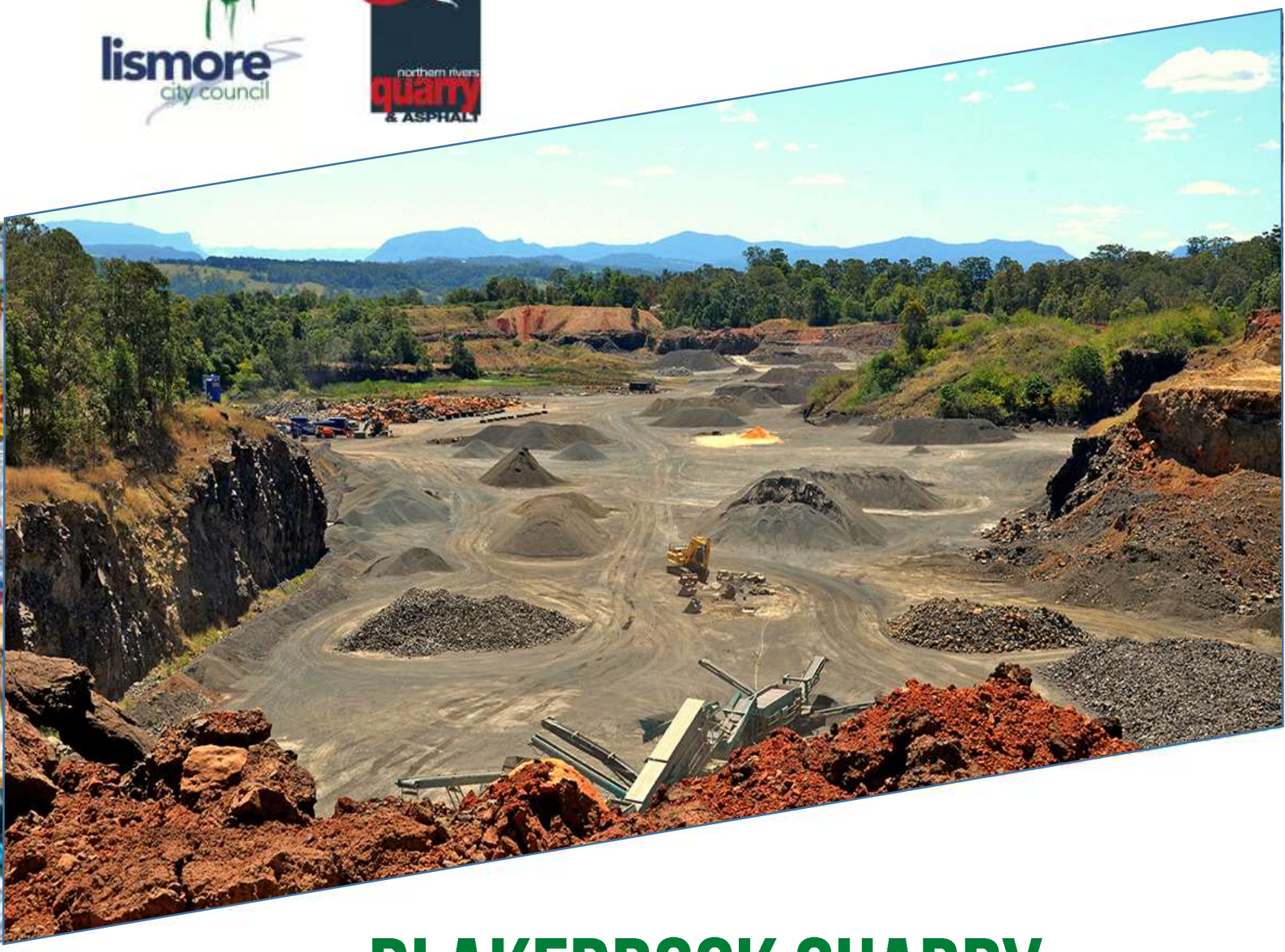

BLAKEBROOK QUARRY

MODIFICATION APPLICATION

ENVIRONMENTAL ASSESSMENT

AUGUST 2017

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Lismore City Council acknowledges the people of the Bundjalung Nation, traditional custodians of the land on which we work.

Background and Summary

This Environmental Assessment (EA) is part of the Modification Application (MA) submitted to the Department of Planning and Environment (DOPE) by Lismore City Council (LCC) in order to mine up to the first 10 metres of the cap rock in the South Pit at Blakebrook Quarry Project. Currently Blakebrook Quarry is slated to not mine in the South Pit until late 2018 at the completion of a detailed groundwater assessment.

Currently LCC are supplying oversize rock to the Coffs Harbour Northern Break Wall Rehabilitation Project on behalf of Haslin Construction. LCC acknowledges that the Coffs Harbour North Break Wall is a State significant project and needs to be progressed for the benefit of all the stakeholders.

In 2009, Lismore City Council (trading as Northern Rivers Quarry and Asphalt) expanded its operations (as part of a Modification Application) to 600,000 tonnes per annum of material from the quarry over 30 years. Product from the site is extracted primarily to be used by Council to maintain local roads as well as supply the region with affordable material for significant construction projects such as the Pacific Highway upgrade.

LCC is seeking permission to mine the South Pit with a maximum depth of ten metres depending on required/retrieved volumes in order to retrieve the hard cap rock in this area. The hard basaltic cap rock meets the required specifications for Haslin Construction (contractor) and the Coffs Harbour Breakwall Project.

LCC have supplied 4547.12 tonnes of five tonne to eight tonne single rocks for this project. The initial quotation for Haslin Constructions was for 35,000 tonnes of rock which was comprised of 10,000 to 15,000 tonne of two to five tonne rock and 15,000 to 20,000 tonne of five to eight tonne rock. Haslin Construction then indicated that they required only the five to eight tonne rock. The remaining 10,000 tonnes of five to eight tonnes rock has not been able to be sourced as planned from the Main Pit due to the geological differences of the two volcanic flows.

Haslin Construction have advised that they have exhausted supply within Northern NSW quarries for this size rock for the Coffs Harbour Break Wall Project will come to a halt as aforementioned Blakebrook Quarry is not able to supply the quantities from the Main Pit as first quoted.

The cap rock in the South Pit meets the specification required for Haslin Construction, is easy to access to reduce costs and additionally this rock is an issue for the quarry and ends up as waste as it becomes unviable to resize after blasting.

As part of the modification, Lismore City Council engaged Gilbert and Sutherland (Engineering/Geotechnical Services) and Newton Denny Chapelle (Surveying Services) to assess the current South Pit groundwater (aquifer) heights from data collected from the new groundwater monitoring program with new surveyed heights and previous groundwater data.

Surveying, research and modelling as part of this MA indicates that the proposed rock extraction may require a full ten metres of this cap rock to be mined which will bring the extraction to 118.5mAHD.

The nearest water zone is the pressure head of a shallow water bearing zone located at 105.64mAHD with the actual shallow water bearing zone at 98.4 to 89.4mAHD.

Currently an Order issued by the Department of Planning and Environment is active on the Blakebrook Quarry site to remedy a breach of Part 3A of the act , namely to prepare and submit for approval a detailed groundwater assessment in accordance with Schedule 3,

Condition 20 (b) of MP 07_0020 as modified. At this point Blakebrook Quarry has met the timeframe and conditions of the Order and are on schedule to meet the requirements prior to the December 2018 deadline.

The information currently available shows that mining the cap rock in the South Pit will have no effect on the groundwater underlying the South Pit (aquifers) and be advantageous for the completion of the State Significant Coffs Harbour Break Wall Project, have no other deleterious environmental effects and no change to normal operating flows.

Lismore City Council acknowledges this MA is targeting an area currently under the Order but must communicate to the Department that it is only considering mining the cap rock in the South Pit area in order to expedite the supply of rock for a State significant project. Lismore engaged Gilbert and Sutherland to in July 2016 to undertake all parameters of the ground water monitoring program. Lismore is fully aware that the deadline for the ground water monitoring assessment was late in 2018.

1. Introduction

1.1 Reasoning for Modification Application

This Modification Application (MA) is submitted to the Department of Planning and Environment (DOPE) by Lismore City Council (LCC) in order to mine up to the first 10 metres of the cap rock in the South Pit at Blakebrook Quarry Project. Currently Blakebrook Quarry is slated to not mine in the South Pit until late 2018 at the completion of a detailed groundwater assessment.

Currently LCC are supplying oversize rock to the Coffs Harbour Northern Break Wall Rehabilitation Project on behalf of Haslin Construction. LCC acknowledges that the Coffs Harbour North Break Wall is a State significant project and needs to be progressed for the benefit of all the stakeholders.

LCC is seeking permission to mine the South Pit with a maximum depth of ten metres depending on required/retrieved volumes in order to retrieve the hard cap rock in this area. The hard basaltic cap rock is appropriate for Haslin Construction (contractor) and the Coffs Harbour Break Wall Project.

LCC have supplied 4547.12 tonnes of 5 tonne to 8 tonne rock for this project. The initial quotation for Haslin Constructions was for 35,000 tonnes of rock which was comprised of 10,000 to 15,000 tonne of 2 to 5 tonne rock and 15,000 to 20,000 tonne of 5 to 8 tonne rock. Haslin Construction then indicated that they required only the 5 to 8 tonne rock. The remaining 10,000 tonnes of 5 to 8 tonnes rock has not been able to be retrieved as planned from the Main Pit.

Haslin Construction have advised that they have exhausted supply within NSW quarries for this size rock for the Coffs Harbour Break Wall Project will come to a halt as aforementioned Blakebrook Quarry is not able to supply the quantities from the Main Pit as first quoted.

The cap rock in the South Pit meets the specification required for Haslin Construction, is easy to access to reduce costs and additionally this rock is an issue for the quarry and ends up as waste as it becomes unviable to resize after blasting.

As part of the modification Lismore City Council engaged Gilbert and Sutherland (Engineering/Geotechnical Services) and Newton Denny Chapelle (Surveying Services) to assess the current South pit groundwater (aquifer) heights from data collected from the new groundwater monitoring program with new surveyed heights and previous groundwater data.

1.2 The Proponent

The proponent for this Modification Application is Lismore City Council and the Blakebrook Quarry Project.

Blakebrook Quarry operations have occurred at the site since 1979.

1.3 Land and Ownership

Owner: Lismore City Council.
Parcel (main): Lot: 201 DP: 1227138.
Total Land Area: 128.2 Hectares.

The Blakebrook Quarry Project is situated within a hill known as Booerie Hill, an igneous basalt intrusion located in the Lismore Local Government Area (See Figures One and Two). The internal haul road exits the Quarry to the west and joins Nimbin Road. The area surrounding the site is characterised as rural, with the predominant land use being grazing. Terania Creek is located 1 km to the west and Booerie Creek is located 1 km to the southeast. Both are tributaries of Leycester Creek which enters the Wilsons River at Lismore.

Figure One: Blakebrook Quarry Project Land Area

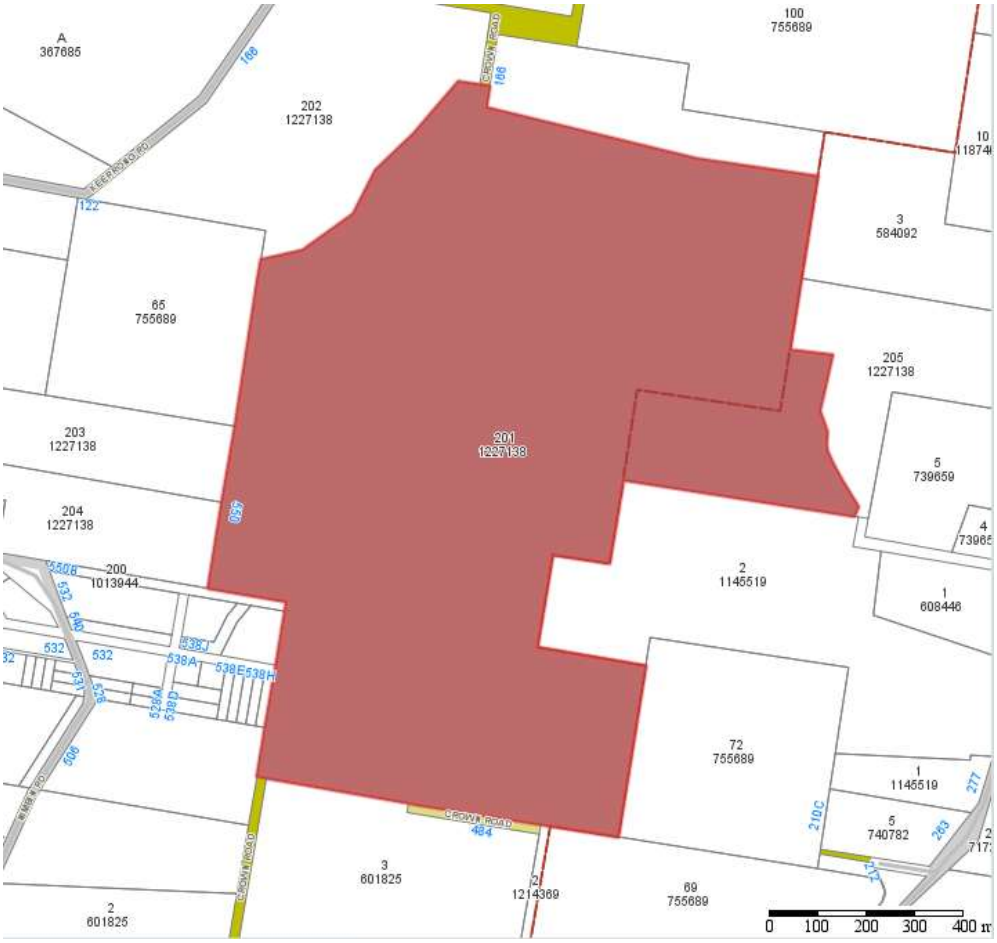
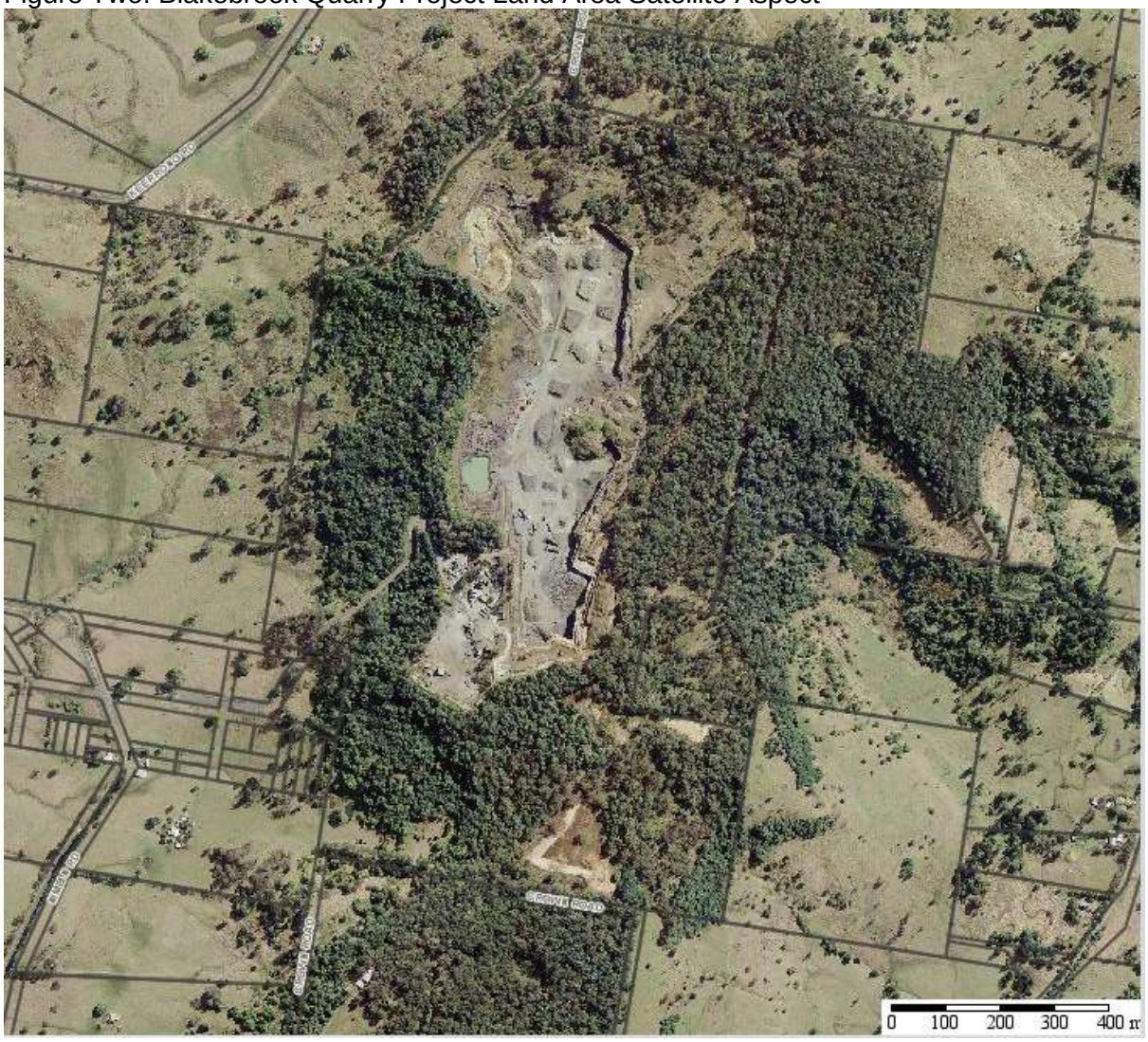


Figure Two: Blakebrook Quarry Project Land Area Satellite Aspect



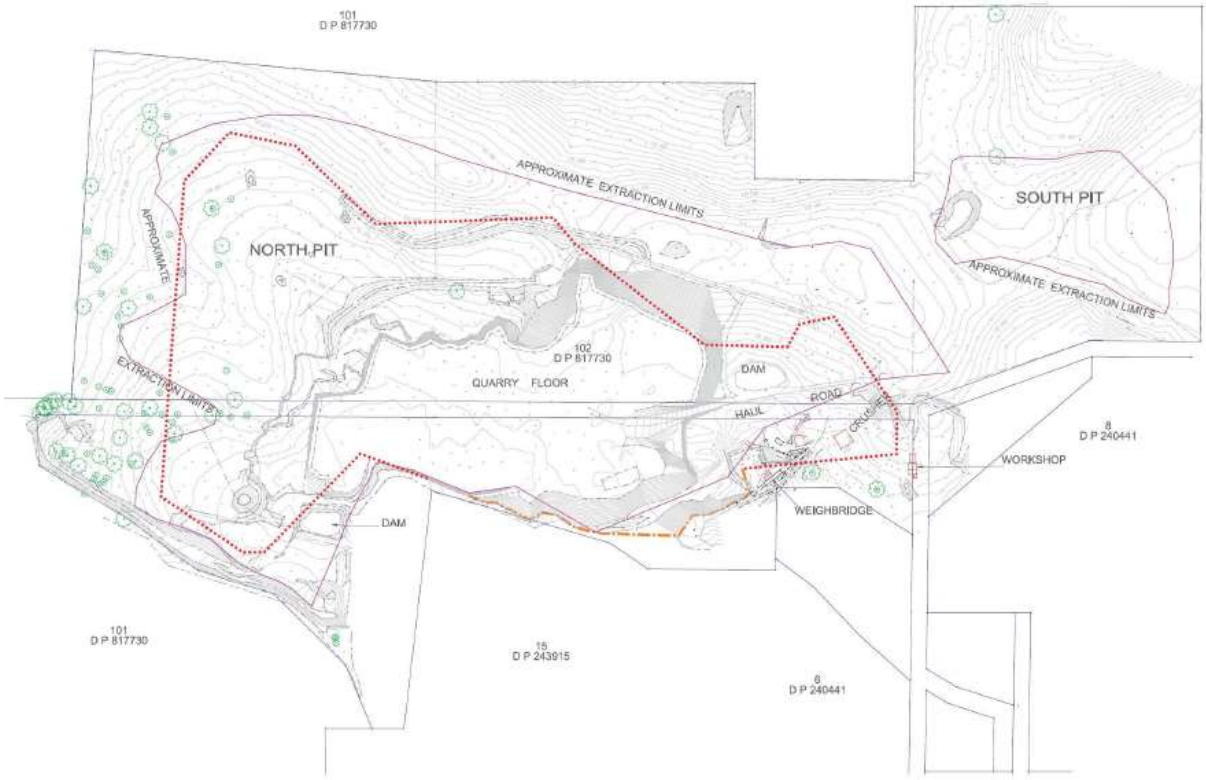
1.4 Development History

Quarry operations have taken place at the site since 1979. The quarry was given development consent by the Council in 1995, with an 182,000 tonne per annum production limit. The consent also allowed a 2.5% increase per annum in this production limit over 25 years to a maximum extraction rate of 337,500 tonne per annum.

In 2009, Lismore City Council expanded its operations (as a Part 3A Application) to 600,000 tonnes per annum of material from the quarry over 30 years (see Figure Three). Additionally a new DA for a State Significant Project was completed. Product from the site is extracted primarily to be used by Council to maintain local roads as well as supply the region with affordable material for significant construction projects such as the Pacific Highway upgrade. The 2009 determination (07_0020) set several parameters pertinent to this MA including the extraction depths and a detailed groundwater assessment report.

Production at the quarry in 2016 amounted to 149,375.57 tonnes comprising a combination of various grades of aggregate, road base and select fill (overburden). This was within the applicable production thresholds for the Quarry.

Figure Three: Extraction Limits 2009 Determination (07_0020)



1.5 The Order

On the 30th of June 2016, the Blakebrook Quarry was served an Order in accordance with item 18 of the table in section 121B of the Environmental Planning and Assessment Act (1979) to remedy a breach of Part 3A of the Act. The Order referred to the Major Project approval 07_0020 which referred to the requirement to prepare and submit for approval a detailed groundwater assessment in accordance with Schedule 3, Condition 20 (b).

The terms of the Order are:

1. Council is to carry out work in accordance with Schedule 3, Condition 20 of the project approval, to prepare and submit for approval a detailed groundwater assessment report to the satisfaction of the Secretary, including:
    a. Engage a suitably qualified groundwater expert;
    b. Consult with Department of Primary Industries (DPI) Water;
    c. Approved by the Secretary before any vertical extraction below 105 m AHD in the northern pit or any further extraction in the southern pit;
    d. Adequately assess groundwater resources affected by the northern and southern pits, to the proposed full extraction depths of those pits;
    e. Adequately assess all groundwater impacts associated with proposed extraction;
    f. Provide data for predicted groundwater pit inflows during and following extraction; and

g. Propose satisfactory management measures to address pit inflows and impacts to groundwater resources.

2. The detailed groundwater assessment report referred to above shall incorporate:
   a. The scope of monitoring described in council's approved Ground Water Monitoring and Management Sub-Plan (dated April 2011);
   b. The scope of monitoring described in council's Stage 1 and Stage 2 of the Monitoring Well Implementation Plan (dated 15 April 2013);
   c. DPI Water response comments to council (dated 13 April 2016) relating to the Larry Cook Consulting groundwater monitoring report (dated 12 January 2016); and
   d. At least two (2) years of monitoring data at all groundwater depths and locations outlined in the above plans.

The timelines for the completion of the Order included:

- Installation of a groundwater monitoring network within 3 months from the issue of the Order (by September 30 2016)
- Completion of groundwater monitoring within 2 years and three months from the issue of the Order (by 30 September 2018); and
- Completion and submission of a detailed groundwater assessment report within 2 years and 6 months from the issue of the Order (by 30 September 2018).

Gilbert and Sutherland were subsequently engaged by the quarry operator to complete the required assessments. Since June 2016 (the date of issue of the Order), LCC has implemented the installation of a groundwater monitoring network that met the conditions. This network added to the existing two nests of wells that had been previously recording data from the ground water monitoring network. The network now (as per conditions) consists of three nests of three bores across the Blakebrook Quarry site known as BQN1, BQN2 and BQS1 (see Figure Five). This has included the installation of new piezometers, which provide for constant monitoring of the groundwater levels in the vicinity of the quarry. BQS1 sits adjacent (to the near north) of the South Pit and the operations outlined in the MA.

These assessments are ongoing in accordance with a timeframe agreed with the Department.

Figure Five: Location of the Groundwater Monitoring Nests in relation to the Main Pit

Lismore City Council acknowledges this MA is targeting an area currently under the Order but must communicate to the Department that it is only considering mining the cap rock in the South Pit area in order to expedite the supply of rock for a State significant project. Lismore is fully aware that the deadline and therefore potential entry to enter this area (dependent on the delivery of conditions of the Order) was late in 2018.

2 Proposed Modification

Accompanying Documents:

- Proposed Quarrying of Cap Rock in Southern Pit Blakebrook Quarry
- Political Donations Disclosure Statement
- LCC Blakebrook Quarry Modification Application

As outlined in Section 1.1, this Environmental Assessment (EA) and the MA is submitted to the Department of Planning and Environment (DOPE) by Lismore City Council (LCC) in order to mine up to the first 10 metres of the cap rock in the South Pit at Blakebrook Quarry. Currently Blakebrook Quarry is slated to not mine in the South Pit until late 2018 at the completion of a detailed groundwater assessment.

- LCC is seeking permission to mine the South Pit with a maximum depth of ten metres depending on required/retrieved volumes in order to retrieve the hard cap rock in this area.
- Up to 10,000 tonnes of 5 to 8 tonnes rock is required
- LCC have supplied 4547.12 tonnes of 5 tonne to 8 tonne rock for the State significant project
- All extraction in the South Pit would be within the extraction area with the focus on the area investigated by Gilbert and Sutherland.

The area targeted for the cap rock will not significantly disturb any areas that have not been previously developed or maintained.
The study zone as outlined in Figure Six (area highlighted by the red line) is indicative of the extraction zone and limits in the South Pit by the yellow bordered area.

There will be no additional traffic movements externally from the Quarry as per normal movements. The additional movements will be internally in the Quarry as movements occur from the South Pit to the haul road (~210m). This will be managed by the Traffic Management Plan.

Figure Six: MA Survey and Aquifer Study Area – South Pit

The large rock project to date has resulting in 4547.12 tonnes of material being supplied to the project.

This has generated:

- 251 individual loads handled by four separate contractors
- Ten contractor jobs including plant and maintenance
- Ongoing work for blasting contractors

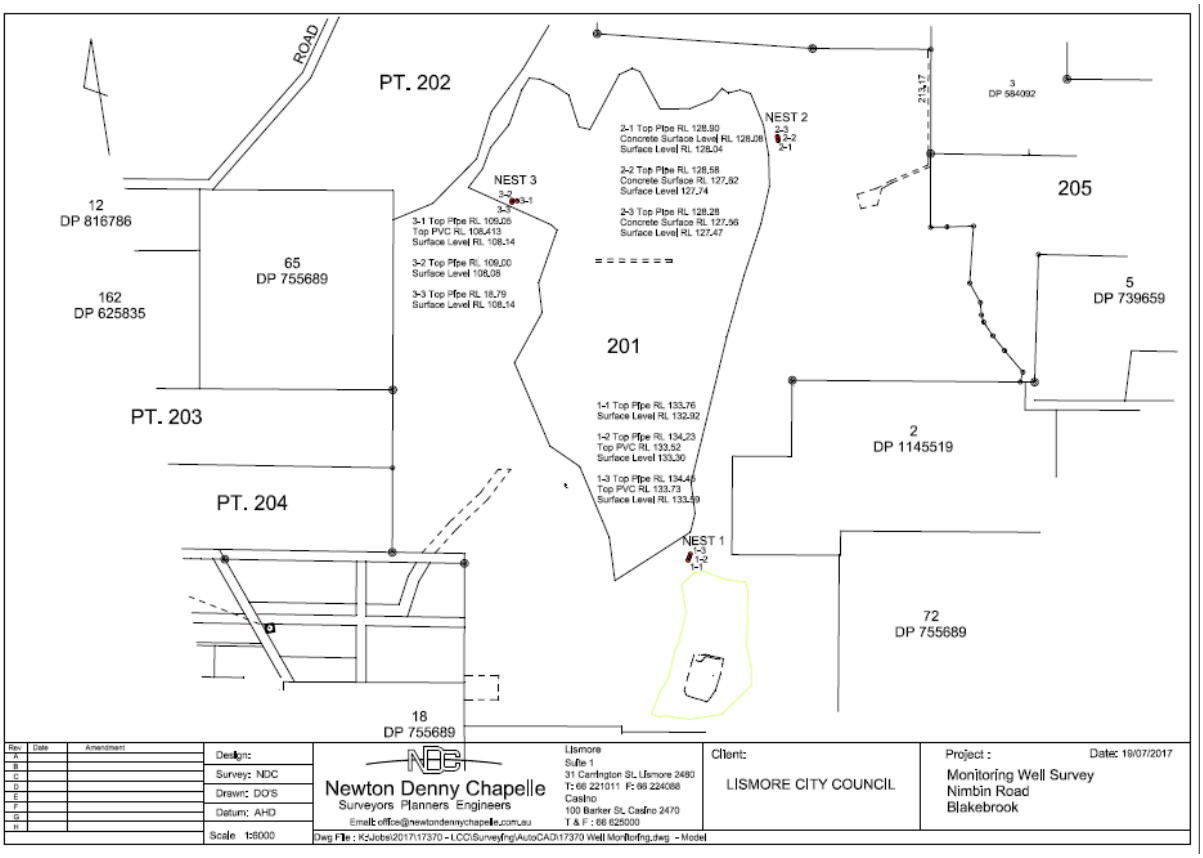
3 Environmental Assessment

3.1 Groundwater Assessment

LCC has implemented the installation of a groundwater monitoring network. This network consists of three nests of three bores across the Blakebrook Quarry site known as BQN1, BQN2 and BQS1. This has included the installation of new piezometers, which provide for constant monitoring of the groundwater levels in the vicinity of the quarry.

A study was undertaken in July 2017 as part of the MA with the results presented in the accompanying document '*Proposed Quarrying of Cap Rock in Southern Pit Blakebrook Quarry*'. The study was undertaken with Gilbert and Sutherland (engineers) and Newton Denny Chapelle (surveyors/planners). Stage One of the investigation was to resurvey the real heights of the top of the all the bores across the three nests in order to accurately ascertain the true height comparison with the drilling bore logs (see Figure Seven). Additionally the surface of the South Pit was surveyed in order to gauge the potential extraction depth against the known bore and aquifer depths and to determine exact heights across the South Pit.

Figure Seven: Bore Nest Height Sketch



Gilbert and Sutherland then quantified the survey data and the drill bore logs in a conceptual model to map the true height of the known water bearing layers in the identified extraction area. Three different water bearing zones (shallow, intermediate and deep) and the relative pressure heads levels are presented.

Monitoring Bore	Target water bearing zone	Minimum groundwater level (mAHD)	Maximum groundwater level (mAHD)
BQS1S	shallow	101.55	105.64
BQS1I	intermediate	84.00	84.83
BQS1D	deep	53.59	53.97

Table 1: minimum and maximum groundwater levels for the period 6 September 2016 to 6 June 2017

Gilbert and Sutherland concluded that the highest groundwater level in the Southern Pit area is that of the shallow water bearing zone at a maximum of 105.64 mAHD, recorded between 6 September 2016 and 6 June 2017. This indicates that the water bearing zones will not be interfered with by the extraction proposed in the MA.

The nearest water zone is the pressure head of a shallow water bearing zone located at 105.64mAHD with the actual shallow water bearing zone at 98.4 to 89.4mAHD.

The nearest water zone is the pressure head for the shallow water bearing zone located at 105.64mAHD with the actual shallow water bearing zone at 98.4 to 89.4mAHD.

As outlined in '*Proposed Quarrying of Cap Rock in Southern Pit Blakebrook Quarry*', mining of the cap rock in the South Pit is perceived to not affect the groundwater aquifers in any way.

3.2 Surface Water Monitoring

Schedule 3, Condition 21

The adopted Soil and Water Management Sub Plan identifies that the Monitoring Program will comprise the following:

• Water quality monitoring will be undertaken in sediment basins prior to these being actively discharged to receiving watercourses.

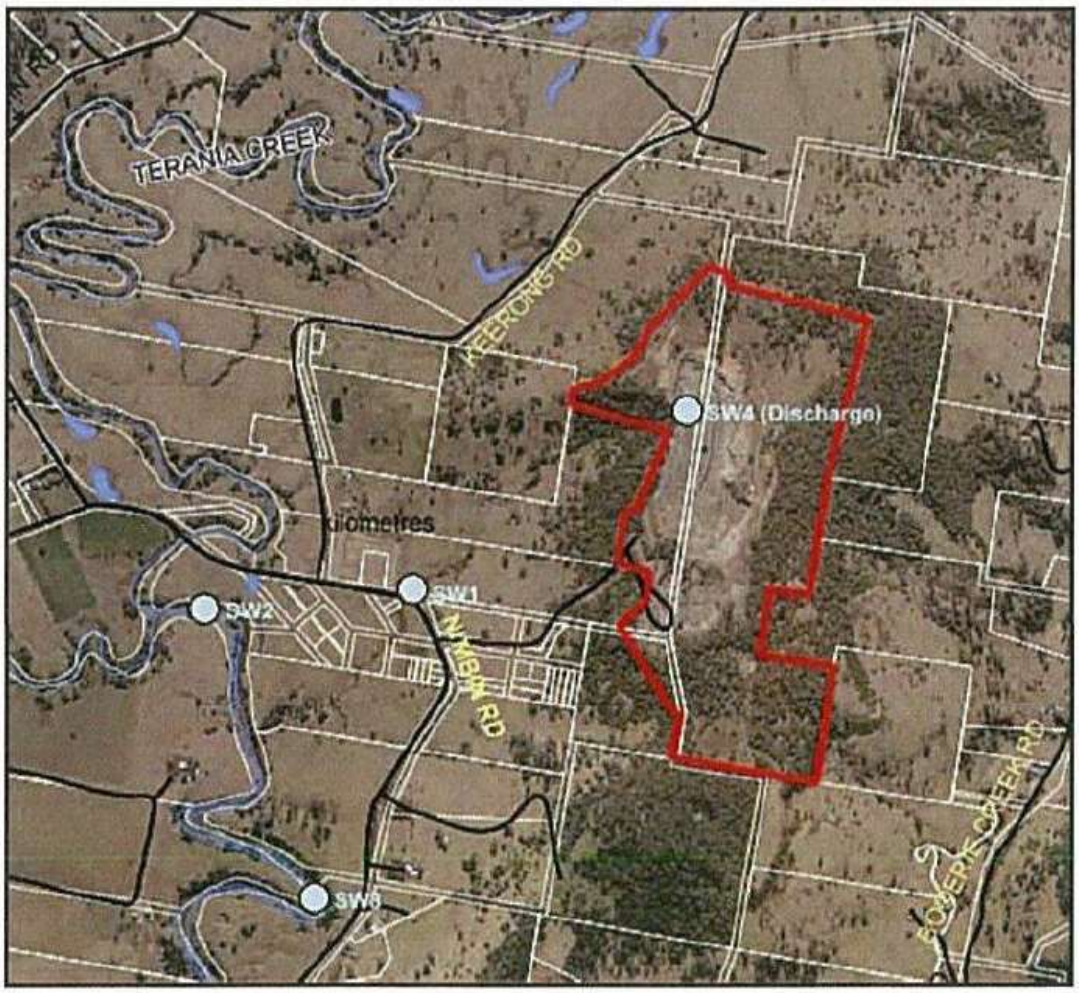
• Water samples will be collected and analysed for pH, Total Suspended Solids /155]. Heavy Metals and Oil & Grease.

• Surface water sampling points will also be established on drainage lines that may receive runoff from the quarry floor or from active site discharges

• Water flow behaviour will be assessed in watercourses discharging from the site.

Surface water monitoring stations are located at three sites (SW1, SW2 and SW3) on the western side of the Quarry, with a discharge point located within the Quarry (SW4 - only sampled where there is an exceedance of 60.2mm rain in one event).

The surface water monitoring is conducted quarterly, sampled and tested by Environmental Analysis Laboratories – Southern Cross University.



Over the monitoring period, there have been two peaks in the suspended solids levels in 2013 and 2016, both of which correlate directly with intense rainfall periods (See comments from Quarry Management, below). The results must therefore be considered in the context of the characteristics of the discharge point from the quarry - namely an informal dirt gully located within a property utilised for cattle grazing.

With respect to heavy metals, recorded levels for arsenic, cadmium, chromium, copper, nickel, lead, zinc and mercury were within the nominated ANZECC Trigger Values in 2016. As illustrated in Figure 5, the recorded levels of Aluminium are above the ANZECC trigger values at all recording stations. It is further noted that the results have consistently been above the trigger value since February 2013. In June 2017, LCC completed a study (*Blakebrook Quarry Preliminary Water Quality Investigation*; *Ecoteam, 2017*) to look at the elevate d Aluminium levels and will present this report in addendum to the Annual Environmental Audit in January 2018.

The report found that elevated concentrations of aluminium and copper in surface water samples is attributed to the local in-situ soils of the Wollongbar landscape which are highly erodible, have high acidity and high aluminium toxicity potential. Elevated concentrations of total metals and suspended solids in groundwater may be attributed to surface water percolating through the surface soils and exposed basalt within the Quarry as well as from naturally occurring soft, muddy soil layers located at various depths. While total metals concentrations are above ANZECC Guideline limits, the discrete sample collected at BQN1-D returned dissolved metal concentrations below the ANZECC Guidelines for Freshwater Aquatic Ecosystems.

The MA has been assessed to not affect the surface water quality.

3.3 Noise Monitoring

Schedule 3, Condition 6

The most recent annual noise monitoring assessment was completed in November 2016 by Ambience Audio Services. It has been determined from the assessments that operations in the South Pit will not affect or exceed the current parameters.

3.4 Blast Monitoring

Schedule 3, Condition 14

Conducted by Donnelly Blasting Services, which includes drilling, stemming, shot firing and reporting of monitoring points (compliant to Schedule 3, Conditions 7-10).

3.5 Air Quality Monitoring

Schedule 3, Condition 16

Dust monitoring stations are located at three sites around the Quarry boundaries. Samples are collected monthly by NRQA staff and tested by Environmental Analysis Laboratories.

3.6 Landscape and Biodiversity Management Plan

Koala Management Plan (Schedule 3, Condition 27) – conducted by Biolink Ecological Consultants with the five year study completed in 2016. LCC will continue a biennial study in order to track populations in the area. The operations described in the MA have been determined not to affect local koala populations as the Biolink study found no resident koala population in this area of the Quarry site.

Rehabilitation, Revegetation Plan - Conducted by Roots Down Conservation monthly, working through specified zones on site. Scope of works includes: weed identification, native species identification, following a treatment program and summary of results. An extra person will be added to the team in the first half of the current financial year to improve the existing habitat and encourage endemic species naturally revegetating the existing habitat.

Biodiversity Offset Strategy - Schedule 3, Condition 26 – Completed in January 2017 in line with this Condition.

3.7 Aboriginal and Cultural Heritage Plan

Schedule 3, Condition 33

Awareness training is part of the NRQA induction.

Environmental assessments are conducted as necessary, prior to stripping operations or ground disturbance. If any new areas are to be developed, all procedures will be followed.

3.8 Traffic Management Plan

Schedule 3, Condition 35

Truck movements are captured daily and recorded in line with this Condition. The large rock job as part of the Haslin Coffs Harbour Break Wall Project will not affect the current conditions regarding truck site movements (100 per day).

The onsite traffic management plan is part of the driver induction, and is a 'live' document that evolves as physical changes are planned on site. All consideration will be given to any change of traffic movements due to movements coming from the South Pit area. All risk assessments will be carried out for truck movements in a new area of the Quarry.

3.9 Environmental Management Strategy

- Independent Environmental Audits are currently ongoing. They are currently conducted by Coffee Geotechnics with the next audit is due in 2018.
- Establishment of a Community Consultative Committee – established in line with the Condition. Meetings are held each 6 months, incorporating a collective Wild Dog management program.
- Convenient Public Access to Information – conducted in line with this Condition. Access is available on Lismore City Council website: www.lismore.nsw.gov.au
- Maintenance of a Complaints Register - conducted in line with Conditions. A complaints register is contained with NRQA Integrated Management System.

4 Conclusion

Gilbert and Sutherland concluded that the highest groundwater level in the Southern Pit area is that of the shallow water bearing zone at a maximum of 105.64 mAHD, recorded between 6 September 2016 and 6 June 2017. This indicates that the water bearing zones will not be interfered with by the extraction proposed in the MA.

In light of this data and recommendation, LCC progressed to the modification application stage for project approval. In addition to the aforementioned data, no adverse environmental potential impacts or change to the operating conditions at the Quarry were identified during the assessment including:

- No further truck movements than what is already approved
- No increase in production limits
- No changes to noise or air quality
- No increase in already approved blasting schedule

Lismore City Council acknowledges this MA is targeting an area currently under the Order but must communicate to the Department that it is only considering mining the cap rock in the South Pit area in order to expedite the supply of rock for a State significant project. Lismore engaged Gilbert and Sutherland to in July 2016 to undertake all parameters of the ground water monitoring program. Lismore is fully aware that the deadline for the ground water monitoring assessment was late in 2018.