

INDEPENDENT ENVIRONMENTAL AUDIT OF HITCHCOCK ROAD SAND PROJECT

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1. Background to Independent Environmental Audit

Conditions 6, 7 and 8 of Schedule 5 of the Department of Planning's Hitchcock Road Sand Project approval (06_0104) dated 3 February 2009 and provided in Appendix 1 state as follows.

Condition 6. Within 12 months of the date of this approval, and every 3 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. This audit shall:

- (a) be conducted by a suitably qualified, experienced, and independent person(s) whose appointment has been approved by the Director-General;
- (b) include consultation with the relevant agencies;
- (c) assess the environmental performance of the project, and its effects on the surrounding environment;
- (d) assess whether the project is complying with the relevant standards, performance measures and statutory requirements; and
- (e) review the adequacy of any strategy/plan/program required under this approval, and, if necessary, recommend measures or actions to improve the environmental performance of the project, and/or any strategy/plan/program required under this approval.

Note: The person(s) conducting the audit should have expertise in flora and fauna assessment, hydrogeology and quarry rehabilitation.

Condition 7. Within 6 weeks of completion of each Independent Environmental Audit, the Proponent shall submit a copy of the audit report to the Director-General, with a response to any of the recommendations in the audit report.

Condition 8. Within 3 months of submitting a copy of the audit report to the Director-General, the Proponent shall review and if necessary revise:

- (a) each of the environmental management and monitoring strategies/plans/programs in Schedules 3 and 5; and
- (b) the sum of the Vegetation Offset Bond (see Schedule 3). This review shall consider:
 - the effects of inflation;
 - any changes to the total area of disturbance; and
 - the performance of the vegetation offsets against the completion criteria of the Rehabilitation and Vegetation Offset Management Plan,to the satisfaction of the Director-General.

On 13 July 2010 the Department of Planning¹ approved Mr Bruce Adcock BA, Dip T&RP, CPP, CEnvP of Environmental Planning Pty Ltd to complete the independent environmental audit. On 15 November 2011 the Department of Planning & Infrastructure advised PF Formation it had reviewed the first Independent Environmental Audit dated April 2011 and the response to the audit recommendations and it was satisfied with their form, content and presentation and they had no further requirements. The second independent environmental audit acknowledges the use of AS/NZS ISO 19011:2003 *Guidelines for quality and/or environmental management systems auditing*.

2. Site Operations

Figure 1 over provides an aerial view of the Hitchcock Road Sand Project (the site) showing approximate cadastral boundaries (in red). Large portions of the site are undergoing extraction with substantial areas yet to be extracted. Total extraction area is approximately 75 hectares. Extraction areas are required to be progressively rehabilitated. A number of rural residential detached dwellings owned by PF Formation and occupied by their employees also occupy the site.

Figure 2 over provides a site survey plan of the project area as at mid-2013. Note that the contours were based on a survey in 2009 and have been modified since due to the extraction, rehabilitation and silt ponds activity areas shown on the plan.

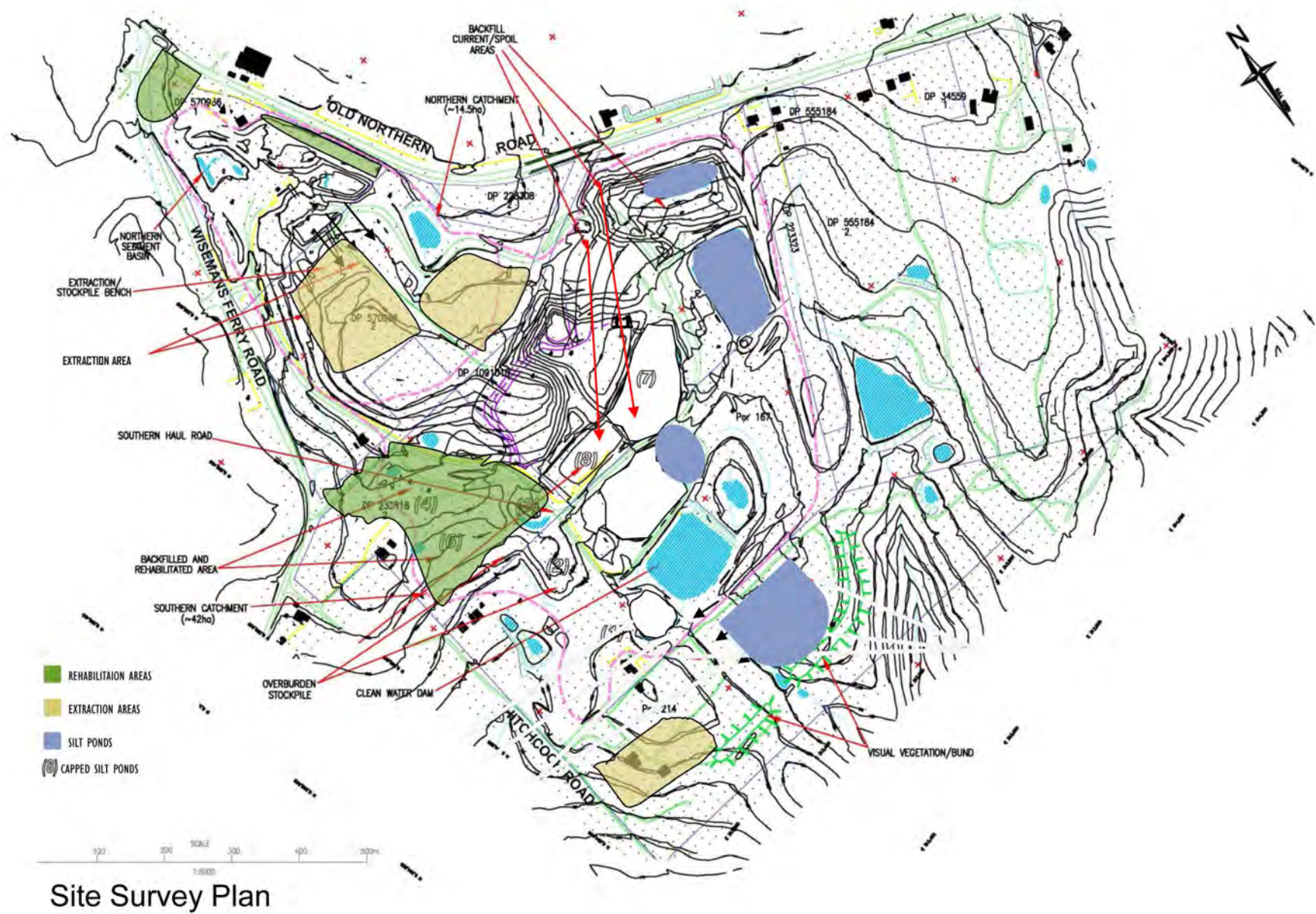
¹ Subsequently Planning and Infrastructure and now Department of Planning and Environment.

Figure 1 Aerial View of Hitchcock Road Sand Project Site



Source: SIX Maps 2014

Figure 2 Site Survey Plan of Hitchcock Road Sand Project



The Hitchcock Road Sand Project majority site owner, operator and proponent is Etra Pty Ltd as trustee for PF Formation. PF Formation has operated sand and clay extraction quarries in the Maroota area in The Hills Shire and Hornsby Shire since 1983. PF Formation refers to the sand quarries within the Hitchcock Road Sand Project site as Pit 6, Pit 7 and Pit 12 and sometimes as the Trig site in reference to the Maroota survey landmark at 241 metres Australian Height Datum near the centre of the site. This survey landmark portion (Lot 1 DP 1013943) of the site is leased until 2045 from the Crown. Permission to remove the Maroota survey landmark has been granted and removal of the nearby Sydney Hinterland Transition Woodland commenced in the first quarter of 2014.

Bulldozers strip topsoil and overburden from various pits within the project site and excavators then put raw material into dump trucks for transport to the on-site fixed processing or slurry plant located in the northern portion of the site. The coarse sand is initially screened and washed then pumped via a slurry pipeline under Wisemans Ferry Road and along a haul road to PF Formation's main processing plant (Lot 198 DP 752025) located approximately 750 metres to the north-west. The main processing plant together with offices, workshops, concrete batch plant, fuel storage, weigh bridge, loading and processed sand storage areas form PF Formation's main operational area off Patricia Fay Drive at 1774 Wisemans Ferry Road, Maroota. The processed sand is stockpiled then transported to markets by heavy vehicles for use in metropolitan Sydney's construction industry.

Figures 3, 4, 5, 6, 7, 8, 9 and 10 provide various views of the Hitchcock Road Sand Project site operations, extraction, stockpile, tailings ponds and rehabilitation areas as at February 2014 and April 2014.

Figure 3 View of Site Entrance on Wisemans Ferry Road



Figure 4 View of Main Pit at Hitchcock Road Sand Project



Figure 5 View of Extraction and Stockpile Areas From Near Hitchcock Road



Figure 6 View of Processing Plant at Hitchcock Road Sand Project



Figure 7 View of Main Tailings Ponds at Hitchcock Road Sand Project



Figure 8 View of Partial Removal of Sydney Hinterland Transition Woodland at Hitchcock Road Sand Project



Figure 9 View of Site Rehabilitation Area at Hitchcock Road Sand Project



Figure 10 View of Partial Site Rehabilitation at Hitchcock Road Sand Project



3. Audit Aim, Criteria and Tasks

The aim of the independent environmental audit is to ensure that Condition 6 of the Hitchcock Road Sand Project approval is met to the satisfaction of the renamed Department of Planning and Environment. Condition 6 also specifies the criteria for the audit. To complete the environmental audit and met the Condition 6 criteria the following tasks were undertaken.

- Overview of the Environmental Assessment and associated technical papers for the project, Preferred Project Report and Department of Planning's Hitchcock Road Sand Project approval (06_0104) dated 3 February 2009. The project approval is also available for download from PF Formation's website at www.pfformation.com.au.
- Review of the Environmental Strategy and associated Noise Management Plan, Air Quality Monitoring Program, Water Management Plan and Landscape Management Plan for the project. All of these documents were revised by PF Formation in September 2011 and approved by the Department of Planning & Infrastructure on 15 November 2011 in partial fulfilment of the project approval conditions and are the principal environmental reference documents for the site. These documents are available at www.pfformation.com.au.
- Review of Annual Environmental Management Reports (AEMR) for 2010-2011, 2011-2012 and 2012-2013 for the project. The 2012-2013 AEMR is available at www.pfformation.com.au.
- Review of Environment Protection Licence No. 3407 and associated 2010-2011, 2011-2012 and 2012-2013 annual returns for the site. Appendix 2 provides a copy of Environment Protection Licence Number 3407 covering the Hitchcock Road Sand Project.
- Site inspections, observation of activities and environmental audit of the project site in fine weather on 24 February 2014 and 16 April 2014. On-site interviews were held with PF Formation's Managing Director Mr John Graham, General Manager Mr Peter Cummins, Operations Manager Mr Joshua Graham, Quarry Manager Mr Peter Watt and the Weighbridge Officer Ms Dianna Rea. Requests were made for relevant documentation, records, information and correspondence. The locations of three dust monitoring deposition gauges were checked. Production, safety, induction, waste disposal,

environmental and monitoring records were checked. Site boundary setbacks and rehabilitation areas were checked.

- Subsequent email and telephone enquiries with the General Manager Mr Peter Cummins on some issues of concern and requests for further information and documents.
- Issue of consultation letters on 7 March 2014 to three public authorities (Office of Environment and Heritage, Department of Primary Industries – Mineral Resources and The Hills Shire Council) requesting a response within 21 days including any comments or issues on the project.
- A review of the implementation of the April 2011 audit recommendations.

This second independent environmental audit covers the three year period from the first audit in April 2011 to April 2014.

4. Audit Evidence and Environmental Monitoring

In addition to the review of formal documentation produced for the project site and referred to in Section 3, on-site inspections of the site and checking of other documentation revealed the following areas of environmental performance and concern (in no particular order or priority) in relation to effects on the surrounding environment and compliance with project approval conditions, project approval commitments, Environment Protection Licence conditions and AEMR requirements.

The Environment Protection Licence covering the site allows up to 500,000 tonnes/annum and the project approval provides for 400,000 tonnes/annum. The 2010-2011, 2011-2012 and 2012-2013 annual returns to the NSW Department of Trade & Investment, Resources & Energy Division outline the type of product (clay and fill, pea gravel, construction sand), quantity and value of material sold. A review of the monthly production and Section 94 contribution records confirmed that annual production is less than 400,000 tonnes/annum from The Hills Shire quarries including the project. The total production of each type of material has not been disclosed in this audit document because of the confidentiality and commercial sensitivity of the release of such information but it is available at PF Formation's offices. The Hills Shire Council also receives Section 94 contributions based on monthly production records which in turn are based on weigh bridge records. These Section 94 contributions were audited by Council in late 2012.

Weigh bridge records detailing the type of material and mass to be transported off-site were reviewed and were satisfactory. A sample of weigh bridge records also demonstrated that laden truck movements were less than 200 vehicles per day and generally less than 10 vehicles per day entering/exiting the site between 6am and 7am. Truck movements are regularly audited by the Environmental Manager. The October 2011, February 2012 and April 2012 operational checklists in the 2011-2012 AEMR noted a total of 15, 12 and 12 truck movements respectively between 6am and 7am. The February 2013 operational checklist in the 2012-2013 AEMR noted a total of 14 truck movements between 6am and 7am. There is no physical or documentary evidence of any Virgin Excavated Natural Material being imported into the site to date.

In April 2014 PF Formation plotted existing extraction levels at three locations as shown on the revised depth of mining contours plan (see Appendix 7). The three extraction levels are all above and in compliance with the depth of mining contours plan.

A review of randomly selected timesheets for the workforce which show start and finish times for each employee generally confirmed that operating hours were between 6am and 3pm. Some employee's timesheet records had a few earlier start times at 5.30am and 5.45am in relation to opening up the weigh bridge so that the site could commence operations at 6am. Some of the weigh dockets issued to drivers at the weigh bridge confirmed that laden trucks had traversed the weigh bridge a few minutes before 6am.

A rehabilitation and offset bond (project approval schedule 3 condition 27) for \$500,000 in the form of an ANZ bank guarantee for \$500,000 in favour of the Director General of the Department of Planning and letter was forwarded to the Department of Planning on 22 November 2010. The bond was calculated based on a maximum of 127,600 square metres being disturbed in the next three years and 120,000 square metres of previously disturbed area. On 26 September 2011 PF Formation confirmed to the Department of Planning & Infrastructure that no revision of the

rehabilitation and offset bond was required. PF Formation confirmed again in March 2014 that no revision of the rehabilitation and offset bond was required.

Some star pickets painted green on top have been installed near the site boundaries (see Figure 4) to show the extent of buffer or extraction area setbacks.

A 3m high peripheral bund planted with screening vegetation needs to be located 30m from and all along the Hitchcock Road boundary.

Automatic weather station records held at the weighbridge and included in the 2010-2011, 2011-2012 and 2012-2013 AEMPs were reviewed and are satisfactory.

Minutes of the Community Consultative Committee held in November 2010, May 2011, November 2011, May 2012, November 2012, April 2013 and November 2013 were reviewed and they provide another perspective on the progress and impacts of the project.

One complaint was received and recorded in the Complaints Register during the audit period. On 24 April 2012 a telephone complaint was made about mud across Wisemans Ferry Road. A mechanical broom sweeper removed the mud as a corrective action.

No dangerous goods are stored on-site. In March 2006 WorkCover NSW advised that PF Formation no longer stores or handles notifiable quantities of dangerous goods on the premises.

Documents show regular removal of waste recyclables and waste disposal from the site is by The Hills Shire Council and an EPA licensed waste transport provider.

The Hazardous Substance Register and material safety data sheets were viewed. The Hazardous Substance Register includes 51 products/chemicals and associated material safety data sheets. Many of the products/chemicals within the register are not classified as hazardous substances² and should be removed from the register. However material safety data sheets for all materials including hazardous materials still need to be kept on site and up to date.

The visitor/contractor induction forms, site safety rules, truck driver safety rules and safety booklet were viewed and are satisfactory.

At the site entrance on Wisemans Ferry Road a single tyre was in public view on one site inspection and the 20km/hour speed limit sign was missing.

The Environment Protection Licence No. 3407 for the site lists five pollution reduction programs completed in 2008-2009.

The 2010-2011, 2011-2012 and 2012-2013 annual returns for Environment Protection Licence No. 3407 showed compliance with all conditions of the licence including dust and noise monitoring and compliance requirements. However, the 2011-2012 annual return should have recorded the 24 April 2012 complaint as required by Condition M4 of the licence. The 2010-2011 and 2011-2012 annual returns for Environment Protection Licence No. 3407 were not included in the 2010-2011 and 2011-2012 AEMRs.

The pollution incident response management plan available at www.pfformation.com.au and prepared to comply with section 153A of the *Protection of the Environment Operations Act 1997* was reviewed. The plan was last tested on 5 November 2013 but needs revision to include telephone numbers for all for all authorities and inclusion of Attachment A Hazardous Substances Register, Attachment B Emergency Procedure and Attachment C Site Plans/Map. PF Formation should consider including landslip or land stability as an additional hazard to be considered in the plan. The revised plan then needs to be made available on the PF Formation website.

² Hazardous material is defined in the Fire Brigades Act 1989 as "anything that, when produced, stored, moved, used or otherwise dealt with without adequate safeguards to prevent it from escaping, may cause injury or death or damage to property".

Production data was not included in AEMRs as per project approval conditions. Annual reports on the effectiveness of the retention basins were not available in the AEMRs and also need to be produced as per the project approval statement of commitments.

The PF Formation website needs regular updating for progress on Department of Planning and Environment approvals, revised documents and the audit.

At the Department of Planning and Infrastructure's request a copy of the latest December 2013 monitoring of revegetation report is included in Appendix 8.

5. Consultation With Agencies

On 7 March 2014 consultation letters were sent to three government agencies (Office of Environment and Heritage, Department of Primary Industries – Mineral Resources and The Hills Shire Council) requesting a response within 21 days including any comments or issues on the project. A copy of the consultation letters and the response from The Hills Shire Council are provided in Appendix 3. In summary The Hills Shire Council advised that Council staff have no concerns regarding Hitchcock Road. No responses were received from the Office of Environment and Heritage and Department of Primary Industries – Mineral Resources.

6. Audit Findings

6.1 Implementation of the April 2011 Audit Recommendations

Implementation of the April 2011 independent environmental audit recommendations and the PF Formation 14 June 2011 response (within quotation marks and italics) is provided below.

1. Improve screen planting on Lot 1 DP 570966 along Old Northern Road between Wisemans Ferry Road and 200 metres south and also near the project site access point on Wisemans Ferry Road.

The PF Formation response stated "The bund wall along Old Northern Road will be reshaped to improve the visual screening."

With regard to the comment regarding Wisemans Ferry Road this relates to the gap in the bund wall used to access the site (see photo below). As the entry point is right opposite our extraction area there is no room to build a screening bund until this area is fully extracted which could take several years. Whilst the extraction area is clearly visible at this entry point the reality is no one other than staff and visitors see this view. The gap in the bund wall is approximately 20 metres wide and road users only see this window while passing at 80 kilometres an hour i.e. for about 1.1 seconds."



As at April 2014 screen planting has been improved on Lot 1 DP 570966 along Old Northern Road between Wisemans Ferry Road and 200 metres south. Screen planting still needs to be improved near the project site access point on Wisemans Ferry Road and along Hitchcock Road.

2. Old tyres need to be removed from public view near the project site access point on Wisemans Ferry Road and either stored within the main processing plant workshop area or legally disposed of.

PF Formation agreed and the tyres are now stored on a mobile trailer out of public view.

3. The survey plan provided to the Department of Planning in May 2009 in the form of an orthophoto-map needs amendment taking into account the approved Landscape Management Plan and re-submission to the Department of Planning and Infrastructure to show the following:
 - a. A 10 metre buffer area (rather than 30 metres) along Old Northern Road near Lot 2 DP 570966 and Lot 2 DP 1063296.
 - b. Areas of vegetation to be conserved including Sydney Hinterland Transition Woodland.
 - c. An area of at least 12 hectares to be rehabilitated and revegetated.

The PF Formation response stated "The survey plan will be updated and re-submitted to the Department of Planning. The 12 hectares to be rehabilitated is conceptually shown in Appendix 5 to the Approval and will be progressively surveyed over the life of the development." The revised survey plan (see Appendix 4) was submitted to the Department of Planning & Infrastructure on 14 September 2011.

4. Any encroachment of the extraction area within Lot 2 DP 570966 and the 10 metre buffer area near the intersection of the disused access way/Crown Road and Old Northern Road needs to be rehabilitated and revegetated during the spring months of 2011.

The PF Formation response stated "There has not been an encroachment within the 10 metre set back from the Crown Road other than being used as an access track to backfill the extraction area. No extraction occurred within the setback. The area will be rehabilitated when the adjoining silt pond area is rehabilitated."

5. All buffer setback areas need to be clearly delineated on the ground with a peg out survey and use of permanent markers such as star posts and high visibility tape, coloured stakes, fences or similar.

The PF Formation response stated "The buffer setback areas in all extraction areas are all defined by existing bund walls, fences or other markers. Further identifying markers will be used."

6. A Traffic Noise Management Strategy needs to be included in the Noise Management Plan and to refer to the Maroota local traffic management policy agreed with Maroota's major quarry operators.

The PF Formation response stated "This will be included in the Noise Management Plan." Although the need for a Traffic Noise Management Strategy was removed as a condition in Environment Protection Licence No. 3407 for the site in February 2011 it is still included in the Noise Management Plan.

7. The Environmental Strategy needs to be updated including the date of publication, new names of NSW government departments, new legislation, revised Australian Standards and references.

The PF Formation response stated "this will be done". The Environmental Strategy was updated in September 2011; however the names of NSW government departments have changed again and the Environmental Strategy will need continually updating. For example, legislation and Australian Standards continually evolve and the Department of Planning is now the Department of Planning and Environment.

8. As required by the Environmental Strategy an annual internal audit needs to be completed and documented by the Environmental Manager and the Site Manager to provide the basis for the management of potential non-conformances and for annual reporting of environmental performance.

The PF Formation response stated "Monthly the Environmental Manager has a checklist that is reviewed and signed with comments made as necessary. Annually each action required by the Environmental Operations Procedures are reviewed and signed by the relevant Manager. Annually these documents and a copy of the consent are reviewed by the Management team to make sure all matters have been completed. This review and matters taken forward are reported in the Annual Environmental Management Report (Chapter 3). The wording in 3.3.2 Compliance Audit of the Environmental Strategy will be revised to reflect the actual procedures which are satisfactory." The wording in the Compliance Audit of the Environmental Strategy has been revised.

9. Annual reports on the effectiveness of the retention basins need to be produced and included in the AEMRs.

The PF Formation response stated "In the Water Management Statement of Commitments it says 'All retention basins will be regularly inspected and an annual report prepared on their effectiveness'. This commitment was incorporated into Strategy 5.1 of the Environmental Operation Procedures and is reviewed as part of the monthly checklist. These reports are signed off, dated and copies included in the AEMR (Chapter 3). Whilst there is no separate report it is reported in the AEMR in a satisfactory manner.

10. In addition to the water truck the irrigation system along parts of the internal haul roads near the revegetation (other woodland) area needs to be fixed for regular use during dry windy periods.

The PF Formation response stated "To minimize the need for water trucks to be used for dust suppression we have invested in fixed irrigation systems along some sections of the road. These systems require a high level of maintenance and regularly get blocked or break down. Therefore we have not expanded the use of the irrigation system and do not rely on it. We use our water truck to suppress dust from the roads when it is dry and windy." PF Formation has purchased another water truck of 30,000 litres capacity.

11. The concrete pipes and a large disused oil tank within the project site need to be removed off-site to reduce any risk of the items being buried within the areas of site excavation.

In their response PF Formation agreed and they have been removed.

12. The depth of mining contours plan dated 08/05/2009 and supplied to the Department of Planning needs to be updated to cover the whole extraction area of the site.

The PF Formation response stated "As required by Clause 4 of Schedule 3 of the Approval Conditions this will be reviewed and updated within 3 months of the Environmental Audit." A revised depth of mining plan was provided to the Department of Planning & Infrastructure on 14 September 2011 and is provided in Appendix 5.

13. The water table contours plan dated 08/05/2009 (see Appendix 7) and supplied to the Department of Planning needs to be updated to cover the whole extraction area of the site.

The PF Formation response stated "as above in point 12." A revised depth of water table contours plan was provided to the Department of Planning & Infrastructure on 14 September 2011 and is provided in Appendix 6.

14. Current calibration certificates for the weighbridge need to be included in the AEMRs.

The PF Formation response stated "A copy of the certificate from the Department of Fair Trading will be included in the AEMR." The certificate of verification dated 11 May 2012 in accordance with the National Measurement Act 1960 for the on-site 60 tonne weighbridge was included in the 2012-2013 AEMR.

15. Modified copies of the annual production data produced for the Department of Primary Industries using the standard form for that purpose need to be included in the AEMRs. With the consent of the Department of Planning & Infrastructure and to avoid disclosure of commercially sensitive information to the public and competitors, production data should be provided in 100,000 tonne bands in the AEMRs.

The PF Formation response stated "The AEMR is available on our website for public viewing and therefore we are reluctant to include the detail of our sales as disclosed in the annual production data provided to the Department of Primary Industries. In the second paragraph of Chapter 2 of the AEMR we confirm that our annual volume was within the limit of 400,000 tonnes. We propose that the annual production form be appended to the

AEMR but not included in the copy on the website or other copies that may potentially be publicized.” The annual production forms have not been appended to the AEMRs.

16. Annual production data needs to be separated for Hornsby Shire and The Hills Shire in annual returns so that the maximum throughput of 400,000 tonnes/annum for the project can be independently verified.

The PF Formation response stated “We are only required to complete one annual production data form for the Department of Primary Industries and there seems little point requiring more than one return. Even if a separate return was completed for Baulkham Hills Shire it still would not relate to this Approval as we have 3 different Approvals/Consents in this Council area (and 6 in the Maroota area). The throughput was readily audited in this Environmental Audit and any further paperwork serves no purpose.”

The 2010-2011 and 2011-2012 annual returns both showed combined annual production was between 400,000 tonnes/annum and 500,000 tonnes/annum from the Hornsby and Baulkham Hills quarries. In 2012-2013 combined annual production was between 300,000 tonnes/annum and 400,000 tonnes/annum from the Hornsby and Baulkham Hills quarries. The annual returns do not show the levels of production split between the Hornsby and Baulkham Hills quarries although the monthly records of Section 94 Contributions do so.

17. The Complaints Register needs to be recorded in full in response to any complaints on the project and any corrective actions undertaken.

In their response PF Formation agreed and this happened for the one complaint in the audit period although it was not recorded in the EPA annual return.

18. Within the workshop area in PF Formations main processing area an impervious bund under a shelter needs to be provided as a storage area for disused and empty fuel, lubricant and chemical drums and containers. The bund must be designed to contain at least 110% of the volume of materials stored within the area.

The PF Formation response stated “There is a storage area that should be used. Staff will be reminded of this.”

19. With the consent of the Department of Planning and Infrastructure only the three closest noise assessment locations to the project being R3 Jurd, R5 Pignataro, R10 Tornatola plus R7 Maroota Public School need be monitored in future.

The PF Formation response stated “This is as required under our EPA licence after on-site meetings with the DECC before the Approval commenced.”

20. Future AEMRs need to make reference that the Site Manager and the Quarry Manager are interchangeable and the same person. Similarly future AEMRs need to make reference that the Environmental Manager and Environmental Officer positions are either one or two persons.

In their response PF Formation agreed and this is shown in the 2010-2011, 2011-2012 and 2012-2013 AEMRs.

21. The AEMRs need to provide a plan showing all areas of in-progress rehabilitation and completed rehabilitation. The rehabilitation location plan should be based on the Vegetation Offset Plan and areas for new plantings included as Appendix 5 in the Project Approval.

The PF Formation response stated “This is shown on Attachment 2A (green area) of the AEMR but will be made clearer in future AEMRs” and this is shown in the 2010-2011, 2011-2012 and 2012-2013 AEMRs.

22. In the interests of ecologically sustainable development the volume or quantity of fuels/lubricants, electricity and water/groundwater consumed by PF Formation’s operations including the on-site and off-site processing plants should be monitored quarterly and an efficiency programme implemented to reduce annual consumption.

The PF Formation response stated “We are a small company who closely monitor all expenses particularly the major components that impact our business such as fuel, electricity and water. Other than labour these are the major expenses in running our business. We constantly look for ways to reduce the usage of these items.

Fuel is used running all our quarry equipment and the fuel efficiency is a major

consideration in every purchase decision.

Electricity is used to run all our sand washing equipment. We have always adopted a policy of utilizing electricity rather than diesel/petrol where we have a choice. We have had electricity specialists investigate our operations but as we mainly use it for running pumps and similar equipment there is little opportunity for introducing more efficient energy use.

Because of the shortage of water over the last few years we have an engineer implement measures to minimize our usage in our wash plants. The main water loss is through evaporation in our silt ponds and we are continually looking at ways of minimizing this loss.

Formal quarterly monitoring would be an inefficient waste of resources on something that is reviewed continually and in particular each month when the bills are signed. An annual summary of work done will be incorporated in the AEMP."

23. The PF Formation website needs regular updating for progress on approvals from the Department of Planning and Infrastructure and the audit.

In their response PF Formation agreed and they advise the website is updated regularly.

24. The document *Methodology* to assess success of revegetation within Hitchcock Road site, September 2008, Parsons Brinckerhoff Australia Pty Limited needs to be added to PF Formation's website as an addition to the Project Approval.

The PF Formation response stated "Agreed and done. Included in Appendix 6 to the Project Approval."

25. A full legible copy of the Project Approval including all Appendices as provided by the Department of Planning on 7 March 2011 needs to be included on PF Formation's website.

The PF Formation response stated "Agreed and done. The copy previously on the website was the one received from the Department of Planning - a new clearer copy has now been received and put on the website.

6.2 Assess the Environmental Performance of the Project and its Effects on the Surrounding Environment

A sand extraction project generally has the potential to affect the surrounding environment through adverse impacts on inter alia, flora and fauna, groundwater, water quality, noise, air quality, visual quality, waste generation and traffic generation. The sand extraction project has had impacts on the surrounding environment although the impacts are generally localised and contained within the project site. For example, removal of bushland and extraction of material has caused soil erosion, surface water quality and visual impacts within the boundaries of the quarry areas. The site operations use of heavy machinery also causes localised air and noise pollution. There are extensive areas of extraction, stockpiles, haul roads, tailing ponds and rehabilitation areas within the confines of the project area. Project approval and Environment Protection Licence conditions have been imposed to minimise any potential adverse impacts.

6.3 Assess Whether the Project Is Complying with the Relevant Standards, Performance Measures and Statutory Requirements

This section assesses the project for compliance with the relevant standards, performance measures and statutory requirements being the project approval conditions, project approval statement of commitments and Environment Protection Licence conditions.

6.3.1 Compliance With Project Approval Conditions

Tables 1, 2, 3 and 4 below summarise whether the project is complying with the project approval Schedules 2, 3, 4 and 5 conditions for administrative; environmental performance; additional procedures; environmental management, monitoring, reporting and auditing respectively.

Table 1 Compliance With Project Approval Administrative Conditions

Project Approval Schedule 2 Administrative Conditions	Compliance
Obligation to Minimise Harm to the Environment	
1. The Proponent shall implement all reasonable and feasible measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the project.	Yes
Terms of Approval	
2. The Proponent shall carry out the project generally in accordance with the: (a) Environmental Assessment (EA); (b) preferred project report; (c) statement of commitments; and (d) conditions of this approval. <i>Notes:</i> · <i>The layout of the project is shown in the figure in Appendix 2; and</i> · <i>The statement of commitments is included in Appendix 3.</i>	Yes, generally with some non-compliances.
3. If there is any inconsistency between the above: (a) the preferred project report shall prevail over the EA; (b) the conditions of this approval shall prevail generally, to the extent of the inconsistency.	Noted
4. The Proponent shall comply with any reasonable requirement/s of the Director-General arising from the Department's assessment of: (a) any reports, plans, programs or correspondence that are submitted in accordance with the conditions of this approval; and (b) the implementation of any actions or measures contained in these reports, plans, programs or correspondence.	Noted, only requirement to date is for a detailed report on rehabilitation and offset obligations already provided.
Existing Sand Mining Consent	
5. Subject to an agreement in accordance with condition 7 below, the Proponent may accept material extracted from Lot 2 DP 555184 and Lot 1 DP 34599 in accordance with the development consent issued by the Land and Environment Court on 14 July 1998 to be transported across the site and to the slurry plant on Lot 1 DP 570966 via the slurry pipeline and processed on Lot 198 DP 752025.	Noted
Limits on Approval	
6. Extraction and processing operations may take place until 30 November 2028. <i>Note: Under this approval, the Proponent is required to rehabilitate the site and provide offsets to the satisfaction of the Director-General. Consequently this approval will continue to apply in all other respects other than the right to conduct extraction and processing operations until the site has been rehabilitated and the offset provided to a satisfactory standard.</i>	Yes
7. The quantity of processed material produced at the site, together with material produced on Lot 2 DP 555184 and Lot 1 DP 34599 in accordance with the development consent issued by the Land and Environment Court on 14 July 1998, shall not exceed 400,000 tonnes a year. Prior to the commencement of any processing of extractive material (under the above consent) from activities on Lot 2 DP 555184 or Lot 1 DP 34599, the Proponent shall demonstrate, to the satisfaction of the Director-General, that it has reached an agreement with the owners of those Lots regarding the proportion of the extraction limit as it applies to each Lot.	Yes, no material accepted from Lot 2 DP 555184 and Lot 1 DP 34599 to date.

Project Approval Schedule 2 Administrative Conditions	Compliance
<p>8. The Proponent shall restrict total laden truck movements associated with the project to:</p> <p>(a) 200 per day, for the Proponent's combined operations at Maroota;</p> <p>(b) 20 per day, for trucks importing VENM to the site; and</p> <p>(c) 10 per day, for trucks entering/exiting the site between 6.00am and 7.00am.</p> <p><i>Note: For the avoidance of doubt, 200 is the maximum laden truck movement volume allowed on any one day, including the VENM and early morning truck movements.</i></p>	<p>Yes</p> <p>Yes</p> <p>Yes</p>
<p>9. The Proponent shall not undertake any extraction within 2 metres of the established wet weather groundwater level.</p> <p><i>Note: The wet weather groundwater level shall be established in accordance with condition 3 of Schedule 3.</i></p>	<p>Yes, maximum extraction level at April 2014 was 186 metres.</p>
<p>10. The Proponent shall not disturb any Sydney Hinterland Transition Woodland (SHTW) vegetation (as shown on the plan in Appendix 5) on site without the prior written approval of the Director-General. In seeking this approval the Proponent shall demonstrate, to the satisfaction of the Director-General, that it has established at least 3.7 hectares of SHTW on the site, to a standard that meets the criteria in Appendix 6.</p> <p><i>Note: This demonstration must include an assessment by a suitably qualified and independent ecologist.</i></p>	<p>Yes, 4.2 hectares of SHTW was established by November 2012. On 15 March 2013 the Department of Planning & Infrastructure provided written approval for clearing of SHTW.</p>
Management Plans / Monitoring Programs	
<p>11. With the approval of the Director-General, the Proponent may submit any management plan or monitoring program required by this approval on a progressive basis.</p>	<p>Yes</p>
Demolition	
<p>12. The Proponent shall ensure that all demolition work is carried out in accordance with AS 2601-2001: <i>The Demolition of Structures</i>, or its latest version.</p>	<p>Yes, no demolition to date.</p>
Protection of Public Infrastructure	
<p>13. The Proponent shall:</p> <p>(a) repair, or pay all reasonable costs associated with repairing, any public infrastructure that is damaged by the project; and</p> <p>(b) relocate, or pay all reasonable costs associated with relocating, any public infrastructure that needs to be relocated as a result of the project.</p>	<p>Yes, no public infrastructure affected to date.</p>
Operation of Plant and Equipment	
<p>14. The Proponent shall ensure that all plant and equipment used at the site is:</p> <p>(a) maintained in a proper and efficient condition; and</p> <p>(b) operated in a proper and efficient condition.</p>	<p>Yes</p>
Crown Land	
<p>15. The Proponent shall not commence any development authorised by this approval on Crown land without the prior approval of the Department of Lands.</p>	<p>Yes, no development on leased</p>

Project Approval Schedule 2 Administrative Conditions	Compliance
	Crown land (Lot 1 DP 1013943) to date.
Section 94 Contributions	
16. The Proponent shall pay a monthly contribution to the Council for the upgrade and maintenance of roads in accordance with Baulkham Hills Shire Council's section 94 plan in force at the date of this approval.	Yes

Table 2 Compliance With Project Approval Environmental Performance Conditions

Project Approval Schedule 3 Environmental Performance Conditions	Compliance
GENERAL EXTRACTION AND PROCESSING PROVISIONS	
Identification of Boundaries	
<p>1. Within 3 months of the date of this approval, or as otherwise agreed by the Director-General, the Proponent shall:</p> <p>(a) engage an independent registered surveyor to survey the boundaries of the approved limit of extraction and the approved ancillary work areas;</p> <p>(b) submit a survey plan of these boundaries to the Director-General; and</p> <p>(c) ensure that these boundaries are clearly marked at all times in a permanent manner that allows operating staff and inspecting officers to clearly identify those limits.</p> <p><i>Note: The limit of extraction and ancillary areas is shown conceptually on the layout plans in Appendix 2, as amended/clarified by the conditions below.</i></p>	Yes, revised site survey plan approved and provided in Appendix 4. Most boundaries have permanent markers.
General Limits of Extraction	
<p>2. Notwithstanding the layout plans in Appendix 2, the Proponent shall not undertake extraction within:</p> <p>(a) 30 metres of Hitchcock Road; and</p> <p>(b) 10 metres of the property boundary of Lot 2 DP 555184, unless sand extraction has commenced on that lot, and extraction in this buffer has been agreed by the Director-General.</p>	Yes Yes
Maximum Extraction Depth Map	
<p>3. The Proponent shall:</p> <p>(a) establish the wet weather groundwater level for the site based on all available (and at least 12 months) site specific groundwater monitoring data;</p> <p>(b) engage a suitably qualified and experienced expert to establish the maximum extraction depths to which extraction can be undertaken on site, to comply with condition 9 of Schedule 2;</p> <p>(c) submit a Maximum Extraction Depth Map (contour map or similar) for the project to the Director- General within 3 months of the date of this approval; and</p> <p>(d) comply with the extraction depths specified in the map, to the satisfaction of the Director-General.</p>	Yes, see revised Depth of Mining Contours and revised Water Table Contours plans (Appendices 5 and 6).
<p>4. Within 3 months of the completion of the Independent Environmental Audit (see condition 6 of Schedule 5), the Proponent shall review and update the Maximum Extraction Depth Map for the project to the satisfaction of the Director-General.</p>	Yes

Project Approval Schedule 3 Environmental Performance Conditions				Compliance																																							
NOISE																																											
Operational Noise Assessment Criteria																																											
5. The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 1 at any residence or on more than 25 per cent of any privately-owned land.				Yes, compliance with noise criteria for three closest monitoring sites to project R3 Jurd, R5 Pignataro, R10 Tomatola, plus R7 Maroota Public School (see AEMR 2012-2013).																																							
<table><tr><th rowspan="2">Noise Assessment Location</th><th>Day</th><th colspan="2">Night</th></tr><tr><th>L_{Aeq} (15 minute)</th><th>L_{Aeq} (15 minute)</th><th>L_{A1} (1 minute)</th></tr><tr><td>R1 - Hammond</td><td>41</td><td>35</td><td>45</td></tr><tr><td>R2 – Hitchcock</td><td>40</td><td>35</td><td>45</td></tr><tr><td>R5 – Pignataro</td><td>42</td><td>35</td><td>45</td></tr><tr><td>R6 – Camilleri</td><td>40</td><td>35</td><td>45</td></tr><tr><td>R7 – Maroota Public School</td><td>36_{(L_{Aeq}(1 Hour))}</td><td>N/A</td><td>N/A</td></tr><tr><td>R8 – Portelli</td><td>39</td><td>35</td><td>45</td></tr><tr><td>R9 – Young</td><td>39</td><td>35</td><td>45</td></tr><tr><td>R10 - Tomatola</td><td>39</td><td>35</td><td>45</td></tr></table>					Noise Assessment Location	Day	Night		L _{Aeq} (15 minute)	L _{Aeq} (15 minute)	L _{A1} (1 minute)	R1 - Hammond	41	35	45	R2 – Hitchcock	40	35	45	R5 – Pignataro	42	35	45	R6 – Camilleri	40	35	45	R7 – Maroota Public School	36 _{(L_{Aeq}(1 Hour))}	N/A	N/A	R8 – Portelli	39	35	45	R9 – Young	39	35	45	R10 - Tomatola	39	35	45
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Table 1: Noise Impact Assessment Criteria																																											
Notes:																																											
· To determine compliance with the L _{Aeq(15 minute)} noise limits, noise from the project is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of the dwelling where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the project is impractical, alternative means of determining compliance may be accepted (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise level where applicable.																																											
· To determine compliance with the L _{A1(1 minute)} limit, noise from the project is to be measured at 1 metre from the dwelling façade.																																											
· The noise limits apply under meteorological conditions of:																																											
- wind speed up to 3m/s at 10m above ground level;																																											
- temperature inversion conditions of up to 3 degrees C/100m and wind speed up to 2m/s at 10m above the ground;																																											
where the wind velocity and temperature gradients are determined to be relevant to the project site in accordance with the NSW Industrial Noise Policy.																																											
· The Director-General may relax the noise limits in Table 1 for any property where the Proponent has an agreement with the relevant owner/s to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.																																											
· For more information on the noise assessment locations see Appendix 4.																																											
Cumulative Noise Criteria																																											
6. The Proponent shall take all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other extractive industries does not exceed the following amenity criteria on any privately owned land, to the satisfaction of the Director-General:				Yes, see AEMR 2012-2013.																																							
· L _{Aeq(11 hour)} 50 dB(A) – Day;																																											
· L _{Aeq(4 hour)} 45 dB(A) – Evening; and																																											
· L _{Aeq(9 hour)} 40 dB(A) – Night.																																											

Project Approval Schedule 3 Environmental Performance Conditions			Compliance
Operating Hours			
7. The Proponent shall comply with the operating hours in Table 2.			Yes generally, although some employee's timesheet records had a few earlier start times at 5.30am and 5.45am to enable opening up the weighbridge so that the site could commence operations at 6am. Some transport of product before 6am.
Construction work	Monday - Friday	7.00am to 6.00pm	
	Saturday	8.00am to 1.00pm	
	Sunday and Public Holidays	None	
Quarrying and Processing, (inc. overburden removal)	Monday – Saturday	7.00am to 6.00pm	
	Sunday and Public Holidays	None	
Product Transportation	Monday – Saturday	6.00am to 6.00pm	
	Sunday and Public Holidays	None	
Maintenance	Monday – Saturday	7.00am to 6.00pm	
	Sunday and Public Holidays	None	
Table 2: Operating Hours			
Notes:			
· Product transportation prior to 7.00am is restricted as per condition 8 of Schedule 2.			
· Maintenance activities may be conducted outside the hours in Table 2 provided that the activities are not audible at any residence beyond the boundary of the site.			
· This condition does not apply to delivery of material if that delivery is required by police or other authorities for safety reasons, and/or the operation or personnel or equipment are endangered. In such circumstances, notification is to be provided to DECC and the affected residents as soon as possible, or within a reasonable period in the case of emergency.			
Noise Management Plan			
8. The Proponent shall prepare and implement a Noise Management Plan for the project to the satisfaction of the Director-General. This plan shall:			Yes, revised Noise Management Plan approved 15 November 2011.
(a) be submitted to the Director-General within 3 months of the date of this approval;			
(b) be prepared in consultation with DECC;			
(c) include details of how the noise performance of the project would be monitored, and include a noise monitoring protocol for evaluating compliance with the relevant noise limits in this approval; and			
(d) include an investigation and assessment (including modelling) of additional reasonable and feasible noise mitigation measures that would be implemented to ensure that noise emissions at all stages of the project comply with the noise impact assessment criteria in Table 1.			
Note: The EA predicted that receiver locations R5, R6, R9 and R10 would exceed the applicable noise criteria by between 2 and 5 decibels, during worst case operations.			
9. If the additional noise mitigation measures identified in condition 8(d) are not able to reduce noise levels to within 2 decibels of the impact assessment criteria in Table 1 then, upon receiving a written request from the applicable landowner, the Proponent shall implement additional noise mitigation consultation with the landowner.			Yes, not required as noise compliance achieved.
These additional mitigation measures must be reasonable and feasible.			
If within 3 months of receiving this request from the landowner, the Proponent and the landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director-General for resolution.			

Project Approval Schedule 3 Environmental Performance Conditions				Compliance									
AIR QUALITY													
Impact Assessment Criteria													
10. The Proponent shall ensure that dust generated by the project does not cause exceedances of the criteria listed in Tables 3, 4 and 5 at any residence or on more than 25 per cent of any privately owned land.				Yes, see AEMPs.									
<table><tr><th>Pollutant</th><th>Averaging period</th><th>Criterion</th></tr><tr><td>Total suspended particulate (TSP) matter</td><td>Annual</td><td>90 µg/m³</td></tr><tr><td>Particulate matter < 10 µm (PM₁₀)</td><td>Annual</td><td>30 µg/m³</td></tr></table>			Pollutant		Averaging period	Criterion	Total suspended particulate (TSP) matter	Annual	90 µg/m ³	Particulate matter < 10 µm (PM ₁₀)	Annual	30 µg/m ³	
Pollutant	Averaging period	Criterion											
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Table 3: Long Term Impact Assessment Criteria for Particulate Matter													
<table><tr><th>Pollutant</th><th>Averaging period</th><th>Criterion</th></tr><tr><td>Particulate matter < 10 µm (PM₁₀)</td><td>24 hour</td><td>50 µg/m³</td></tr></table>			Pollutant	Averaging period	Criterion	Particulate matter < 10 µm (PM ₁₀)	24 hour	50 µg/m ³					
Pollutant	Averaging period	Criterion											
Particulate matter < 10 µm (PM ₁₀)	24 hour	50 µg/m ³											
Table 4: Short Term Impact Assessment Criteria for Particulate Matter													
<table><tr><th>Pollutant</th><th>Averaging period</th><th>Maximum increase in deposited dust level</th><th>Maximum total deposited dust level</th></tr><tr><td>Deposited dust</td><td>Annual</td><td>2 g/m²/month</td><td>4 g/m²/month</td></tr></table>				Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level	Deposited dust	Annual	2 g/m ² /month	4 g/m ² /month		
Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level										
Deposited dust	Annual	2 g/m ² /month	4 g/m ² /month										
Table 5: Long Term Impact Assessment Criteria for Deposited Dust													
Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, 1991, AS 3580.10.1-1991: Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method.													
Operating Conditions													
11. The Proponent shall ensure any visible air pollution generated by the project is assessed regularly, and that quarrying operations are relocated, modified, and/or stopped as required to minimise air quality impacts on privately owned land.				Yes									
Air Quality Monitoring													
12. The Proponent shall prepare and implement an Air Quality Monitoring Program for the project to the satisfaction of the Director-General. This program shall: (a) be submitted to the Director-General for approval within 3 months of the date of this approval; (b) be prepared in consultation with DECC; (c) include details of how the air quality performance of the project would be monitored, providing for additional dust deposition monitoring in the vicinity of clusters of residences to the north and west of the site; and (d) include a protocol for evaluating compliance with the relevant air quality criteria in this approval.				Yes, revised Air Quality Monitoring Program approved 15 November 2011.									
METEOROLOGICAL MONITORING													
13. The Proponent shall ensure the project has a suitable meteorological station on the site or in the immediate vicinity that complies with the requirements in the Approved Methods for Sampling of Air Pollutants in New South Wales publication.				Yes									

Project Approval Schedule 3 Environmental Performance Conditions	Compliance
WATER	
Water Supply	
14. The Proponent shall ensure that it has sufficient water for all stages of the project, and if necessary, adjust the scale of operations to match its water supply. <i>Note: The Proponent is required to obtain necessary water licences for the project under the Water Act 1912 and/or Water Management Act 2000.</i>	Yes to date.
Discharges	
15. The Proponent shall not discharge any water from the quarry or its associated operations except in accordance with an EPL.	Yes
Water Management and Monitoring	
16. The Proponent shall prepare and implement a Water Management Plan for the project to the satisfaction of the Director-General. This plan shall: (a) be submitted to the Director-General within 3 months of the date of this approval; (b) be prepared in consultation with DWE and DECC; and (c) include a: · Site Water Balance; · Erosion and Sediment Control Plan; · Surface Water Monitoring Program; and · Groundwater Monitoring Program.	Yes, revised Water Management Plan approved 15 November 2011.
17. The Site Water Balance shall: (a) include details of: · sources and security of water supply; · water use on site; · water management on site, including the location and capacity of water storages on site and the means of access; · off-site water transfers; and · reporting procedures; and (b) investigate and describe measures to minimise water use by the project.	Yes
18. The Erosion and Sediment Control Plan shall: (a) be consistent with the requirements of <i>Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition, 2004</i> (Landcom); (b) identify activities that could cause soil erosion and generate sediment; (c) describe measures to minimise soil erosion and the potential for the transport of sediment to downstream waters; (d) describe the location, function, and capacity of erosion and sediment control structures; (e) demonstrate that the design capacity of basins intended to collect storm runoff will not be compromised by storage of operational water; and (f) describe what measures would be implemented to maintain (and if necessary decommission) the structures over time.	Yes
19. The Surface Water Monitoring Program shall include: (a) detailed baseline data on surface water flows and quality in downstream watercourses that could be affected by the project; (b) surface water quality and stream health assessment criteria, including trigger levels for investigating any potentially adverse surface water impacts; and (c) a program to monitor: · surface water flows, quality, and impacts on water users; · stream health; and · channel stability.	Yes

Project Approval Schedule 3 Environmental Performance Conditions	Compliance								
<p>20. The Groundwater Monitoring Program shall include:</p> <p>(a) provision of additional monitoring bores around the periphery of the site;</p> <p>(b) detailed baseline data on groundwater levels, flows and quality in the region, and particularly any groundwater bores, springs and seeps (including spring and seep fed dams) that may be affected by operations on site;</p> <p>(c) groundwater assessment criteria, including trigger levels for investigating any potentially adverse groundwater impacts;</p> <p>(d) a program to monitor:</p> <ul style="list-style-type: none"> · groundwater levels and quality in new and existing monitoring bores; · the impacts of the project on: <ul style="list-style-type: none"> - any groundwater bores, springs and seeps (including spring and seep fed farm dams) on privately-owned land; and - any groundwater dependent ecosystems; and <p>(e) a protocol for further groundwater modelling to confirm the limits to excavation depth across the site permitted in accordance with condition 9 of Schedule 2.</p>	Yes								
LANDSCAPE MANAGEMENT									
Rehabilitation									
<p>21. The Proponent shall progressively rehabilitate the site to the satisfaction of the Director-General, in a manner that is generally consistent with the concept final landform (Strategy A or Strategy B) in the preferred project report (as reproduced in Appendix 7).</p>	Yes, see Figure 2.								
Offset Strategy									
<p>22. The Proponent shall implement the Offset Strategy described in the preferred project report, and summarised in Table 6 (shown conceptually on the plan in Appendix 5), to the satisfaction of the Director-General.</p> <table border="1"> <thead> <tr> <th>Area</th><th>Minimum Size (hectares)</th></tr> </thead> <tbody> <tr> <td>On-Site Revegetation Area (SHTW)</td><td>7.9</td></tr> <tr> <td>On-Site Revegetation Area (Other Woodland)</td><td>4.1</td></tr> <tr> <td>Total</td><td>12</td></tr> </tbody> </table> <p><i>Table 6: Offset Strategy</i></p>	Area	Minimum Size (hectares)	On-Site Revegetation Area (SHTW)	7.9	On-Site Revegetation Area (Other Woodland)	4.1	Total	12	Yes, revegetation (other woodland) areas in progress. 4.2 hectares of SHTW established by November 2012.
Area	Minimum Size (hectares)								
On-Site Revegetation Area (SHTW)	7.9								
On-Site Revegetation Area (Other Woodland)	4.1								
Total	12								
<p>23. Within 3 years of the date of this approval, the Proponent shall make suitable arrangements to provide appropriate long term security for the offset areas to the satisfaction of the Director-General.</p> <p><i>Note: The Department acknowledges that the arrangements may provide for staged or delayed implementation, in accordance with the extraction in these areas.</i></p>	Yes								
Landscape Management Plan									
<p>24. The Proponent shall prepare and implement a Landscape Management Plan for the project to the satisfaction of the Director-General. This plan must:</p> <p>(a) be prepared in consultation with DECC by suitably qualified expert/s whose appointment/s have been approved by the Director-General;</p> <p>(b) be submitted to the Director-General for approval within 6 months of the date of this approval; and</p> <p>(c) include a:</p> <ul style="list-style-type: none"> · Rehabilitation and Offset Management Plan; and · Quarry Closure Plan. 	Yes, revised Landscape Management Plan approved 15 November 2011.								

Project Approval Schedule 3 Environmental Performance Conditions	Compliance
Rehabilitation and Offset Management Plan	
<p>25. The Rehabilitation and Offset Management Plan must include:</p> <p>(a) the rehabilitation objectives for the site, vegetation offsets and landscaping;</p> <p>(b) a description of the short, medium, and long term measures that would be implemented to:</p> <ul style="list-style-type: none"> · rehabilitate the site; · implement the Offset Strategy; and · maintain and enhance existing site vegetation outside the disturbance area; <p>(c) detailed performance and completion criteria for the site rehabilitation and implementation of the Offset Strategy;</p> <p>(d) a detailed description of the measures that would be implemented over the next 3 years, including the procedures to be implemented for:</p> <ul style="list-style-type: none"> · progressively rehabilitating disturbed areas; · implementing vegetation offsets; · protecting vegetation and soil outside the disturbance areas; · rehabilitating creeks and drainage lines on the site to ensure no net loss of stream length and aquatic habitat; · undertaking pre-clearance surveys; · managing impacts on fauna; · landscaping the site to minimise visual impacts; · conserving and reusing topsoil; · collecting and propagating seed for rehabilitation works; · salvaging and reusing material from the site for habitat enhancement; · controlling weeds and feral pests; · controlling access; and · bushfire management; <p>(e) a program to monitor the effectiveness of these measures, and progress against the performance and completion criteria;</p> <p>(f) a description of the potential risks to successful rehabilitation and/or revegetation, and a description of the contingency measures that would be implemented to mitigate these risks; and</p> <p>(g) details of who would be responsible for monitoring, reviewing, and implementing the plan.</p>	Yes
Quarry Closure Plan	
<p>26. The Quarry Closure Plan must:</p> <p>(a) include provision for certification from a qualified geotechnical engineer that the final proposed landform is stable;</p> <p>(b) define the objectives and criteria for closure of the quarry;</p> <p>(c) investigate options for the future use of the site, including any final void;</p> <p>(d) describe the measures that would be implemented to minimise or manage the ongoing (post closure) environmental effects of the project; and</p> <p>(e) describe how the performance of these measures would be monitored over time.</p>	Noted

Project Approval Schedule 3 Environmental Performance Conditions	Compliance
Rehabilitation and Offset Bond	
<p>27. Within 3 months of the approval of the Landscape Management Plan, the Proponent shall lodge a rehabilitation and offset bond for the project with the Director-General. The sum of the bond shall be calculated at:</p> <p>(a) \$2.50/m² for the area of disturbance in each 3 year review period, including the offset areas; and</p> <p>(b) \$1.00/m² for the total area of land previously disturbed by the quarry, or as otherwise directed by the Director-General.</p> <p><i>Notes:</i></p> <ul style="list-style-type: none"> · <i>If the rehabilitation and offsets are completed to the satisfaction of the Director-General, the Director-General will release the bond.</i> · <i>If the rehabilitation and/or offsets are not completed to the satisfaction of the Director-General, the Director-General will call in all or part of the bond, and arrange for the satisfactory completion of the relevant works.</i> 	<p>Yes, bond lodged November 2010. On 26 September 2011 PF Formation confirmed to the Department of Planning & Infrastructure that no revision of the rehabilitation and offset bond was required.</p>
ABORIGINAL HERITAGE	
<p>28. Should the Proponent discover material suspected of being Aboriginal relics or skeletal remains, work in that area shall cease and the Proponent shall advise DECC and proceed in accordance with DECC instructions.</p>	<p>Yes, no Aboriginal relics or skeletal remains found to date.</p>
TRAFFIC AND TRANSPORT	
Materials Transport	
<p>29. The Proponent shall transport all excavated material between the extraction site and processing plant site, including processing residues, via slurry pipelines.</p> <p><i>Note: When the slurry system is unusable by reason of breakdown or essential maintenance, extractive material may be transported by truck during the period of such breakdown or maintenance. The Proponent shall ensure that such periods are as brief as possible and shall advise the Council each day that truck transport is to be used.</i></p>	<p>Yes</p>
Haulage Records	
<p>30. The Proponent shall record and maintain a log of the extraction quantities and traffic movement in and out of the site, available for inspection at the request of the Director-General or the Council.</p>	<p>Yes</p>
Road Haulage	
<p>31. The Proponent shall ensure that:</p> <p>(a) all loaded vehicles entering or leaving the site are covered; and</p> <p>(b) all loaded vehicles leaving the site are cleaned of materials that may fall on the road, before they leave the site.</p>	<p>Yes</p>
VISUAL	
Visual Amenity	
<p>32. The Proponent shall minimise the visual impacts of the project to the satisfaction of the Director-General.</p>	<p>Yes</p>

Project Approval Schedule 3 Environmental Performance Conditions	Compliance
Lighting Emissions	
33. The Proponent shall: (a) take all practicable measures to mitigate off-site lighting impacts from the project; and (b) ensure that all external lighting associated with the project complies with <i>Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting</i> , to the satisfaction of the Director-General.	Yes
Advertising	
34. The Proponent shall not erect or display any advertising structure(s) or signs on the site without the written approval of the Director-General. <i>Note: This does not include traffic management and safety or environmental signs.</i>	Yes, new replacement advertising sign on Wisemans Ferry Road installed March 2014.
WASTE MANAGEMENT	
Waste Minimisation	
35. The Proponent shall: (a) only import VENM to the site; and (b) minimise the amount of waste generated by the project to the satisfaction of the Director-General.	Yes
EMERGENCY AND HAZARDS MANAGEMENT	
Dangerous Goods	
36. The Proponent shall ensure that the storage, handling, and transport of dangerous goods are conducted in accordance with the relevant Australian Standards, particularly AS1940 and AS1596, and the <i>Dangerous Goods Code</i> .	Yes, no dangerous goods on site.
Safety	
37. The Proponent shall secure the project to ensure public safety to the satisfaction of the Director-General.	Yes
Bushfire Management	
38. The Proponent shall: (a) ensure that the project is suitably equipped to respond to any fires on-site; and (b) assist the Rural Fire Service and emergency services as much as possible if there is a fire on site.	Yes, site has a 10,000 litre tanker and a 30,000 litre water truck plus fire extinguishers in vehicles and workshop.
PRODUCTION DATA	
39. The Proponent shall: (a) provide annual production data to the DPI using the standard form for that purpose; and (b) include a copy of this data in the AEMR.	Yes No

Table 3 Compliance With Project Approval Additional Procedures Conditions

Project Approval Schedule 4 Additional Procedures Conditions	Compliance
NOTIFICATION OF LANDOWNERS	
<p>1. If the results of monitoring required in Schedule 3 identify that impacts generated by the project are greater than the relevant impact assessment criteria, then the Proponent shall notify the Director- General and the affected landowners and/or existing or future tenants accordingly, and provide quarterly monitoring results to each of these parties until the results show that the project is complying with the relevant criteria.</p>	<p>Yes, no notifications required to date.</p>
INDEPENDENT REVIEW	
<p>2. If a landowner of privately owned land considers that the operations of the quarry are exceeding the impact assessment criteria in Schedule 3, then he/she may ask the Proponent in writing for an independent review of the impacts of the project on his/her land.</p> <p>If the Director-General is satisfied that an independent review is warranted, the Proponent shall within 3 months of the Director-General advising that an independent review is warranted:</p> <p>(a) consult with the landowner to determine his/her concerns;</p> <p>(b) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Director-General, to conduct monitoring on the land, to determine whether the project is complying with the relevant criteria in Schedule 3, and identify the source(s) and scale of any impact on the land, and the project's contribution to this impact; and</p> <p>(c) give the Director-General and landowner a copy of the independent review.</p>	<p>Yes, no independent reviews required to date.</p>
<p>3. If the independent review determines that the quarrying operations are complying with the relevant criteria in Schedule 3, then the Proponent may discontinue the independent review with the approval of the Director-General.</p>	<p>Noted</p>
<p>4. If the independent review determines that the quarrying operations are not complying with the relevant criteria in Schedule 3, and that the quarry is primarily responsible for this non-compliance, then the Proponent shall:</p> <p>(a) implement all reasonable and feasible measures, in consultation with the landowner, to ensure that the project complies with the relevant criteria; and</p> <p>(b) conduct further monitoring to determine whether these measures ensure compliance; or</p> <p>(c) secure a written agreement with the landowner to allow exceedances of the relevant criteria in Schedule 3, to the satisfaction of the Director-General.</p> <p>If the additional monitoring referred to above subsequently determines that the quarrying operations are complying with the relevant criteria in Schedule 3, then the Proponent may discontinue the independent review with the approval of the Director-General.</p> <p>If the Proponent is unable to finalise an agreement with the landowner, then the Proponent or landowner may refer the matter to the Director-General for resolution.</p> <p>If the matter cannot be resolved within 21 days, the Director-General shall refer the matter to an Independent Dispute Resolution Process (see Appendix 8).</p>	<p>Noted</p>
<p>5. If the landowner disputes the results of the independent review, either the Proponent or the landowner may refer the matter to the Director-General for resolution.</p> <p>If the matter cannot be resolved within 21 days, the Director-General shall refer the matter to an Independent Dispute Resolution Process (see Appendix 8).</p>	<p>Noted</p>

Table 4 Compliance With Project Approval Environmental Management, Monitoring, Reporting and Auditing Conditions

Project Approval Schedule 5 Environmental Management, Monitoring, Reporting and Auditing Conditions	Compliance
ENVIRONMENTAL MANAGEMENT STRATEGY	
<p>1. The Proponent shall prepare and implement an Environmental Management Strategy for the project to the satisfaction of the Director-General. This strategy shall be submitted to the Director-General within 3 months of the date of this approval, and;</p> <p>(a) provide the strategic context for environmental management of the project;</p> <p>(b) identify the statutory requirements that apply to the project;</p> <p>(c) describe in general how the environmental performance of the project would be monitored and managed;</p> <p>(d) describe the procedures that would be implemented to:</p> <ul style="list-style-type: none"> · keep the local community and relevant agencies informed about the construction, operation and environmental performance of the project; · receive, handle, respond to, and record complaints; · resolve any disputes that may arise during the life of the project; · respond to any non-compliance; · manage cumulative impacts; and · respond to emergencies; and <p>(e) describe the role, responsibility, authority, and accountability of the key personnel involved in the environmental management of the project.</p>	Yes, revised Environmental Strategy approved 15 November 2011.
ENVIRONMENTAL MONITORING PROGRAM	
<p>2. The Proponent shall prepare an Environmental Monitoring Program for the project to the satisfaction of the Director-General. This program shall be submitted to the Director-General concurrently with the submission of the various monitoring programs and consolidate the various monitoring requirements in Schedule 3 of this approval into a single document.</p>	Yes, Environmental Monitoring Program within revised Environmental Strategy approved 15 November 2011.
REPORTING	
Incident Reporting	
<p>3. Within 24 hours of detecting an exceedance of the limits/performance criteria in this approval or the occurrence of an incident that causes (or may cause) harm to the environment, the Proponent shall notify the Department and other relevant agencies of the exceedance/incident.</p>	Yes, no exceedances or incidents reported to date.
<p>4. Within 6 days of notifying the Department and other relevant agencies of an exceedance/incident, the Proponent shall provide the Department and these agencies with a written report that:</p> <p>(a) describes the date, time, and nature of the exceedance/incident;</p> <p>(b) identifies the cause (or likely cause) of the exceedance/incident;</p> <p>(c) describes what action has been taken to date; and</p> <p>(d) describes the proposed measures to address the exceedance/incident.</p>	Yes, no exceedances or incidents reported to date.
Annual Reporting	
<p>5. Within 12 months of the date of this approval, and annually thereafter, the Proponent shall submit an AEMR to the Director-General, relevant agencies and</p>	Yes,

Project Approval Schedule 5 Environmental Management, Monitoring, Reporting and Auditing Conditions	Compliance
<p>CCC. This report shall:</p> <ul style="list-style-type: none"> (a) identify the standards and performance measures that apply to the project; (b) describe the works that will be carried out in the next 12 months; (c) include a summary of the complaints received during the past year, and compare this to the complaints received in previous years; (d) include a summary of the monitoring results for the project during the past year; (e) include an analysis of these monitoring results against the relevant: <ul style="list-style-type: none"> · impact assessment criteria/limits; · monitoring results from previous years; and · predictions in the EA; (f) identify any trends in the monitoring results over the life of the project; (g) identify any non-compliance during the previous year; and (h) describe what actions were, or are being, taken to ensure compliance. 	<p>2008-2009, 2009-2010, 2010-2011, 2011-2012 and 2012-2013 AEMRs submitted to date.</p>
INDEPENDENT ENVIRONMENTAL AUDIT	
<p>6. Within 12 months of the date of this approval, and every 3 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. This audit shall:</p> <ul style="list-style-type: none"> (a) be conducted by a suitably qualified, experienced, and independent person(s) whose appointment has been approved by the Director-General; (b) include consultation with the relevant agencies; (c) assess the environmental performance of the project, and its effects on the surrounding environment; (d) assess whether the project is complying with the relevant standards, performance measures and statutory requirements; and (e) review the adequacy of any strategy/plan/program required under this approval, and, if necessary, recommend measures or actions to improve the environmental performance of the project, and/or any strategy/plan/program required under this approval. <p><i>Note: The person(s) conducting the audit should have expertise in flora and fauna assessment, hydrogeology and quarry rehabilitation.</i></p>	<p>Yes, but delayed approval of auditor in July 2010. First audit dated April 2011.</p>
<p>7. Within 6 weeks of completion of each Independent Environmental Audit, the Proponent shall submit a copy of the audit report to the Director-General, with a response to any of the recommendations in the audit report.</p>	<p>Yes, audit response forwarded to the Director-General on 14 June 2011.</p>
<p>8. Within 3 months of submitting a copy of the audit report to the Director-General, the Proponent shall review and if necessary revise:</p> <ul style="list-style-type: none"> (a) each of the environmental management and monitoring strategies/plans/programs in Schedules 3 and 5; and (b) the sum of the Vegetation Offset Bond (see Schedule 3). This review shall consider: <ul style="list-style-type: none"> · the effects of inflation; · any changes to the total area of disturbance; and · the performance of the vegetation offsets against the completion criteria of the Rehabilitation and Vegetation Offset Management Plan, to the satisfaction of the Director-General. 	<p>Yes, PF Formation advised the Director-General on 14 September 2011 of changes to the plans and no revision of vegetation offset bond is required.</p>

Project Approval Schedule 5 Environmental Management, Monitoring, Reporting and Auditing Conditions	Compliance
COMMUNITY CONSULTATIVE COMMITTEE	
<p>9. The Proponent shall establish a Community Consultative Committee (CCC) for the project to the satisfaction of the Director-General, in general accordance with the Department's <i>Guideline for Establishing and Operating Community Consultative Committees for Mining Projects</i>.</p> <p><i>Note: The Proponent may continue the operation of the Liaison and Review Committee established under condition 6.7 of the development consent issued by the Land and Environment Court on 14 July 1998 to fulfil this condition.</i></p>	Yes
ACCESS TO INFORMATION	
<p>10. Within 1 month of the approval of any plan/strategy/program required under this approval (or any subsequent revision of these plans/strategies/programs), or the completion of the audits or AEMR required under this approval, the Proponent shall:</p> <p>(a) provide a copy of the relevant document/s to the relevant agencies and to members of the general public upon request; and</p> <p>(b) ensure that a copy of the relevant document/s is made publicly available on its website and at the Proponent's office.</p>	Yes
<p>11. During the project, the Proponent shall:</p> <p>(a) make a summary of monitoring results required under this approval publicly available on its website and at the site office; and</p> <p>(b) update these results on a regular basis.</p>	Yes, AEMRs also provide the results.

6.3.2 Compliance With Project Approval Statement of Commitments

Table 5 summarises whether the statement of commitments listed in the project approval are being complied with. Most of the "Yes" compliances relied on observations during the audit site inspections and the review of the environmental reference documents rather than extensive and time consuming checking of all the background paperwork. In particular the Environmental Manager's monthly checklists and annual environmental operations procedures checklists in the AEMRs provide for self-assessment and whether compliance is achieved.

Table 5 Compliance With Project Approval Statement of Commitments

Project Approval Statement of Commitments	Compliance
Noise and Vibration	
· Site activities will be managed so that any necessary high noise and vibration levels occur at times of least impact.	Yes
· All site activities will be undertaken incorporating noise attenuation measures such as restricting working hours for certain works required in the proximity of sensitive receptors.	Yes
· All equipment used on site will be certified in relation to noise performance.	Yes
· Panels and covers of silenced plant will be kept shut and plant and equipment switched off when not in use.	Yes
· All mechanical equipment will be silenced by the best practical means using current technology, prior to use. Noise suppression devices will be fitted according to manufacturer's instructions. Noise control kits will be fitted to noisy mobile equipment and shrouds provided around stationary equipment where necessary.	Yes
· All plant and equipment will be inspected regularly to ensure that it is well maintained to minimise noise emissions.	Yes

Project Approval Statement of Commitments	Compliance
· The L ₁₀ noise level at the boundary of adjacent receivers where baseline data has been obtained will not normally exceed the background level by more than 5 dB(A).	Yes
· Compliance monitoring of noise levels will be undertaken and appropriate records of measurements kept.	Yes
· The local community will be informed of the level and duration of noise to be expected during specific activities and phases of development when necessary. Communication of concerns to the Environmental Manager will be invited.	Yes
Air Quality and Greenhouse Gas Emissions	
· Ambient air quality monitoring will be conducted at identified sites.	Yes
· Dust suppression equipment will be fitted to all processing plant on the site. This will be regularly inspected and maintained in good working order at all times.	Yes
· Trafficable areas will be defined to prevent unnecessary vehicle movement into other parts of the site.	Yes
· All unsealed trafficable areas and working areas will be kept damp by spraying regularly with a water cart, water sprays or sprinklers to minimise dust emissions. Frequency of spraying to be determined based on weather conditions, soil erodibility and the observation of any visible dust.	Yes, water carts used.
· Speed controls will be applied to all unsealed areas (maximum speed of 20 km/h) and signposted accordingly.	No, maximum 20km/hour speed sign needs to be installed at site entrance.
· All semi-permanent stockpiles will be vegetated with suitable groundcover and regularly watered until the vegetation is well established.	Yes, not required to date.
· Work on any extraction activity producing dust will cease due to high winds if control cannot be achieved by watering or other means. Work will not resume until the wind velocity decreases and any dust generation can be controlled by normal means.	Yes, not required to date.
· All loaded trucks leaving the central processing plant on Lot 198 DP 752025 will have their payloads fully covered by a suitable material to prevent spillage.	Yes
· No fires will be permitted on-site without a permit.	Yes
· A mechanical road sweeping unit and water cart will be maintained for use as required to keep all roads including the intersection of the haul road and Wisemans Ferry Road free from deposited material.	Yes, but one complaint received.
· Exhausts from all vehicles and plant/equipment will be inspected to ensure that they are maintained at an acceptable level.	Yes
· All vehicles will be regularly serviced to ensure that exhaust emissions comply with the regulations. Appropriate service records will be maintained.	Yes
· Any opportunities to minimise machinery use and ensure that all equipment used on the site is energy efficient will be identified.	Yes
Access and Traffic	
· If the sand slurry plant and transport system is unusable due to breakdown or during maintenance periods, trucks will be used for the transport of extractive material on a temporary basis. This will cease once the system is operating satisfactorily.	Yes, not required to date.

Project Approval Statement of Commitments	Compliance
· The number of laden vehicle movements will not exceed a combined total of two hundred per day via the intersection of the haulage road and Wisemans Ferry Road. This is the total of laden vehicle movements allowed for PF Formation's combined extractive industry operations in Baulkham Hills Shire.	Yes
· Operations involving the transportation of material on the site will only be undertaken between 07.00 and 18.00 hours, Monday to Saturday, except a maximum of 10 laden vehicles will be allowed to enter and leave the site between 06.00 and 07.00 hours, Monday to Saturday only. Vehicles will not be allowed to arrive at the site prior to 05.45 hours on any day.	Partial, some trucks just before 6am and more than 10 trucks before 7am.
Erosion and Sediment Control	
· Soil and Water Management Plan will be reviewed and revised, if required.	Noted
· Temporary erosion and sedimentation control structures such as detention basins and catch drains will be constructed as appropriate to collect runoff from cleared land including extraction areas and access roads.	Yes
· Silt traps and erosion control fencing will be erected as appropriate along extraction area boundaries and drainage lines.	Yes
· Sediment basins with a minimum storage capacity of 400 m ³ per hectare of catchment will be constructed. Spillway capacity and stability will be designed as follows: - life of less than 5 years, adopt the 20 year time of concentration event; - life between 5 and 10 years, adopt the 50 year time of concentration event; and - life greater than 10 years, adopt the 100 year time of concentration event.	Noted
· Stormwater control measures will be assessed and routine inspections conducted to ensure that compliance with best practice guidelines and relevant legislation is achieved.	Yes
· Locations for topsoil and material stockpiles will be selected on level ground and away from drainage lines. Diversion drains and sediment filter fences will be installed up slope as appropriate.	Yes
· Training will be provided to operational personnel on the importance of erosion control measures and drivers informed of the damage that can be caused to the environment by heavy vehicles.	Yes
· Areas of exposed land will be kept to a minimum compatible with operational requirements.	Yes
· Exposed areas not in use will be stabilized with an appropriate cover crop and watered until well established.	Noted
· Erosion and sediment controls will be monitored regularly and immediately following a rainfall event. Monitoring will take place initially on a weekly basis, then monthly once operating correctly. Sediment will be cleared when the traps have collected 60% of the capacity of the basin or where sediment build-up is less than 300 mm below the spillway crest. Sediment will be removed to a location where further pollution to downslope lands and waterways will not occur.	Yes
· Maintenance of erosion and sediment controls will be undertaken when any deterioration is identified or when replacement is necessary.	Yes
· Stored stormwater will be reused for dust control and the watering of site vegetation.	Yes
· Soil stockpiles will be seeded where these are to remain unused for a period in excess of four weeks. The area will be watered until the vegetation is well established.	Noted

Project Approval Statement of Commitments	Compliance
Water Management	
<ul style="list-style-type: none"> Maximum depth of extraction will be restricted to not less than two metres above the wet weather high groundwater level (nominally 181 m AHD). 	<p>Yes, maximum depth of extraction at April 2014 was 186m AHD.</p>
<ul style="list-style-type: none"> The groundwater will not be breached or contaminated. In the event that either should occur, operations will cease in the affected area and the Department of Environment and Climate Change consulted to determine the basis on which extraction may recommence. 	<p>Yes, no breaches or contamination to date.</p>
<ul style="list-style-type: none"> Retention basins will be designed to accommodate the 100-year time of concentration event. The minimum basin capacities are: <ul style="list-style-type: none"> Northern catchment 10,000 m³ Southern catchment 38,000 m³ <p>The volume of these basins can be varied depending on the extent of the area exposed for extraction within each catchment.</p>	<p>Noted, although revised and endorsed Environmental Strategy nominates 7,800 m³ northern catchment and 19,400 m³ southern catchment.</p>
<ul style="list-style-type: none"> All retention basins will be regularly inspected and an annual report prepared on their effectiveness. 	<p>No, annual reports not prepared to date.</p>
<ul style="list-style-type: none"> A minimum of two groundwater monitoring bores will be installed. One will be located within or near the extraction area and another at some location within the site beyond the area of any direct extraction influence. The location of these bores will meet the requirements of the Department of Environment and Conservation and Baulkham Hills Shire Council. 	<p>Yes</p>
Flora and Fauna	
<ul style="list-style-type: none"> All areas which are not to be disturbed will be clearly marked. 	<p>No, all buffer areas need to be clearly marked.</p>
<ul style="list-style-type: none"> Topsoil will be separated and stored or use in rehabilitation works. 	<p>Yes</p>
<ul style="list-style-type: none"> An area of not less than 12 hectares will be identified, and indicated on the site survey. This will be identified as a revegetation area and access controlled. 	<p>Yes, shown in revised site survey.</p>
<ul style="list-style-type: none"> Seed will be collected from the existing woodland communities (Sydney Hinterland Transition Woodland), stored under controlled conditions, made available for future broadcasting and a suitable proportion propagated to provide tube stock for revegetation. 	<p>Yes</p>
<ul style="list-style-type: none"> Stored topsoil and that derived from suitable areas adjacent to the woodland communities will be spread over the defined revegetation area and seed broadcast over the site to augment the soil-borne native seed bank. Tube stock suitably protected against animal predation will also be used in appropriate locations. 	<p>Noted, topsoil is stockpiled on-site.</p>

Project Approval Statement of Commitments	Compliance
· Access to bushland will be restricted to minimise the potential for damage. These areas will be marked and signs erected to ensure that this prohibition is made clear. The boundary of the site will be fenced to prevent external access.	Yes
Rehabilitation	
· The Rehabilitation Plan will be reviewed and amended as necessary to reflect changing operational conditions. This will include a revised phasing plan and implementation programme.	Noted, not required to date.
· Setbacks to all roads and adjacent properties will be defined taking account of existing trees and other features. Programmes of mound construction and screen planting will be undertaken as required in the Rehabilitation Plan. All plant material used will reflect the species mix existing in the area.	Noted, not required to date.
· A staged seeding and planting programme will be undertaken as areas become available following completion of extraction and capping of sediment basins. This will be aimed at producing a dense plantation on the steeper slopes derived from the flora resources already established. The aim is to replicate as far as possible the mix and density of planting which is currently present.	Noted, not required to date.
· All suitable plant material will be used on the site as a seed and planting medium. Topsoil will be stored in appropriately marked low stockpiles for reuse in locations as close as possible to their source. Care will be taken to ensure that this does not become contaminated with the seeds of exotic species and weeds.	Yes
· The site will be rehabilitated in stages leaving areas exposed for as short a time as possible. This will be undertaken in conformity with the approved Rehabilitation Plan with maximum final batter grades of 4(H):1(V) on north and west facing slopes and 3(H):1(V) on those facing south and east. Final slopes will be as gentle as possible depending on the availability of fill material.	Noted, not required to date.
· All soil stockpiles and exposed areas will be seeded with an appropriate vegetation cover where no activity is to take place for more than four weeks.	Noted, not required to date.
· Revegetation of the site will be undertaken on the following basis: - as far as possible re-establish the Sydney Hinterland Transitional Woodland using seed and mulch collected from the area; - rehabilitate other areas to native species with a light sowing of cereal and allowing natural regeneration; - rehabilitate the soil to achieve a full profile; - lime, fertilise and sow areas where improved grass cover is required; and - suitably turf surfaces expected to experience high surface flows leaving the site.	Yes, generally not required to date except for SHTW rehabilitation area.
· A maintenance programme aimed at promoting and protecting the growth of the rehabilitated areas will be established.	Yes
Social Impact Management	
· Material concerning activities at the site will be prepared and published on the company's website which will allow the community and others to be informed about current news on the site.	Yes
· Regular bi-annual meetings of community representatives will be established to discuss issues in relation to sand extraction on the site.	Yes
· A Complaints Register will be established incorporating date and time, type of communication, contact details of the complainant, nature of the complaint and response taken.	Yes

Project Approval Statement of Commitments	Compliance
Heritage	
· All work will cease in the area if an archaeological or heritage item is identified during extraction operations and the National Parks and Wildlife Service, the Deerubbin Aboriginal Land Council or the Heritage Office consulted to determine any appropriate course of action prior to recommencement of the work.	Noted, no items identified to date.
· Any additional survey work required for submittal of application to destroy artefact scatters located in the later stages of the development will be undertaken. Reasonable requirements of the National Parks and Wildlife Service (DECC), the Deerubbin Aboriginal Land Council and the Heritage Office arising out of any additional studies will be implemented.	Noted, not required to date.
Visual Amenity	
· Peripheral bunds will be constructed within the established setbacks where necessary to screen extraction activities. These will be a minimum of three metres high with slopes ranging from 3(H):1(V) to 6(H):1(V) depending on the location using overburden stripped from the site.	Yes, except a complete vegetated bund needs to be established along the Hitchcock Road boundary.
· Screen planting works will be undertaken in the peripheral areas to an agreed specification using mulch to allow for native plant regeneration. This species mix will be reinforced using appropriate plantings at specified intervals.	Yes
· A tree planting programme will be undertaken within the ten metre buffer zones and in other defined parts of the site to establish a dense plantation using an appropriate mix of species reflecting that of the existing community.	Yes, generally not required to date except for a portion of The Northern Road frontage.
· The final rehabilitated landform will be established in conformity with the Rehabilitation Plan.	Noted, not required to date.
· All temporary fencing will be removed when no longer required.	Noted, not required to date.
· Vegetation in areas suitable for agricultural/horticultural uses will be re-established.	Noted, not required to date.
· All site infrastructure including the slurry plant and its associated pipelines will be removed. Those areas affected by the plant will be restored and rehabilitated.	Noted, not required to date.
· All waste materials will be removed and disposed of in an appropriate manner.	Noted, not required to date.
· The final Rehabilitation Plan will be reviewed and proposals for future use of the site prepared.	Noted, not required to date.
Waste Management	
· Waste handling areas will be clearly delineated.	Yes

Project Approval Statement of Commitments	Compliance
· Specific areas for the collection of materials for reuse and recycling will be defined and clearly labelled.	Yes
· Cleared vegetation will be used within the landscape programme.	Yes
· All topsoil will be stored in stockpiles for later use in site rehabilitation.	Yes
· Bins or skips will be provided for the collection and storage of recyclable material and waste. General construction waste will be stored in a skip located at the workshop on Lot 198 DP752025. Waste food will be removed and stored in a vermin proof bin for collection by a waste contractor. Paper waste generated from site offices, plastics and glass will be collected separately for recycling.	Yes
· Hazardous wastes (including empty drums, rags, soil contaminated with oil) will be separated from nonhazardous wastes and managed in accordance with the relevant legislation.	Yes
· Liquid wastes (chemicals, oils and greases) will be temporarily stored in an appropriately bunded area and disposed of via a licensed contractor. Wash down water will be directed to an appropriate settlement basin if quality is acceptable.	Yes
· Copies of current licences of all waste removal contractors on site will be retained.	Yes
· All documentation relating to waste removal and disposal will be retained on file at the site. This documentation will include dockets for the removal and disposal of waste at a licensed facility.	Yes
· Waste material will be progressively separated and stockpiled in designated areas for collection. Adequately secure waste disposal areas to prevent access by wildlife.	Yes
· All waste licences will be reviewed and terms and conditions for compliance monitored.	Yes
· Any materials and waste remaining on the site following completion of extraction operations will be recycled or sent for disposal. This will be either recycled or disposed of in an appropriate manner.	Noted, not required to date.
Emergency Response	
· All personnel on site during operations will be trained in appropriate procedures including site induction, materials handling and response procedures.	Yes
· Emergency response procedures will be developed and put in place. Appropriate individuals will be appointed as emergency services liaison officers.	Yes
· An emergency response table listing contact details of all relevant parties required in an environmental emergency will be prepared.	Yes, but needs revision.
· A Register of Environmentally Hazardous Materials to be stored and used on site will be established.	Yes, but needs revision.
· Appropriate safety and spill response equipment will be made available on site.	Yes
· All materials to be used and stored on site will be clearly labelled.	Yes
· Emergency response procedures will be reviewed and updated bi-annually.	Yes
· Appropriate safety and response equipment will be available at all times.	Yes
Hazard, Risk and Safety	
· A licence to keep dangerous goods will be obtained from WorkCover NSW for	Noted, not

Project Approval Statement of Commitments	Compliance
all materials stored on site which require licensing.	required.
· A Register of Hazardous Materials setting out details of quantities, storage and specific handling requirements for all relevant materials stored on site will be established.	Yes, but needs revision.
· Material Safety Data Sheets for all hazardous materials stored on site will be obtained.	Yes
· Appropriate storage and secondary containment facilities for all hazardous materials stored on site will be provided. All bunded areas will be designed to contain at least 110% of the volume of materials stored within the area.	Yes.
· A Safety Officer will be appointed for the development.	Yes
· All flammable material storage areas will be located at least ten metres from possible ignition sources.	Yes
· Contents of all above ground storage areas will be clearly labelled.	Yes
· All hazardous and dangerous goods storage areas will be secured and appropriate signage displayed. All incompatible material will be segregated.	Yes
· All personnel will be trained in the handling and safety procedures required for the hazardous materials stored and used on site.	Yes
· An Emergency Response Plan will be developed and put in place.	Yes, an EPA approved pollution incident response management plan is in place but needs revising.
· A mobile spill control kit containing appropriate absorbent materials, neutralising chemicals and other spill containment equipment will be provided.	Yes
· Personal protective equipment will be provided and personnel instructed in its use.	Yes
· Any spills beyond the bunded area will be cleaned up immediately and the contaminated material disposed of in an appropriate manner.	Yes
· The relevant authorities will be contacted in the event of a leak or spill and any instructions followed. Any contamination will be remediated to the satisfaction of the regulatory authorities.	Noted, not required to date.
· Any spills or hazardous wastes that cannot be recycled will be collected and disposal by a licensed waste contractor arranged. All records of waste removal on site will be retained.	Yes

6.3.3 Compliance With Environment Protection Licence Conditions

Table 6 summarises whether the Environment Protection Licence number 3407 conditions are being complied with. The licence covers all PF Formation operations within The Hills Shire and includes lands in addition to the Hitchcock Road Sand Project. It is noted that the requirement for Tapering Element Oscillating Microbalance air quality monitoring near Maroota Public School and referenced in the Air Quality Monitoring Program was deleted from the Environment Protection Licence conditions. In February 2011 the licence was also varied by deleting the condition that a traffic noise management strategy be developed and implemented. The next review date for the Environment Protection Licence is 5 May 2016.

Table 6 Compliance With Environment Protection Licence Conditions

Compliance With Environment Protection Licence Conditions				Compliance
Administrative conditions				
This licence authorises the carrying out of the scheduled activities listed below at the premises specified (Etra Pty Ltd, Wisemans Ferry Road, Maroota). The activities are listed according to their scheduled activity classification (extractive activities including concrete works), fee-based activity classification (land-based extractive activity) and the scale of the operation (100,000 – 500,000 tonnes).				Yes
Discharges to air and water and applications to land				
The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.				Yes
Air				
EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Description of Location	
1	Dust monitoring		Dust gauge labelled "1- School" on the Map faxed to the EPA on 5 August 2002	
2	Dust monitoring		Dust gauge labelled 2 - intersection of Hitchcock and Wisemans Ferry Road	
3	Dust monitoring		Dust gauge labelled as "Jurds Paddock - 3 Por168" on the map faxed to the EPA on 5 August 2002	
Limit conditions - Pollution of Waters				
Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.				Noted
Limit conditions - Waste				
The licensee must not cause, permit or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or any waste generated at the premises to be disposed of at the premises, except as expressly permitted by the licence.				Yes, no waste accepted to date.
This condition only applies to the storage, treatment, processing, reprocessing or disposal of waste at the premises if those activities require an environment protection licence.				Noted

Compliance With Environment Protection Licence Conditions	Compliance																				
Limit conditions - Noise Limits																					
<p>Noise generated at the premises must not exceed the noise limits presented in the table below. Note that the noise limits represent the noise contribution from the activity on the premise.</p> <p style="text-align: center;">Noise Limits (dB(A))</p> <table><tr><th>Location</th><th>Day</th><th colspan="2">Night</th></tr><tr><td></td><td>$L_{Aeq(15 \text{ minute})}$</td><td>$L_{Aeq(15 \text{ minute})}$</td><td>$L_{A1(1 \text{ minute})}$</td></tr><tr><td>Maroota Public School</td><td>40</td><td>NA</td><td>NA</td></tr><tr><td>Pignataro</td><td>40</td><td>37</td><td>52</td></tr><tr><td>Tornatola</td><td>39</td><td>38</td><td>52</td></tr></table> <p>For the purposes of the above condition:</p> <ul style="list-style-type: none">• Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public holidays.• Evening is defined as the period 6pm to 10pm,• Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays.	Location	Day	Night			$L_{Aeq(15 \text{ minute})}$	$L_{Aeq(15 \text{ minute})}$	$L_{A1(1 \text{ minute})}$	Maroota Public School	40	NA	NA	Pignataro	40	37	52	Tornatola	39	38	52	<p>Yes</p> <p>Noted</p>
Location	Day	Night																			
	$L_{Aeq(15 \text{ minute})}$	$L_{Aeq(15 \text{ minute})}$	$L_{A1(1 \text{ minute})}$																		
Maroota Public School	40	NA	NA																		
Pignataro	40	37	52																		
Tornatola	39	38	52																		
<p>Noise from the premises is to be measured at the most affected point or within the residential boundary or at the most affected point within 30m of the dwelling (rural situations) where the dwelling is more than 30m from the boundary to determine compliance with the noise $L_{Aeq,(15min)}$ limits in the above condition.</p> <p>Noise from the premises is to be measured at 1m from the dwelling façade to determine compliance with the $L_{A1(1 \text{ minute})}$ noise limits in the above condition.</p> <p>Where it can be demonstrated that direct measurement of noise from the premises is impractical, the EPA may accept alternative means of determining compliance. See Chapter 11 of the NSW Industrial Noise Policy.</p> <p>The modification factors presented in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.</p>	<p>Noted</p>																				
<p>The noise emission limits identified above apply for prevailing meteorological conditions (winds up to 3m/s at 10 metres above ground level), temperature inversion conditions of up to 3°C/100m and wind speed up to 2m/s at 10 metres above the ground. Noise impacts that may be enhanced by temperature inversions must be addressed by:</p> <ul style="list-style-type: none">• documenting noise complaints received to identify any higher level of impacts or patterns of temperature inversions;• where levels of noise complaints indicate a higher level of impact then actions to quantify and ameliorate any enhanced impacts under temperature inversion conditions should be developed and implemented.	<p>Noted</p>																				
<p>The proponent shall prepare and implement a Noise Management Plan (NMP). The NMP must include but need not be limited to:</p> <p>a) The primary objective of minimising noise emissions from the premises</p> <p>b) A system that allows for periodic assessment of Best Management Practice (BMP) and Best Available Technology Economically Achievable (BATEA) to minimise noise emissions at all times and to seek to achieve noise contributions not exceeding the Project Specific Noise Levels at all receiver locations.</p> <p>c) Measures to monitor noise performance and respond to complaints.</p>	<p>Yes</p>																				

Compliance With Environment Protection Licence Conditions	Compliance
Limit conditions – Hours of Operation	
Activities covered by this licence must only be carried out between the hours of 0600 and 1800 Monday to Friday, and 0600 and 1800 Saturday, and at no time on Sundays and Public Holidays.	Yes generally, but some transport of product just before 6am.
Operating conditions	
Licensed activities must be carried out in a competent manner. This includes: (a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and (b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.	Yes
All plant and equipment installed at the premises or used in connection with the licensed activity: (a) must be maintained in a proper and efficient condition; and (b) must be operated in a proper and efficient manner.	Yes
The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.	Yes
All loaded trucks entering and leaving the premises must have their loads covered.	Yes
The licensee must not cause or permit the emission of offensive odour beyond the boundary of the premises.	Yes
Monitoring and recording conditions	
The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.	Yes
All records required to be kept by this licence must be: (a) in a legible form, or in a form that can readily be reduced to a legible form; (b) kept for at least 4 years after the monitoring or event to which they relate took place; and (c) produced in a legible form to any authorised officer of the EPA who asks to see them.	Yes
The following records must be kept in respect of any samples required to be collected for the purposes of this licence: (a) the date(s) on which the sample was taken; (b) the time(s) at which the sample was collected; (c) the point at which the sample was taken; and (d) the name of the person who collected the sample.	Yes

Compliance With Environment Protection Licence Conditions				Compliance
For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:				Yes
Air				
POINT 1				
Pollutant	Units of measure	Frequency	Sampling Method	
Particulates - Deposited Matter	grams per square metre per month	Monthly	AM-19	
POINT 2				
Pollutant	Units of measure	Frequency	Sampling Method	
Particulates - Deposited Matter	grams per square metre per month	Monthly	AM-19	
POINT 3				
Pollutant	Units of measure	Frequency	Sampling Method	
Particulates - Deposited Matter	grams per square metre per month	Monthly	AM-19	
Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with: (a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or (b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or (c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place.				Yes
The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.				Yes
The record must include details of the following: (a) the date and time of the complaint; (b) the method by which the complaint was made; (c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect; (d) the nature of the complaint; (e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and (f) if no action was taken by the licensee, the reasons why no action was taken.				Yes, however the 24 April 2012 complaint was not recorded in the 2012-2013 EPA Annual Return.
The record of a complaint must be kept for at least 4 years after the complaint was made.				Yes
The record must be produced to any authorised officer of the EPA who asks to see them.				Noted
The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.				Yes

Compliance With Environment Protection Licence Conditions	Compliance
The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.	Yes
The conditions above do not apply until 3 months after: (a) the date of the issue of this licence or (b) if this licence is a replacement licence within the meaning of the Protection of the Environment Operations (Savings and Transitional) Regulation 1998, the date on which a copy of the licence was served on the licensee under clause 10 of that regulation.	Noted
Reporting conditions	
The licensee must complete and supply to the EPA an Annual Return in the approved form comprising: (a) a Statement of Compliance; and (b) a Monitoring and Complaints Summary.	Yes
An Annual Return must be prepared in respect of each reporting period, except as provided below.	Yes
Where this licence is transferred from the licensee to a new licensee: (a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and (b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.	Noted
Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on: (a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or (b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.	Noted
The Annual Return for the reporting period must be supplied to the EPA by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').	Yes
The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.	Yes
Within the Annual Return, the Statement of Compliance must be certified and the Monitoring and Complaints Summary must be signed by: (a) the licence holder; or (b) by a person approved in writing by the EPA to sign on behalf of the licence holder.	Yes
A person who has been given written approval to certify a certificate of compliance under a licence issued under the Pollution Control Act 1970 is taken to be approved for the purpose of this condition until the date of first review of this licence.	Noted
Notifications must be made by telephoning the Environment Line service on 131 555.	Noted
The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.	Noted

Compliance With Environment Protection Licence Conditions				Compliance
Where an authorised officer of the EPA suspects on reasonable grounds that: (a) where this licence applies to premises, an event has occurred at the premises; or (b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence, and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.				Noted
The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.				Noted
The request may require a report which includes any or all of the following information: (a) the cause, time and duration of the event; (b) the type, volume and concentration of every pollutant discharged as a result of the event; (c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event; (d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort; (e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants; (f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and (g) any other relevant matters.				Noted
The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.				Noted
General conditions				
A copy of this licence must be kept at the premises to which the licence applies.				Yes
The licence must be produced to any authorised officer of the EPA who asks to see it.				Noted
The licence must be available for inspection by any employee or agent of the licensee working at the premises.				Yes
Pollution studies and reduction programs				
Completed Pollution Reduction Programs (PRP)				Noted
PRP No	PRP	Description	Completed Date	
1	Impervious bunded area to fuel storage tank	The bunded area serving the above ground fuel storage tank located outside the main workshop made impervious	1 May 2008	
2	Roofed bunded area to fuel storage tank	The bunded area serving the above ground fuel storage tank located outside the main workshop fitted with roof to exclude rainwater	1 May 2008	
3	Upgrade overflow point of sediment dam	The overflow point to the sediment dam upgraded	1 May 2008	
4	Prevent mud tracking from premises	Upgraded controls to help prevent mud tracking from the premises onto Wiseman's Ferry Road	1 May 2008	
5	PM10 dust monitoring	PM10 dust monitoring conducted from 1 March 2008 to 1 March 2009	1 March 2009	

6.4 Review the Adequacy of Any Strategy/Plan/Program Required Under This Approval, and, if Necessary, Recommend Measures or Actions to Improve the Environmental Performance of the Project, and/or Any Strategy/Plan/Program Required Under This Approval.

The Environmental Strategy and associated Noise Management Plan, Air Quality Monitoring Program, Water Management Plan and Landscape Management Plan for the project were originally approved by the Department of Planning on 8 July 2009. All of these documents were revised by PF Formation in September 2011 and approved by the Department of Planning & Infrastructure on 15 November 2011.

6.4.1 Environmental Strategy

The Environmental Strategy approved by the Department of Planning & Infrastructure on 15 November 2011 is adequate, appropriate and satisfactory to date. However, it is noted that some of the terminology in the Environmental Strategy needs updating again, such as the new names of NSW government departments, new legislation, updated emergency response management, revised Australian Standards and new references.

6.4.2 Noise Management Plan

The Noise Management Plan approved by the Department of Planning & Infrastructure on 15 November 2011 is adequate, appropriate and satisfactory to date subject to the following corrective action.

With the consent of the Department of Planning and Environment or a Section 96 modification and as in the approved Noise Management Plan only the three closest noise assessment locations to the project being R3 Jurd, R5 Pignataro, R10 Tornatola plus R7 Maroota Public School need to be monitored. These four noise assessment locations have been monitored for over 10 years by PF Formation. R5 Pignataro, R10 Tornatola and R7 Maroota Public School are premises that have noise emission limits specified in the Environment Protection Licence. Additional monitoring points described in project approval schedule 3 condition 5 are located further away from the project, are subject to noise from other sand extraction operations and do not contribute any meaningful data to noise impact assessments for the project site.

6.4.3 Air Quality Monitoring Program

The Air Quality Monitoring Program approved by the Department of Planning & Infrastructure on 15 November 2011 is adequate, appropriate and satisfactory to date.

6.4.4 Water Management Plan

The Water Management Plan approved by the Department of Planning & Infrastructure on 15 November 2011 is adequate, appropriate and satisfactory to date.

6.4.5 Landscape Management Plan

The Landscape Management Plan approved by the Department of Planning & Infrastructure on 15 November 2011 is adequate, appropriate and satisfactory to date.

6.4.6 Annual Environmental Management Reports for 2010-2011, 2011-2012 and 2012-2013

The three AEMRs include the following.

- Identify the standards and performance measures that apply to the project.
- Describe the works that will be carried out in the next 12 months.
- A summary of the complaints received during the past year and compares this to complaints received in previous years.

- A summary of the monitoring results for the project during the past year to 30 June.
- An analysis of these results against the relevant impact assessment criteria/limits, monitoring results from previous years and predictions in the EA.
- Identify any trends in the monitoring results over the life of the project.
- Identify any non-compliance during the previous year.
- Describe what actions were, or are being, taken to ensure compliance.

Signed monthly and annual checklists based on the Environmental Strategy, actions and management controls are included in the AEMRs. The Environmental Strategy nominates the Environmental Manager (Mr Joshua Graham) and Quarry Manager (Mr Peter Watts also the Site Manager) as responsible for implementing the Environmental Strategy. As at April 2014 Mr Joshua Graham is also the Operations Manager.

The 2012-2013, 2011-2012 and 2010-2011 AEMPs all noted *“All monitoring indicated that quarry operations were within any defined limits and no indicators of new potential issues were identified. From the procedures conducted there are no trends identified as yet and no areas of non-compliance.”* In addition, the 2012-2013 AEMP noted that due to approval to clear the Sydney Hinterland Transition Woodland area that the final landform for rehabilitation of the site will be based on Strategy A from the planning approval documents.

There was general compliance with the monitoring conditions.

The AEMRs are adequate, appropriate and satisfactory to date subject to the following corrective actions in future.

- Annual reports on the effectiveness of the retention basins need to be produced and included in the AEMRs.
- As required, the AEMRs do not include copies of the standard form for annual production data produced for the Department of Primary Industries.
- The monthly operational checklists in the AEMPs need more complete heading descriptors for the first three columns. For example, first column Environmental Strategy Appendix, second column Environmental Strategy Actions and page numbers (which need revising), and third column a fuller description of the environmental strategy management controls.

7. Audit Conclusions

Full cooperation was obtained from PF Formation staff during the audit with full access granted to records and copies made of records if requested. No obstacles were encountered during the audit and subsequent queries. Based on the audit findings the audit conclusions are as follows.

Based on completion of the environmental audit tasks (section 3), audit evidence and environmental monitoring results (section 4), consultation with agencies (section 5) and assessment of the compliance tables and audit findings (section 6) the environmental performance of the sand project is satisfactory with some non-compliances. The project is generally complying with the relevant standards, performance measures and statutory requirements including project approval conditions, project approval commitments and Environment Protection Licence conditions with some non-compliances that can be rectified. There is a need to improve on some environmental commitments and record keeping.

The effects of the Hitchcock Road sand project on the surrounding environment appear to be relatively minor and generally localised within the confines of the project area, nevertheless acceptable and manageable with some improvements and corrective actions needed. This assumes that all environmental management measures continue to be implemented by PF Formation.

All strategies/plans/programs required under the project approval to date are adequate with some corrective actions proposed.

There is nothing confidential in this audit report and it can be distributed as required.

8. Audit Recommendations

Based on the results of the audit, it is recommended that the following corrective actions, in no particular order or priority, be implemented by PF Formation generally within three months after assessment by the Department of Planning and Environment so that operations of the project comply with all of the project approval conditions, project approval statement of commitments and Environment Protection Licence conditions. This will help reduce any potential adverse environmental impacts of operations, improve the environmental performance of the project and reduce the risk of any third party environmental action.

1. The Environmental Strategy needs to be updated including the date of publication, new names of NSW government departments, new legislation, updated emergency response management, revised Australian Standards and references. The revised documents should then be made available on the PF Formation website.
2. All AEMPs need to include the EPA annual returns.
3. Annual reports on the effectiveness of the retention basins need to be produced and included in the AEMRs.
4. The monthly operational checklists in the AEMPs need more complete heading descriptors for the first three columns.
5. Modified copies of the annual production data produced for the Department of Primary Industries using the standard form for that purpose need to be included in the AEMRs. With the consent of the Department of Planning and Environment and to avoid disclosure of commercially sensitive information to the public and competitors, production data should be provided in 100,000 tonne bands in the AEMRs. Alternatively a Section 96 modification could be made to amend this consent condition.
6. The Complaints Register needs to be recorded in full in response to any complaints on the project and any corrective actions undertaken.
7. With the consent of the Department of Planning and Environment only the three closest noise assessment locations to the project being R3 Jurd, R5 Pignataro, R10 Tornatola plus R7 Maroota Public School need be monitored in future. Alternatively a Section 96 modification could be made to amend this consent condition.
8. The EPA approved pollution incident response management plan needs updating (on page 11) to include telephone contacts for all authorities and inclusion of Attachment A Hazardous Substances Register, Attachment B Emergency Procedure and Attachment C Site Plans/Map. PF Formation should consider including landslip or land stability as an additional hazard to be considered in the plan. The revised plan then needs to be made available on the PF Formation website.
9. Procedures must be improved so that the site operations including truck movements and use of the weigh bridge do not commence before 6am and that no more than 10 laden trucks enter and leave the site between 6am and 7am.
10. The Hazardous Substance Register needs revision to include only hazardous substances.
11. At the site entrance on Wisemans Ferry Road a 20km/hour speed limit sign needs to be installed.
12. A 3m high peripheral bund planted with screening vegetation needs to be fully established all along and 30m away from the Hitchcock Road boundary to improve visual amenity.

After consideration of the audit recommendations by PF Formation and endorsement by the Department of Planning and Environment, implementation of the audit recommendations should be verified in the next AEMR for the project.

Appendix 1
Project Approval 06_0104

Project Approval

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

I approve the project referred to in Schedule 1, subject to the conditions set out in Schedules 2 to 5.

These conditions are required to:

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

Hon Kristina Keneally MP
Minister for Planning

Sydney

2009

SCHEDULE 1

Project Application:

06_0104

Proponent:

PF Formation

Approval Authority:

Minister for Planning

Land:

See Appendix 1

Project:

Hitchcock Road Sand Project

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DEFINITIONS

AEMR	Annual Environmental Management Report
Council	The Hills Shire Council
Day	The period from 7.00am to 6.00pm on Monday to Saturday, and 8.00am to 6.00pm on Sundays and Public Holidays
DECC	Department of Environment and Climate Change
Department	Department of Planning
Director-General	Director-General of the Department of Planning, or delegate
DPI	Department of Primary Industries
DWE	Department of Water and Energy
EA	Environmental Assessment for the project titled <i>Hitchcock Road Sand Extraction and Rehabilitation Project Environmental Assessment and Appendices</i> (3 volumes), dated November 2007, prepared by DFA Consultants, including the response to submissions and preferred project report
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000</i>
EPL	Environment Protection Licence issued under the <i>Protection of the Environment Operations Act 1997</i>
Evening	The period from 6.00pm to 10.00pm
Extraction Area	The land described as the extraction area in Appendix 1
Land	Land means the whole of a lot, or contiguous lots owned by the same landowner, in a current plan registered at the Land Titles Office at the date of this approval
Minister	Minister for Planning, or delegate
Night	The period from 10.00pm to 7.00am on Monday to Saturday, and 10.00pm to 8.00am on Sundays and Public Holidays
Privately owned land	Land not owned by a public agency or the Proponent or its related companies
Preferred Project Report	The Proponent's Preferred Project Report dated September 2008, prepared by DFA Consultants, as modified in the Proponent's email to the Department of 18 November 2008
Project	The development as described in the EA
Proponent	PF Formation, or its successors in title
Response to Submissions	The Proponent's response to issues raised in submissions, dated March 2008, prepared by DFA Consultants, and subsequent submissions to the Department dated 27 August 2008
RTA	Roads and Traffic Authority
SHTW	Sydney Hinterland Transition Woodland
Site	Land to which the project application applies
Statement of Commitments	The Proponent's commitments in Appendix 3
Strategy A, Strategy B	The alternative rehabilitation proposals described in the preferred project report
Vegetation Offset	The conservation and enhancement program described in the preferred project report, to occur on the land shown on the plan in Appendix 5
VENM	Virgin Excavated Natural Material, as defined in the <i>Protection of the Environment Operations Act 1997</i>

SCHEDULE 2 ADMINISTRATIVE

Obligation to Minimise Harm to the Environment

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

Terms of Approval

2. The Proponent shall carry out the project generally in accordance with the:
 - (a) EA;
 - (b) preferred project report;
 - (c) statement of commitments; and
 - (d) conditions of this approval.

Notes:

- The layout of the project is shown in the figure in Appendix 2; and
- The statement of commitments is included in Appendix 3.

3. If there is any inconsistency between the above:
 - (a) the preferred project report shall prevail over the EA;
 - (b) the conditions of this approval shall prevail generally, to the extent of the inconsistency.
4. The Proponent shall comply with any reasonable requirement/s of the Director-General arising from the Department's assessment of:
 - (a) any reports, plans, programs or correspondence that are submitted in accordance with the conditions of this approval; and
 - (b) the implementation of any actions or measures contained in these reports, plans, programs or correspondence.

Existing Sand Mining Consent

5. Subject to an agreement in accordance with condition 7 below, the Proponent may accept material extracted from Lot 2 DP 555184 and Lot 1 DP 34599 in accordance with the development consent issued by the Land and Environment Court on 14 July 1998 to be transported across the site and to the slurry plant on Lot 1 DP 570966 via the slurry pipeline and processed on Lot 198 DP 752025.

Limits on Approval

6. Extraction and processing operations may take place until 30 November 2028.

Note: Under this approval, the Proponent is required to rehabilitate the site and provide offsets to the satisfaction of the Director-General. Consequently this approval will continue to apply in all other respects other than the right to conduct extraction and processing operations until the site has been rehabilitated and the offset provided to a satisfactory standard.

7. The quantity of processed material produced at the site, together with material produced on Lot 2 DP 555184 and Lot 1 DP 34599 in accordance with the development consent issued by the Land and Environment Court on 14 July 1998, shall not exceed 400,000 tonnes a year.

Prior to the commencement of any processing of extractive material (under the above consent) from activities on Lot 2 DP 555184 or Lot 1 DP 34599, the Proponent shall demonstrate, to the satisfaction of the Director-General, that it has reached an agreement with the owners of those Lots regarding the proportion of the extraction limit as it applies to each Lot.

8. The Proponent shall restrict total laden truck movements associated with the project to:
 - (a) 200 per day, for the Proponent's combined operations at Maroota;
 - (b) 20 per day, for trucks importing VENM to the site; and
 - (c) 10 per day, for trucks entering/exiting the site between 6.00am and 7.00am.

Note: For the avoidance of doubt, 200 is the maximum laden truck movement volume allowed on any one day, including the VENM and early morning truck movements.

9. The Proponent shall not undertake any extraction within 2 metres of the established wet weather groundwater level.

Note: The wet weather groundwater level shall be established in accordance with condition 3 of Schedule 3.

10. The Proponent shall not disturb any SHTW vegetation (as shown on the plan in Appendix 5) on site without the prior written approval of the Director-General. In seeking this approval the Proponent shall demonstrate, to the satisfaction of the Director-General, that it has established at least 3.7 hectares of SHTW on the site, to a standard that meets the criteria in Appendix 6.

Note: This demonstration must include an assessment by a suitably qualified and independent ecologist.

Management Plans / Monitoring Programs

11. With the approval of the Director-General, the Proponent may submit any management plan or monitoring program required by this approval on a progressive basis.

Demolition

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

Protection of Public Infrastructure

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

Operation of Plant and Equipment

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

Crown Land

15. The Proponent shall not commence any development authorised by this approval on Crown land without the prior approval of the Department of Lands.

Section 94 Contributions

16. The Proponent shall pay a monthly contribution to the Council for the upgrade and maintenance of roads in accordance with Baulkham Hills Shire Council's section 94 plan in force at the date of this approval.

SCHEDULE 3 ENVIRONMENTAL PERFORMANCE

GENERAL EXTRACTION AND PROCESSING PROVISIONS

Identification of Boundaries

1. Within 3 months of the date of this approval, or as otherwise agreed by the Director-General, the Proponent shall:
 - (a) engage an independent registered surveyor to survey the boundaries of the approved limit of extraction and the approved ancillary work areas;
 - (b) submit a survey plan of these boundaries to the Director-General; and
 - (c) ensure that these boundaries are clearly marked at all times in a permanent manner that allows operating staff and inspecting officers to clearly identify those limits.

Note: The limit of extraction and ancillary areas is shown conceptually on the layout plans in Appendix 2, as amended/clarified by the conditions below.

General Limits of Extraction

2. Notwithstanding the layout plans in Appendix 2, the Proponent shall not undertake extraction within:
 - (a) 30 metres of Hitchcock Road; and
 - (b) 10 metres of the property boundary of Lot 2 DP 555184, unless sand extraction has commenced on that lot, and extraction in this buffer has been agreed by the Director-General.

Maximum Extraction Depth Map

3. The Proponent shall:
 - (a) establish the wet weather groundwater level for the site based on all available (and at least 12 months) site specific groundwater monitoring data;
 - (b) engage a suitably qualified and experienced expert to establish the maximum extraction depths to which extraction can be undertaken on site, to comply with condition 9 of Schedule 2;
 - (c) submit a Maximum Extraction Depth Map (contour map or similar) for the project to the Director-General within 3 months of the date of this approval; and
 - (d) comply with the extraction depths specified in the map, to the satisfaction of the Director-General.
4. Within 3 months of the completion of the Independent Environmental Audit (see condition 6 of Schedule 5), the Proponent shall review and update the Maximum Extraction Depth Map for the project to the satisfaction of the Director-General.

NOISE

Operational Noise Assessment Criteria

5. The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 1 at any residence or on more than 25 per cent of any privately-owned land.

Noise Assessment Location	Day	Night	
	L _{Aeq} (15 minute)	L _{Aeq} (15 minute)	L _{A1} (1 minute)
R1 - Hammond	41	35	45
R2 – Hitchcock	40	35	45
R5 – Pignataro	42	35	45
R6 – Camilleri	40	35	45
R7 – Maroota Public School	36(L _{Aeq} (1 Hour))	N/A	N/A
R8 – Portelli	39	35	45
R9 – Young	39	35	45
R10 - Tornatola	39	35	45

Table 1: Noise Impact Assessment Criteria

Notes:

- To determine compliance with the L_{Aeq}(15 minute) noise limits, noise from the project is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of the dwelling where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the project is impractical, alternative means of determining compliance

may be accepted (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise level where applicable.

- To determine compliance with the $L_{A1(1 \text{ minute})}$ limit, noise from the project is to be measured at 1 metre from the dwelling façade.
- The noise limits apply under meteorological conditions of:
 - wind speed up to 3m/s at 10m above ground level;
 - temperature inversion conditions of up to 3 degrees C/100m and wind speed up to 2m/s at 10m above the ground;
 where the wind velocity and temperature gradients are determined to be relevant to the project site in accordance with the NSW Industrial Noise Policy.
- The Director-General may relax the noise limits in Table 1 for any property where the Proponent has an agreement with the relevant owner/s to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.
- For more information on the noise assessment locations see Appendix 4.

Cumulative Noise Criteria

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

Operating Hours

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

Activity	Day	Time
Construction work	Monday - Friday	7.00am to 6.00pm
	Saturday	8.00am to 1.00pm
	Sunday and Public Holidays	None
Quarrying and Processing, (inc. overburden removal)	Monday – Saturday	7.00am to 6.00pm
	Sunday and Public Holidays	None
Product Transportation	Monday – Saturday	6.00am to 6.00pm
	Sunday and Public Holidays	None
Maintenance	Monday – Saturday	7.00am to 6.00pm
	Sunday and Public Holidays	None

Table 2: Operating Hours

Notes:

- Product transportation prior to 7.00am is restricted as per condition 8 of Schedule 2.
- Maintenance activities may be conducted outside the hours in Table 2 provided that the activities are not audible at any residence beyond the boundary of the site.
- This condition does not apply to delivery of material if that delivery is required by police or other authorities for safety reasons, and/or the operation or personnel or equipment are endangered. In such circumstances, notification is to be provided to DECC and the affected residents as soon as possible, or within a reasonable period in the case of emergency.

Noise Management Plan

8. The Proponent shall prepare and implement a Noise Management Plan for the project to the satisfaction of the Director-General. This plan shall:
 - (a) be submitted to the Director-General within 3 months of the date of this approval;
 - (b) be prepared in consultation with DECC;
 - (c) include details of how the noise performance of the project would be monitored, and include a noise monitoring protocol for evaluating compliance with the relevant noise limits in this approval; and
 - (d) include an investigation and assessment (including modelling) of additional reasonable and feasible noise mitigation measures that would be implemented to ensure that noise emissions at all stages of the project comply with the noise impact assessment criteria in Table 1.

Note: The EA predicted that receiver locations R5, R6, R9 and R10 would exceed the applicable noise criteria by between 2 and 5 decibels, during worst case operations.

9. If the additional noise mitigation measures identified in condition 8(d) are not able to reduce noise levels to within 2 decibels of the impact assessment criteria in Table 1 then, upon receiving a written request from the applicable landowner, the Proponent shall implement additional noise mitigation

measures such as double glazing, insulation, and/or air conditioning at any residence on the land in consultation with the landowner.

These additional mitigation measures must be reasonable and feasible.

If within 3 months of receiving this request from the landowner, the Proponent and the landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director-General for resolution.

AIR QUALITY

Impact Assessment Criteria

10. The Proponent shall ensure that dust generated by the project does not cause exceedances of the criteria listed in Tables 3, 4 and 5 at any residence or on more than 25 per cent of any privately owned land.

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

Table 3: Long Term Impact Assessment Criteria for Particulate Matter

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

Table 4: Short Term Impact Assessment Criteria for Particulate Matter

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

Table 5: Long Term Impact Assessment Criteria for Deposited Dust

Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, 1991, AS 3580.10.1-1991: Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method.

Operating Conditions

11. The Proponent shall ensure any visible air pollution generated by the project is assessed regularly, and that quarrying operations are relocated, modified, and/or stopped as required to minimise air quality impacts on privately owned land.

Air Quality Monitoring

12. The Proponent shall prepare and implement an Air Quality Monitoring Program for the project to the satisfaction of the Director-General. This program shall:
 - (a) be submitted to the Director-General for approval within 3 months of the date of this approval;
 - (b) be prepared in consultation with DECC;
 - (c) include details of how the air quality performance of the project would be monitored, providing for additional dust deposition monitoring in the vicinity of clusters of residences to the north and west of the site; and
 - (d) include a protocol for evaluating compliance with the relevant air quality criteria in this approval.

METEOROLOGICAL MONITORING

13. The Proponent shall ensure the project has a suitable meteorological station on the site or in the immediate vicinity that complies with the requirements in the *Approved Methods for Sampling of Air Pollutants in New South Wales* publication.

WATER

Water Supply

14. The Proponent shall ensure that it has sufficient water for all stages of the project, and if necessary, adjust the scale of operations to match its water supply.

Note: The Proponent is required to obtain necessary water licences for the project under the Water Act 1912 and/or Water Management Act 2000.

Discharges

15. The Proponent shall not discharge any water from the quarry or its associated operations except in accordance with an EPL.

Water Management and Monitoring

16. The Proponent shall prepare and implement a Water Management Plan for the project to the satisfaction of the Director-General. This plan shall:
- (a) be submitted to the Director-General within 3 months of the date of this approval;
 - (b) be prepared in consultation with DWE and DECC; and
 - (c) include a:
 - Site Water Balance;
 - Erosion and Sediment Control Plan;
 - Surface Water Monitoring Program; and
 - Groundwater Monitoring Program.
17. The Site Water Balance shall:
- (a) include details of:
 - sources and security of water supply;
 - water use on site;
 - water management on site, including the location and capacity of water storages on site and the means of access;
 - off-site water transfers; and
 - reporting procedures; and
 - (b) investigate and describe measures to minimise water use by the project.
18. The Erosion and Sediment Control Plan shall:
- (a) be consistent with the requirements of *Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition, 2004* (Landcom);
 - (b) identify activities that could cause soil erosion and generate sediment;
 - (c) describe measures to minimise soil erosion and the potential for the transport of sediment to downstream waters;
 - (d) describe the location, function, and capacity of erosion and sediment control structures;
 - (e) demonstrate that the design capacity of basins intended to collect storm runoff will not be compromised by storage of operational water; and
 - (f) describe what measures would be implemented to maintain (and if necessary decommission) the structures over time.
19. The Surface Water Monitoring Program shall include:
- (a) detailed baseline data on surface water flows and quality in downstream watercourses that could be affected by the project;
 - (b) surface water quality and stream health assessment criteria, including trigger levels for investigating any potentially adverse surface water impacts; and
 - (c) a program to monitor:
 - surface water flows, quality, and impacts on water users;
 - stream health; and
 - channel stability.
20. The Groundwater Monitoring Program shall include:
- (a) provision of additional monitoring bores around the periphery of the site;
 - (b) detailed baseline data on groundwater levels, flows and quality in the region, and particularly any groundwater bores, springs and seeps (including spring and seep fed dams) that may be affected by operations on site;
 - (c) groundwater assessment criteria, including trigger levels for investigating any potentially adverse groundwater impacts;
 - (d) a program to monitor:
 - groundwater levels and quality in new and existing monitoring bores;
 - the impacts of the project on:
 - any groundwater bores, springs and seeps (including spring and seep fed farm dams) on privately-owned land; and

- any groundwater dependent ecosystems; and
- (e) a protocol for further groundwater modelling to confirm the limits to excavation depth across the site permitted in accordance with condition 9 of Schedule 2.

LANDSCAPE MANAGEMENT

Rehabilitation

21. The Proponent shall progressively rehabilitate the site to the satisfaction of the Director-General, in a manner that is generally consistent with the concept final landform (Strategy A or Strategy B) in the preferred project report (as reproduced in Appendix 7).

Offset Strategy

22. The Proponent shall implement the Offset Strategy described in the preferred project report, and summarised in Table 6 (shown conceptually on the plan in Appendix 5), to the satisfaction of the Director-General.

Area	Minimum Size (hectares)
On-Site Revegetation Area (SHTW)	7.9
On-Site Revegetation Area (Other Woodland)	4.1
Total	12

Table 6: Offset Strategy

23. Within 3 years of the date of this approval, the Proponent shall make suitable arrangements to provide appropriate long term security for the offset areas to the satisfaction of the Director-General.

Note: The Department acknowledges that the arrangements may provide for staged or delayed implementation, in accordance with the extraction in these areas.

Landscape Management Plan

24. The Proponent shall prepare and implement a Landscape Management Plan for the project to the satisfaction of the Director-General. This plan must:
- (a) be prepared in consultation with DECC by suitably qualified expert/s whose appointment/s have been approved by the Director-General;
 - (b) be submitted to the Director-General for approval within 6 months of the date of this approval; and
 - (c) include a:
 - Rehabilitation and Offset Management Plan; and
 - Quarry Closure Plan.

Rehabilitation and Offset Management Plan

25. The Rehabilitation and Offset Management Plan must include:
- (a) the rehabilitation objectives for the site, vegetation offsets and landscaping;
 - (b) a description of the short, medium, and long term measures that would be implemented to:
 - rehabilitate the site;
 - implement the Offset Strategy; and
 - maintain and enhance existing site vegetation outside the disturbance area;
 - (c) detailed performance and completion criteria for the site rehabilitation and implementation of the Offset Strategy;
 - (d) a detailed description of the measures that would be implemented over the next 3 years, including the procedures to be implemented for:
 - progressively rehabilitating disturbed areas;
 - implementing vegetation offsets;
 - protecting vegetation and soil outside the disturbance areas;
 - rehabilitating creeks and drainage lines on the site to ensure no net loss of stream length and aquatic habitat;
 - undertaking pre-clearance surveys;
 - managing impacts on fauna;
 - landscaping the site to minimise visual impacts;
 - conserving and reusing topsoil;
 - collecting and propagating seed for rehabilitation works;
 - salvaging and reusing material from the site for habitat enhancement;
 - controlling weeds and feral pests;

- controlling access; and
 - bushfire management;
- (e) a program to monitor the effectiveness of these measures, and progress against the performance and completion criteria;
- (f) a description of the potential risks to successful rehabilitation and/or revegetation, and a description of the contingency measures that would be implemented to mitigate these risks; and
- (g) details of who would be responsible for monitoring, reviewing, and implementing the plan.

Quarry Closure Plan

26. The Quarry Closure Plan must:
- (a) include provision for certification from a qualified geotechnical engineer that the final proposed landform is stable;
 - (b) define the objectives and criteria for closure of the quarry;
 - (c) investigate options for the future use of the site, including any final void;
 - (d) describe the measures that would be implemented to minimise or manage the ongoing (post closure) environmental effects of the project; and
 - (e) describe how the performance of these measures would be monitored over time.

Rehabilitation and Offset Bond

27. Within 3 months of the approval of the Landscape Management Plan, the Proponent shall lodge a rehabilitation and offset bond for the project with the Director-General. The sum of the bond shall be calculated at:
- (a) \$2.50/m² for the area of disturbance in each 3 year review period, including the offset areas; and
 - (b) \$1.00/m² for the total area of land previously disturbed by the quarry, or as otherwise directed by the Director-General.

Notes:

- *If the rehabilitation and offsets are completed to the satisfaction of the Director-General, the Director-General will release the bond.*
- *If the rehabilitation and/or offsets are not completed to the satisfaction of the Director-General, the Director-General will call in all or part of the bond, and arrange for the satisfactory completion of the relevant works.*

ABORIGINAL HERITAGE

28. Should the Proponent discover material suspected of being Aboriginal relics or skeletal remains, work in that area shall cease and the Proponent shall advise DECC and proceed in accordance with DECC instructions.

TRAFFIC AND TRANSPORT

Materials Transport

29. The Proponent shall transport all excavated material between the extraction site and processing plant site, including processing residues, via slurry pipelines.

Note: When the slurry system is unusable by reason of breakdown or essential maintenance, extractive material may be transported by truck during the period of such breakdown or maintenance. The Proponent shall ensure that such periods are as brief as possible and shall advise the Council each day that truck transport is to be used.

Haulage Records

30. The Proponent shall record and maintain a log of the extraction quantities and traffic movement in and out of the site, available for inspection at the request of the Director-General or the Council.

Road Haulage

31. The Proponent shall ensure that:
- (a) all loaded vehicles entering or leaving the site are covered; and
 - (b) all loaded vehicles leaving the site are cleaned of materials that may fall on the road, before they leave the site.

VISUAL

Visual Amenity

32. The Proponent shall minimise the visual impacts of the project to the satisfaction of the Director-General.

Lighting Emissions

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

Advertising

34. The Proponent shall not erect or display any advertising structure(s) or signs on the site without the written approval of the Director-General.

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

WASTE MANAGEMENT

Waste Minimisation

35. The Proponent shall:
- (a) only import VENM to the site; and
 - (b) minimise the amount of waste generated by the project to the satisfaction of the Director-General.

EMERGENCY AND HAZARDS MANAGEMENT

Dangerous Goods

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

Safety

37. The Proponent shall secure the project to ensure public safety to the satisfaction of the Director-General.

Bushfire Management

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

PRODUCTION DATA

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

SCHEDULE 4 ADDITIONAL PROCEDURES

NOTIFICATION OF LANDOWNERS

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

INDEPENDENT REVIEW

2. If a landowner of privately owned land considers that the operations of the quarry are exceeding the impact assessment criteria in Schedule 3, then he/she may ask the Proponent in writing for an independent review of the impacts of the project on his/her land.

If the Director-General is satisfied that an independent review is warranted, the Proponent shall within 3 months of the Director-General advising that an independent review is warranted:

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

If the additional monitoring referred to above subsequently determines that the quarrying operations are complying with the relevant criteria in Schedule 3, then the Proponent may discontinue the independent review with the approval of the Director-General.

If the Proponent is unable to finalise an agreement with the landowner, then the Proponent or landowner may refer the matter to the Director-General for resolution.

If the matter cannot be resolved within 21 days, the Director-General shall refer the matter to an Independent Dispute Resolution Process (see Appendix 8).

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

If the matter cannot be resolved within 21 days, the Director-General shall refer the matter to an Independent Dispute Resolution Process (see Appendix 8).

SCHEDULE 5

ENVIRONMENTAL MANAGEMENT, MONITORING, REPORTING & AUDITING

ENVIRONMENTAL MANAGEMENT STRATEGY

1. The Proponent shall prepare and implement an Environmental Management Strategy for the project to the satisfaction of the Director-General. This strategy shall be submitted to the Director-General within 3 months of the date of this approval, and;
 - (a) provide the strategic context for environmental management of the project;
 - (b) identify the statutory requirements that apply to the project;
 - (c) describe in general how the environmental performance of the project would be monitored and managed;
 - (d) describe the procedures that would be implemented to:
 - keep the local community and relevant agencies informed about the construction, operation and environmental performance of the project;
 - receive, handle, respond to, and record complaints;
 - resolve any disputes that may arise during the life of the project;
 - respond to any non-compliance;
 - manage cumulative impacts; and
 - respond to emergencies; and
 - (e) describe the role, responsibility, authority, and accountability of the key personnel involved in the environmental management of the project.

ENVIRONMENTAL MONITORING PROGRAM

2. The Proponent shall prepare an Environmental Monitoring Program for the project to the satisfaction of the Director-General. This program shall be submitted to the Director-General concurrently with the submission of the various monitoring programs and consolidate the various monitoring requirements in Schedule 3 of this approval into a single document.

REPORTING

Incident Reporting

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

Annual Reporting

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

INDEPENDENT ENVIRONMENTAL AUDIT

6. Within 12 months of the date of this approval, and every 3 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. This audit shall:
 - (a) be conducted by a suitably qualified, experienced, and independent person(s) whose appointment has been approved by the Director-General;
 - (b) include consultation with the relevant agencies;

- (c) assess the environmental performance of the project, and its effects on the surrounding environment;
- (d) assess whether the project is complying with the relevant standards, performance measures and statutory requirements; and
- (e) review the adequacy of any strategy/plan/program required under this approval, and, if necessary, recommend measures or actions to improve the environmental performance of the project, and/or any strategy/plan/program required under this approval.

Note: The person(s) conducting the audit should have expertise in flora and fauna assessment, hydrogeology and quarry rehabilitation.

- 7. Within 6 weeks of completion of each Independent Environmental Audit, the Proponent shall submit a copy of the audit report to the Director-General, with a response to any of the recommendations in the audit report.
- 8. Within 3 months of submitting a copy of the audit report to the Director-General, the Proponent shall review and if necessary revise:
 - (a) each of the environmental management and monitoring strategies/plans/programs in Schedules 3 and 5; and
 - (b) the sum of the Vegetation Offset Bond (see Schedule 3). This review shall consider:
 - the effects of inflation;
 - any changes to the total area of disturbance; and
 - the performance of the vegetation offsets against the completion criteria of the Rehabilitation and Vegetation Offset Management Plan,
 to the satisfaction of the Director-General

COMMUNITY CONSULTATIVE COMMITTEE

- 9. The Proponent shall establish a Community Consultative Committee (CCC) for the project to the satisfaction of the Director-General, in general accordance with the Department's *Guideline for Establishing and Operating Community Consultative Committees for Mining Projects*.

Note: The Proponent may continue the operation of the Liaison and Review Committee established under condition 6.7 of the development consent issued by the Land and Environment Court on 14 July 1998 to fulfil this condition.

ACCESS TO INFORMATION

- 10. Within 1 month of the approval of any plan/strategy/program required under this approval (or any subsequent revision of these plans/strategies/programs), or the completion of the audits or AEMR required under this approval, the Proponent shall:
 - (a) provide a copy of the relevant document/s to the relevant agencies and to members of the general public upon request; and
 - (b) ensure that a copy of the relevant document/s is made publicly available on its website and at the Proponent's office.
- 11. During the project, the Proponent shall:
 - (a) make a summary of monitoring results required under this approval publicly available on its website and at the site office; and
 - (b) update these results on a regular basis.

**APPENDIX 1
SCHEDULE OF LAND**

Extraction Area	<ul style="list-style-type: none"> • Lots 1 & 2 DP 570966 • Lots 1 & 2 DP 1063296 • Lot 1 DP 1013943 • Lot 2 DP 233818 • Lot 1 DP 1091018 • Lot 1 DP 223323
Processing Plant	<ul style="list-style-type: none"> • Lots 167 & 214 DP 752039 • Lot 198 DP 752025

APPENDIX 2
GENERAL LAYOUT OF PROJECT

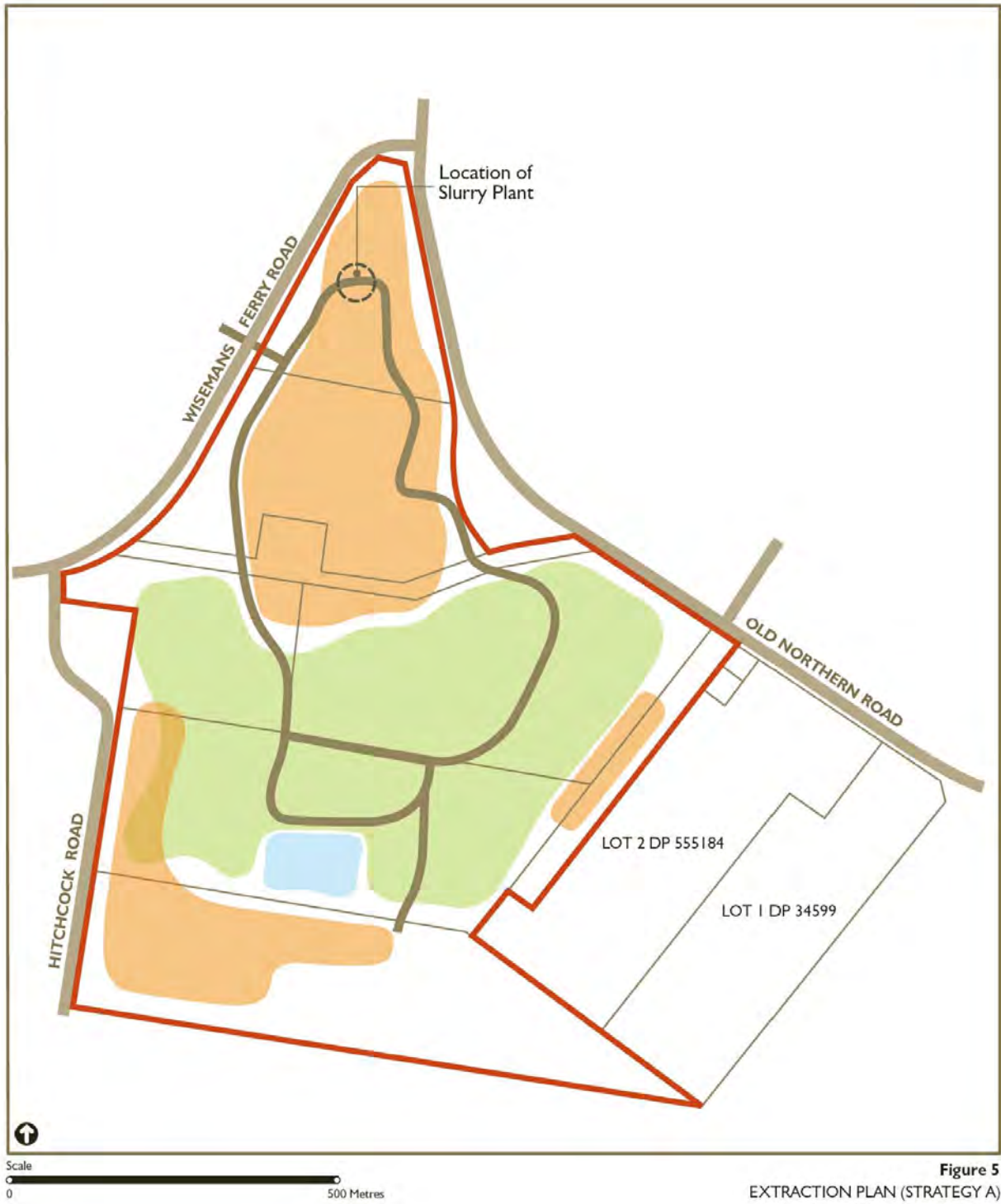


Figure 5
EXTRACTION PLAN (STRATEGY A)

- Area already extracted and partially rehabilitated
- Area for future extraction
- Clean water dam
- Existing internal haul road
- Land included in the application

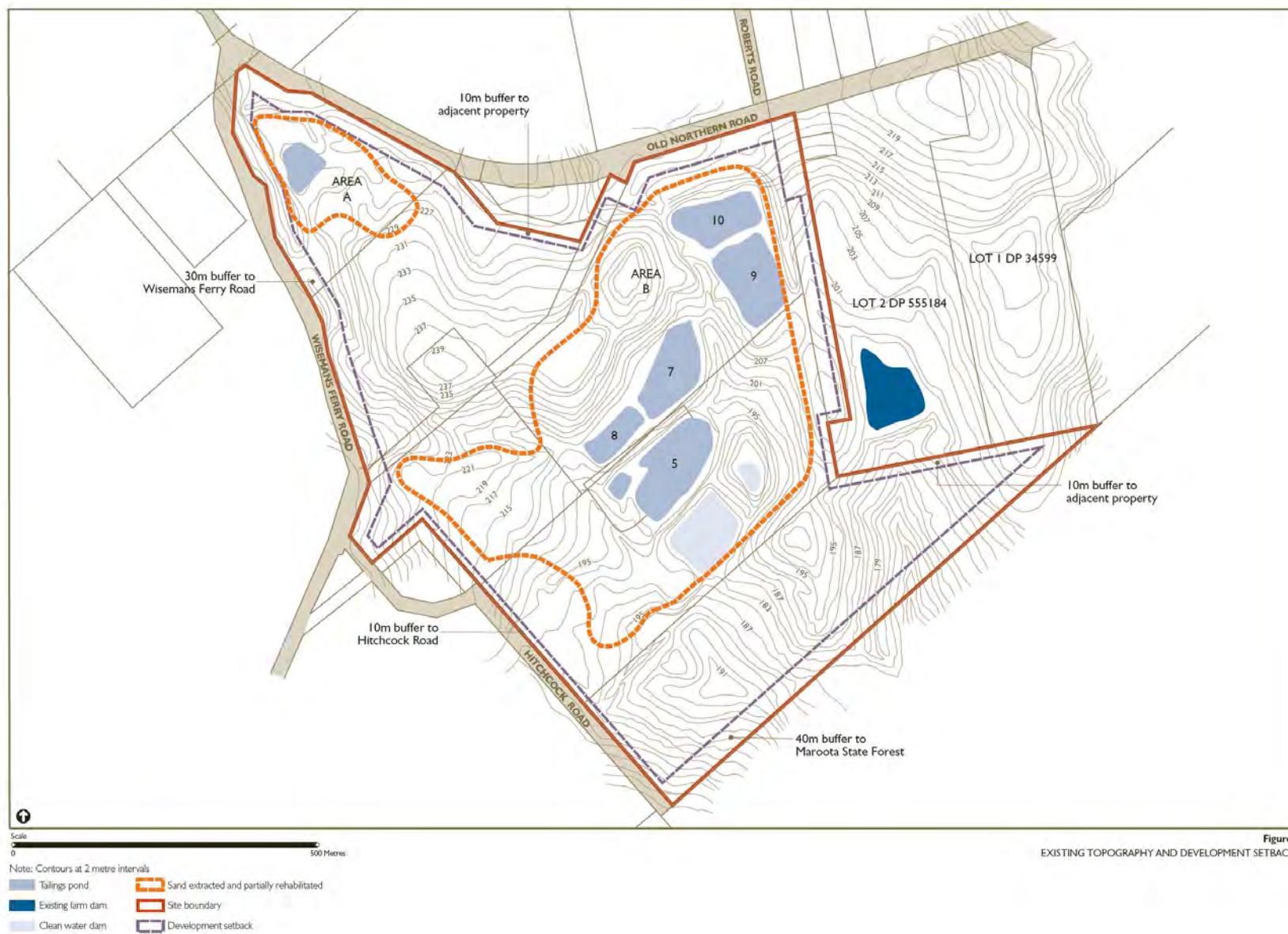


Figure 4
EXISTING TOPOGRAPHY AND DEVELOPMENT SETBACKS

APPENDIX 3 STATEMENT OF COMMITMENTS

Noise and Vibration

- Site activities will be managed so that any necessary high noise and vibration levels occur at times of least impact.
- All site activities will be undertaken incorporating noise attenuation measures such as restricting working hours for certain works required in the proximity of sensitive receptors.
- All equipment used on site will be certified in relation to noise performance.
- Panels and covers of silenced plant will be kept shut and plant and equipment switched off when not in use.
- All mechanical equipment will be silenced by the best practical means using current technology, prior to use. Noise suppression devices will be fitted according to manufacturer's instructions. Noise control kits will be fitted to noisy mobile equipment and shrouds provided around stationary equipment where necessary.
- All plant and equipment will be inspected regularly to ensure that it is well maintained to minimise noise emissions.
- The L_{10} noise level at the boundary of adjacent receivers where baseline data has been obtained will not normally exceed the background level by more than 5 dB(A).
- Compliance monitoring of noise levels will be undertaken and appropriate records of measurements kept.
- The local community will be informed of the level and duration of noise to be expected during specific activities and phases of development when necessary. Communication of concerns to the Environmental Manager will be invited.

Air Quality and Greenhouse Gas Emissions

- Ambient air quality monitoring will be conducted at identified sites.
- Dust suppression equipment will be fitted to all processing plant on the site. This will be regularly inspected and maintained in good working order at all times.
- Trafficable areas will be defined to prevent unnecessary vehicle movement into other parts of the site.
- All unsealed trafficable areas and working areas will be kept damp by spraying regularly with a water cart, water sprays or sprinklers to minimise dust emissions. Frequency of spraying to be determined based on weather conditions, soil erodibility and the observation of any visible dust.
- Speed controls will be applied to all unsealed areas (maximum speed of 20 km/h) and signposted accordingly.
- All semi-permanent stockpiles will be vegetated with suitable groundcover and regularly watered until the vegetation is well established.
- Work on any extraction activity producing dust will cease due to high winds if control cannot be achieved by watering or other means. Work will not resume until the wind velocity decreases and any dust generation can be controlled by normal means.
- All loaded trucks leaving the central processing plant on Lot 198 DP 752025 will have their payloads fully covered by a suitable material to prevent spillage.
- No fires will be permitted on-site without a permit.
- A mechanical road sweeping unit and water cart will be maintained for use as required to keep all roads including the intersection of the haul road and Wisemans Ferry Road free from deposited material.
- Exhausts from all vehicles and plant/equipment will be inspected to ensure that they are maintained at an acceptable level.
- All vehicles will be regularly serviced to ensure that exhaust emissions comply with the regulations. Appropriate service records will be maintained.

- Any opportunities to minimise machinery use and ensure that all equipment used on the site is energy efficient will be identified.

Access and Traffic

- If the sand slurry plant and transport system is unusable due to breakdown or during maintenance periods, trucks will be used for the transport of extractive material on a temporary basis. This will cease once the system is operating satisfactorily.
- The number of laden vehicle movements will not exceed a combined total of two hundred per day via the intersection of the haulage road and Wisemans Ferry Road. This is the total of laden vehicle movements allowed for PF Formation's combined extractive industry operations in Baulkham Hills Shire.
- Operations involving the transportation of material on the site will only be undertaken between 07.00 and 18.00 hours, Monday to Saturday, except a maximum of 10 laden vehicles will be allowed to enter and leave the site between 06.00 and 07.00 hours, Monday to Saturday only. Vehicles will not be allowed to arrive at the site prior to 05.45 hours on any day.

Erosion and Sediment Control

- Soil and Water Management Plan will be reviewed and revised, if required.
- Temporary erosion and sedimentation control structures such as detention basins and catch drains will be constructed as appropriate to collect runoff from cleared land including extraction areas and access roads.
- Silt traps and erosion control fencing will be erected as appropriate along extraction area boundaries and drainage lines.
- Sediment basins with a minimum storage capacity of 400 m³ per hectare of catchment will be constructed. Spillway capacity and stability will be designed as follows:
 - life of less than 5 years, adopt the 20 year tc event;
 - life between 5 and 10 years, adopt the 50 year tc event; and
 - life greater than 10 years, adopt the 100 year tc event.
- Stormwater control measures will be assessed and routine inspections conducted to ensure that compliance with best practice guidelines and relevant legislation is achieved.
- Locations for topsoil and material stockpiles will be selected on level ground and away from drainage lines. Diversion drains and sediment filter fences will be installed up slope as appropriate.
- Training will be provided to operational personnel on the importance of erosion control measures and drivers informed of the damage that can be caused to the environment by heavy vehicles.
- Areas of exposed land will be kept to a minimum compatible with operational requirements.
- Exposed areas not in use will be stabilized with an appropriate cover crop and watered until well established.
- Erosion and sediment controls will be monitored regularly and immediately following a rainfall event. Monitoring will take place initially on a weekly basis, then monthly once operating correctly. Sediment will be cleared when the traps have collected 60% of the capacity of the basin or where sediment build-up is less than 300 mm below the spillway crest. Sediment will be removed to a location where further pollution to downslope lands and waterways will not occur.
- Maintenance of erosion and sediment controls will be undertaken when any deterioration is identified or when replacement is necessary.
- Stored stormwater will be reused for dust control and the watering of site vegetation.
- Soil stockpiles will be seeded where these are to remain unused for a period in excess of four weeks. The area will be watered until the vegetation is well established.

Water Management

- Maximum depth of extraction will be restricted to not less than two metres above the wet weather high groundwater level. (nominally 181 m AHD).

- The groundwater will not be breached or contaminated. In the event that either should occur, operations will cease in the affected area and the Department of Environment and Climate Change consulted to determine the basis on which extraction may recommence.
- Retention basins will be designed to accommodate the 100-year tc event. The minimum basin capacities are:
 - Northern catchment 10,000 m³
 - Southern catchment 38,000 m³

The volume of these basins can be varied depending on the extent of the area exposed for extraction within each catchment.

- All retention basins will be regularly inspected and an annual report prepared on their effectiveness.
- A minimum of two groundwater monitoring bores will be installed. One will be located within or near the extraction area and another at some location within the site beyond the area of any direct extraction influence. The location of these bores will meet the requirements of the Department of Environment and Conservation and Baulkham Hills Shire Council.

Flora and Fauna

- All areas which are not to be disturbed will be clearly marked.
- Topsoil will be separated and stored or use in rehabilitation works.
- An area of not less than 12 hectares will be identified, and indicated on the site survey. This will be identified as a revegetation area and access controlled.
- Seed will be collected from the existing woodland communities (Sydney Hinterland Transition Woodland), stored under controlled conditions, made available for future broadcasting and a suitable proportion propagated to provide tubestock for revegetation.
- Stored topsoil and that derived from suitable areas adjacent to the woodland communities will be spread over the defined revegetation area and seed broadcast over the site to augment the soil-borne native seed bank. Tube stock suitably protected against animal predation will also be used in appropriate locations.
- Access to bushland will be restricted to minimise the potential for damage. These areas will be marked and signs erected to ensure that this prohibition is made clear. The boundary of the site will be fenced to prevent external access.

Rehabilitation

- The Rehabilitation Plan will be reviewed and amended as necessary to reflect changing operational conditions. This will include a revised phasing plan and implementation programme.
- Setbacks to all roads and adjacent properties will be defined taking account of existing trees and other features. Programmes of mound construction and screen planting will be undertaken as required in the Rehabilitation Plan. All plant material used will reflect the species mix existing in the area.
- A staged seeding and planting programme will be undertaken as areas become available following completion of extraction and capping of sediment basins. This will be aimed at producing a dense plantation on the steeper slopes derived from the flora resources already established. The aim is to replicate as far as possible the mix and density of planting which is currently present.
- All suitable plant material will be used on the site as a seed and planting medium. Topsoil will be stored in appropriately marked low stockpiles for reuse in locations as close as possible to their source. Care will be taken to ensure that this does not become contaminated with the seeds of exotic species and weeds.
- The site will be rehabilitated in stages leaving areas exposed for as short a time as possible. This will be undertaken in conformity with the approved Rehabilitation Plan with maximum final batter grades of 4(H):1(V) on north and west facing slopes and 3(H):1(V) on those facing south and east. Final slopes will be as gentle as possible depending on the availability of fill material.
- All soil stockpiles and exposed areas will be seeded with an appropriate vegetation cover where no activity is to take place for more than four weeks.
- Revegetation of the site will be undertaken on the following basis:
 - as far as possible re-establish the Sydney Hinterland Transitional Woodland using seed and mulch collected from the area ;

- rehabilitate other areas to native species with a light sowing of cereal and allowing natural regeneration;
 - rehabilitate the soil to achieve a full profile;
 - lime, fertilise and sow areas where improved grass cover is required; and
 - suitably turf surfaces expected to experience high surface flows leaving the site.
- A maintenance programme aimed at promoting and protecting the growth of the rehabilitated areas will be established.

Social Impact Management

- Material concerning activities at the site will be prepared and published on the company's website which will allow the community and others to be informed about current news on the site.
- Regular bi-annual meetings of community representatives will be established to discuss issues in relation to sand extraction on the site.
- A Complaints Register will be established incorporating date and time, type of communication, contact details of the complainant, nature of the complaint and response taken.

Heritage

- All work will cease in the area if an archaeological or heritage item is identified during extraction operations and the National Parks and Wildlife Service, the Deerubbin Aboriginal Land Council or the Heritage Office consulted to determine any appropriate course of action prior to recommencement of the work.
- Any additional survey work required for submittal of application to destroy artefact scatters located in the later stages of the development will be undertaken. Reasonable requirements of the National Parks and Wildlife Service (DECC), the Deerubbin Aboriginal Land Council and the Heritage Office arising out of any additional studies will be implemented.

Visual Amenity

- Peripheral bunds will be constructed within the established setbacks where necessary to screen extraction activities. These will be a minimum of three metres high with slopes ranging from 3(H):1(V) to 6(H):1(V) depending on the location using overburden stripped from the site.
- Screen planting works will be undertaken in the peripheral areas to an agreed specification using mulch to allow for native plant regeneration. This species mix will be reinforced using appropriate plantings at specified intervals.
- A tree planting programme will be undertaken within the ten metre buffer zones and in other defined parts of the site to establish a dense plantation using an appropriate mix of species reflecting that of the existing community.
- The final rehabilitated landform will be established in conformity with the Rehabilitation Plan.
- All temporary fencing will be removed when no longer required.
- Vegetation in areas suitable for agricultural/horticultural uses will be re-established.
- All site infrastructure including the slurry plant and its associated pipelines will be removed. Those areas affected by the plant will be restored and rehabilitated.
- All waste materials will be removed and disposed of in an appropriate manner.
- The final Rehabilitation Plan will be reviewed and proposals for future use of the site prepared.

Waste Management

- Waste handling areas will be clearly delineated.
- Specific areas for the collection of materials for reuse and recycling will be defined and clearly labelled.
- Cleared vegetation will be used within the landscape programme.
- All topsoil will be stored in stockpiles for later use in site rehabilitation.

- Bins or skips will be provided for the collection and storage of recyclable material and waste. General construction waste will be stored in a skip located at the workshop on Lot 198 DP752025. Waste food will be removed and stored in a vermin proof bin for collection by a waste contractor. Paper waste generated from site offices, plastics and glass will be collected separately for recycling.
- Hazardous wastes (including empty drums, rags, soil contaminated with oil) will be separated from nonhazardous wastes and managed in accordance with the relevant legislation.
- Liquid wastes (chemicals, oils and greases) will be temporarily stored in an appropriately bunded area and disposed of via a licensed contractor. Wash down water will be directed to an appropriate settlement basin if quality is acceptable.
- Copies of current licences of all waste removal contractors on site will be retained.
- All documentation relating to waste removal and disposal will be retained on file at the site. This documentation will include dockets for the removal and disposal of waste at a licensed facility.
- Waste material will be progressively separated and stockpiled in designated areas for collection. Adequately secure waste disposal areas to prevent access by wildlife.
- All waste licences will be reviewed and terms and conditions for compliance monitored.
- Any materials and waste remaining on the site following completion of extraction operations will be recycled or sent for disposal. This will be either recycled or disposed of in an appropriate manner.

Emergency Response

- All personnel on site during operations will be trained in appropriate procedures including site induction, materials handling and response procedures.
- Emergency response procedures will be developed and put in place. Appropriate individuals will be appointed as emergency services liaison officers.
- An emergency response table listing contact details of all relevant parties required in an environmental emergency will be prepared.
- A Register of Environmentally Hazardous Materials to be stored and used on site will be established.
- Appropriate safety and spill response equipment will be made available on site.
- All materials to be used and stored on site will be clearly labelled.
- Emergency response procedures will be reviewed and updated bi-annually.
- Appropriate safety and response equipment will be available at all times.

Hazard, Risk and Safety

- A licence to keep dangerous goods will be obtained from WorkCover NSW for all materials stored on site which require licensing.
- A Register of Hazardous Materials setting out details of quantities, storage and specific handling requirements for all relevant materials stored on site will be established.
- Material Safety Data Sheets for all hazardous materials stored on site will be obtained.
- Appropriate storage and secondary containment facilities for all hazardous materials stored on site will be provided. All bunded areas will be designed to contain at least 110% of the volume of materials stored within the area.
- A Safety Officer will be appointed for the development.
- All flammable material storage areas will be located at least ten metres from possible ignition sources.
- Contents of all above ground storage areas will be clearly labelled.
- All hazardous and dangerous goods storage areas will be secured and appropriate signage displayed. All incompatible material will be segregated.

- All personnel will be trained in the handling and safety procedures required for the hazardous materials stored and used on site.
- An Emergency Response Plan will be developed and put in place.
- A mobile spill control kit containing appropriate absorbent materials, neutralising chemicals and other spill containment equipment will be provided.
- Personal protective equipment will be provided and personnel instructed in its use.
- Any spills beyond the bunded area will be cleaned up immediately and the contaminated material disposed of in an appropriate manner.
- The relevant authorities will be contacted in the event of a leak or spill and any instructions followed. Any contamination will be remediated to the satisfaction of the regulatory authorities.
- Any spills or hazardous wastes that cannot be recycled will be collected and disposal by a licensed waste contractor arranged. All records of waste removal on site will be retained.

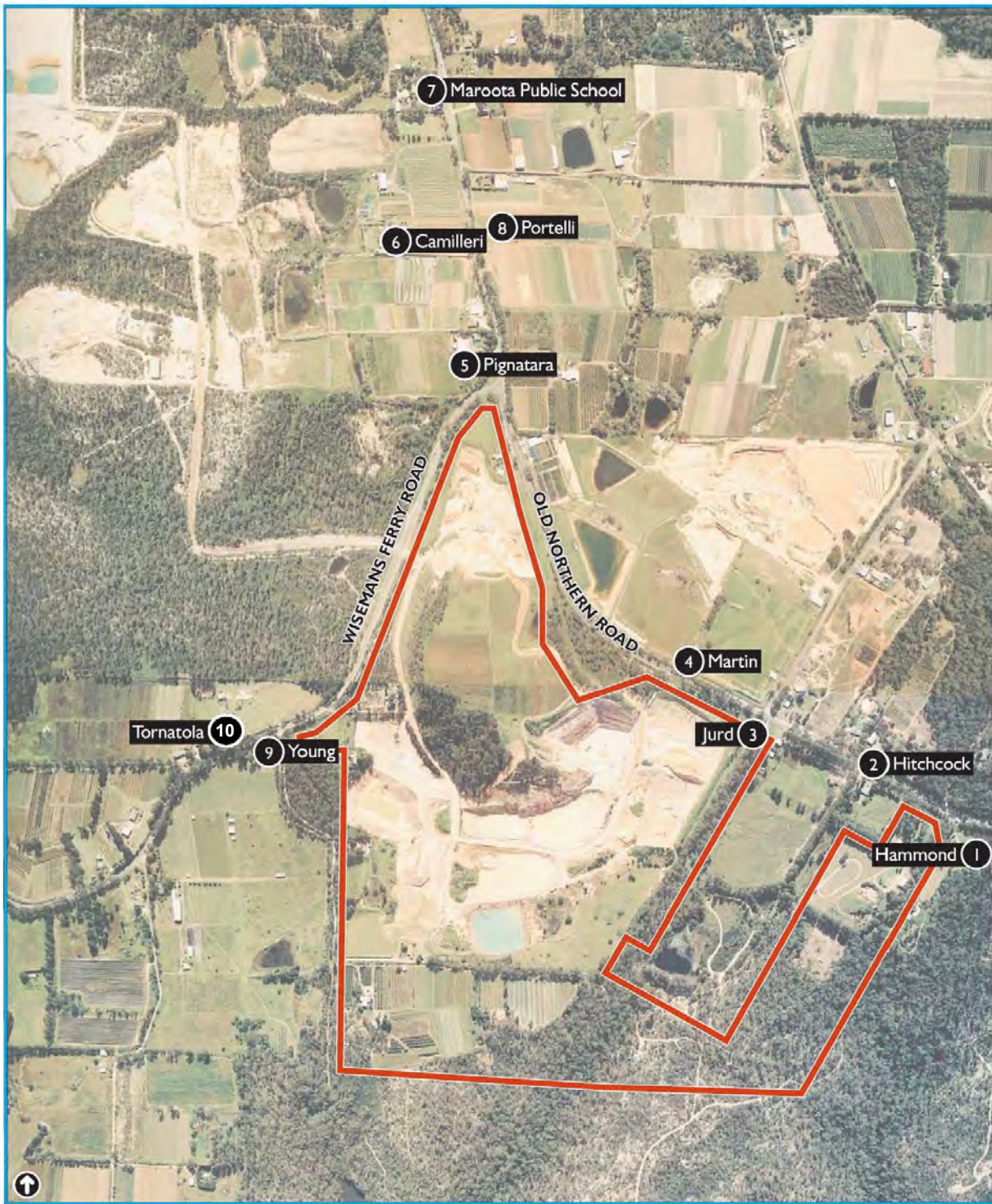


Figure 4.7

NOISE MONITORING AND ASSESSMENT LOCATIONS

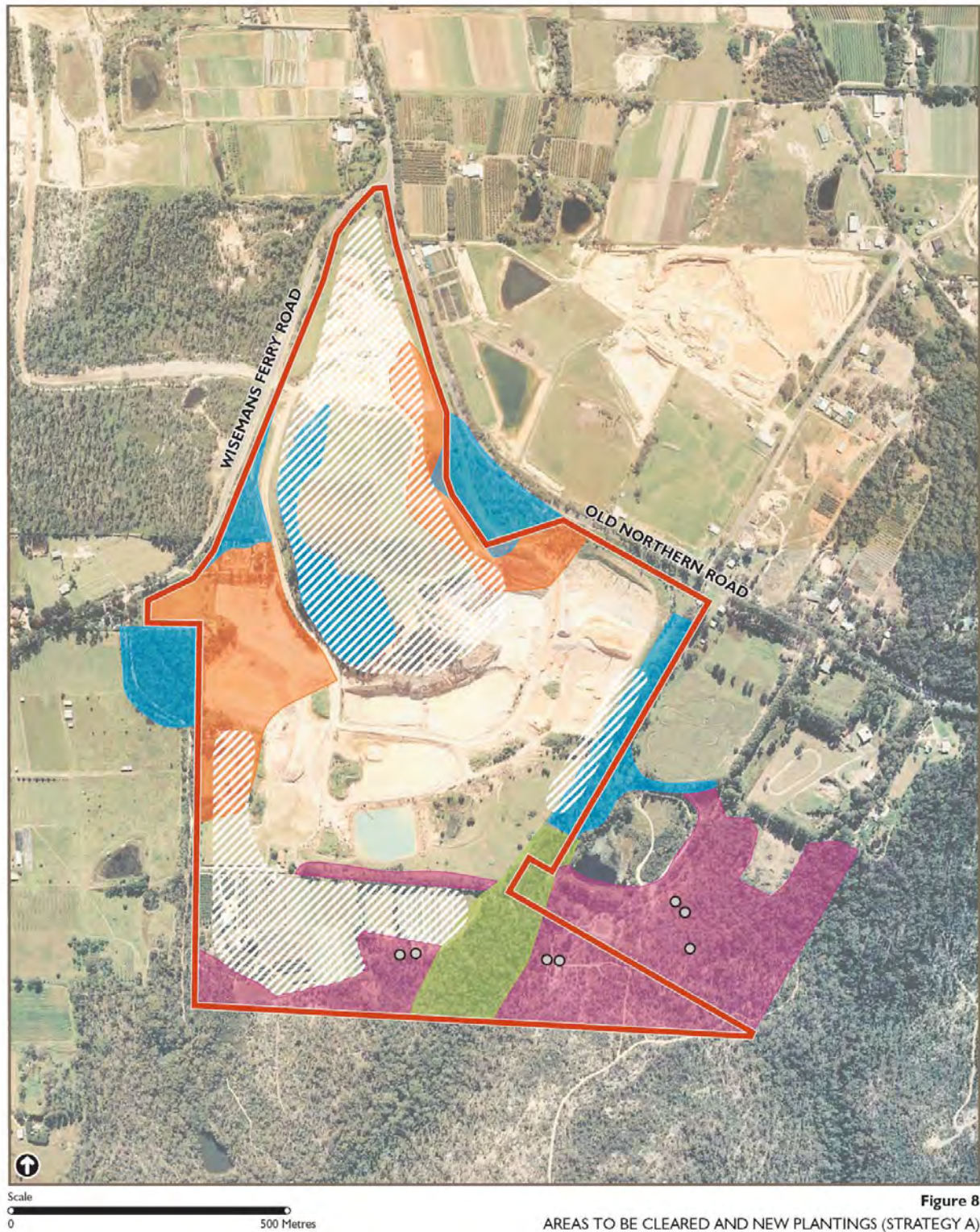
Scale
0 500 Metres

Hitchcock Road site boundary

Monitoring locations

APPENDIX 4 NOISE ASSESSMENT LOCATIONS

APPENDIX 5 VEGETATION OFFSET PLAN



- Hitchcock Road site
- Areas for new plantings
- Sydney Sandstone Gully Forest
- Sydney Sandstone Ridgetop Woodland
- Sydney Hinterland Transition Woodland
- ▨ Area to be cleared
- *Tetratheca glandulosa*

Note: Sydney Hinterland Transition Woodland shown at time of photograph (2005)
Parts of this area can be cleared under the current consent

APPENDIX 6 CRITERIA TO MONITOR SUCCESS OF REVEGETATION



Methodology to assess success of revegetation
within Hitchcock Road site

Table 3-1 Criteria to monitor success of revegetation

Category	Criteria	Target			Existing condition of vegetation to be removed
		5 years	10 years	15 years	
Native species	Native species diversity (average number per 400m ² quadrat)	20	35	40	46
	Average number of characteristic species for the site occurring within 400m ²	15	20	27	34.5 (+/- 1.5)
	Native species cover (% of vegetation cover in 400m ² quadrat)	>50	>85	>95	99
Weeds	Weed abundance (% of vegetation cover in 400m ² quadrat)	<50	<15	<5	<1
	Invasive or Noxious weed species (e.g. Lantana, Blackberry, exotic vines)	Controlled	Controlled	Controlled	Restricted
Vegetation structure	Vegetation structure	Canopy, shrublayer and groundcover species present. However, structure limited, generally consisting of low canopy and ground cover.	Canopy, shrublayer and groundcover species present. Structure beginning to develop.	Well structured and includes canopy, mid- storey and ground cover units	Well structured and includes canopy, mid- storey and ground cover units
Canopy ^a	Average canopy height (m)	4	8	12	12-16
	Native canopy cover (minimum % cover) [modified braun blanquet scale] ^b	5 [3]	5 [3]	5 [3]	5 [3]
Shrub layer ^a	Native shrub cover (minimum % cover) [modified braun blanquet scale] ^b	10 [3]	15 [3]	25 [4]	32.5 (+/-7.5) [4]
	Average shrub layer height (m)	0.5	1	1	1.25
Ground cover	Native ground cover (minimum % cover) [modified braun blanquet scale] ^b	5 [3]	10 [3]	10 [3]	15 (+/-5) [3]

PB

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Category	Criteria	Target			Existing condition of vegetation to be removed
		5 years	10 years	15 years	
Ecosystem function	Habitat values	Vegetation structure beginning to develop.	Woodland birds recorded. Habitat structure beginning to develop, including groundcover such as leaf litter and fallen timber.	Woodland birds recorded. Habitat structure beginning to develop, including groundcover such as leaf litter and fallen timber.	Provides minimal habitat for fauna, however, many woodland birds present. Well structured habitat, includes moderate levels of leaf litter and fallen timber.
	Natural regeneration indicating dispersal of seed into site and/or presence of soil seed bank	Yes	Yes	Yes	Yes

Notes: a) cover of canopy species and shrubs may be higher initially due to successional changes with dense growth potentially occurring initially particularly due to the presence of colonising species. Natural thinning is expected as colonising species senesce and canopy species mature, however, some thinning of vegetation may be required after 10 years if too dense.

b) Modified braun blanquet scale:

1. <5%- rare or few individuals
2. <5% common
3. 5-25%
4. 25-50%
5. 50-75%
6. 75-100%

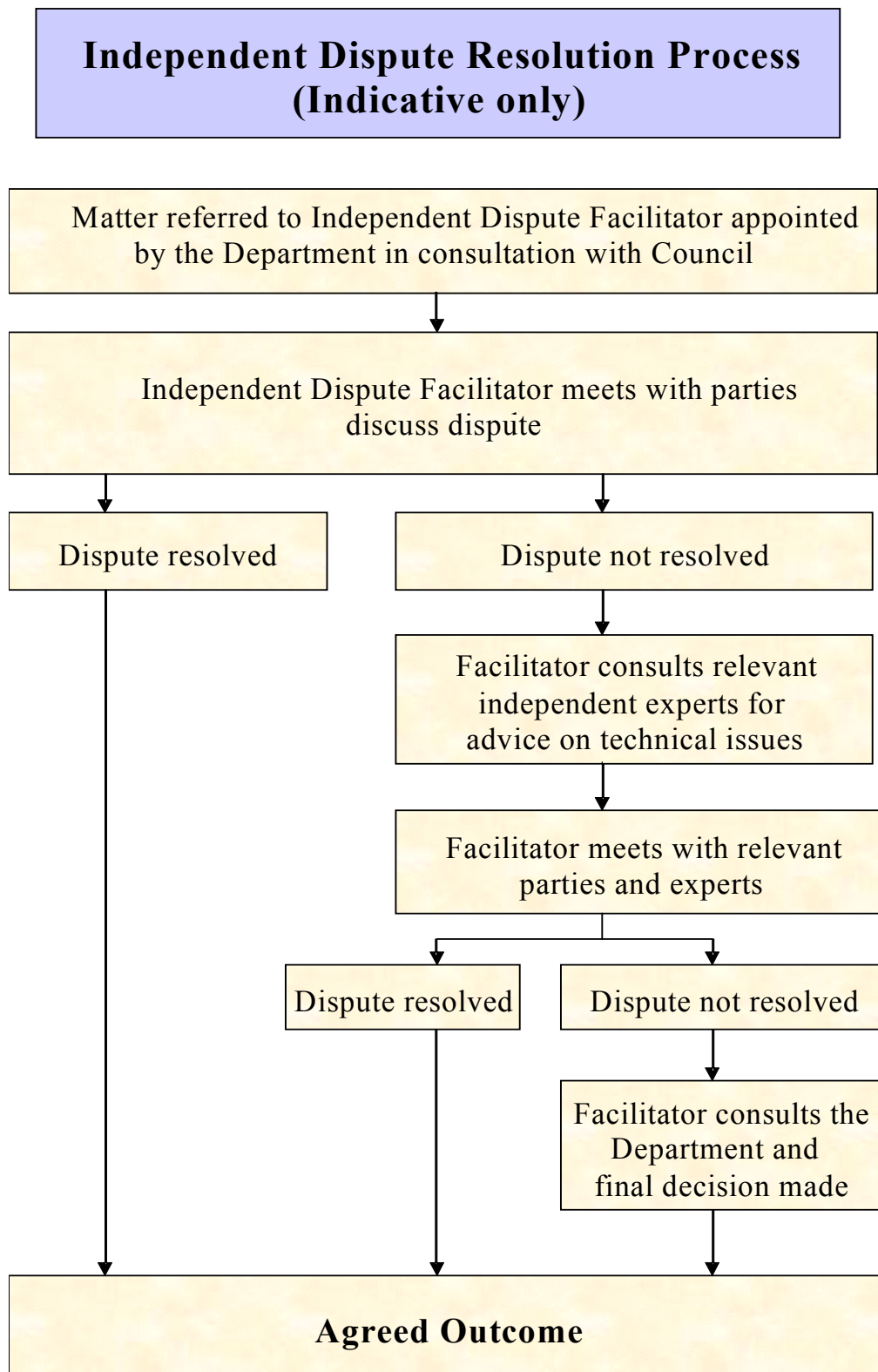
APPENDIX 7 FINAL LANDFORM PLANS





Figure 10
FINAL LANDFORM (STRATEGY B)

**APPENDIX 8
INDEPENDENT DISPUTE RESOLUTION PROCESS**



Appendix 2

Environment Protection Licence No. 3407

Environment Protection Licence



Environment,
Climate Change
& Water

Licence - 3407

Licence Details

Number:	3407
Anniversary Date:	30-September

Licensee

ETRA PTY LTD
1774 WISEMANS FERRY ROAD
MAROOTA NSW 2756

Licence Type

Premises

Premises

ETRA PTY LTD
WISEMANS FERRY ROAD
MAROOTA NSW 2756

Scheduled Activity

Extractive activities

Fee Based Activity

Land-based extractive activity

Scale

> 100000 - 500000 T obtained

Region

Metropolitan
Level 3, NSW Govt Offices, 84 Crown Street
WOLLONGONG NSW 2500
Phone: 02 4224 4100
Fax: 02 4224 4110

PO Box 513 WOLLONGONG EAST
NSW 2520

Environment Protection Licence

Licence - 3407



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Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act); and
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).

The EPA publication "A Guide to Licensing" contains information about how to calculate your licence fees.

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The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

ETRA PTY LTD
1774 WISEMANS FERRY ROAD
MARROOTA NSW 2756

subject to the conditions which follow.

1 Administrative conditions

A1 What the licence authorises and regulates

A1.1 Not applicable.

A1.2 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity

Extractive activities

Fee Based Activity	Scale
Land-based extractive activity	> 100000 - 500000 T obtained

A1.3 Not applicable.

Environment Protection Licence

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A2 Premises to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
ETRA PTY LTD
WISEMANS FERRY ROAD
MAROOKA
NSW
2756
PARISH OF
CORNELIA:LOT2DP703821;LOT198DP752025;LO
T 1 DP 588936;LOTS1DP595538; WR35733
PARISH OF MAROOKA LOT 1DP1013943;
LOT2DP555184;LOT167 & 214 DP752039;
LOT2DP233818; LOT1DP34599;
LOT 1 and 2DP570966; LOTS 1 & 2 DP1063296;
LOT 1DP1091018 and LOT LOT 1DP223323

A3 Other activities

A3.1 This licence applies to all other activities carried on at the premises, including:

Concrete Works

A4 Information supplied to the EPA

A4.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:

- (a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and

- (b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

2 Discharges to air and water and applications to land

P1 Location of monitoring/discharge points and areas

- P1.1 The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.

Air

EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Description of Location
1	Dust monitoring		Dust gauge labelled "1- School" on the Map faxed to the EPA on 5 August 2002
2	Dust monitoring		Dust gauge labelled 2 - intersection of Hitchcock and Wisemans Ferry Road
3	Dust monitoring		Dust gauge labelled as "Jurds Paddock - 3 Por168" on the map faxed to the EPA on 5 August 2002

- P1.2 Not applicable.

- P1.3 Not applicable.

3 Limit conditions

L1 Pollution of waters

- L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L2 Load limits

- L2.1 Not applicable.

- L2.2 Not applicable.

Environment Protection Licence

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L3 Concentration limits

L3.1 Not applicable.

L3.2 Not applicable.

L3.3 Not applicable.

L4 Volume and mass limits

L4.1 Not applicable.

L5 Waste

L5.1 The licensee must not cause, permit or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or any waste generated at the premises to be disposed of at the premises, except as expressly permitted by the licence.

L5.2 This condition only applies to the storage, treatment, processing, reprocessing or disposal of waste at the premises if those activities require an environment protection licence.

L6 Noise Limits

L6.1 Noise generated at the premises must not exceed the noise limits presented in the table below. Note that the noise limits represent the noise contribution from the activity on the premise.

Noise Limits (dB(A))

Location	Day	Night	
	L _{Aeq} (15 minute)	L _{Aeq} (15 minute)	L _{A1} (1 minute)
Maroota Public School	40	NA	NA
Pignataro	40	37	52
Tornatola	39	38	52

Note the Locations are as described in the Richard Heggie Associates Pty Ltd, 13 April 2005, *Lot 198 DP 752025 Old Northern Road, Maroota Sand Extraction Project Noise Impact Assessment*. Report 10-3138-R1.

L6.2 For the purposes of condition L6.1:

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public holidays.
- Evening is defined as the period 6pm to 10pm,
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays.

L6.3 Noise from the premises is to be measured at the most affected point or within the residential boundary or at the most affected point within 30m of the dwelling (rural situations) where the dwelling is more than 30m from the boundary to determine compliance with the noise $L_{Aeq, (15min)}$ limits in condition L6.1

Noise from the premises is to be measured at 1m from the dwelling façade to determine compliance with the $L_{A1(1 \text{ minute})}$ noise limits in condition L6.1

Where it can be demonstrated that direct measurement of noise from the premises is impractical, the EPA may accept alternative means of determining compliance. See Chapter 11 of the NSW Industrial Noise Policy.

The modification factors presented in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.

Definition

$L_{A10(15 \text{ minute})}$ is the sound pressure level that is exceeded for 10% of the time when measured over a 15 minute period.

Note: Noise measurement

For the purpose of noise measurements required for this condition, the L_{A10} noise level must be measured or computed at any point specified in L6.3 over a period of 15 minutes using "FAST" response on the sound level meter.

For the purpose of the noise criteria for this condition, 5dBA must be added to the measured level if the noise is substantially tonal or impulsive in character. The location or point of impact can be different for each development, for example, at the closest residential receiver or at the closest boundary of the development. Measurement locations can be:

1 metre from the facade of the residence for night time assessment;

at the residential boundary;

30 metres from the residence (rural situations) where the boundary is more than 30 metres from residence.

- L6.4 The noise emission limits identified in **L6.1** apply for prevailing meteorological conditions (winds up to 3m/s at 10 metres above ground level), temperature inversion conditions of up to 3°C/100m and wind speed up to 2m/s at 10 metres above the ground. Noise impacts that may be enhanced by temperature inversions must be addressed by:
documenting noise complaints received to identify any higher level of impacts or patterns of temperature inversions;

where levels of noise complaints indicate a higher level of impact then actions to quantify and ameliorate any enhanced impacts under temperature inversion conditions should be developed and implemented.

- L6.5 The proponent shall prepare and implement a Noise Management Plan (NMP). The NMP must include but need not be limited to:
- a) The primary objective of minimising noise emissions from the premises
 - b) A system that allows for periodic assessment of Best Management Practice (BMP) and Best Available Technology Economically Achievable (BATEA) to minimise noise emissions at all times and to seek to achieve noise contributions not exceeding the Project Specific Noise Levels at all receiver locations.
 - c) Measures to monitor noise performance and respond to complaints.

L7 Hours of operation

- L7.1 Activities covered by this licence must only be carried out between the hours of 0600 and 1800 Monday to Friday, and 0600 and 1800 Saturday, and at no time on Sundays and Public Holidays.

4 Operating conditions

O1 Activities must be carried out in a competent manner

- O1.1 Licensed activities must be carried out in a competent manner.

This includes:

- (a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
- (b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

- O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:
- (a) must be maintained in a proper and efficient condition; and
 - (b) must be operated in a proper and efficient manner.

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O3 Dust Control

- O3.1 The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.
- O3.2 All loaded trucks entering and leaving the premises must have their loads covered.

O4 Potentially offensive odour

- O4.1 The licensee must not cause or permit the emission of offensive odour beyond the boundary of the premises.

Note: Section 129 of the Protection of the Environment Operations Act 1997, provides that the licensee must not cause or permit the emission of any offensive odour from the premises but provides a defence if the emission is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of a licence directed at minimising odour.

5 Monitoring and recording conditions

M1 Monitoring records

- M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.
- M1.2 All records required to be kept by this licence must be:
- (a) in a legible form, or in a form that can readily be reduced to a legible form;
 - (b) kept for at least 4 years after the monitoring or event to which they relate took place; and
 - (c) produced in a legible form to any authorised officer of the EPA who asks to see them.
- M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
- (a) the date(s) on which the sample was taken;
 - (b) the time(s) at which the sample was collected;
 - (c) the point at which the sample was taken; and
 - (d) the name of the person who collected the sample.

M2 Requirement to monitor concentration of pollutants discharged

- M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:

Air

POINT 1

Pollutant	Units of measure	Frequency	Sampling Method
Particulates - Deposited Matter	grams per square metre per month	Monthly	AM-19

POINT 2

Pollutant	Units of measure	Frequency	Sampling Method
Particulates - Deposited Matter	grams per square metre per month	Monthly	AM-19

POINT 3

Pollutant	Units of measure	Frequency	Sampling Method
Particulates - Deposited Matter	grams per square metre per month	Monthly	AM-19

M3 Testing methods - concentration limits

M3.1 Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with:

- any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or
- if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or
- if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place.

Note: The Protection of the Environment Operations (Clean Air) Regulation 2002 requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".

M3.2 Not applicable.

M4 Recording of pollution complaints

M4.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

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- M4.2 The record must include details of the following:
- (a) the date and time of the complaint;
 - (b) the method by which the complaint was made;
 - (c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
 - (d) the nature of the complaint;
 - (e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
 - (f) if no action was taken by the licensee, the reasons why no action was taken.

M4.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M4.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M5 Telephone complaints line

M5.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

M5.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.

M5.3 Conditions M5.1 and M5.2 do not apply until 3 months after:

- (a) the date of the issue of this licence or
- (b) if this licence is a replacement licence within the meaning of the Protection of the Environment Operations (Savings and Transitional) Regulation 1998, the date on which a copy of the licence was served on the licensee under clause 10 of that regulation.

M6 Requirement to monitor volume or mass

M6.1 Not applicable.

6 Reporting conditions

R1 Annual return documents

What documents must an Annual Return contain?

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:

- (a) a Statement of Compliance; and

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(b) a Monitoring and Complaints Summary.

A copy of the form in which the Annual Return must be supplied to the EPA accompanies this licence. Before the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

Period covered by Annual Return

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

R1.3 Where this licence is transferred from the licensee to a new licensee:

- (a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
- (b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:

- (a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or
- (b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

Deadline for Annual Return

R1.5 The Annual Return for the reporting period must be supplied to the EPA by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

Notification where actual load can not be calculated

R1.6 Not applicable.

Licensee must retain copy of Annual Return

R1.7 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

Certifying of Statement of Compliance and signing of Monitoring and Complaints Summary

R1.8 Within the Annual Return, the Statement of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:

- (a) the licence holder; or
- (b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

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- R1.9 A person who has been given written approval to certify a certificate of compliance under a licence issued under the Pollution Control Act 1970 is taken to be approved for the purpose of this condition until the date of first review of this licence.

R2 Notification of environmental harm

Note: The licensee or its employees must notify the EPA of incidents causing or threatening material harm to the environment as soon as practicable after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

- R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.
- R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

R3 Written report

- R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:
- (a) where this licence applies to premises, an event has occurred at the premises; or
 - (b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,
- and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.
- R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.
- R3.3 The request may require a report which includes any or all of the following information:
- (a) the cause, time and duration of the event;
 - (b) the type, volume and concentration of every pollutant discharged as a result of the event;
 - (c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
 - (d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
 - (e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
 - (f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
 - (g) any other relevant matters.
- R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

General conditions

G1 Copy of licence kept at the premises

- G1.1 A copy of this licence must be kept at the premises to which the licence applies.
- G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.
- G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

Pollution studies and reduction programs

U1 Completed Pollution Reduction Programs (PRP)

PRP No	PRP	Description	Completed Date
1	Impervious bunded area to fuel storage tank	The bunded area serving the above ground fuel storage tank located outside the main workshop made impervious	1 May 2008
2	Roofed bunded area to fuel storage tank	The bunded area serving the above ground fuel storage tank located outside the main workshop fitted with roof to exclude rainwater	1 May 2008
3	Upgrade overflow point of sediment dam	The overflow point to the sediment dam upgraded	1 May 2008
4	Prevent mud tracking from premises	Upgraded controls to help prevent mud tracking from the premises onto Wiseman's Ferry Road	1 May 2008
5	PM10 dust monitoring	PM10 dust monitoring conducted from 1 March 2008 to 1 March 2009	1 March 2009

Special conditions

Dictionary

General Dictionary

In this licence, unless the contrary is indicated, the terms below have the following meanings:

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 1998.
flow weighted	Means a sample whose composites are sized in proportion to the flow at each composites time of

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composite sample	collection.
general solid waste (non-putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder described at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 months. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
restricted solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
special waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TM	Together with a number, means a test method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .

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TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste type	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non-putrescible), special waste or hazardous waste

Mr Nigel Sargent

Environment Protection Authority

(By Delegation)

Date of this edition - 08-Feb-2011

End Notes

- 1 Licence varied by notice V/M Upgrade, issued on 06-Jul-2000, which came into effect on 06-Jul-2000.
- 2 Licence varied by notice 1007929, issued on 02-Jul-2001, which came into effect on 27-Jul-2001.
- 3 Licence varied by notice 1010310, issued on 23-Aug-2002, which came into effect on 17-Sep-2002.
- 4 Licence varied by notice 1024315, issued on 16-Jan-2003, which came into effect on 10-Feb-2003.
- 5 Licence varied by notice 1076205, issued on 29-Feb-2008, which came into effect on 29-Feb-2008.
- 6 Licence varied by Change to Schedule 1, issued on 02-May-2008, which came into effect on 02-May-2008.
- 7 Condition A1.3 Not applicable varied by notice issued on <issue date> which came into effect on <effective date>

Environment Protection Licence

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& Water

End Notes

- | | |
|----|---|
| 8 | Licence varied by notice 1099065, issued on 18-May-2009, which came into effect on 18-May-2009. |
| 9 | Licence varied by notice 1111706, issued on 31-Mar-2010, which came into effect on 31-Mar-2010. |
| 10 | Licence varied by notice 1124599, issued on 08-Feb-2011, which came into effect on 08-Feb-2011. |

Appendix 3

Letters to Agencies and Response



**ENVIRONMENTAL
PLANNING Pty Ltd**

ABN 23 064 176 174

**PO Box 6443
Silverwater NSW 1811**

**Phone (02) 9648 4400
bruce@eplanning.com.au
www.eplanning.com.au**

7 March 2014

Ms Kristine McKenzie
Principal Executive Planner
Baulkham Hills Shire Council
PO Box 75
Castle Hill NSW 1765

Dear Madam,

Independent Environmental Audit of Hitchcock Road Sand Project at Maroota

The Hitchcock Road Sand Project was approved by the Minister for Planning on 7 February 2009. Schedule 5 Condition 6 of the project approval states as follows.

Within 12 months of the date of this approval, and every 3 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. This audit shall:

- (a) be conducted by a suitably qualified, experienced, and independent person(s) whose appointment has been approved by the Director-General;
- (b) include consultation with the relevant agencies;
- (c) assess the environmental performance of the project, and its effects on the surrounding environment;
- (d) assess whether the project is complying with the relevant standards, performance measures and statutory requirements; and
- (e) review the adequacy of any strategy/plan/program required under this approval, and, if necessary, recommend measures or actions to improve the environmental performance of the project, and/or any strategy/plan/program required under this approval.

On 13 July 2010 the Director-General approved the undersigned to conduct the independent environmental audits. The first audit was completed in April 2011 with the second audit now in progress. With regard to condition (b) above I am writing to you representing one of the relevant agencies.

The 2012-2013 Annual Environmental Management Report and supporting documents for the project are available for download at the proponent's (PF Formation) website by following the links for the Hitchcock Road Sand Extraction Development at <http://www.pfformation.com.au/Pages/news.htm>. For your information the attached A4 color aerial photograph outlines the extent of the project as at April 2009 and the approximate cadastral boundaries. Please note that more recent aerial photographs of the project area are not available.

Could your agency please forward a response including any comments or issues on the project to the undersigned within 21 days or 28 March 2014.

Yours faithfully

Bruce Adcock
Director

Enclosure: A4 colour aerial photograph



**ENVIRONMENTAL
PLANNING Pty Ltd**

ABN 23 064 176 174

**PO Box 6443
Silverwater NSW 1811**

**Phone (02) 9648 4400
bruce@eplanning.com.au
www.eplanning.com.au**

7 March 2014

Executive Director Mineral Resources
Department of Primary Industries – Mineral Resources
PO Box 344
Hunter Region Mail Centre NSW 2310

Dear Sir/Madam,

Independent Environmental Audit of Hitchcock Road Sand Project at Maroota

The Hitchcock Road Sand Project was approved by the Minister for Planning on 7 February 2009. Schedule 5 Condition 6 of the project approval states as follows.

Within 12 months of the date of this approval, and every 3 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. This audit shall:

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Bruce Adcock
Director

Enclosure: A4 colour aerial photograph



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ABN 23 064 176 174

**PO Box 6443
Silverwater NSW 1811**

**Phone (02) 9648 4400
bruce@eplanning.com.au
www.eplanning.com.au**

7 March 2014

Director
Office of Environment and Heritage
PO Box A290
Sydney South NSW 1232

Dear Sir/Madam,

Independent Environmental Audit of Hitchcock Road Sand Project at Maroota

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Yours faithfully

Bruce Adcock
Director

Enclosure: A4 colour aerial photograph

THE HILLS SHIRE COUNCIL

3 Columbia Court, Baulkham Hills NSW 2153
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Facsimile +61 2 9843 0409

DX 9966 Norwest

Email council@thehills.nsw.gov.au
www.thehills.nsw.gov.au

ABN No. 25 034 494 656

13 March 2014

Mr Bruce Adcock
Environmental Planning Pty Ltd
PO Box 6443
SILVERWATER NSW 1811

Our Ref:

Dear Mr Adcock

**Independent Environmental Audit of Project Approval 06_0104 Issued by
Department of Planning
PF Formation, Hitchcock Road Site, Maroota**

I refer to your letter dated 7 March 2014 in respect to Condition 6 of Schedule 5 of the Project Approval granted by the Department of Infrastructure and Planning.

In response to your letter, Council staff have no concerns regarding Hitchcock Road. In this respect the site in general was inspected on 12 November 2013 at the bi-annual Liaison and Review Meeting. Please note however that as Council was not the determining authority for this consent the purpose of the site inspection was not to identify non-compliances with conditions of consent relating to Hitchcock Road and this part of the operation was not inspected.

Thank you for the opportunity to comment on this matter. Should you wish to discuss the matter further please contact me on 9843 0319.

Yours faithfully



Kristine McKenzie
PRINCIPAL EXECUTIVE PLANNER

CC: PF Formation, 1774 Wisemans Ferry Road, Maroota NSW 2756

Appendix 4

Revised Hitchcock Road Site Survey Plan



**PF FORMATION
HITCKCOCK ROAD
SAND EXTRACTION AND REHABILITATION PROJECT SITE
MAROOTA**

ORTHOPHOTOMAP
CONTOUR INTERVAL 1 METRE

SCALE 1:5,000 0 100 200 METRES

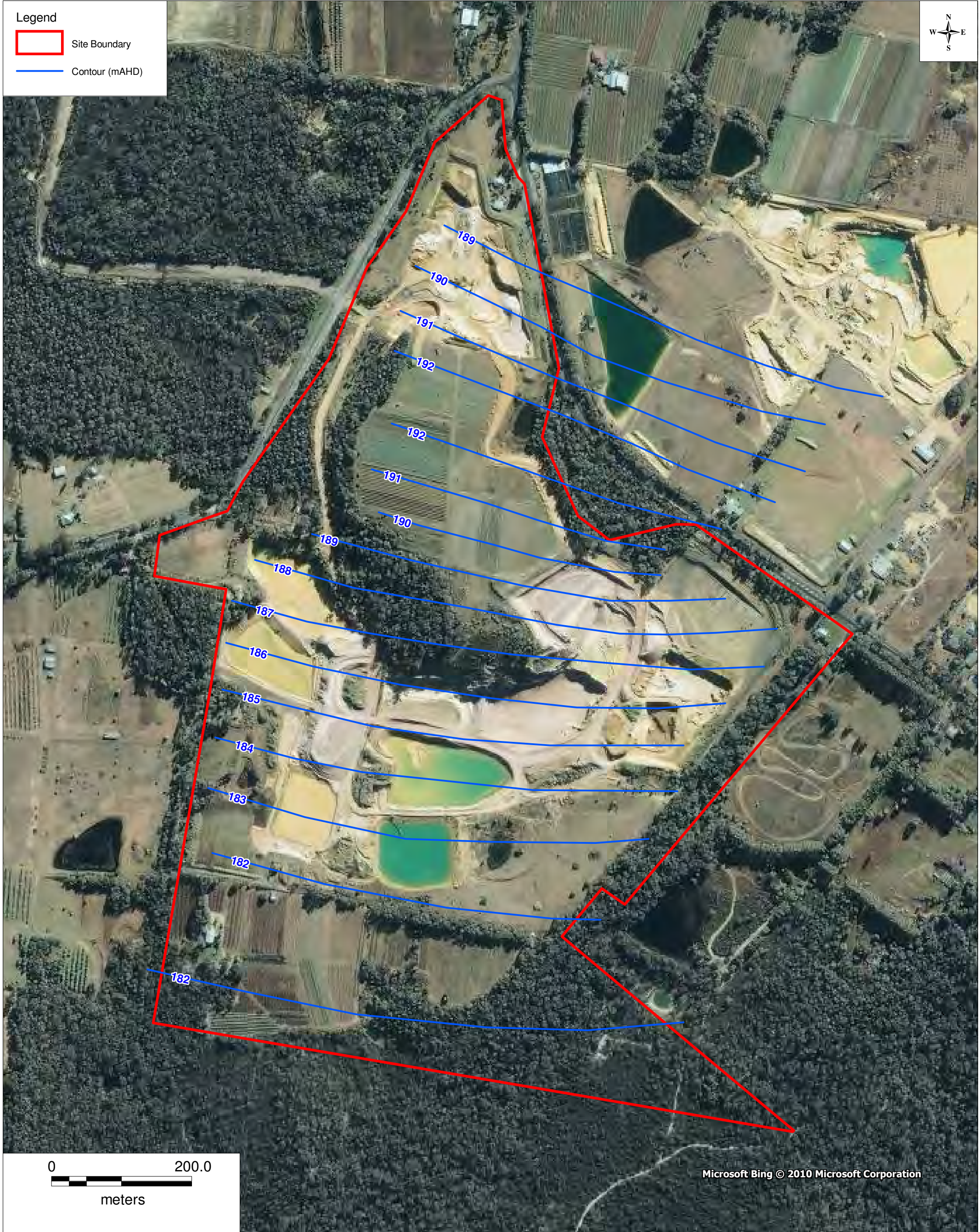
HORIZONTAL PROJECTION: MAP GRID OF AUSTRALIA
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM

Geospectrum (Australia) Pty Limited

ORIGINATED BY
GEO-APPLICATIONS (AUSTRALIA) PTY LIMITED
2008 & 2009
IN DAY 5005 FROM 1:50,000 SCALE
AERIAL PHOTOGRAPHY PLUSHY 1980 APRIL 2005
BORDERING SURVEY BY
HARRISON BRIDGEMAN & CO.

Appendix 5

Revised Hitchcock Road Site Depth of Mining Contours



Source: Aerial imagery from Bing Maps © 2010 Microsoft Corporation and its data suppliers.
Whilst every care is taken by URS to ensure the accuracy of the digital data, URS makes no representation or warranties about its accuracy, reliability, completeness, suitability for any particular purpose and disclaims all responsibility and liability (including without limitation, liability in negligence) for any expenses, losses, damages (including indirect or consequential damage) and costs which may be incurred as a result of data being inaccurate in any way for any reason. Electronic files are provided for information only. The data in these files is not controlled or subject to automatic updates for users outside of URS.

PF FORMATION

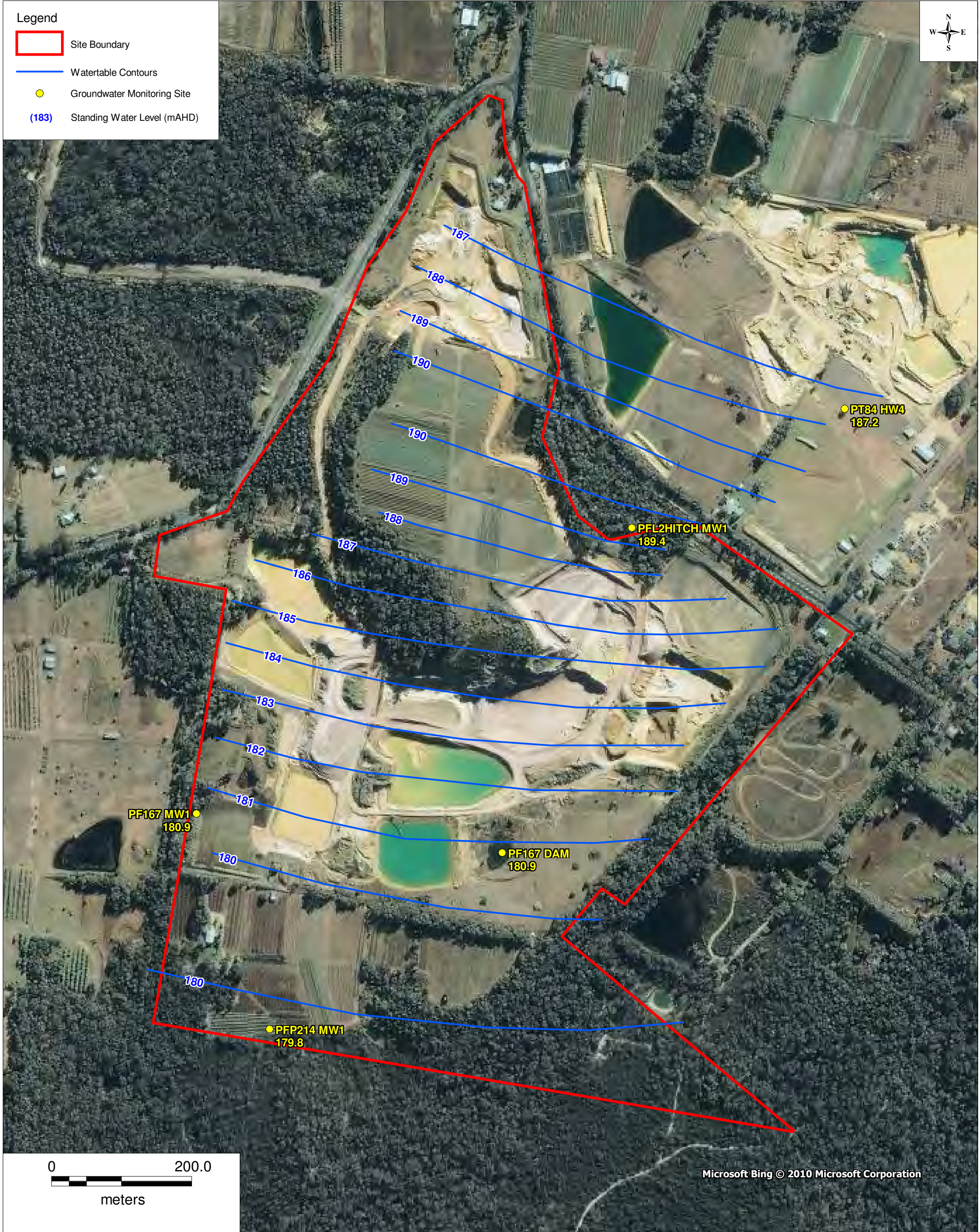
HITCHCOCK ROAD, SAND EXTRACTION
AND REHABILITATION PROJECT

HITCHCOCK ROAD SITE
DEPTH OF MINING CONTOURS
@ 22/06/2011



Appendix 6

Revised Hitchcock Road Site Water Table Contours



Source: Aerial imagery from Bing Maps © 2010 Microsoft Corporation and its data suppliers.
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Appendix 7

Hitchcock Road Site Depth of Mining Contours and April 2014 Extraction Levels



PF FORMATION

HITCHCOCK ROAD, SAND EXTRACTION
AND REHABILITATION PROJECT

References - Parsons Brinckerhoff Geological Cross Section NS3
- Geospectrum Orthophotomap

**HITCHCOCK ROAD SITE
DEPTH OF MINING CONTOURS
@ 22/06/2011**

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Figure: 002

Rev: A

A3

Appendix 8

2013 Monitoring of Revegetation at Hitchcock Road, Maroota, 5 December 2013, Parsons Brinckerhoff

PF Formation

2013 Monitoring of revegetation at Hitchcock Road, Maroota

5 December 2013



Document information

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Distribution

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1. Introduction

This report presents the findings of the third monitoring session of a rehabilitation area within PF Formation's sandmining operations at Hitchcock Road, Maroota.

1.1 Background

Expansion of an existing PF Formation sand mine at Hitchcock Road required clearing of 3.7 hectares of Sydney Hinterland Transition Woodland. It was proposed to offset this clearing with revegetation and re-creation of this community within a 7.9 hectare area on the western boundary of the site where quarrying has been completed. A key condition of the clearing being permitted is that PF Formation establishes at least 3.7 hectares of revegetation, recreating the Sydney Hinterland Transition Woodland community. Revegetation was commenced by PF Formation in 2004. To date an area of 4.2 hectares has been replanted (approximately 1 hectare in 2004, 2 hectares in 2006 and 1.2 hectares in 2011) with the aim to recreate the vegetation to be cleared from Lot 1 DP 1013943.

Monitoring of the rehabilitation of previously mined areas is a requirement of project approval and environmental reporting is required to provide some certainty that this revegetation will ultimately result in the creation of a naturally regenerating patch of Sydney Hinterland Transition Woodland. This monitoring needs to be undertaken regularly by independent consultants (not those undertaking the revegetation works) and to include assessment against the success criteria developed for rehabilitation within the site, as included in the consent conditions for the project.

Parsons Brinckerhoff undertook monitoring of the site in July 2010 (Parsons Brinckerhoff 2010) with a second monitoring session in October 2012. Based on the monitoring results of 2012 (Parsons Brinckerhoff 2012) and the progress towards the ecological completion criteria, the Department of Planning and Infrastructure approved the clearing of Sydney Hinterland Transition Woodland within the site in March 2013. Continuation of the monitoring of the rehabilitation and offset obligations are required in accordance with the project approval and to provide detailed reporting for inclusion in the next Independent Environmental Audit report for the quarry in 2014.

1.2 Objectives of revegetation

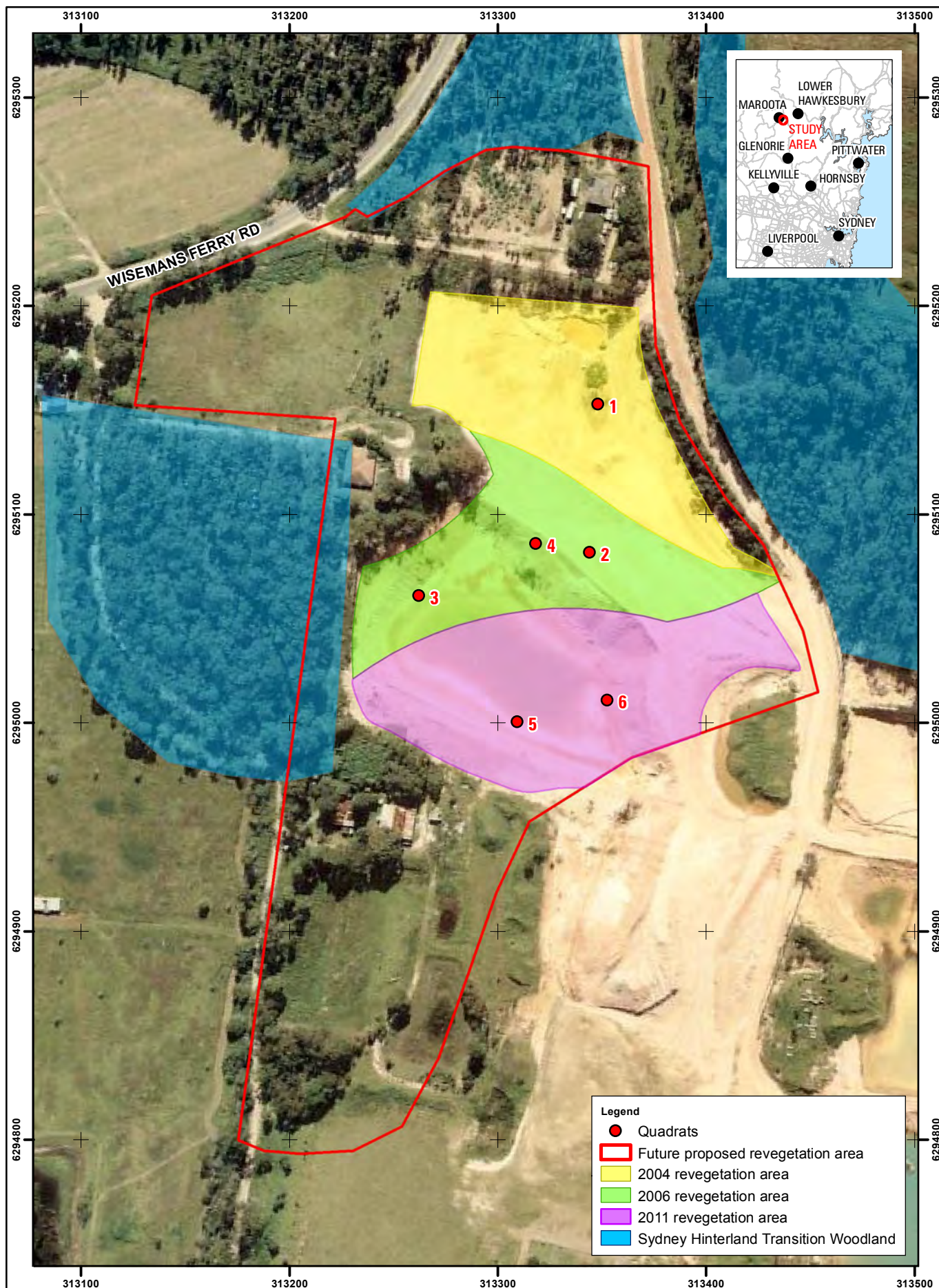
The objectives of revegetation within the Hitchcock Road site are to:

- rehabilitate and revegetate quarried areas
- revegetate with native vegetation characteristic of the community to be removed from Lot 1 DP 1013943, namely Sydney Hinterland Transition Woodland
- re-create the existing characteristics of this community, to provide an area suitable for offsetting the clearing of this community at that time.

1.3 Aims of report

The aims of this report are to:

- present the results of the monitoring survey
- analyse the results against the criteria for monitoring the success of rehabilitation and progress towards five, ten and fifteen year targets (see Section 2.3)
- provide recommendations on management actions required to assist in successful re-creation of Sydney Hinterland Transition Woodland within the site and to meet the long-term goals
- provide independent monitoring report for inclusion as part of the Independent Environmental Audit for the quarry in 2014.



Data Source: -

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Map No: 2162329A_GIS_F001_A3

Author: GK

Approved by: SH

Date: 31/10/2012



Scale ratio correct when printed at A4 Portrait

Coordinate System: GCS GDA 1994

2012 Monitoring of revegetation at Hitchcock Road Sand Mine, Maroota
Figure 1-1
 Revegetation areas and survey sites



2. Methodology

2.1 Nomenclature

Names of plants used in this document follow Harden (Harden 1992, 1993, 2000, 2002) with updates from PlantNet (Royal Botanic Gardens 2013) and the Australian Plant Census (Council of Heads of Australasian Herbaria 2010). Scientific names are used in this report for species of plant. Scientific and common names (where available) are provided in plant lists in Appendices A and B. Introduced species are identified within the text with an asterisk following the name, for example *Lantana camara**

2.2 Field survey

This is the third monitoring survey of the revegetation areas. The first site inspection was undertaken on 5 July 2010, the second undertaken on 25 October 2012 and this, the third undertaken on 2 December 2013. Fixed quadrats (20 x 20 m) were set up with edges running in a north-south, east west direction. Quadrats were marked with stakes at the north western and south western corners of the quadrat.

Within each quadrat, every species of plant present was recorded and its cover abundance estimated using a modified braun blanquet scale:

1. <5%- rare or few individuals
2. <5% common
3. 5–25%
4. 25–50%
5. 50–75%
6. 75–100%.

Additional information recorded at each quadrat site included:

- centre and south western corner of quadrat using GPS
- slope and aspect,
- landform
- soil type
- evidence of disturbance, condition
- evidence of canopy recruitment, natural regeneration
- fauna habitat values
- photographs from the south western corner of the quadrat (to the north, north east, east, south and west).

The location of quadrats is summarised in Table 2.1.

Table 2.1 **Quadrat survey locations**

Stratification	Quadrat identifier	Centre of site ¹		South west corner ²	
		Easting	Northing	Easting	Northing
2004 revegetation area	1	313348	6295163	313335	6295148
2006 revegetation area	2	313343	6295082	313333	6295087
	3	313262	6295061	313253	6295059
	4	313318	6295086	313306	6295077
2011 revegetation area	5	313319	6295008	313309	6295000
	6	313363	6295018	313352	6295011

(1) UTM, WGS 84

(2) Location of monitoring photo point and stake marking the south western corner of quadrat

2.3 Criteria to assess rehabilitation success

Field surveys were undertaken in 2008 of the vegetation to be cleared to provide data on the typical characteristics of the community and provide baseline information against which the revegetation program can be assessed (Parsons Brinckerhoff 2008).

The criteria for assessment and the target values for these goals are provided in Table 2.2 on the following page.

Table 2.2 Criteria to monitor success of revegetation

Category	Criteria	Target			Condition of vegetation to be removed
		5 years	10 years	15 years	
Native species	Native species diversity (average number per 400 m ² quadrat)	20	35	40	46
	Average number of characteristic species for the site occurring within 400 m ²	15	20	27	34.5 (+/- 1.5)
	Native species cover (% cover in 400 m ² quadrat)	>50	>85	>95	99
Weeds	Weed abundance (% of vegetation cover in 400 m ² quadrat)	<50	<15	<5	<1
	Invasive or Noxious weed species (e.g. Lantana, Blackberry, exotic vines)	Controlled	Controlled	Controlled	Restricted
Vegetation structure	Vegetation structure	Canopy, shrublayer and groundcover species present. However, structure limited, generally consisting of low canopy and ground cover.	Canopy, shrublayer and groundcover species present. Structure beginning to develop.	Well structured and includes canopy, mid-storey and ground cover units	Well structured and includes canopy, mid-storey and ground cover units
Canopy ^a	Average canopy height (m)	4	8	12	12-16
	Native canopy cover (minimum % cover) [modified braun blanquet scale] ^b	5 [3]	5 [3]	5 [3]	5 [3]
Shrub layer ^a	Native shrub cover (minimum % cover) [modified braun blanquet scale] ^b	10 [3]	15 [3]	25 [4]	32.5 (+/-7.5) [4]
	Average shrub layer height (m)	0.5	1	1	1.25

Category	Criteria	Target			Condition of vegetation to be removed
		5 years	10 years	15 years	
Ground cover	Native ground cover (minimum % cover) [modified braun blanquet scale] ^b	5 [3]	10 [3]	10 [3]	15 (+/-5) [3]
Ecosystem function	Habitat values	Vegetation structure beginning to develop.	Woodland birds recorded. Habitat structure beginning to develop, including groundcover such as leaf litter and fallen timber.	Woodland birds recorded. Habitat structure beginning to develop, including groundcover such as leaf litter and fallen timber.	Provides minimal habitat for fauna, however, many woodland birds present. Well structured habitat, includes moderate levels of leaf litter and fallen timber.
	Natural regeneration indicating dispersal of seed into site and/or presence of soil seed bank	Yes	Yes	Yes	Yes

2.4 Results

Photos of the vegetation to be cleared within Lot 1 DP 1013943 and the rehabilitation area quadrat sites are provided in Appendix B. Species recorded, vegetation structure and other environmental characteristics of the quadrat sites are summarised in Appendix C.

2.5 Species of plant

A total of 84 species of plant was recorded within the site during this monitoring session, of which 68 (81%) are native. A full list of species recorded within each quadrat and the vegetation structure is provided in Appendix C.

No species listed as noxious under the *Noxious Weeds Act 1993* or Weed of National Significance was recorded.

2.6 Assessment against criteria

The results of the field survey were assessed against the criteria for successful revegetation, using the five, 10 and 15 year targets (Table 2.3).

Table 2.3 Assessment against criteria to monitor success of revegetation

Category	Criteria	Target			Results		
		5 years	10 years	15 years	2004 revegetation area (9 years)	2008 revegetation area (7 years)	2011 revegetation area (2 years)
Native species	Native species diversity (average number per 400 m ² quadrat)	20	35	40	33	23	16
	Average number of characteristic species for the site occurring within 400 m ²	15	20	27	28	17	11
	Native species cover (% of species in 400 m ² quadrat)	>50	>85	>95	94	78	54
Weeds	Weed abundance (% of vegetation cover in 400 m ² quadrat)	<50	<15	<5	1	19	33
	Invasive or Noxious weed species (e.g. Lantana, Blackberry, exotic vines)	Controlled	Controlled	Controlled	Controlled	Controlled	Ground cover generally dominated by invasive species, but no noxious or highly invasive species present
Vegetation structure	Vegetation structure	Canopy, shrublayer and groundcover species present. However, structure limited, generally consisting of low canopy and ground cover.	Canopy, shrublayer and groundcover species present. Structure beginning to develop.	Well structured and includes canopy, mid-storey and ground cover units	Well structured and includes canopy, mid-storey and ground cover units	Canopy, shrublayer and groundcover species present. Structure beginning to develop.	Canopy, shrublayer and groundcover species present. However, structure limited, generally consisting of low canopy and ground cover.

Category	Criteria	Target			Results		
		5 years	10 years	15 years	2004 revegetation area (9 years)	2008 revegetation area (7 years)	2011 revegetation area (2 years)
Canopy ^a	Average canopy height (m)	4	8	12	12	6	0.2
	Native canopy cover (minimum % cover) [modified braun blanquet scale] ^b	5 [3]	5 [3]	5 [3]	25 [3]	13 [3]	0
Shrub layer ^a	Native shrub cover (minimum % cover) [modified braun blanquet scale] ^b	10 [3]	15 [3]	25 [4]	10 [3]	18 [3]	33 [4]
	Average shrub layer height (m)	0.5	1	1	1.5	2	1.4
Ground cover	Native ground cover (minimum % cover) [modified braun blanquet scale] ^b	5 [3]	10 [3]	10 [3]	55 [5]	52 [5]	17 [3]
Ecosystem function	Habitat values	Vegetation structure beginning to develop.	Woodland birds recorded. Habitat structure beginning to develop, including groundcover such as leaf litter and fallen timber.	Woodland birds recorded. Habitat structure beginning to develop, including groundcover such as leaf litter and fallen timber.	Woodland birds recorded. Habitat structure beginning to develop, including groundcover such as leaf litter and fallen timber.	Woodland birds recorded. Habitat structure beginning to develop, including groundcover such as leaf litter and fallen timber.	Species of all layers present, however, no distinct canopy layer developing yet. Leaf litter and fallen timber absent or very sparse.
	Natural regeneration indicating dispersal of seed into site and/or presence of soil seed bank	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Purple font indicates that the 5 year target has been met; black font that the 10 year target has been met, green font that the 15 year criteria has been met. Red font indicates that no target has been met.



3. Discussion and recommendations

There has been a general improvement in the habitat quality and native species diversity cover and vegetation structure since the previous monitoring survey in 2011. Erosion noted in previous years appears to be stable with increasing cover of groundcover vegetation. Key findings include:

- After 9 years the 2004 revegetation area:
 - ▶ has met the 10 and even 15 year targets in the majority of criteria. The only exception is that the:
 - native shrub cover (% cover) is at the 5 year target. This is not considered to require active management at this stage, and is likely to continue to develop towards the 10 and 15 year targets.
- After 7 years, the 2006 revegetation area:
 - ▶ has met the 5 year targets for all criteria
 - ▶ has met the 10 and 15 year targets for a number of criteria relating to vegetation structure (cover and vegetation height)
 - ▶ has some criteria that will require improvement to reach the 10 year target. However, at this stage no active management is considered necessary for these criteria as they are likely to improve naturally given time. These criteria are:
 - native species cover and diversity
 - decrease in weed cover
 - increase in canopy height.
- After 2 years, the 2011 revegetation area:
 - ▶ has had only a short time since rehabilitation
 - ▶ was dominated by early colonising species and ground cover weed species
 - ▶ has met few of the 5 year targets. The exceptions (species cover, native ground cover, shrub cover and height and weed abundance) provide some encouragement that given more time, this area will regenerate well.
 - ▶ requires regular visual assessments to check for spread of weeds that may inhibit germination and growth of native species.

Given the progress towards the targets, little additional work is considered necessary at this stage with natural regeneration considered likely to continue without active management. Recommendations for weed control and monitoring are summarised Table 3.1.

Table 3.1 Recommendations to improve revegetation success

Observation	Recommendation
Monitoring	
Monitoring has not been undertaken annually as part of the annual environmental reporting. However, based on the work undertaken and natural regeneration of the area, this has been appropriate.	<p>Given that the rehabilitation has met or exceeded the relevant targets for the 2004 and 2006 revegetation areas, monitoring next year is not considered necessary for these areas. In these areas monitoring in two years' time (i.e. at 11 and 9 years since rehabilitation respectively) would be sufficient.</p> <p>The 2011 revegetation area would benefit from regular visual inspections (twice yearly), particularly for weed abundance and cover. Where noxious, highly invasive species or dense weeds smothering native species are noted, these should be controlled. Detailed independent monitoring of this area in two year's would be sufficient.</p>
Weeds	
Weed abundance was generally low and restricted to the groundcover. Exotic grasses were dominant in patches.	<p>Consider broad spraying exotic grasses where they occur densely, particularly in the 2011 revegetation area. Broad spraying should be followed by:</p> <ul style="list-style-type: none"> ■ slashing and raking or mowing to remove excess debris and stimulate seed germination ■ inspection for regeneration of native plants ■ repeated broad spraying of germinating weeds if native regeneration is minimal ■ spot-spraying and/or hand weeding if substantial germination of native species is recorded.

The rehabilitation is progressing well and is generally meeting or exceeding the targets set. This suggests that given time the 2004 and 2006 revegetation areas are likely to continue to meet and exceed the target criteria. Given the promising results to date and the fact that the 2011 revegetation has been undertaken using similar methods as the 2004 and 2006 areas, with time, this area is likely to have similar success.



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Appendix A

Revegetation works to date



A1. Revegetation works to date

To date an area of 4.2 hectares has been replanted with the aim to recreate the vegetation to be removed from Lot 1 DP 1013943. The revegetation area is on the western boundary of the site (Figure 1.1) and further revegetation scheduled to the south as quarrying is completed. The revegetation area occurs adjacent to remnant vegetation, both within and adjacent to the site. This adjacent vegetation provides a potential seed source for natural seed dispersal into the revegetation area.

Greening Australia were commissioned to propagate tubestock from cuttings and seed from collected vegetation within Lot 1 DP 1013943 to enable the revegetation of quarried areas. The first collection period occurred from late 2000 to February 2002.

Rehabilitation and revegetation has commenced with further revegetation scheduled to the south as quarrying is completed. In 2004 over one hectare of the quarry that had been previously extracted and used as a silt pond was reshaped and prepared for rehabilitation by PF Formation staff. The top soil had been stored from an adjacent area with Sydney Hinterland Transition Woodland and was spread over the site. Further seed collected over the previous 4 years was broadcast over the site in June 2004 to augment the natural soil borne native seed bank.

In 2006 an additional area of approximately two hectares that had been previously mined was prepared for revegetation. The stored top soil was distributed over the site. Greening Australia then provided over 10,000 seedlings and supervised the planting in September to November 2006. An irrigation system was installed to water the plantings over that summer.

In 2011 an additional area of approximately 1.2 hectares was prepared for revegetation and stored top soil was spread over the site.

In 2011, additional work was undertaken as recommended in the 2010 report. This included weed control, erosion control and additional planting (of both seed and tube stock). Seed used for the revegetation was collected locally including from the former trig site. Species used for additional planting are listed in Table A.1.

No additional work has been undertaken on the site since the 2012 monitoring survey.

Table 4.1 Additional plantings undertaken in 2011

Scientific name	Common name	Previously recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Additional plantings	
				Seed	Tubestock
<i>Acacia decurrens</i>	Black Wattle			Y	Y
<i>Acacia falcata</i>			Y	Y	Y
<i>Acacia fimbriata</i>	Fringed Wattle			Y	
<i>Acacia linifolia</i>	Flax-leaved Wattle	Y	Y		Y
<i>Acacia longifolia</i>			Y	Y	Y
<i>Acacia myrtifolia</i>	Red-stemmed Wattle	Y	Y		Y
<i>Acacia parramattensis</i>	Parramatta Wattle	Y	Y	Y	Y
<i>Acacia suaveolens</i>	Sweet Wattle	Y	Y	Y	Y

Scientific name	Common name	Previously recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Additional plantings	
				Seed	Tubestock
<i>Acacia terminalis</i>	Sunshine Wattle	Y	Y	Y	
<i>Acacia ulicifolia</i>	Heath Wattle	Y	Y	Y	Y
<i>Allocasuarina littoralis</i>	Black Sheoak	Y	Y	Y	Y
<i>Angophora costata</i>	Sydney Red Gum	Y	Y	Y	Y
<i>Angophora floribunda</i>				Y	
<i>Angophora hispida</i>				Y	
<i>Austrodanthonia tenuior</i>			Y		Y
<i>Banksia ericifolia</i>	Heath Banksia				Y
<i>Banksia integrifolia</i>					Y
<i>Bursaria spinosa</i>	Native Blackthorn				Y
<i>Callistemon pinifolius</i>				Y	
<i>Chloris truncata</i>					Y
<i>Clematis aristata</i>		Y		Y	
<i>Daviesia acicularis</i>			Y		Y
<i>Daviesia ulicifolia</i>					Y
<i>Daviesia virgata</i>					Y
<i>Dianella caerulea</i>		Y	Y		Y
<i>Dichelachne crinita</i>					Y
<i>Dodonaea triquetra</i>			Y	Y	Y
<i>Elaeocarpus reticulatus</i>				Y	
<i>Eragrostis benthamii</i>			Y	Y	
<i>Eragrostis brownii</i>	Brown's Lovegrass		Y	Y	
<i>Eucalyptus crebra</i>			Y	Y	
<i>Eucalyptus eugenioides</i>	Thin-leaved Stringybark	Y	Y	Y	
<i>Eucalyptus eximia</i>				Y	
<i>Eucalyptus globoidea</i>				Y	
<i>Eucalyptus haemastoma</i>				Y	
<i>Eucalyptus moluccana</i>				Y	
<i>Eucalyptus pilularis</i>			Y	Y	
<i>Eucalyptus piperita</i>				Y	
<i>Eucalyptus punctata</i>	Grey Gum	Y	Y		Y
<i>Eucalyptus robusta</i>				Y	
<i>Eucalyptus saligna</i>					Y

Scientific name	Common name	Previously recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Additional plantings	
				Seed	Tubestock
<i>Eucalyptus sp.</i>				Y	
<i>Eucalyptus sparsifolia</i>	Narrow-leaved Stringybark	Y	Y	Y	
<i>Gahnia sieberiana</i>				Y	
<i>Glycine clandestina</i>		Y	Y		Y
<i>Hakea sericea</i>		Y	Y		Y
<i>Imperata cylindrica</i> var. <i>major</i>	Bladey Grass	Y	Y	Y	
<i>Isopogon anemonifolius</i>			Y	Y	
<i>Kunzea ambigua</i>	Tick Bush		Y	Y	Y
<i>Leptospermum polygalifolium</i>				Y	
<i>Leptospermum trinervium</i>			Y	Y	Y
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush	Y		Y	Y
<i>Macrozamia spiralis</i>		Y	Y	Y	
<i>Petrophile pulchella</i>			Y	Y	
<i>Pittosporum undulatum</i>	Sweet Pittosporum	Y		Y	
<i>Poa labillardierei</i> var. <i>labillardierei</i>		Y		Y	Y
<i>Pultenaea villosa</i>			Y	Y	Y
<i>Syncarpia glomulifera</i> subsp. <i>glomulifera</i>	Turpentine	Y	Y	Y	
<i>Themeda australis</i>	Kangaroo Grass	Y	Y		Y

Following planting of the site, regular visual assessments of the site have been undertaken by PF Formation staff. Observations of the establishment of revegetation within the site, suggest that weeds initially took over the site, providing soil stability but within 12 months native plants stabilized. The native plants start growing rapidly 1 to 2 years following planting and the weeds begin to die off (pers comm. P Cummins, PF Formation).

Appendix B

Photos













B1. Vegetation within Lot 1 DP 1013943 (2008)



B2. Photomonitoring

Table B2.1 Quadrat 1 – 2004 rehabilitation area

Q1	2010	2012	2013
To north			
To east			

Q1	2010	2012	2013
To south			
To west			

Q1	2010	2012	2013
North east into centre			

Table B2.2
Quadrat 2 – 2006 rehabilitation area

Q2	2010	2012	2013
To north			

Q2	2010	2012	2013
To east			
To south			











Q2	2010	2012	2013
To west			
North east into centre			

Table B2.3
 Quadrat 3 – 2006 rehabilitation area







Q3	2010	2012	2013
To north			
To east			

Q3	2010	2012	2013
To south			
To west			

Q3	2010	2012	2013
North east into centre			

Table B2.4 Quadrat 4 – 2006 rehabilitation area

Q4	2010	2012	2013
To north			

Q4	2010	2012	2013
To east			
To south			







Q4	2010	2012	2013
To west			
North east into centre			




Table B2.5 Quadrat 5 – 2011 rehabilitation area



Q5	2012	2013
To north		
To east		
To south		

Q5		2012	2013
To west			
			

Table B2.6 Quadrat 6 – 2011 rehabilitation area

Q6		2012	2013
To north			

Q6	2012	2013
To east		
To south		
To west		

Q6	2012	2013
North east into centre	 A photograph showing a dry, sandy area with sparse, low-lying green vegetation. In the background, there is a dense line of dark green trees under a clear blue sky.	 A photograph showing the same area in 2013. The vegetation has grown significantly, with several tall, thin trees and dense green foliage in the foreground, partially obscuring the sandy ground. The background trees are still visible.

Appendix C

Quadrat results



C1. Quadrat results

Table C1.1 Vegetation structure

Vegetation layer	Height: range (median) m	% foliage cover	Dominant species
Quadrat 1			
T1	6-15 (12)	25	<i>Acacia parramattensis</i> , <i>Allocasuarina littoralis</i> , <i>Eucalyptus oblonga</i> , <i>Angophora costata</i>
S1	0.5-3 (1.5)	10	<i>Daviesia genistifolia</i> , <i>Bossiaea lenticularis</i> , <i>Ozothamnus diosmifolius</i> , <i>Oxylobium ilicifolium</i> , <i>Acacia parramattensis</i>
G1	0-0.5 (0.3)	55	<i>Entolasia stricta</i> , <i>Bossiaea lenticularis</i> , <i>Lomandra longifolia</i> ,
Notes:	Good regeneration. Canopy developing. Good layer of leaf litter and some dead grass; Very low cover of weeds, No weedy shrubs, weeds present only in groundcover layer; good soil health- soil lichens and moss; fauna habitat moderate- no hollows or timber, limited groundcover, leaf litter developing; lots of birds present.		
Quadrat 2			
T1	4-10 (8)	15	<i>Angophora costata</i> , <i>Syncarpia glomulifera</i> , <i>Acacia parramattensis</i> ,
S1	0.5-3 (1)	10	<i>Hakea dactyloides</i> , <i>Hakea sericea</i> , <i>Syncarpia glomulifera</i> , <i>Angophora costata</i>
G1	0-1 (0.3)	38	<i>Briza maxima</i> *, <i>Themeda australis</i> , <i>Hypochaeris radicata</i> *, <i>Andropogon virginicus</i> *
Notes:	Significant planting has been undertaken in the area. Lots of native seedlings, especially of <i>Hakea sericea</i> and <i>Eucalyptus</i> spp. Shrub layer is developing. Soil health developing with cryptograms present, <i>Themeda australis</i> dominant in patches; poor fauna habitat - no hollows, grass is dense, leaf litter developing, some senescent and fallen shrubs. Main weeds are <i>Andropogon virginicus</i> * and <i>Briza maxima</i> *.		
Quadrat 3			
T1	8-11 (9)	15	<i>Eucalyptus eugenioides</i> , <i>Angophora costata</i> , <i>Syncarpia glomulifera</i> , <i>Allocasuarina littoralis</i>
S1	2-5 (3)	30	<i>Leptospermum trinervium</i> , <i>Hakea sericea</i> , <i>Persoonia levis</i> , <i>Acacia fimbriata</i>
G1	0-1 (0.2)	65	<i>Entolasia stricta</i> , <i>Themeda australis</i> , <i>Andropogon virginicus</i> *, <i>Kunzea ambigua</i> , <i>Leptospermum trinervium</i>
Notes:	Canopy developing and tall shrub layer evident. Few weeds, only occasional introduced grass; good regeneration of natives including seedlings from seedbank and mature plantings; some erosion; good soil health- soil lichens and moss common; fauna habitat poor- no hollows or timber, sparse understory, limited leaf litter, lots of small lizards present.		

Vegetation layer	Height: range (median) m	% foliage cover	Dominant species
Quadrat 4			
T1	1.5-4 (2)	10	<i>Banksia ericifolia</i> , <i>Kunzea ambigua</i> , <i>Hakea dactyloides</i>
S1	0.2-1 (0.6)	15	<i>Acacia myrtifolia</i> , <i>spp.</i> , <i>Acacia ulicifolia</i>
G1	0-0.5 (0.4)	82	<i>Themeda australis</i> , <i>Hakea sericea</i> , <i>Andropogon virginicus</i> *, <i>Leptospermum trinervium</i> , <i>Briza maxima</i> *, <i>Kunzea ambigua</i>
Notes:	Erosion evident from previous surveys has stabilized, no eucalypts present; good recruitment; good native groundcover dominated by <i>Themeda australis</i> ; soil health developing with good cover of cryptograms, fauna habitat poor- no hollows or timber, limited groundcover or leaf litter		
Quadrat 5			
T1	-	-	-
S1	0.3- 2 (1.2)	30	<i>Acacia parramattensis</i> , <i>Acacia longifolia</i> , <i>Verbena bonariensis</i> *
G1	0-0.5 (0.3)	80	<i>Acacia parramattensis</i> , <i>Trifolium repens</i> *, <i>Conyza bonariensis</i> *, <i>Paspalum dilatatum</i> *
Notes:	Predominantly weedy groundcover, a diversity of <i>Acacia</i> spp. growing and some other native species germinating; leaf litter developing, shrub layer developing. Fauna habitat poor, evidence of kangaroos and rabbits.		
Quadrat 6			
T1	-	-	
S1	1-3 (1.5)	35	<i>Acacia parramattensis</i> , <i>Acacia longifolia</i> , <i>Acacia myrtifolia</i>
G1	0-0.5 (0.3)	20	<i>Acacia parramattensis</i> , <i>Sida rhombifolia</i> *, <i>Conyza bonariensis</i> *, <i>Plantago lanceolata</i> *, <i>Hypochaeris radicata</i> *
Notes:	Shrub layer developing with colonizing <i>Acacia</i> spp., regeneration of canopy species evident in groundcover including <i>Allocasuarina littoralis</i> and <i>Eucalyptus</i> spp., predominantly weedy groundcover however some regeneration of native ground cover species evident; Hard baked soil, with no leaf litter and some gully erosion evident. Fauna habitat poor, evidence of foxes and rabbits.		

Notes: T1= Tree layer; S1= Shrub layer; G1=Groundcover

Table C1.2 Quadrat results: groundcover, vegetation cover, slope and aspect

Characteristic	2010				2012						2013					
	1	2	3	4	1	2	3	4	5	6	1	2	3	4	5	6
Ground cover (% cover)																
Bare soil	5	6	13	33	5	8	15	20	50	80	0	5	10	10	10	80
Litter	57	2	5	0	41	25	5	-	-	-	40	15	15	2	5	0
Timber	1	0	0	0	-	2	-	-	-	-	2	2	0	0	0	0
Rock	5	2	1	5	2	-	-	2	3	2	1	0	0	2	3	2
Cryptogram	2	0	1	2	2	-	10	2	-	-	2	10	10	5	0	0
Vegetation	30	90	80	60	50	65	70	76	47	18	55	68	65	81	82	18
Ground cover vegetation (% cover)																
Native ground cover- grasses	20	15	70	25	28	10	53	45	1	-	44	25	43	60	15	5
Native ground cover- shrubs	2	2	5	2	3	3	5	5	5	5	3	2	10	10	5	5
Native ground cover- other	1	1	0	2	2	2	2	12	1	1	7	3	2	2	2	2
Exotic	7	72	5	30	10	50	10	20	40	12	1	38	10	9	60	6
Vegetation cover (% cover)																
Total native groundcover	23	18	75	24	33	15	60	51	7	6	55	30	55	72	22	12
Native overstorey	30	10	10	0	25	15	10	-	-	-	25	15	15	0	0	0
Native midstorey	10	10	20	8	10	8	25	10	-	-	5	10	30	15	30	35
Exotic cover (all layers)	10	72	5	30	10	50	10	20	40	12	1	38	10	9	60	6
Slope (degrees)	3	6	8	6	3	6	8	6	5	4	3	6	8	6	5	4
Aspect	S	S	SE	SE	S	S	SE	SE	SW	S	S	S	SE	SE	SW	S

Table C1.3 Species recorded

Scientific name	Common name	Exotic	Recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Recorded in rehabilitation area			Quadrat results (2013)					
					2010	2012	2013	1	2	3	4	5	6
<i>Acacia brownii</i>	Heath Wattle			Y	Y	Y	Y			1	1		
<i>Acacia decurrens</i>	Black Wattle				Y		Y		3				
<i>Acacia falcata</i>				Y	Y	Y	Y	1					
<i>Acacia fimbriata</i>	Fringed Wattle				Y	Y	Y			1	1		
<i>Acacia hispidula</i>				Y									
<i>Acacia linifolia</i>	Flax-leaved Wattle		Y	Y	Y	Y	Y	1		3			
<i>Acacia longifolia</i>				Y		Y	Y		2		2	3	3
<i>Acacia myrtifolia</i>	Red-stemmed Wattle		Y	Y	Y	Y	Y	1			1	1	3
<i>Acacia parramattensis</i>	Parramatta Wattle		Y	Y	Y	Y	Y	3	1		2		4
<i>Acacia parvipinnula</i>				Y			Y					3	
<i>Acacia saligna</i>	Golden Wreath Wattle	*			Y								
<i>Acacia suaveolens</i>	Sweet Wattle		Y	Y	Y	Y	Y		1				
<i>Acacia terminalis</i>	Sunshine Wattle		Y	Y	Y	Y	Y	1		2	1		
<i>Acacia trinervata</i>				Y			Y				2		
<i>Acacia ulicifolia</i>	Heath Wattle		Y	Y	Y	Y	Y		1	1		1	1
<i>Acetosella vulgaris</i>		*					Y					1	
<i>Acianthus fornicatus</i>	Pixie Caps		Y	Y			Y				2		
<i>Actinotus helianthi</i>				Y									
<i>Ageratina adenophora</i>	Crofton Weed	*	Y		Y								

Scientific name	Common name	Exotic	Recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Recorded in rehabilitation area			Quadrat results (2013)					
					2010	2012	2013	1	2	3	4	5	6
<i>Agrostis avenacea</i>						Y	Y					2	2
<i>Allocasuarina littoralis</i>	Black Sheoak		Y	Y	Y	Y	Y	4	1	2	1	1	2
<i>Anagallis arvensis</i>	Scarlet Pimpernel	*				Y	Y		1				
<i>Andropogon virginicus</i>	Whisky Grass	*			Y	Y	Y		3	2	2		
<i>Angophora bakeri</i>	Narrow-leaved Apple		Y	Y	Y	Y	Y						
<i>Angophora costata</i>	Sydney Red Gum		Y	Y	Y	Y	Y	3	3	2			1
<i>Anisopogon avenaceus</i>				Y									
<i>Araujia sericifera</i>	Moth Vine	*	Y										
<i>Aristida benthamii</i>				Y									
<i>Aristida vagans</i>	Threeawn Speargrass		Y	Y									
<i>Aristida warburgii</i>				Y									
<i>Astroloma humifusum</i>				Y									
<i>Astroloma pinifolium</i>				Y									
<i>Austrodanthonia fulva</i>				Y									
<i>Austrodanthonia tenuior</i>				Y			Y					2	
<i>Austrostipa pubescens</i>			Y	Y									
<i>Banksia ericifolia</i>	Heath Banksia				Y	Y	Y		1				
<i>Banksia integrifolia</i>					Y	Y	Y		1				
<i>Banksia oblongifolia</i>					Y	Y							

Scientific name	Common name	Exotic	Recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Recorded in rehabilitation area			Quadrat results (2013)					
					2010	2012	2013	1	2	3	4	5	6
<i>Banksia spinulosa</i> var. <i>spinulosa</i>				Y									
<i>Bidens pilosa</i>		*				Y	Y					1	
<i>Billardiera scandens</i>	Appleberry		Y	Y		Y	Y	1					
<i>Boronia polygalifolia</i>			Y										
<i>Bossiaea lenticularis</i>			Y	Y	Y	Y	Y	2					
<i>Bossiaea obcordata</i>			Y	Y	Y								
<i>Bossiaea rhombifolia</i> subsp. <i>rhombifolia</i>				Y									
<i>Breynia oblongifolia</i>	Coffee Bush		Y										
<i>Briza maxima</i>	Quaking Grass	*				Y	Y		3			1	1
<i>Brunoniella pumilio</i>	Dwarf Blue Trumpet		Y	Y	Y	Y	Y	1					
<i>Bursaria spinosa</i>	Native Blackthorn				Y	Y	Y		2				
<i>Caesia parviflora</i>				Y									
<i>Callistemon linearis</i>				Y									
<i>Callistemon rigidus</i>				Y									
<i>Cassytha glabella</i>				Y									
<i>Cassytha pubescens</i>				Y									
<i>Caustis flexuosa</i>				Y									
<i>Centaurium erythraea</i>		*				Y	Y		2	1		2	2
<i>Ceratopetalum apetalum</i>	Coachwood		Y										

Scientific name	Common name	Exotic	Recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Recorded in rehabilitation area			Quadrat results (2013)					
					2010	2012	2013	1	2	3	4	5	6
<i>Cheilanthes sieberi</i>				Y			Y	1					
<i>Clematis aristata</i>			Y										
<i>Comesperma ericinum</i>	Pyramid flower		Y										
<i>Conyza bonariensis</i>	Flaxleaf Fleabane	*	Y		Y	Y	Y			1		2	2
<i>Corymbia eximia</i>				Y									
<i>Corymbia gummifera</i>	Red Bloodwood		Y	Y									
<i>Cyathochaeta diandra</i>				Y									
<i>Cynodon dactylon</i>	Couch						Y					1	
<i>Cyperus ?polystachyos</i>						Y	Y					1	
<i>Daviesia acicularis</i>				Y									
<i>Daviesia corymbosa</i>				Y									
<i>Daviesia genistifolia</i>	Broom Bitter Pea			Y	Y	Y	Y	1	1	1			
<i>Daviesia squarrosa</i>				Y									
<i>Dianella caerulea</i>			Y	Y		Y	Y		1				
<i>Dianella prunina</i>			Y	Y	Y	Y	Y		1		1		
<i>Dianella revoluta</i> var. <i>revoluta</i>				Y									
<i>Dichelachne crinite</i>	Long-haired Plume Grass						Y			2			
<i>Dillwynia acicularis</i>				Y									
<i>Dillwynia parvifolia</i>				Y									

Scientific name	Common name	Exotic	Recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Recorded in rehabilitation area			Quadrat results (2013)					
					2010	2012	2013	1	2	3	4	5	6
<i>Dillwynia retorta</i>				Y	Y	Y	Y			1			1
<i>Dodonaea pinnata</i>				Y									
<i>Dodonaea triquetra</i>				Y									
<i>Drosera auriculata</i>				Y									
<i>Echinopogon caespitosus</i> var. <i>caespitosus</i>				Y									
<i>Einadia hastata</i>	Berry Saltbush		Y										
<i>Entolasia stricta</i>	Wiry Panic		Y	Y	Y	Y	Y	3		3			
<i>Entolasia whiteana</i>				Y									
<i>Epacris pulchella</i>	NSW Coral Heath			Y	Y								
<i>Epacris purpurascens</i> var. <i>purpurascens</i>				Y									
<i>Eragrostis benthamii</i>				Y									
<i>Eragrostis brownii</i>	Brown's Lovegrass			Y	Y	Y	Y	1		1			
<i>Eriostemon australasius</i>				Y									
<i>Eucalyptus ?saligna</i>					Y	Y							
<i>Eucalyptus beyeriana</i>				Y									
<i>Eucalyptus crebra</i>				Y									
<i>Eucalyptus eugenioides</i>	Thin-leaved Stringybark		Y	Y	Y	Y	Y		1	3		1	
<i>Eucalyptus notabilis</i>				Y	Y								
<i>Eucalyptus oblonga</i>	Stringybark			Y	Y	Y	Y	4					

Scientific name	Common name	Exotic	Recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Recorded in rehabilitation area			Quadrat results (2013)					
					2010	2012	2013	1	2	3	4	5	6
<i>Eucalyptus pilularis</i>				Y									
<i>Eucalyptus punctata</i>	Grey Gum		Y	Y	Y	Y	Y	2					
<i>Eucalyptus resinifera</i> <i>subsp. resinifera</i>				Y									
<i>Eucalyptus scias</i> subsp. <i>scias</i>				Y									
<i>Eucalyptus sclerophylla</i>			Y	Y									
<i>Eucalyptus</i> sp.						Y	Y				1		1
<i>Eucalyptus sparsifolia</i>	Narrow-leaved Stringybark		Y	Y									
<i>Eucalyptus squamosa</i>				Y									
<i>Exocarpos cupressiformis</i>	Native Cherry				Y	Y	Y	1					
<i>Exocarpos strictus</i>	Dwarf Cherry		Y	Y		Y							
<i>Glycine clandestina</i>			Y	Y	Y	Y	Y	1	2		1		
<i>Glycine tabacina</i>			Y	Y		Y	Y	2					1
<i>Gnaphalium</i> sp.					Y	Y	Y		2			2	
<i>Gompholobium glabratum</i>	Dainty Wedge Pea		Y	Y									
<i>Gompholobium grandiflorum</i>				Y									
<i>Gompholobium inconspicuum</i>				Y									

Scientific name	Common name	Exotic	Recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Recorded in rehabilitation area			Quadrat results (2013)					
					2010	2012	2013	1	2	3	4	5	6
<i>Gompholobium minus</i>				Y									
<i>Gompholobium pinnatum</i>				Y									
<i>Gompholobium uncinatum</i>				Y									
<i>Gonocarpus tetragynus</i>				Y									
<i>Gonocarpus teucroides</i>					Y	Y	Y			1			
<i>Goodenia bellidifolia</i> subsp. <i>bellidifolia</i>			Y	Y			Y	2					
<i>Goodenia hederacea</i> subsp. <i>hederacea</i>				Y									
<i>Goodenia heterophylla</i>			Y	Y									
<i>Grevillea buxifolia</i> subsp. <i>buxifolia</i>	Grey Spider Flower		Y	Y									
<i>Grevillea diffusa</i>				Y									
<i>Grevillea longifolia</i>				Y									
<i>Grevillea mucronulata</i>				Y									
<i>Grevillea parviflora</i> subsp. <i>parviflora</i>				Y									
<i>Grevillea phyllicoides</i>				Y									
<i>Grevillea sericea</i>				Y									
<i>Grevillea sphacelata</i>				Y									
<i>Haemodorum planifolium</i>				Y									

Scientific name	Common name	Exotic	Recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Recorded in rehabilitation area			Quadrat results (2013)					
					2010	2012	2013	1	2	3	4	5	6
<i>Hakea dactyloides</i>	Broad-leaved Hakea			Y	Y	Y	Y		2	2	1		
<i>Hakea sericea</i>			Y	Y	Y	Y	Y			2	3		
<i>Hardenbergia violacea</i>	False Sarsaparilla		Y	Y	Y	Y	Y	1	1			1	1
<i>Hibbertia aspera</i> subsp. <i>aspera</i>				Y									
<i>Hibbertia bracteata</i>				Y									
<i>Hibbertia diffusa</i>				Y									
<i>Hibbertia serpyllifolia</i>				Y									
<i>Hibbertia</i> sp.					Y	Y							
<i>Hovea linearis</i>			Y	Y									
<i>Hybanthus monopetalus</i>				Y									
<i>Hypochaeris radicata</i>	Catsear	*			Y	Y	Y		2		2	2	3
<i>Imperata cylindrica</i> var. <i>major</i>	Bladey Grass		Y	Y	Y	Y	Y	1		2			
<i>Isopogon anemonifolius</i>				Y									
<i>Jacksonia scoparia</i>				Y									
<i>Juncus</i> sp.			Y		Y	Y							
<i>Kunzea ambigua</i>	Tick Bush			Y	Y	Y	Y	2		3	2		
<i>Lagenifera gracilis</i>				Y									
<i>Lambertia formosa</i>	Mountain Devil			Y									

Scientific name	Common name	Exotic	Recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Recorded in rehabilitation area			Quadrat results (2013)					
					2010	2012	2013	1	2	3	4	5	6
<i>Lasiopetalum ferrugineum</i>				Y									
<i>Lasiopetalum rufum</i>				Y									
<i>Laxmannia gracilis</i>				Y									
<i>Lepidosperma latens</i>				Y									
<i>Lepidosperma laterale</i>			Y	Y	Y	Y	Y	2					
<i>Leptomeria acida</i>				Y									
<i>Leptospermum parvifolium</i>				Y									
<i>Leptospermum trinervium</i>				Y	Y	Y	Y	2		3	2		
<i>Leucopogon juniperinus</i>			Y		Y	Y	Y	1		1			
<i>Leucopogon lanceolatus</i>	Lance Beard Heath		Y										
<i>Leucopogon muticus</i>				Y									
<i>Leucopogon virgatus</i>				Y									
<i>Lindsaea microphylla</i>				Y									
<i>Lissanthe sapida</i>				Y									
<i>Lissanthe strigosa</i>				Y									
<i>Lobelia gracilis</i>				Y									
<i>Logania pusilla</i>				Y									
<i>Lomandra confertifolia</i> subsp. <i>rubiginosa</i>				Y									

Scientific name	Common name	Exotic	Recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Recorded in rehabilitation area			Quadrat results (2013)					
					2010	2012	2013	1	2	3	4	5	6
<i>Lomandra cylindrica</i>				Y									
<i>Lomandra filiformis</i> subsp. <i>coriacea</i>				Y									
<i>Lomandra filiformis</i> subsp. <i>filiformis</i>				Y									
<i>Lomandra glauca</i>				Y									
<i>Lomandra gracilis</i>			Y	Y									
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush		Y		Y	Y	Y	2	1	1	1		
<i>Lomandra multiflora</i> subsp. <i>multiflora</i>			Y	Y									
<i>Lomandra obliqua</i>			Y	Y									
<i>Lomatia silaifolia</i>	Crinkle Bush		Y	Y									
<i>Macrozamia spiralis</i>			Y	Y									
<i>Medicago</i> sp.		*				Y							
<i>Melaleuca nodosa</i>				Y									
<i>Micrantheum ericoides</i>				Y									
<i>Microtis</i> sp.						Y							
<i>Mirbelia rubiifolia</i>				Y									
<i>Monotoca scoparia</i>				Y									
<i>Myrsiphyllum asparagoides</i>	Florist's Smilax	*	Y										
<i>Olearia microphylla</i>				Y									

Scientific name	Common name	Exotic	Recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Recorded in rehabilitation area			Quadrat results (2013)					
					2010	2012	2013	1	2	3	4	5	6
<i>Opercularia diphylla</i>				Y									
<i>Opercularia varia</i>				Y									
<i>Oxalis perennans</i>					Y	Y	Y	1					
<i>Oxylobium ilicifolium</i>	Prickly Shaggy Pea		Y		Y	Y	Y	1					
<i>Ozothamnus diosmifolius</i>	White Dogwood		Y	Y	Y	Y	Y	1					
<i>Pandorea pandorana</i>	Wonga Vine		Y										
<i>Panicum simile</i>	Two-colour Panic		Y	Y	Y	Y	Y	1					
<i>Paspalum dilatatum</i>	Paspalum	*			Y	Y	Y	1	2		1	3	2
<i>Passiflora sp.</i>	Passionfruit		Y										
<i>Patersonia glabrata</i>				Y									
<i>Patersonia longifolia</i>				Y									
<i>Patersonia sericea</i>				Y									
<i>Pennisetum clandestinum</i>		*				Y	Y					2	3
<i>Persicaria decipiens</i>	Pepperweed					Y							
<i>Persoonia hirsuta</i>				Y									
<i>Persoonia lanceolata</i>				Y									
<i>Persoonia laurina</i>				Y									
<i>Persoonia levis</i>	Broad-leaved Geebung			Y	Y	Y	Y	1		2			
<i>Persoonia linearis</i>	Narrow-leaved Geebung		Y	Y									

Scientific name	Common name	Exotic	Recorded within Lot 1 DP 1013943	Species of Sydney Hinterland transition woodland	Recorded in rehabilitation area			Quadrat results (2013)					
					2010	2012	2013	1	2	3	4	5	6
<i>Persoonia oblongata</i>				Y									
<i>Persoonia pinifolia</i>				Y									
<i>Petrophile pulchella</i>				Y									
<i>Petrophile sessilis</i>				Y									
<i>Philotheca hispidula</i>				Y									
<i>Phyllanthus hirtellus</i>				Y									
<i>Pimelea curviflora</i> var. <i>curviflora</i>				Y									
<i>Pimelea linifolia</i> subsp. <i>linifolia</i>				Y			Y			1			
<i>Pittosporum undulatum</i>	Sweet Pittosporum		Y										
<i>Plantago lanceolata</i>	Lamb's Tongues	*			Y	Y	Y		2	1		2	2
<i>Platysace ericoides</i>				Y									
<i>Platysace lanceolata</i>			Y										
<i>Platysace linearifolia</i>				Y									
<i>Poa labillardierei</i> var. <i>labillardierei</i>			Y				Y					2	1
<i>Podolobium scandens</i>				Y									
<i>Polyscias sambucifolia</i>	Elderberry Panax		Y										
<i>Pomax umbellata</i>			Y	Y									
<i>Poranthera microphylla</i>			Y										

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					2010	2012	2013	1	2	3	4	5	6
<i>Pratia purpurascens</i>	Whiteroot		Y	Y									
<i>Prostanthera howelliae</i>				Y									
<i>Pteridium esculentum</i>	Bracken				Y	Y	Y			1			
<i>Pterostylis acuminata</i>				Y									
<i>Pterostylis longifolia</i>				Y									
<i>Pultenaea ferruginea</i>				Y									
<i>Pultenaea microphylla</i>			Y										
<i>Pultenaea polifolia</i>				Y									
<i>Pultenaea scabra</i>			Y	Y									
<i>Pultenaea tuberculata</i>				Y									
<i>Pultenaea villosa</i>				Y		Y	Y				2	2	2
<i>Scaevola ramosissima</i>			Y	Y									
<i>Schizaea bifida</i>				Y									
<i>Schoenus imberbis</i>				Y									
<i>Senecio madagascariensis</i>	Fireweed	*			Y	Y	Y	1	1		1	2	2
<i>Setaria gracilis</i>	Slender Pigeon Grass	*			Y	Y							
<i>Sida rhombifolia</i>	Paddy's Lucerne	*	Y		Y	Y	Y		2		1	3	2
<i>Solanum mauritianum</i>	Wild Tobacco Bush	*	Y										
<i>Solanum nigrum</i>	Black-berry Nightshade	*	Y										

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					2010	2012	2013	1	2	3	4	5	6
<i>Sonchus oleraceus</i>	Common Sowthistle	*	Y										
<i>Stylidium</i> sp.					Y	Y	Y			1			
<i>Styphelia laeta</i> subsp. <i>laeta</i>				Y									
<i>Syncarpia glomulifera</i> subsp. <i>glomulifera</i>	Turpentine		Y	Y	Y	Y	Y		3	2	1	1	
<i>Thelymitra pauciflora</i>				Y									
<i>Themeda australis</i>	Kangaroo Grass		Y	Y	Y	Y	Y		3	2	4		3
<i>Thysanotus tuberosus</i> subsp. <i>tuberosus</i>				Y									
<i>Trachymene incisa</i> subsp. <i>incisa</i>				Y									
<i>Tricoryne simplex</i>				Y									
<i>Trifolium arvense</i>	Haresfoot clover	*				Y	Y		2			2	2
<i>Trifolium repens</i>	White Clover	*			Y	Y	Y		2			3	2
<i>Verbena bonariensis</i>	Purpletop	*			Y	Y	Y		2			2	1
<i>Veronica plebeia</i>	Trailing Speedwell		Y										
<i>Vicia sativa</i>		*			Y	Y							
<i>Wahlenbergia stricta</i>	Tall Bluebell				Y	Y	Y		2		2	2	2
<i>Xanthorrhoea concava</i>				Y									
<i>Xanthorrhoea media</i>				Y									

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					2010	2012	2013	1	2	3	4	5	6
<i>Xanthorrhoea minor</i> subsp. <i>minor</i>				Y									
<i>Xanthorrhoea resinifera</i>				Y									
<i>Xanthorrhoea</i> sp.	Grass tree		Y										
<i>Xanthosia pilosa</i>				Y									
<i>Xanthosia tridentata</i>				Y			Y	1					
<i>Xylomelum pyriforme</i>	Woody Pear		Y	Y									

Notes:

Cover abundance scores:

- (1) 5%- rare or few individuals
- (2) <5% common
- (3) 5-25%
- (4) 25-50%
- (5) 50-75%
- (6) 75-100%