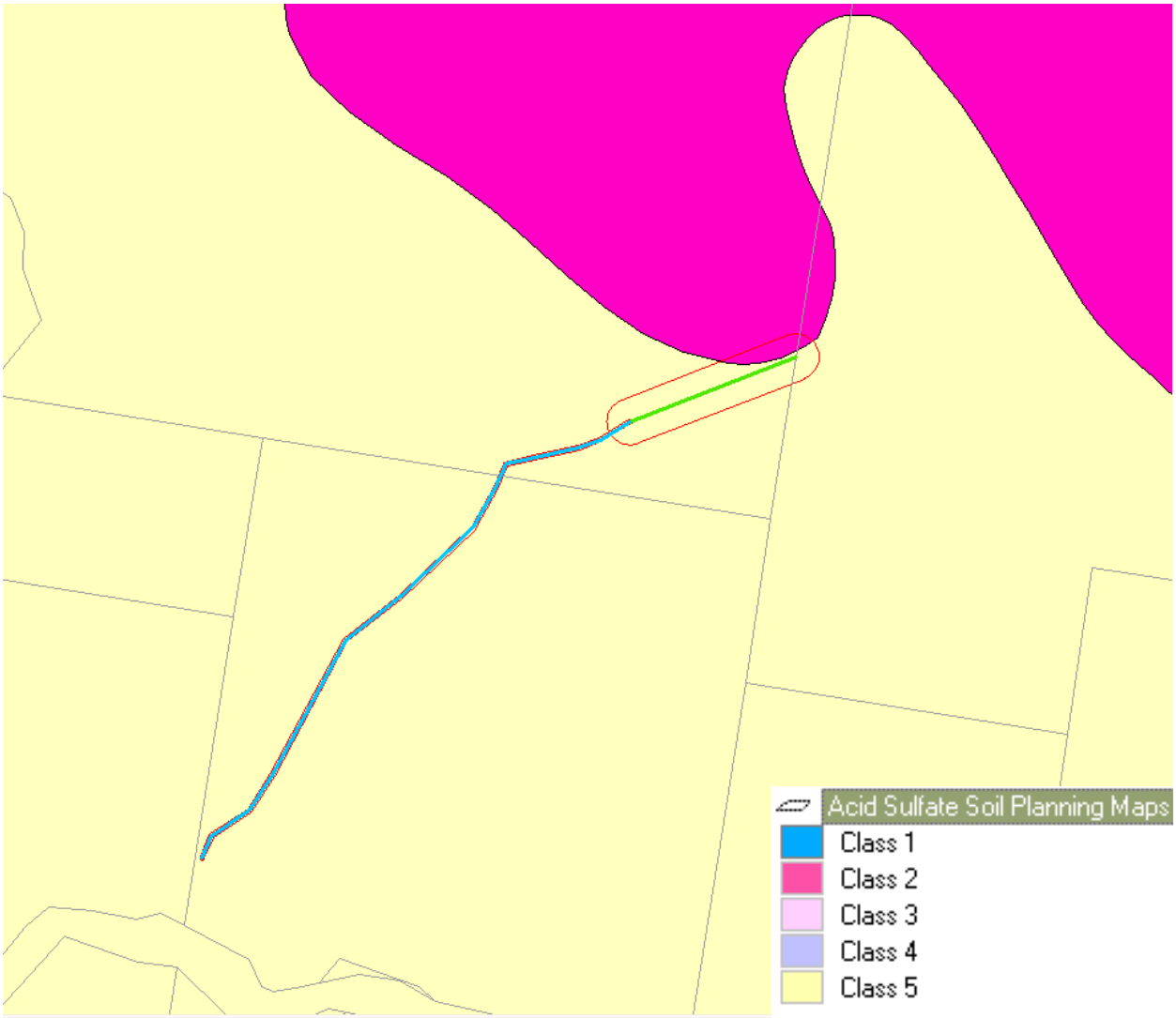

Figure 3: Acid sulfate soil planning map in relation to proposed alignment

2.1.3 Implications to proposed electricity supply

The underground component of the electricity supply requires trenching along a moderately inclined hill slope (~20% grade) through Burringbar erosional soils. As stated above, these soils are known to be highly erodible and dispersive. Accordingly, sediment and erosion control measures will need to be in place to manage erosion risk.

In relation to ASS, preliminary investigations undertaken by Gilbert and Sutherland (2007) indicate PASS at ~1.5m – 4m below the ground surface in the low-lying Class 2 ASS risk area. Ground disturbance in this area would be restricted to excavations for the final power pole (CE268631). Excavations would be to ~2.2m below ground surface, within the PASS depth range. Accordingly, any soil excavated from between 1.5-2.2m would need to be limed. In the absence of ASS data from the proposed pole location and considering the small quantity of spoil expected from the pole excavation (~3.5m^3), it is recommended that a conservative approach be taken and the higher end of the liming rates recommended by Gilbert and Sutherland (2007) be applied: 100.4 kg/t.

In summary, the potential constraints relating to soil include erosion and disturbance of ASS. These issues can be managed with appropriate construction standards and mitigation measures and are not considered significant constraints to the proposal.

Refer to mitigation measures in Section 3 for proposed mitigation measures.

2.2 Topography and drainage

2.2.1 Existing environment

The alignment connects with the existing overhead network on Condong Ridge at ~80AHD and follows a north-easterly spur, gradually falling in elevation, until reaching the alluvial plain at ~2m AHD in the north-east.

The majority of the underground section of the alignment traverses a hill slope of 8-18 degrees. The northern section of the alignment traverses flat land (<8 degrees). As depicted in Figure 4, the alignment has been strategically selected to avoid the steep sloping sides of the spur (as well as existing forested vegetation).

On-site drainage in relation to the proposed alignment is depicted in Figure 5.

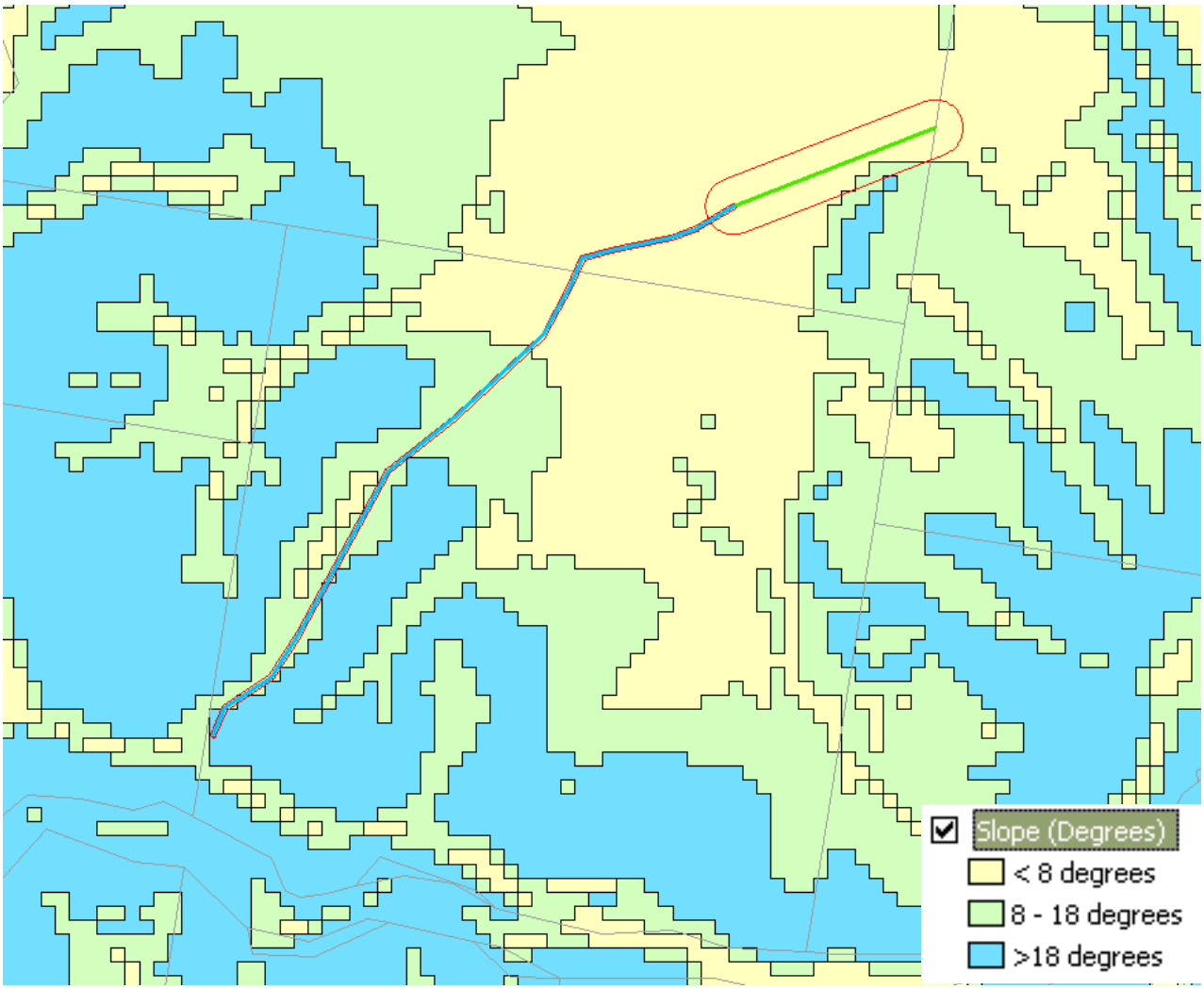

Figure 4: Slope along proposed alignment

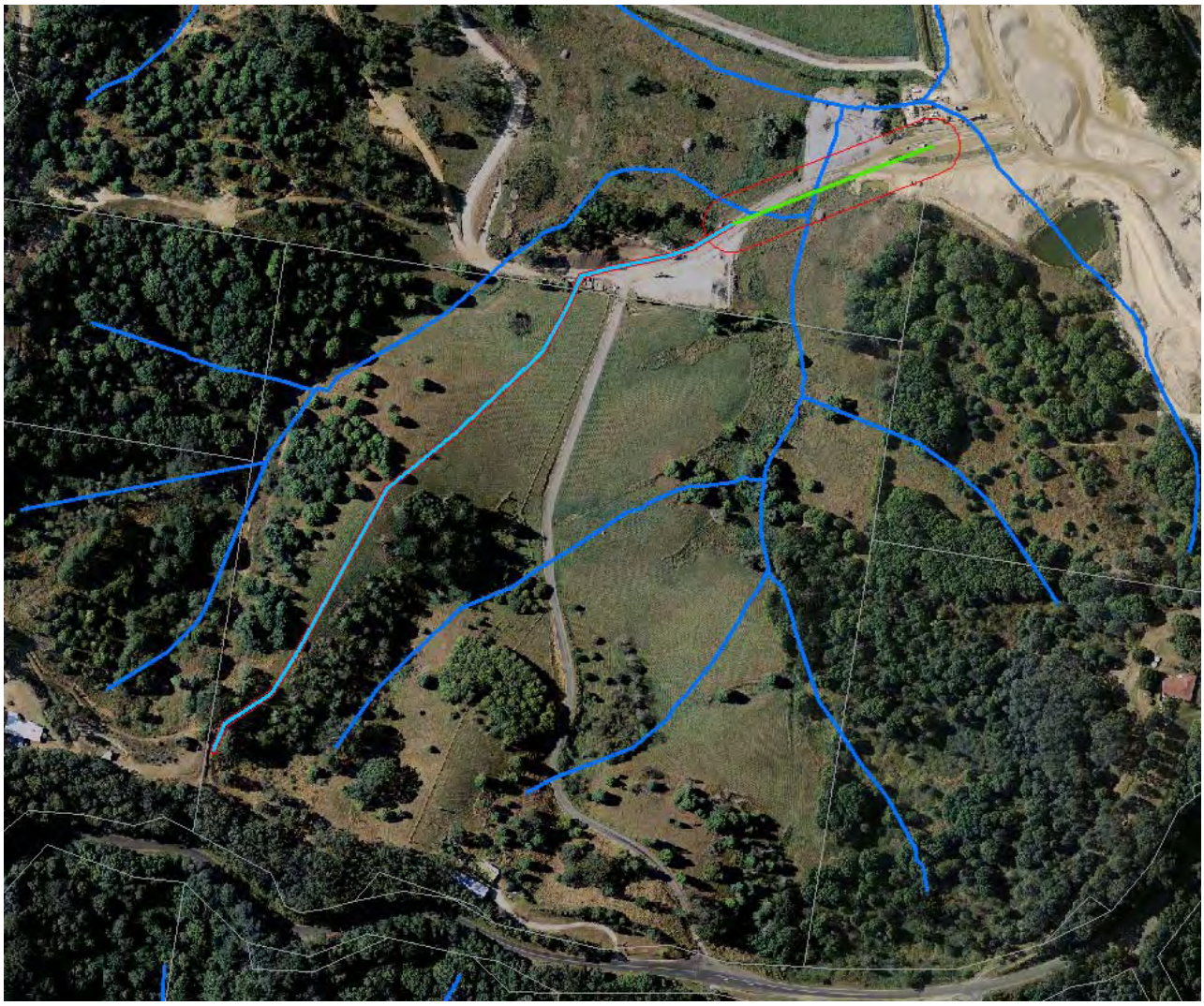

Figure 5: On-site drainage in relation to proposed alignment

2.2.2 Implications to proposed electricity supply

As the alignment follows the crest of a spur it does not interfere with drainage. The overhead component of the supply crosses a drainage line in the northern portion of the alignment; however, the drainage line is directed beneath the access road via a culvert at this point. Further, the proposed poles are not located near the drainage pathways, rather the drainage line occurs mid-span between poles.

Standard erosion and sediment control measures would be in place to minimise the risk of pollution of receiving waterways due to uncontrolled release of sediment.

2.3 Amenity

2.3.1 Existing environment

The site's landscape is generally of a rural character with sugar cane crops on the low-lying areas and bushland with scattered rural residences along the ridgelines. Stott's Creek waste management facilities occurs on the toe of the slope to the north-west and Quirks Quarry occurs to the north-east.

Natural landscape features make a significant contribution to the visual amenity of the locality, namely:

- Ridgelines – Condong Range traverses the landscape in a southwest to northeast direction. In relation to the site it occurs to the immediate south, east of the highway and in the distant northeast. Terranora Ridge traverses the landscape in a similar orientation on the northern side of the Tweed River.
- Waterways – the Tweed River, particularly from Condong to the river mouth including Stott's Island. However, the Tweed River is not visible from the site. Cudgen Lake and Cudgen Creek to the removed east is also of high visual quality; however, they too are not visible from the site.

The above-described features are designated medium (3) to high (5) visual quality; the more urbanised areas nearer to the coast are designated medium-low (2) visual quality (Corkery, 2004) (Figure 6).

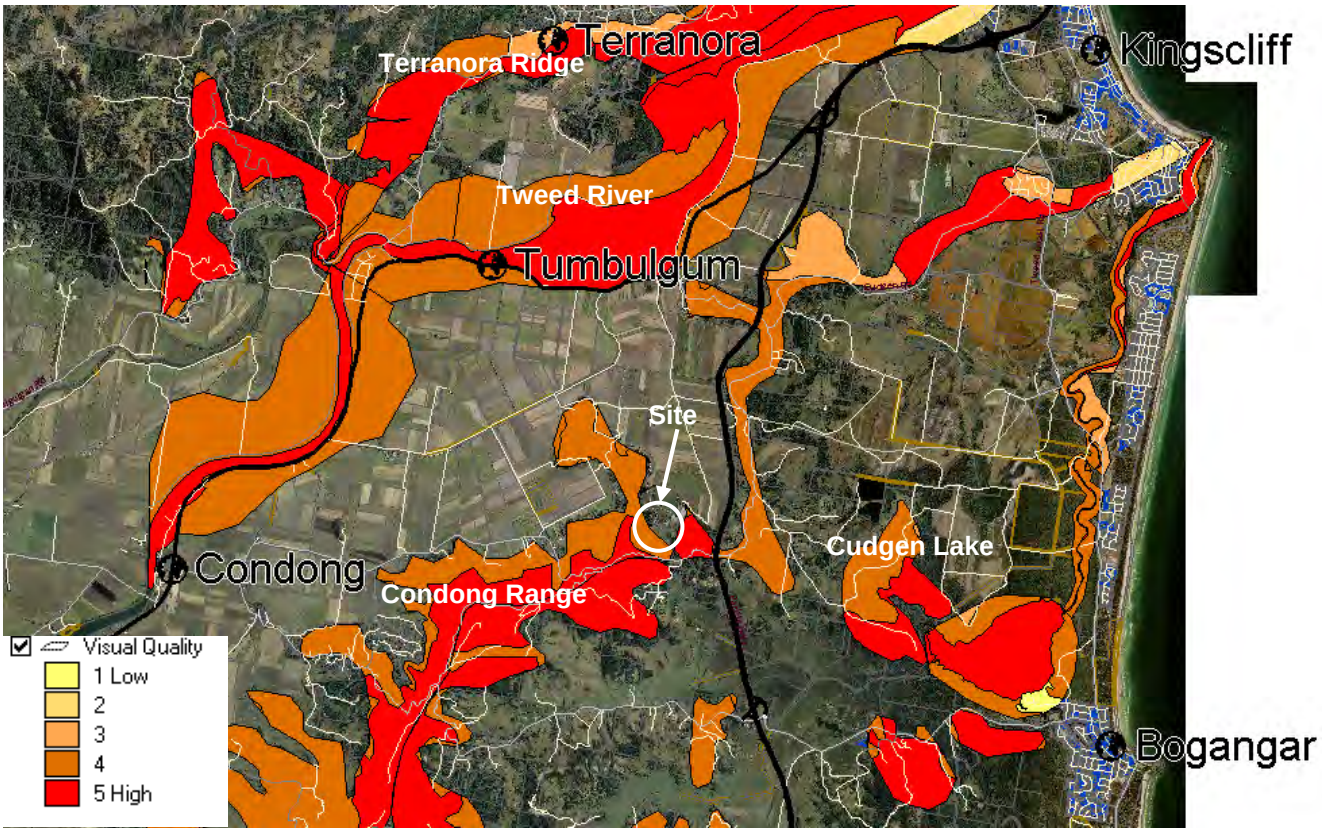

Figure 6: Visual quality rating of surrounding locality

The EA notes the vegetation of significance to the visual assessment, in the vicinity of the site, is predominantly confined to the hills surrounding the site with the lowland areas surrounding the site mostly cleared of vegetation and used for agriculture (GHD, 2011) or quarry/landfill activities.

2.3.2 Implications of proposed electricity supply

Based on the visual impact assessment undertaken as part of the EA (GHD, 2011), and with the establishment of the proposed visual screens, the proposed alignment is expected to be visible within the view catchments of the following vantage points:

- Vantage Point 4 – the spur along which the underground component of the power supply will be installed would be visible from this vantage point;
- Vantage Point 8 – the overhead component of the proposed power supply would be visible from this vantage point.

And partially within the view catchments of the following:

- Vantage Point 2 – the spur along which the underground component of the power supply will be installed would be partially visible, albeit at considerable distance, from this vantage point;
- Vantage Point 3 – the spur along which the underground component of the power supply will be installed would be partially visible from this vantage point.

The impact of the underground component of the proposal would be largely restricted to the construction phase. During construction, some of the ground disturbance created from trenching and backfilling would potentially be seen from the residences at Vantage Points 2, 3 and 4. However, the extent of disturbance proposed is considered minor relative to the modelled view shed (provided in Section 9.10 of the main EA document). Furthermore, this disturbance would be temporary as the coverage of weedy grasses existing along the alignment is expected to rapidly recolonise.

The overhead component of the proposal would be visible from the residence at Vantage Point 8. It would be a permanent visual detraction in the landscape; however, as for the underground component of works, is small in scale relative to the modelled view shed. Furthermore, the easement is located in an area which is predominantly cleared of native vegetation and therefore would not require any significant disturbance to existing vegetation to accommodate the required easement.

The visual disturbance associated with the proposed electricity supply is considered to be of significantly lesser scale than that associated with the proposed quarry and landfill operations and therefore not expected to escalate the visual impact beyond that reported on in the main EA document. Further, the mitigation measures proposed in the main EA document are considered adequate in reducing the visual impact upon the sensitive receptors.

2.4 Traffic and access

The impacts of the proposed quarry and landfill on traffic are assessed in the main document of the EA (GHD, 2011).

2.4.1 Implications of proposed electricity supply

The proposed power alignment traverses existing internal access roads at two locations:

- The underground component traverses the existing access road near the northern boundary of Lot 1 DP34555 at approximately CH440. The cable will be buried beneath the track at this location. Disturbance to traffic utilising this track would be temporary for a very short duration (one day);
- The overhead component crosses the same existing access track with one pole on either side of the road. Disruption is expected to be minimal being limited to a short period during installation of overhead wires.

Most internal traffic movements will utilise the proposed haul road which connects the existing Stott's Creek waste management centre with the existing Quirks Quarry. Once the proposed haul road is completed, traffic utilising the existing access road will be limited to small vehicles using the Eviron Road exit. Heavy vehicle movements will be restricted to the proposed haul road. The proposed overhead powerlines would be situated to the south of this haul road and have been strategically located to avoid interference with the future haul road and heavy vehicle movements.

A small number of vehicles would require access to the alignment during construction. There is adequate cleared space available for vehicle parking on site including to the east of the gate at the boundary between Lot 1 DP34555 and Lot 1 DP1159352. Once operational, the proposed electricity supply would not generate additional traffic movements with the exception of the occasional maintenance inspection vehicle.

2.5 Noise

2.5.1 Existing environment

Once operational, the proposed electricity supply would not contribute to the noise generation at the site. All noise impacts would be restricted to the construction phase.

The noise assessment undertaken for the main Eviron Q&L EA noted that existing levels of industrial noise in the area are not a significant contributor to the existing ambient noise level (GHD, 2007).

Attended noise assessments found the existing noise environment to be characterised by:

- animals and nearby insects audible at times;
- distant traffic noise from the Pacific Highway usually audible;
- landfill and quarry operations occasionally audible but generally not measurable above background levels (GHD, 2007).

The noise assessment indentified the surrounding residential premises as sensitive receivers. These residences are located along Eviron Road to the south-east and west of the proposed quarry. An aerial photograph showing the location of the nearby sensitive receptors is shown in Figure 27 of the main document of the EA (GHD, 2011).

2.5.2 Implications of proposed electricity supply

As stated above, noise impacts would be limited to the construction phase of the proposed electricity supply. This would be a result of machinery (excavator and trucks) operating within the easement.

Receivers 3 (656 Eviron Rd/Lot 25 on DP 615931) and 4 (657 Eviron Rd/Lot 1 on DP 783802), as well as 719 Eviron Rd/Lot 1 on DP34555, would be expected to be most sensitive to construction noise associated with the proposed electricity supply works due to their proximity to the alignment (~300m, 150, 200m, respectively).

The noise impacts are expected to be minor however, on account of the following:

- the distance between the noise source (construction machinery) and receivers;
- the presence of forested vegetation providing some buffer between noise source and receivers;
- the temporary and short duration of construction (estimated one week);
- the type and intensity of noise expected from the construction machinery would be comparable to that produced by quarry, landfill and farming machinery which is typical of the surrounding locality.

Construction noise could be managed with standard noise mitigation measures such as work hours restrictions and machinery noise levels. Given that noise impacts associated with the proposed electricity supply are expected to be negligible, additional quantitative assessment is not considered warranted.

2.6 Air quality

2.6.1 Implications of proposed electricity supply

Air quality impacts associated with the proposed electricity supply would be limited to potential dust and exhaust fumes generated during construction. Air quality issues are not considered relevant to the operational phase of the proposal.

The air quality assessment undertaken for the Eviron Q&L EA (GHD, 2011) identified Receiver 3 (656 Eviron Rd/Lot 25 on DP 615931) as the most sensitive receptor to dust emissions produced by Stage 1 of the proposed Eviron Q&L. Receivers 3 and 4 (657 Eviron Rd/Lot 1 on DP 783802), as well as 719 Eviron Rd/Lot 1 on DP34555, would be expected to be most sensitive to dust emissions from construction of the proposed electricity supply, depending on the wind direction during construction.

The air quality assessment (GHD, 2011) determined maximum predicted ground level concentrations and deposition rates at the most exposed receptor and, with consideration of the adopted background levels, assessed the cumulative impact. The result indicated that all constituents assessed over the relevant averaging periods were below the respective assessment criteria at the nearest sensitive receptors for the modelled emission rate characteristics, with the exception of PM10 (24-hour) (GHD, 2011). However the PM10 (24-hour) maximum predicted concentrations have been based on a worst-case maximum quarry throughput of 400 TPH without a water spray system on processing equipment, which is not representative of typical operating conditions (GHD, 2011).

The scale of the ground disturbance and movement of heavy machinery required for the proposed electricity supply is considerably less than that associated with Stage 1 of the Eviron Q&L proposal. The potential for dust generation is considered low considering the small area of ground disturbance and the proposed construction methodology of trenching and backfilling progressively along the alignment. In addition, the distance between the disturbance and receivers and the presence of a vegetated buffer is expected to further limit the impact of dust pollution to a negligible level.

Refer to Section 3 for standard air mitigation measures during construction.

2.7 Flora and fauna

2.7.1 Existing vegetation communities

A desktop assessment and site visit by TSC Environmental Scientist found the proposed disturbance footprint site to be highly modified and degraded by past and present land uses.

The ecology report appended to the EA (GHD, 2011) provides ground-truthed mapping of the vegetation communities on the Eviron Q&L site. In addition, detailed vegetation mapping of Lot 1 DP 34555 was undertaken by an undergraduate environmental management student as part of Griffith University's Industrial Affiliates Program (Conwell, 2011). The aim of the latter assessment was to provide detailed mapping of the existing vegetation communities to guide planning and design of the future Regional Botanic Gardens which are proposed for the site post- quarry and landfill.

The majority of the proposed electricity alignment occurs on Lot 1 DP 34555, which was outside the designated study area for the Eviron Q&L ecological assessment (though vegetation community mapping was still provided for it). However, Lot 1 DP 34555 was the focus of the Regional Botanic Gardens vegetation community mapping project. Site investigations support the findings of the Conwell (2011) mapping. Subsequently, the Conwell (2011) mapping is considered the most accurate for the purposes of the proposed electricity supply assessment and is applied hereafter.

As shown in Figure 7 (extracted from Conwell, 2011), the alignment passes through the existing clearing between forested vegetation communities, passing nearby to the following:

- *Cinnamomum*[1]* and *Eucalyptus* open forest;
- Very tall *Cinnamomum** and *Araucaria* open forest;
- Very tall *Lophostemon* and *Cinnamomum** open forest;
- *Leersia* closed grassland (Freshwater Wetland).

Of these neighbouring vegetation communities, one: *Leersia* closed grassland, is an Endangered Ecological Community (EEC), listed under the NSW *Threatened Species Conservation Act 1995* (TSC Act).

[1] An asterisk indicates the species is exotic.

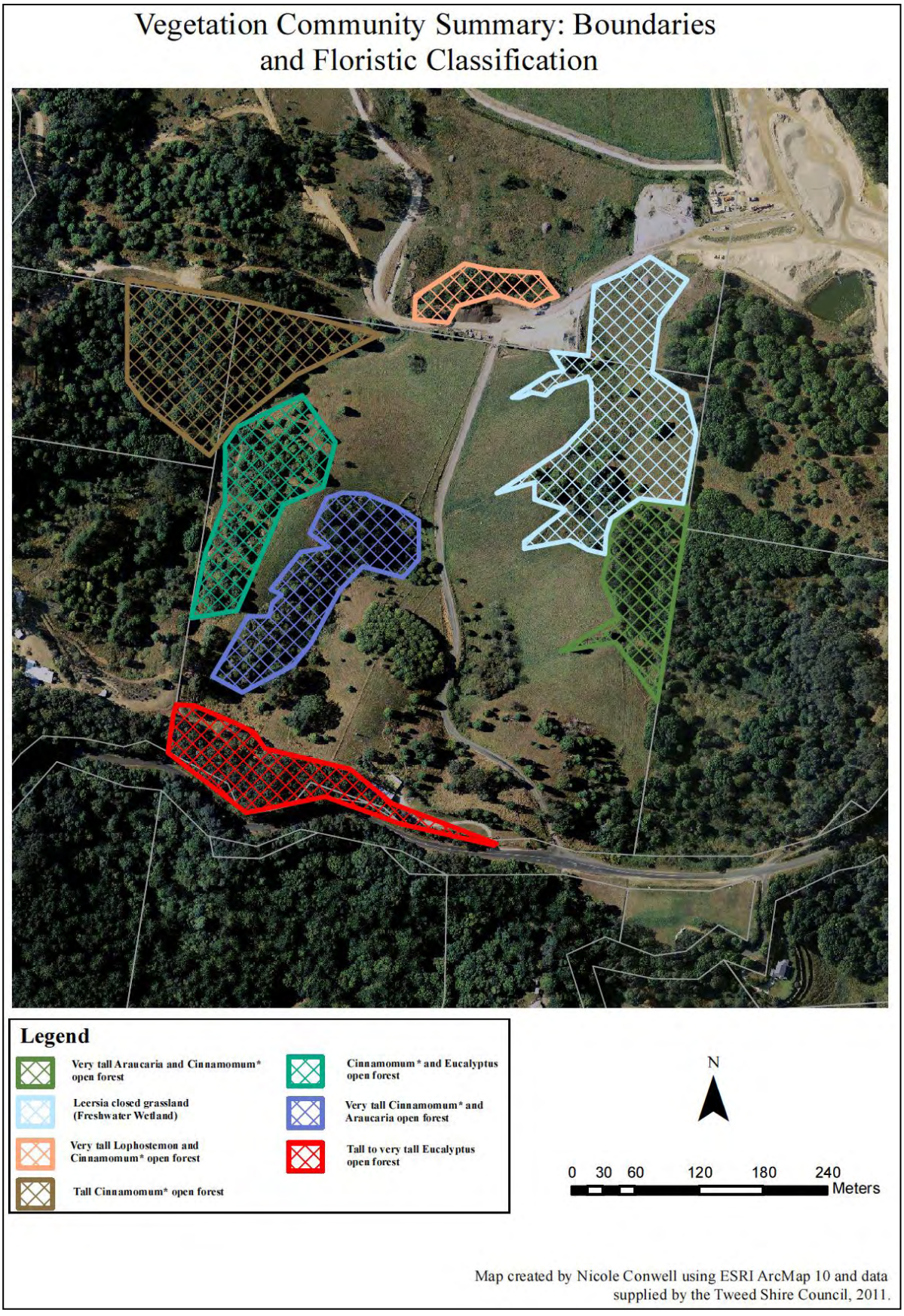

Figure 3 - Vegetation Community Summary: Boundaries and Floristic Classification

An on-site walkover of the proposed alignment identified the vegetation within the existing clearing to be: Closed *Setaria sphacelata** grassland. This clearing is slashed, generally bi-annually, and was in the process of being slashed at the time of the site assessment. Despite the slashing, the dominant species: South African Pigeon Grass (*S. sphacelata**), was easily identifiable. Other commonly occurring species within this community include: Broadleaf Paspalum (*Paspalum mandiocanum**) and Common Bracken (*Pteridium esculentum*).

2.7.2 Threatened flora assessment

Desktop and field assessments did not identify any rare or threatened species listed under the TSC Act or Briggs and Leighs (1995) *Rare or Threatened Australian Plants* (ROTAP), within or adjoining the proposed easement. The threatened flora species recorded on the Eviron Q&L site and those considered highly likely to occur on site are assessed in terms of their relevance to the proposed electricity supply in Table B.1 of Appendix B.

In summary, none of the short-listed threatened flora are considered to possibly occur in the disturbance footprint on account of the absence of suitable habitat. It is noted that the majority of the short-listed threatened flora are rainforest species considered to potentially occur in the understorey of the wet sclerophyll or Camphor Laurel communities throughout the greater Eviron Q&L site. The proposed easement does not encroach into these habitats. The weedy grassland through which the alignment passes was noted to be low in species diversity and trees or shrubs were easily recognisable in this otherwise homogenous low statured community. Accordingly, there is a reasonable degree of confidence that any isolated rainforest trees and shrubs occurring within the grassland habitat would have been identified. The groundcover species, whilst potentially easily overlooked if growing amongst the tall dense grass, are unlikely to occur due to lack of suitable habitat. The habitat occurring along the alignment is considered too exposed, dry and disturbed (by regular slashing) to be suitable for these species. Given the unlikelihood of these species occurring within the proposed disturbance footprint and the standard construction measure proposed to manage indirect damage to adjoining habitats (eg. erosion and sediment loss and incidental clearing), additional formal assessments against the Part 3A Threatened Species Assessment Guidelines and/or the EPBC Act significant impact criteria are not considered warranted.

2.7.3 Existing fauna habitats

The ecological assessment identified nine distinct habitat types within the Eviron Q&L study area (GHD, 2011). The proposed electricity supply easement traverses one of these habitat types: Tall grassland, and occurs in close proximity to vegetation communities hosting habitat characteristics of wet sclerophyll forest with rainforest elements and Camphor laurel open to closed forest, as well as freshwater wetland.

Tall grassland is considered habitat for grassland birds and raptors, snakes, rodents and burrowing and terrestrial frogs (GHD, 2011). The key feature of the Tall grassland habitat is the dense grass in which some species nest. Overall, the habitat value of Tall grassland is considered low (GHD, 2011).

Key features of adjoining and nearby habitats include:

- structural heterogeneity providing canopy, shrub and understorey layers, including vines, ferns and native grasses, leaf litter, fallen logs and woody debris;
- mature eucalypts providing nesting, roosting and foraging (blossom) resources;
- small ephemeral soaks (GHD, 2011).

The above listed features occurring nearby to the alignment provide habitat for: canopy, shrub and understorey nesting birds, ground mammals, fossorial skinks, ephemeral pond-breeding frogs.

2.7.4 Threatened fauna assessment

The ecological assessment for the Eviron Q&L EA (GHD, 2011) recorded a total of 92 fauna species (71 bird species, 6 mammal species, 5 reptile species and 10 amphibian species), five of which are listed as threatened under the TSC Act. An additional four threatened species were considered potentially occurring on-site but could not be positively validated by field records. The threatened fauna species recorded on site and those considered highly likely to occur on site are assessed in terms of their relevance to the proposed electricity supply in Table B.2 of Appendix B. In summary, 13 species are considered to potentially utilise the habitats within the electricity supply footprint, including

- Four birds:
    - Pale-vented Bush-hen (*Amaurornis olivaceus*);
    - Little Lorikeet (*Glossopsitta pusilla*);
    - Square-tailed Kite (*Lophoictinia isura*);
    - Masked Owl (*Tyto novaehollandiae*); and
- Nine mammals (all bats)
    - Large-eared Pied bat (*Chalinolobus dwyeri*);
    - Eastern False Pipistrelle (*Falsistrellus tasmaniensis*);
    - Little Bentwing-bat (*Miniopterus australis*);
    - Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*);
    - Beccari's Freetailbat (*Mormopterus beccarii*);
    - Eastern Freetail-bat (*Mormopterus norfolkensis*);
    - Large-footed Myotis (*Myotis macropus*);
    - Eastern Long-eared Bat (*Nyctophilus bifax*);
    - Grey-headed Flying-fox (*Pteropus poliocephalus*).

Pale-vented Bush-hen would potentially utilise the matrix of suitable habitat provided by cane fields, freshwater wetland and long grass in the low-lying areas of the Eviron Q&L site. The habitat is considered marginal due to on-going disturbances such as regular slashing, heavy machinery movement and likely predation by pest species, such as dogs and foxes, attracted to the landfill site. The Pale-vented Bush-hen may utilise the long grass within the easement, as part of a broader range of habitat use; however, the regular slashing of grass

within the easement renders this habitat unsuitable for a proportion of the year and is likely to deter this species from utilising the area for nesting.

Little Lorikeet may utilise the adjoining vegetation for foraging, flying over the site to move between the more suitable areas of habitat on either side of the alignment. No suitable nesting resources (tree hollows) occur within the easement.

Masked Owl's use of the easement habitats would be limited to foraging (eg. rodents, rabbits and birds). Square-tailed Kite would be expected to fly over the area on occasion, moving along the Condong Range between forested areas of more suitable foraging habitat; however, the habitat provided by the easement is considered sub-optimal foraging habitat for this species. There is no suitable nesting habitat for these species within the disturbance footprint.

The way in which the bats interact with the habitats of the proposed easement would be limited to flyovers and foraging; no suitable roosts occur within the easement. The existing clearing between the forested vegetation, through which the easement is aligned, would potentially be used as a flyway by these species. Some species, namely Eastern Bentwing-bat, Beccari's Freetailbat and Eastern Long-eared Bat, would utilise the forest edges provided by the clearing to forage along. The proposed electricity supply would not interfere with the way these species utilise the area as the power supply is underground along this section.

The habitat within the easement is considered marginal for these species. Furthermore, the habitat resources potentially used by these species will persist within the easement post-construction. By limiting disturbance to existing cleared areas and managing impacts such as erosion and sediment loss, and noise and dust emissions, the likelihood of significantly impacting on threatened species is considered low.

Considering the assessment provided above and that provided in Appendix H of the Ecological Assessment of the EA (GHD, 2011), no further threatened species assessment, under Part 3A of the EP&A Act or EPBC Act, is considered warranted.

2.7.5 Key ecological considerations for proposal

Key ecological considerations for the proposed electricity supply include:

- Protecting existing vegetation by restricting disturbance to the existing clearing (weedy grassland).
- Managing erosion and sediment loss, particularly into receiving waterways and Freshwater Wetland EEC.
- Minimising dust generation to avoid smothering of adjoining native bushland.
- Minimising noise disturbance to minimise stress to wildlife in the locality.

2.8 Hazards

2.8.1 Bushfire hazard

Overhead electricity reticulation networks are recognised as a potential ignition source for bush fires. The power distribution authorities are required under the *Electricity Supply (Safety and Network Management) Regulation 2008* (Clause 12) to prepare and adhere to a bush fire risk management plan.

The Essential Energy Bushfire Risk Management Plan (2011) addresses bush fire risk through:

- Vegetation clearances relating to powerlines
- Asset Inspection regimes (including Annual Pre-summer Inspections)
- Private lines management
- Maintenance of assets including defect priority and rectification
- Refurbishment of ageing infrastructure.

The bush fire risk associated with the proposed electricity supply extension would be managed in accordance with the Essential Energy Bushfire Risk Management Plan (2011).

2.8.2 Flood hazard

The northern section of the alignment which traverses the low-lying areas of the site is subject to flooding. Incorporating the BMT WBM Pty Ltd (2009) updated climate change predictions; the flood design level for the site is 4.0m.

The proposed haul road, located to the north of the electricity easement, has been designed at a minimum RL of 4.0m to act as a levee bank preventing back water from the Tweed River from entering the quarry sites. The Eviron Q&L EA notes that detailed flood modelling will be undertaken during the detailed design of the haul road.

The proposed pole locations for the overhead component are on existing areas of fill although exact fill levels are uncertain. With adequate footing design for the proposed power poles (to be determined at detailed design stage), the proposed electricity infrastructure is considered compatible with the flood risk level in that flooding conditions expected in the area are unlikely to damage the infrastructure. The underground component of the electricity supply occurring within flood liable land is aligned along the existing access road which has been filled above natural surface levels. Accordingly, the proposal would not be expected to interfere with flood flows or storage.

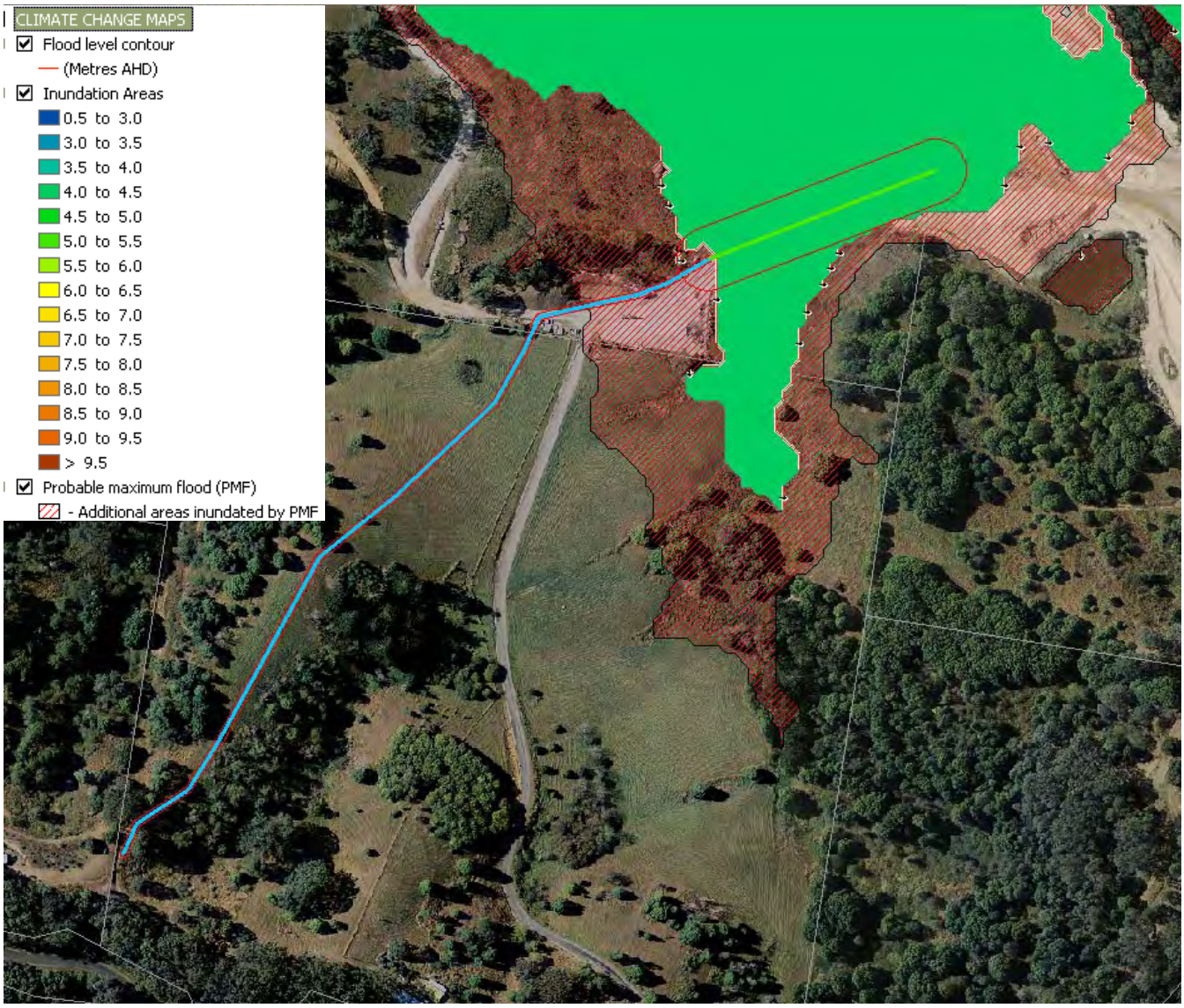

Figure 8: Flood design level, incorporating 2009 climate change predictions

2.9 Heritage

2.9.1 European cultural heritage

The EPBC Act Protected Matters Search determined that there are no World Heritage Properties or National/Commonwealth Heritage Places within, or in close proximity, to the site.

Search results from the State Heritage Register found one item listed by the Heritage Council under the NSW *Heritage Act 1977* within the locality: High Conservation Value Old Growth Forest. The vegetation along the alignment is not identified as Old Growth Forest (NPWS, 1999) and not considered High Conservation Value Old Growth Forest, as confirmed by the site assessment. Accordingly, the proposal would not impact upon high conservation old growth forest.

No items listed in Schedule 2 of the Tweed LEP 2000 occur within the locality.

Of the five Register of the National Estate places identified within the locality (10km radius of the site), only one is on or in close proximity to the site: Tweed River Valley. Unsympathetic development has been identified as a threat to the value of Tweed River Valley. Consideration of the visual amenity impacts has been considered in Section 2.3. Given the nature of the proposed activity, it is unlikely to impact upon this feature.

2.9.2 Aboriginal cultural heritage

The proposed easement was included in the Cultural Heritage Assessment for the proposed Eviron Q&L Site (Converge, 2009). The Converge Assessment did not locate any areas or objects of Indigenous cultural heritage significance. However, the assessment noted that this may be attributed to the low ground integrity (GI) and poor ground surface visibility (GSV) levels that predominated over the majority of the project area and the recent ground disturbance of ridgelines, locations where there would have been a higher possibility of identifying Indigenous cultural heritage. An updated cultural heritage due diligence assessment, undertaken in accordance with the *Due Diligence Assessment for the Protection of Aboriginal Objects in NSW* (DECCW, 2010) is provided in Table 2.1, below. In summary, there are no known records of Aboriginal sites or items of cultural significance within the proposed easement. If any Aboriginal objects are found during construction, work is to stop immediately and OEH is to be notified.

Table 2.1: Aboriginal cultural heritage due diligence assessment

Consideration	Response
1. Will the activity disturb the ground surface or any culturally modified trees?	Yes – installation of the underground component requires trenching to a depth of 0.9m.
2. Are there any: a) relevant confirmed site records or other associated landscape feature information on AHIMS? and/or b) any other sources of information of which a person is already aware? and/or c) landscape features that are likely to indicate presence of Aboriginal objects?	Yes – A basic AHIMS searches were undertaken for a rectangle encompassing the alignment. The basic search did not identify any Aboriginal sites of significant cultural heritage. However, the southern section of the alignment occurs on a ridgeline which is a landscape features are often associated with Aboriginal objects. Ridgelines were often used a thoroughfares through the landscape, particularly the east-west orientated ridgelines linking the upland regions with the coast (Fox, 2006).
3. Can harm to Aboriginal objects listed on the AHIMS or identified by other sources of information and/or the carrying out of the activity at the relevant landscape feature be avoided?	Yes – the proposed alignment does not traverse any known registered Aboriginal sites.
Conclusion	AHIP application not necessary. Proceed with caution. If any Aboriginal objects are found, stop work and notify OEH. If human remains are found, stop work, secure the site and notify the NSW Police and OEH.

Regardless of the due diligence assessment findings, under s90(1) of the NPW Act, it is an offence for a person who without obtaining the consent of the Director General, knowingly destroys, defaces or damages or knowingly causes or permits destruction or defacement or damage to a relic or Aboriginal place. Accordingly, if during construction materials are found, which are believed to be Aboriginal sites or cultural remains, the works are to stop immediately in the vicinity of the find and the contractor must notify DECCW.

2.10 Contaminated land

The TSC's *Contaminated Land Policy* (2007) items of consideration are assessed in Table 2.2 below.

Table 2.2: Response to TSC's Contaminated Lands Policy items for consideration

Item of consideration	Response
1. Please specify all land uses to which the site has been put, including the current use.	Current land use is quarry and landfill. The portion of the site traversed by the alignment is currently undeveloped land and filled access road. Historical aerial photographs indicate past land use was agriculture – grazing, from as early as 1962 (though likely earlier).
2. Is the proponent aware of uses to which properties adjoining the site have been put? If so, please specify.	The low-lying properties to the north were used for sugar cane cropping and the hill slopes to the south and east were used for grazing, prior to some areas being quarried.
3. Do any of the uses correlate with the potentially contaminating activities set out in table 1 in Schedule 1 of this policy.	Yes – chemical use including herbicides and insecticides.
4. If the answer to 3 is yes - has there been any testing or assessment of the site and, if so, what were the results?	The site visit did not identify any evidence of agricultural chemical contamination (eg. no drums, odours or discoloured patches of earth).
5. Is the proponent aware of any contamination on the site?	No.
6. What remediation work, if any (carried out voluntarily or ordered by a government agency), has been taken in respect to contamination which is or may have been present on the site?	No known contamination and therefore no remediation work proposed.

Given the above assessment and the nature of the works proposed, disturbance of contaminated land is not expected to be a concern to construction.

3 Mitigation measures

Table 3.1 provides a summary of the environmental impact mitigation measures recommended for the proposal.

Table 3.1: Summary of proposed mitigation measures

Category	Mitigation Measures
Erosion and sedimentation	Prior to commencement of works: • Erosion and sediment controls would be undertaken in accordance with an approved Erosion and Sediment Control Plan, with ESC measures installed prior to the commencement of construction work. During construction: • Construction works are to be managed such that areas outside the scope of the works remain undisturbed as far as possible and soil disturbance and vegetation clearing kept to the minimum required to complete works. • Trenching associated with the underground component would be staged, reducing exposed areas to soil or water erosion. • Works will be stopped if conditions are not suitable, such as during periods of strong winds or heavy rain. • Surface flows at the site will be managed to minimise erosion and sedimentation from the site. • Sediment control devices will remain in place and in good working order until all works are complete and the area is stabilised. Sediment control devices will be checked periodically to ensure they remain intact and in place, particularly following wet weather. Any sediment control devices found damaged will be replaced promptly. Following construction: • Following completion of the works, the site will be cleared of all debris, spoil and foreign matter.
Acid Sulfate Soils	• In the absence of ASS data from the location of proposed pole CE268631 and considering the small quantity of spoil expected from the pole excavation (~3.5m3), it is recommended that a conservative approach be taken and the higher end of the liming rates recommended by Gilbert and Sutherland (2007) be applied: 11kg/t.
Land use and amenity	• The proposed activity would be managed such that proposal footprint is limited to the extent necessary to complete the scope of works. • All construction plant, equipment, materials and waste would be removed from the site at completion of works.
Noise and vibration	During construction: • Sensitive receptors would be notified of the proposed construction works in advance. • Construction vehicle movements and construction works would be restricted to the DECC (2009) recommended standard hours of 7:00am to 6:00pm Monday to Friday and 8:00am-1:00pm on Saturdays. • No work would be undertaken on Sunday or public holidays. • Plant operators would be instructed to operate equipment in a manner that does not generate unnecessary noise, such as by avoiding excessive revving and avoidance of impacts with solid objects, where possible. • Machines/equipment would be turned off when not in use or throttled down to a minimum.

Category	Mitigation Measures
	• All plant would be maintained in good condition, with all reasonable and feasible acoustic treatments (i.e. residential mufflers and plant enclosures) installed and maintained (refer to AS 2436 – 1981 '*Guide to noise control on construction, maintenance and demolition sites*').
Air quality	During construction: • Disturbed areas will be stabilised once works are complete, or progressively where appropriate. • All plant and machinery would be serviced at regular intervals to minimise exhaust emissions. • Dust dispersion would be managed erosion and sediment controls as described above.
Traffic	During construction: • Construction workforce parking to be restricted to existing cleared areas.
Flora and fauna	Prior to construction: • All Contract personnel working at the site are to be made aware of the development footprint and extent of clearing. During construction: • No work is to be undertaken outside the development footprint. • Vegetation clearing is to be undertaken in a manner such that damage to adjacent vegetation is minimised. All trees/branches will be felled towards cleared areas. Where lopping is undertaken, it is to be undertaken in a manner so as not to affect health of the retained tree. • Works are to cease if any arboreal fauna are found to be present within trees about to be cleared until such time as the animal has dispersed on its own accord or a qualified spotter-catcher is brought in to safely relocate the animal. • Works are to be undertaken in accordance with the relevant provisions of AS4970-2009 *Protection of Trees on Development Sites*. In particular, measures are required to protect the established trees to be retained by establishing a tree protection zone around the retained trees. No excavations, parking of machinery or stockpiling of materials is to occur within the tree protection zone. • No cleared vegetation or disturbed soil is to be pushed into adjacent areas of native vegetation. Any mulched vegetation may be retained on site and used as mulch in landscape plantings, with the exception of the foliage of weed trees (eg. Camphor Laurel) which is likely to contain weed propagules. • All material stockpile areas, and vehicle and plant parking areas will be located in existing cleared areas outside of overland flow paths. • Sediment fences will be installed around the stockpiles to contain any sediment runoff, as required. • Soil stockpiles are to be covered during high wind conditions, as required. • All machinery used on site is to be clean – i.e. tracks, vehicle tyres, buckets and attachments are to be visibly free of soil and plant material to minimise the risk of introduction and spread of weed propagules.
Accidents, hazards and disasters	• A workplace risk assessment would be undertaken prior to commencement of works. The objective of the workplace risk assessment is to ensure risks to the environment and safety of workers and the public are identified and managed, having regard to the types of construction work undertaken and the location of

Category	Mitigation Measures
	the construction works.
Heritage	• If materials are found, which are believed to be Aboriginal sites or cultural remains, the works are to stop immediately in the vicinity of the find. In such an instance, it is the responsibility of the Site Construction Overseer/Ganger to contact the Senior Construction Engineer. The Senior Construction Engineer is to contact the OEH Aboriginal Heritage Conservation Unit, who will advise of the appropriate course of action.
Contamination	• Works to cease immediately if any potential source of contamination (eg. chemical drums) is uncovered during works. In such instance remediation in accordance with a Council approved Remediation Action Plan would be required.

4 Conclusion

The subject assessment of the proposed electricity supply to the proposed Eviron Q&L did not identify any significant environmental constraints. This assessment is intended to supplement the existing EA prepared by GHD (2011) for the Eviron Q&L proposal by focussing specifically on the proposed easement footprint, infrastructure design and construction methodology. With adherence to the recommended mitigation measures summarised in Section 3, the proposed electricity supply is not expected to result in a significant environmental impact.

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Appendix A: Preliminary concept plan

Appendix B: Supplementary threatened species assessment

Table B.1: Threatened flora assessment

Scientific name	Common name	Conservation status*	Likelihood of utilising habitats within greater study area**	Likelihood of utilising habitats within disturbance footprint
Acacia bakeri	Marblewood	V[1]	Likely occurrence	Unlikely occurrence
Archidendron hendersonii	White Lace Flower	V[1]	Known occurrence	Unlikely occurrence
Baloghia marmorata	Jointed Baloghia	V[1], V[2], 3VC-	Possible occurrence	Unlikely occurrence
Bosistoa transversa (Syn. Bosistoa selwynii)	Yellow Satinheart	V[1], V[2]	Likely occurrence	Unlikely occurrence
Cassia brewsteri var. marksiana	Brush Cassia	E[1], 2RCi	Likely occurrence	Unlikely occurrence
Corokia whiteana	Corokia	V[1], V[2], 2VCi	Possible occurrence	Unlikely occurrence
Cryptocarya foetida	Stinking Cryptocarya	V[1], V[2], 3VCi	Likely occurrence	Unlikely occurrence
Davidsonia jerseyana	Davidson's Plum	E[1], E[2], 2ECi	Possible occurrence	Unlikely occurrence
Davidsonia johnsonii	Smooth Davidson's Plum	E[1], E[2]	Possible occurrence	Unlikely occurrence
Dendrocnide moroides	Gympie Stinger	E[1]	Likely occurrence	Unlikely occurrence
Desmodium acanthocladum	Thorny Pea	V[1], V[2], 2VC-	Possible occurrence	Unlikely occurrence
Diospyros mabacea	Red-fruited Ebony	E[1], E[2], 2ECi	Likely occurrence	Unlikely occurrence
Diospyros major var. ebenus	Shiny-leaved Ebony	E[1]	Likely occurrence	Unlikely occurrence
Diploglottis campbellii	Small-leaved Tamarind	E[1], E[2], 2E	Likely occurrence	Unlikely occurrence
Drynaria rigidula	Basket Fern	E[1]	Likely occurrence	Unlikely occurrence
Eleocharis tetraquetra	Square-stemmed Spike-rush	E[1]	Possible occurrence	Unlikely occurrence
Endiandra floydii	Floyd's Walnut	E[1], E[2], 2VC-	Possible occurrence	Unlikely occurrence
Endiandra muelleri subsp. bracteata	Green-leaved Rose Walnut	E[1]	Likely occurrence	Unlikely occurrence

Gossia fragrantissima	Sweet Myrtle	E[1], E[2], 3EC-	Possible occurrence	Unlikely occurrence
Grevillea hilliana	White Silky Oak	E[1]	Possible occurrence	Unlikely occurrence
Hicksbeachia pinnatifolia	Red Boppel Nut	V[1], V[2], 3RC-	Possible occurrence	Unlikely occurrence
Lepiderema pulchella	Fine-leaved Tuckeroo	V[1], 2RC-	Likely occurrence	Unlikely occurrence
Lindsaea brachypoda	Short-footed Screw Fern	E[1]	Possible occurrence	Unlikely occurrence
Lindsaea fraseri	Fraser's Screw Fern	E[1]	Possible occurrence	Unlikely occurrence
Macadamia tetraphylla	Rough-shelled Bush Nut	V[1], V[2], 2VC-	Likely occurrence	Unlikely occurrence
Marsdenia longiloba	Clear Milkvine	E[1], V[2], 3RC-	Possible occurrence	Unlikely occurrence
Oberonia titania	Red-flowered King of the Fairies	V[1]	Possible occurrence	Unlikely occurrence
Ochrosia moorei	Southern Ochrosia	E[1], E[2], 2ECi	Likely occurrence	Unlikely occurrence
Phaius australis	Southern Swamp Orchid	E[1], E[2], 3VCa	Possible occurrence	Unlikely occurrence
Randia moorei	Spiny Gardenia	E[1], E[2], 3ECi	Likely occurrence	Unlikely occurrence
Symplocos baeuerlenii	Small-leaved Hazelwood	V[1], V[2], 2VC-	Likely occurrence	Unlikely occurrence
Syzygium hodgkinsoniae	Red Lilly Pilly	V[1], V[2], 3VC-	Possible occurrence	Unlikely occurrence
Syzygium moorei	Durobby	V[1], V[2], 2VCi	Likely occurrence	Unlikely occurrence
Taeniophyllum muelleri	Minute Orchid	V[2]	Possible occurrence	Unlikely occurrence

* Conservation status: V – Vulnerable; E – Endangered; 1- Listed under TSC Act; 2 – Listed under EPBC Act; ROTAP Status – see Briggs and Leigh, 1995
**As determined in Ecological Assessment of Eviron Q&L Environmental Assessment (GHD, 2011)

Table B.2: Threatened fauna assessment

Scientific name	Common name	Conservation status*	Likelihood of utilising habitats within greater study area**	Likelihood of utilising habitats within disturbance footprint
AMPHIBIANS				
Crinia tinnula	Wallum Froglet	V[1]	Possible	Unlikely
BIRDS				
Amaurornis olivaceus	**Pale-vented Bush-hen**	**V[1]**	**Possible**	**Possible**
Burhinus grallarius	Bush Stone-curlew	E[1]	Likely	Unlikely
Calyptorhynchus lathami	Glossy Black-cockatoo	V[1]	Likely – possible record of the species overflying the study area	Unlikely
Ephippiorhynchus asiaticus	Black-necked Stork	E[1]	Possible	Unlikely
Glossopsitta pusilla	**Little Lorikeet**	**V[1]**	**Known**	**Possible**
Ixobrychus flavicollis	Black Bittern	V[1]	Possible	Unlikely
Lophoictinia isura	**Square-tailed Kite**	**V[1]**	**Possible**	**Possible – for foraging**
Monarcha leucotis	White-eared Monarch	V[1]	Likely	Unlikely
Pandion haliaetus	Osprey	V[1] (Mig, Mar)	Possible	Unlikely
Ptilinopus magnificus	Wompoo Fruit-dove	V[1]	Likely	Unlikely
Ptilinopus regina	Rose-crowned Fruit-dove	V[1]	Known	Unlikely
Todiramphus chloris	Collared Kingfisher	V[1]	Known	Unlikely
Tyto capensis	Grass Owl	V[1]	Likely	Unlikely
Tyto novaehollandiae	**Masked Owl**	**V[1]**	**Possible**	**Possible**

MAMMALS				
Chalinolobus dwyeri	**Large-eared Pied bat**	**V[1], V[2]**	**Possible**	**Possible – as flyway**
Dasyurus maculatus maculatus	Spotted-tailed Quoll	V[1], E[2]	Likely	Possible
Falsistrellus tasmaniensis	**Eastern False Pipistrelle**	**V[1]**	**Likely**	**Possible – as flyway**
Miniopterus australis	**Little Bentwing-bat**	**V[1]**	**Known**	**Possible – as flyway**
Miniopterus schreibersii oceanensis	**Eastern Bentwing-bat**	**V[1]**	**Known**	**Possible – as flyway**
Mormopterus beccarii	**Beccari's Freetailbat**	**V[1]**	**Possible**	**Possible – as flyway**
Mormopterus norfolkensis	**Eastern Freetail-bat**	**V[1]**	**Possible**	**Possible – as flyway**
Myotis macropus	**Large-footed Myotis**	**V[1]**	**Possible**	**Possible – as flyway**
Nyctophilus bifax	**Eastern Long-eared Bat**	**V[1]**	**Likely**	**Possible – as flyway**
Petaurus norfolcensis	Squirrel Glider	V[1]	Possible – tentatively recorded	Unlikely
Phascolarctos cinereus	Koala	V[1]	Known	Unlikely
Pteropus poliocephalus	**Grey-headed Flying-fox**	**V[1], V[2]**	**Known**	**Possible – as flyway**
REPTILES				
Coeranoscincus reticulatus	Three-toed Snake-tooth Skink	V[1], V[2]	Possible	Unlikely
INVERTEBRATES				
Thersites mitchellae	Mitchell's Rainforest Snail	E[1], CE[2]	Possible	Unlikely

* Conservation status: V – Vulnerable; E – Endangered; CE – Critically Endangered; 1- Listed under TSC Act; 2 – Listed under EPBC Act; ROTAP Status – see Briggs and Leigh, 1995
**As determined in Ecological Assessment of Eviron Q&L Environmental Assessment (GHD, 2011)

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