

Appendix D

Figures, Consents and Documents Relating to DA140/2016

Consents for DA140/2016

Our Ref: DA140/2016

25 November 2016

AGL Macquarie Pty Ltd
John Vyse CARE Bettergrow Pty Ltd ,
PO Box 945 ,
WINDSOR NSW 2756

NOTICE OF DETERMINATION OF DEVELOPMENT APPLICATION

Issued in accordance with Section 80 of the Environmental Planning and Assessment Act, 1979

Development Application No. DA140/2016

Applicant name AGL Macquarie Pty Ltd
Applicant address John Vyse CARE Bettergrow Pty Ltd ,
PO Box 945 ,
WINDSOR NSW 2756

**Land to be Developed
Address**

Lot: 10 DP: 1204457 ,74 Lemington Road,RAVENSWORTH
NSW 2330

Proposed development Establishment and operation of a composting facility to
support the rehabilitation of Ravensworth No.2 mine and
Ravensworth South mine."

Determination made on (date) 25/11/2016

Determination Approved

Consent to lapse on (date) 25/11/2021

Your application was considered under the Environmental Planning and Assessment Act 1979 and is approved subject to the following conditions:

General Conditions

1.1 Approved Plans and Supporting Documents

The development shall be carried out substantially in accordance with the approved stamped and signed plans and/or documentation listed below except where modified by any following condition. Where the plans relate to alteration or additions only those works shown in colour or highlighted are approved.

Reference/Drawing No.	Title/Description	Prepared By	Date/s
Sheet 1 of 6	General Arrangement	Tony Mexon & Associates	23 February 2016
Sheet 3 of 6	Stage 1 Works	Tony Mexon & Associates	23 February 2016
Sheet 4 of 6	Stage 2 Works	Tony Mexon & Associates	23 February 2016
Sheet 5 of 6	Cross Section A-A	Tony Mexon & Associates	23 February 2016
Sheet 6 of 6	Cross Section C-C	Tony Mexon & Associates	23 February 2016
Surface and Groundwater Management Plan Version 7		Bio-Recycle Australia Pty Ltd	3/08/2016
Statement of Environmental Effects		AECOM	15/07/2016

Note 1: Modifications to the approved plans will require the lodgement and consideration by Council of a modification pursuant to Section 96 of the *Environmental Planning and Assessment Act, 1979*.

Note 2: The approved plans and supporting documentation may be subject to conditions imposed under section 80A(1)(g) of the Act modifying or amending the development (refer to conditions of consent which must be satisfied prior to the issue of any Construction Certificate).

1.2 Damage on Council Assets

Any existing infrastructure damaged due to the proposed works including, but not limited to, (roads, services, drainage, pipes, guardrails, etc.) is to be repaired or replaced at the applicant's expense. The Applicant must notify Singleton Council Infrastructure or Development Engineering immediately when the structure is damaged.

1.3 Road Act Approval

In case of any asset damage along Lemington Road (from the New England Highway to the entrance of the mining site) the applicant is to submit a Section 138 application in order to obtain a permit with conditions prior to starting works on Council Road Reserve, and at the end, a Certificate of Compliance from Singleton Council Infrastructure Department is to be obtained. All works are to be carried out in accordance with the Singleton Council Development Construction Specifications and details are to be submitted at the time of the application.

1.4 Legal Drainage Point of Discharge

All stormwater from the working area must be directed to a lawful point of discharge such that it does not adversely affect surrounding or downstream properties.

1.5 Leachate Dam Design

Singleton Council request a Compliance Certificate from a qualified practicing Geotechnical/Dams Engineer stating structural adequacy of the dam and that earthworks have been carried out in accordance with the AS 3798-2007 – Guidelines on Earthworks for Commercial and Residential Developments.

The Compliance Certificate along with any correspondence from the Environmental Protection Authority EPA must be submitted to Council prior to filling of the dam.

Condition during the ongoing use of the development

2.1 Waterways Contamination

All reasonable and practicable measures must be taken to prevent pollution of any existing waterways as a result of silt or untreated leachate run-off, and oil or grease spills from any machinery. Wastewater for cleaning equipment must not be discharged or in-directly to any watercourses or stormwater systems.

Integrated Development Terms of Approval

3.1 Integrated Development General Terms of Approval

The following approval bodies have given general terms of approval in relation to the development, as referred to in Section 93 of the *Environmental Planning and Assessment Act 1979*:

- a) NSW Environment Protection Authority

The applicant is to comply with all general terms of approval provided by the NSW Environment Protection Authority Notice No: 1544342. All records and reports required under the General Terms of Approval must be made available to Council within 48 hours of any request by Council.

A copy of the General Terms of Approval is attached and forms part of the development consent.

Advices

4.1 Lapsing of Consent

In accordance with Section 95 of the *Environmental Planning and Assessment Act 1979* (as amended), this Development Consent lapses five (5) years after the date from which it operates unless building, engineering or construction work has substantially physically commenced. The building must be completed, in accordance with the approved plans and specifications, within five (5) years from the date when the building was substantially physically commenced.

4.2 Process for Modification

The plans and/or conditions of this Consent are binding and may only be modified upon written request to Council under Section 96 of the *Environmental Planning and Assessment Act, 1979* (as amended). The request shall be accompanied by the appropriate fee and application form. You are not to commence any action, works, contractual negotiations, or the like, on the requested modification unless and until the written authorisation of Council is received by way of an amended consent.

4.3 Review of Determination

In accordance with the provisions of Section 82A of the *Environmental Planning and Assessment Act 1979* (as amended) the applicant can request Council to review this determination. The request must be made within a period of 6 months from the date shown on this determination. A fee, as prescribed under Council's current Management Plan - Fees and Charges, is payable for such a review.

4.4 88b Instrument

An 88B Instrument made pursuant to the *Conveyancing Act 1919* applies to the subject land and it is the owners/applicants responsibility to check the compliance of the works with the instrument.

Other Approvals

Local Government Act 1993 approvals granted under s 78A (5) N/A

General terms of other approvals integrated as part of the consent

- Mine Subsidence Compensation Act 1961
- Protection of the Environment Operations Act 1997

Right of Appeal

To the extent provided for by Section 97 of the Act, an applicant who is dissatisfied with the determination of this application may appeal to the Court within six (6) months of the date of this notice.

Section 98 of the Act provides that an appeal to the Court may be made by an objector who is dissatisfied with the determination of an application for designated development. Such an appeal must be made within 28 days of the date on which notice is given and must be in accordance with the regulations and rules of the court.

Sections 97 and 98 of the Act do not apply in respect of a development consent declared to be valid or validly granted under Section 25C of the Land and Environment Court Act 1979.

Signed

on behalf of the consent authority

Signature



Our Ref: DA140/2016.2

16/04/2018

Bettergrow
PO Box 945
WINDSOR NSW 2756

NOTICE OF DETERMINATION

S4.55 (2) APPLICATION

This approval has been modified pursuant to *Section 4.55 (2) of the Environmental Planning and Assessment Act, 1979*. Notice is hereby given that the application has been determined by granting of consent, subject to conditions (as modified).

Development Application No. DA140/2016.1

Modification Application No. DA140/2016.2

Development Application

Applicant name Bettergrow

Applicant address PO Box 945 WINDSOR NSW 2756

Land to be Developed:

Address 74 Lemington Road RAVENSWORTH
Lot: 10 DP: 1204457

Surface and Groundwater Management Plan Version 7		Bio-Recycle Australia Pty Ltd	3/08/2016
Statement of Environmental Effects		AECOM	15/07/2016
Statement of Environmental Effects	Section 96 Application – Ravensworth Composting Facility	JACOBS	6 February 2018

Note 1: Modifications to the approved plans will require the lodgement and consideration by Council of a modification pursuant to Section 4.55 of the Environmental Planning and Assessment Act, 1979.

Note 2: The approved plans and supporting documentation may be subject to conditions imposed under section 4.17(1)(g) of the Act modifying or amending the development (refer to conditions of consent which must be satisfied prior to the issue of any Construction Certificate).

1.2 Damage on Council Assets

Any existing infrastructure damaged due to the proposed works including, but not limited to, (roads, services, drainage, pipes, guardrails, etc.) is to be repaired or replaced at the applicant's expense. The Applicant must notify Singleton Council Infrastructure or Development Engineering immediately when the structure is damaged.

1.3 Road Act Approval

In case of any asset damage along Lemington Road (from the New England Highway to the entrance of the mining site) the applicant is to submit a Section 138 application in order to obtain a permit with conditions prior to starting works on Council Road Reserve, and at the end, a Certificate of Compliance from Singleton Council Infrastructure Department is to be obtained. All works are to be carried out in accordance with the Singleton Council Development Construction Specifications and details are to be submitted at the time of the application.

1.4 Legal Drainage Point of Discharge

All stormwater from the working area must be directed to a lawful point of discharge such that it does not adversely affect surrounding or downstream properties.

1.5 Leachate Dam Design

Singleton Council request a Compliance Certificate from a qualified practicing

Geotechnical/Dams Engineer stating structural adequacy of the dam and that earthworks have been carried out in accordance with the AS 3798-2007 – Guidelines on Earthworks for Commercial and Residential Developments.

The Compliance Certificate along with any correspondence from the Environmental Protection Authority EPA must be submitted to Council prior to filling of the dam

Condition 1.6 is amended and shall read as follows:

1.6 Leachate Management Dam Capacity

Singleton Council request a Compliance Certificate from a qualified practicing Hydraulic Engineering Consultancy Company stating that the capacity of the existing dam is adequate to cope with the increment of leachate.

The Compliance Certificate along with any correspondence from the Environmental Protection Authority EPA must be submitted to Council prior to increasing the amount of composting material

Condition 1.7 is amended and shall read as follows:

1.7 Road Impact Assessment

Prior to the commencement of the on-site composting increment, the applicant/contractor is to prepare a Road Condition Report of Lemington Road (from the New England Highway to the entrance of the mining site), identifying all existing problems with this section of the roadway. On completion, a joint inspection between the applicant and Council Officers to identify any further damage is to be carried out. If any additional damage has occurred, all rectification works shall be at the applicant's expense, to the satisfaction of the Council Infrastructure Department. The report is to contain (but not limited to): location of existing deficiencies of the roadway and site photos, especially at areas where turning movements will occur.

Condition during the ongoing use of the development

2.1 Waterways Contamination

All reasonable and practicable measures must be taken to prevent pollution of any existing waterways as a result of silt or untreated leachate run-off, and oil or grease spills from any machinery. Wastewater for cleaning equipment must not be discharged or in-directly to any watercourses or stormwater systems.

Integrated Development Terms of Approval

3.1 Integrated Development General Terms of Approval

The following approval bodies have given general terms of approval in relation to the development, as referred to in Section 7.4 of the Environmental Planning and Assessment

Act 1979:

1. NSW Environment Protection Authority

The applicant is to comply with all general terms of approval provided by the NSW Environment Protection Authority Notice No: 1544342. All records and reports required under the General Terms of Approval must be made available to Council within 48 hours of any request by Council.

A copy of the General Terms of Approval is attached and forms part of the development consent.

Advices

4.1 Lapsing of Consent

In accordance with Section 4.53 of the Environmental Planning and Assessment Act 1979 (as amended), this Development Consent lapses five (5) years after the date from which it operates unless building, engineering or construction work has substantially physically commenced. The building must be completed, in accordance with the approved plans and specifications, within five (5) years from the date when the building was substantially physically commenced.

4.2 Process for Modification

The plans and/or conditions of this Consent are binding and may only be modified upon written request to Council under Section 4.55 of the Environmental Planning and Assessment Act, 1979 (as amended). The request shall be accompanied by the appropriate fee and application form. You are not to commence any action, works, contractual negotiations, or the like, on the requested modification unless and until the written authorisation of Council is received by way of an amended consent.

4.3 Review of Determination

In accordance with the provisions of Section 8.2 of the Environmental Planning and Assessment Act 1979 (as amended) the applicant can request Council to review this determination. The request must be made within a period of 6 months from the date shown on this determination. A fee, as prescribed under Council's current Management Plan - Fees and Charges, is payable for such a review.

4.4 88b Instrument

An 88B Instrument made pursuant to the Conveyancing Act 1919 applies to the subject land and it is the owners/applicants responsibility to check the compliance of the works with the instrument.

4.5 Other Permits and Approvals

Approval shall be sought from the New South Wales Environment Protection Authority for the amendment of Environment Protection License number 7654, to allow for the composting of up to 76,000 tonnes per annum. An amended Environment Protection License must be granted by the New South Wales Environment Protection Authority prior to the increase of composting above 50,000 tonnes per annum.

Other Approvals

**Local Government Act 1993
approvals granted under s
4.12 (5)** N/A

**General terms of other
approvals integrated as part
of the consent (list
approvals)**

- Mine Subsidence Compensation Act 1961
- Protection of the Environment Operations Act 1997

Right of Appeal

The applicant has the right to appeal this determination in accordance with the provisions of Section 8.9 of the *Environmental Planning and Assessment Act, 1979* within six (6) months of the date of this notice.

Right of Review

The applicant has the right to request a review of the determination of this Section 4.55 Application in accordance with the provisions of Section 8.2 of the *Environmental Planning and Assessment Act, 1979*.

Signed

on behalf of the consent authority

Signature



Title

Development Planner

Name

Mr R Gounder

Date

23/04/2018

If you have any inquiries regarding the consent, please contact Mr R Gounder of Council's Planning & Regulated Services, on (02) 6578 7290.

Note 1

The approval of this Application does not amend the timeframe of the validity of Development Consent, which will lapse on the specified date. Sections 4.53(4) and 4.53(5) of the *Environmental Planning and Assessment Act, 1979* provides that a development consent for the erection of a building does not lapse if the building, engineering or construction work relating to the building is commenced on the land to which the consent applies before the date on which consent would otherwise lapse.

Notice of Determination of Modification of Consent

Under section 4.55 and Schedule 1 Clause 20(2) of the *Environmental Planning and Assessment Act 1979*

Development consent is granted to modification of development application 8.2016.140.3 subject to the conditions in Schedule 1.

Notice is hereby made under Section 4.55 of the *Environmental Planning and Assessment Act 1979* (the Act) of a Modification of Development Consent issued under Section 4.55 of the Act, for the development described below. The consent should be read in conjunction with the conditions contained in Schedule 1 and the notes contained in Schedule 2. Details of other approvals are included in Schedule 3. This notice is also given pursuant to the requirements of Schedule 1, Clause 20(2) of the Act.

Determination: Approved, subject to conditions

APPLICATION DETAILS

Development Application No: 8.2016.140.3

Applicant name: Bettergrow Pty Ltd

Applicant address: PO Box 945 WINDSOR NSW 2756

Property Address: Lot: 10 DP: 1204457
74 Lemington Road RAVENSWORTH

Description of Development: Construction of a Composting Facility

Proposed modification: S4.55(1A) Modification to allow truck movements to other sites

Date of Determination: 25 November 2016

Date of Modification Determination: 18 December 2018

Date on which consent shall lapse: 25 November 2021
(unless physical commencement has occurred)



Mr R Lourens
Senior Development Planner

SCHEDULE 1

Reasons for the Determination and Consideration of Community Views:

- The proposed development, subject to the recommended conditions, is consistent with the objectives of the applicable environmental planning instruments, being; *Singleton Local Environmental Plan 2013* (SLEP) and State Environmental Planning Policy No 55 - Remediation of Land.
- The proposed development, subject to the recommended conditions, is consistent with the objectives of the Singleton Development Control Plan 2014 (SDCP).
- Subject to the recommended conditions the proposed development will be provided with adequate essential services required under the SLEP.
- The proposed development is considered to be of an appropriate scale and form for the site and the character of the locality.
- The proposed development, subject to the recommended conditions, will not result in unacceptable adverse impacts upon the natural or built environments.
- The proposed development is a suitable and planned use of the site and its approval is within the public interest.
- Council has given due consideration to community views when making the decision to determine the application.

Reasons for imposing conditions:

The reason for the imposition of the following conditions is to:

- a) ensure, to Council's satisfaction, the objects of the *Environmental Planning and Assessment Act 1979* (as amended) are achieved;
- b) confirm and clarify the terms of Council's Approval;
- c) to encourage the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forest, minerals, water, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment;
- d) set standards and performance measures for acceptable environmental performance;
- e) provide for the ongoing management of the development.

MODIFICATIONS APPROVED AS PART OF DA140/2016/2:

- Condition 1.1 to reflect new Statement of Environmental Effects
- Condition 1.6 to be added to reflect general terms of approval
- Condition 1.7 to be added to reflect general terms of approval
- New condition 1.8 regarding Roads Act Approval
- Condition 4.5 to be added to reflect general terms of approval

MODIFICATIONS APPROVED AS PART OF DA140/2016/3:

- Condition 1.1 to reflect Statement of Environmental Effects associated with Modification 2



GENERAL CONDITIONS

Condition 1.1 is amended and shall read as follows:

1.1 Approved Plans and Supporting Documents

The development shall be carried out substantially in accordance with the approved stamped and signed plans and/or documentation listed below except where modified by any following condition. Where the plans relate to alteration or additions only those works shown in colour or highlighted are approved.

Title/Description	Reference/Drawing No.	Prepared By	Date/s
General Arrangement	Sheet 1 of 6	Tony Mexon & Associates	23 February 2016
Stage 1 Works	Sheet 3 of 6	Tony Mexon & Associates	23 February 2016
Stage 2 Works	Sheet 4 of 6	Tony Mexon & Associates	23 February 2016
Cross Section A-A	Sheet 5 of 6	Tony Mexon & Associates	23 February 2016
Cross Section C-C	Sheet 6 of 6	Tony Mexon & Associates	23 February 2016
Surface and Groundwater Management Plan Version 7	N/A	Bio-Recycle Australia Pty Ltd	3 August 2016
Statement of Environmental Effects	N/A	AECOM	15 July 2016
Statement of Environmental Effects Section 96 Application – Ravensworth Composting Facility	N/A	JACOBS	6 February 2018
Statement of Environmental Effects – Modification 2	IA197800_01	JACOBS	19 September 2018

Note 1: Modifications to the approved plans will require the lodgement and consideration by Council of a modification pursuant to Section 4.55 of the Environmental Planning and Assessment Act, 1979.

Note 2: The approved plans and supporting documentation may be subject to conditions imposed under section 4.17(1)(g) of the Act modifying or amending the development (refer to conditions of consent which must be satisfied prior to the issue of any Construction Certificate).

1.2 Damage on Council Assets

Any existing infrastructure damaged due to the proposed works including, but not limited to, (roads, services, drainage, pipes, guardrails, etc.) is to be repaired or replaced at the applicant's expense. The Applicant must notify Singleton Council Infrastructure or Development Engineering immediately when the structure is damaged.



1.3 Road Act Approval

In case of any asset damage along Lemington Road (from the New England Highway to the entrance of the mining site) the applicant is to submit a Section 138 application in order to obtain a permit with conditions prior to starting works on Council Road Reserve, and at the end, a Certificate of Compliance from Singleton Council Infrastructure Department is to be obtained. All works are to be carried out in accordance with the Singleton Council Development Construction Specifications and details are to be submitted at the time of the application.

1.4 Legal Drainage Point of Discharge

All stormwater from the working area must be directed to a lawful point of discharge such that it does not adversely affect surrounding or downstream properties.

1.5 Leachate Dam Design

Singleton Council request a Compliance Certificate from a qualified practicing Geotechnical/Dams Engineer stating structural adequacy of the dam and that earthworks have been carried out in accordance with the AS 3798-2007 – Guidelines on Earthworks for Commercial and Residential Developments.

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Singleton Council request a Compliance Certificate from a qualified practicing Hydraulic Engineering Consultancy Company stating that the capacity of the existing dam is adequate to cope with the increment of leachate.

The Compliance Certificate along with any correspondence from the Environmental Protection Authority EPA must be submitted to Council prior to increasing the amount of composting material.

Condition 1.7 is amended and shall read as follows:

1.7 Road Impact Assessment

Prior to the commencement of the on-site composting increment, the applicant/contractor is to prepare a Road Condition Report of Lemington Road (from the New England Highway to the entrance of the mining site), identifying all existing problems with this section of the roadway. On completion, a joint inspection between the applicant and Council Officers to identify any further damage is to be carried out. If any additional damage has occurred, all rectification works shall be at the applicant's expense, to the satisfaction of the Council Infrastructure Department. The report is to contain (but not limited to): location of existing deficiencies of the roadway and site photos, especially at areas where turning movements will occur.

Condition during the ongoing use of the development



Insert new condition 1.8:

1.8 Section 138 Roads Act 1993

Prior to any works commencing on Council Road Reserve, the applicant is to submit a Section 138 Application in order to obtain a permit with conditions from the Infrastructure Department.

CONDITION DURING THE ONGOING USE OF THE DEVELOPMENT

2.1 Waterways Contamination

All reasonable and practicable measures must be taken to prevent pollution of any existing waterways as a result of silt or untreated leachate run-off, and oil or grease spills from any machinery. Wastewater for cleaning equipment must not be discharged or indirectly to any watercourses or stormwater systems.

INTEGRATED DEVELOPMENT TERMS OF APPROVAL

3.1 Integrated Development General Terms of Approval

The following approval bodies have given general terms of approval in relation to the development, as referred to in Section 7.4 of the Environmental Planning and Assessment Act 1979:

1. NSW Environment Protection Authority

The applicant is to comply with all general terms of approval provided by the NSW Environment Protection Authority Notice No: 1544342. All records and reports required under the General Terms of Approval must be made available to Council within 48 hours of any request by Council.

A copy of the General Terms of Approval is attached and forms part of the development consent.

ADVICES

4.1 Lapsing of Consent

In accordance with Section 4.53 of the Environmental Planning and Assessment Act 1979 (as amended), this Development Consent lapses five (5) years after the date from which it operates unless building, engineering or construction work has substantially physically commenced. The building must be completed, in accordance with the approved plans and specifications, within five (5) years from the date when the building was substantially physically commenced.

4.2 Process for Modification

The plans and/or conditions of this Consent are binding and may only be modified upon written request to Council under Section 4.55 of the Environmental Planning and Assessment Act, 1979 (as amended). The request shall be accompanied by the appropriate fee and application form. You are not to commence any action, works, contractual negotiations, or the like, on the requested modification unless and until the written authorisation of Council is received by way of an amended consent.



4.3 Review of Determination

In accordance with the provisions of Section 8.2 of the Environmental Planning and Assessment Act 1979 (as amended) the applicant can request Council to review this determination. The request must be made within a period of 6 months from the date shown on this determination. A fee, as prescribed under Council's current Management Plan - Fees and Charges, is payable for such a review.

4.4 88B Instrument

An 88B Instrument made pursuant to the Conveyancing Act 1919 applies to the subject land and it is the owners/applicants responsibility to check the compliance of the works with the instrument.

Insert new condition 4.5:

4.5 Other Permits and Approvals

Approval shall be sought from the New South Wales Environment Protection Authority for the amendment of Environment Protection License number 7654, to allow for the composting of up to 76,000 tonnes per annum. An amended Environment Protection License must be granted by the New South Wales Environment Protection Authority prior to the increase of composting above 50,000 tonnes per annum.

OTHER APPROVALS

Local Government Act 1993 approvals granted under s 4.12 (5)

N/A

General terms of other approvals integrated as part of the consent (list approvals)

- Mine Subsidence Compensation Act 1961
- Protection of the Environment Operations Act 1997

SCHEDULE 2

RIGHT OF APPEAL

To the extent provided for by Section 8.7 and 8.10 of the Act, an applicant who is dissatisfied with the determination of this application may appeal to the Court within six (6) months of the date of this notice.

Sections 8.7 and 8.10 of the Act do not apply in respect of a development consent declared to be valid or validly granted under Section 25C of the *Land and Environment Court Act 1979*.

NOTES

- This is not an approval to commence work. Building works cannot commence until a construction certificate is issued by Council or an accredited certifier.



- Consent operates from the determination date. For more details on the date from which the consent operates refer to section 4.20 and 8.13 of the *Environmental Planning and Assessment Act 1979*.
- Section 4.53 of the Act provides that a development consent for the erection of a building does not lapse if the building, engineering or construction work relating to the building is substantially physically commenced on the land to which the consent applies before the date on which consent would otherwise lapse.



Previous Development Applications

Statement of Environmental Effects

Composting Facility, Ravensworth No. 2 Mine



Statement of Environmental Effects

Composting Facility, Ravensworth No. 2 Mine

Client Bettergrow Pty Ltd

ABN: 18 167 859 494

Prepared by

AECOM Australia Pty Ltd

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15-Jul-2016

Job No.: 60493953

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Quality Information

Document Statement of Environmental Effects

Ref 60493953

Date 15-Jul-2016

Prepared by Jack Turner

Reviewed by Catherine Brady

Revision History

Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
A	19-Apr-2016	Draft for client review	James McIntyre Associate Director - Environment	
0	28-Jun-2016	Final	James McIntyre Associate Director - Environment	
1	08-Jul-2016	Final for Council Submission	James McIntyre Associate Director - Environment	
2	15-Jul-2016	Revised Final for Council Submission	James McIntyre Associate Director - Environment	

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1.0 Introduction

1.1 The Proponent

Bettergrow Pty Ltd (Bettergrow) was formed in 1978. Bettergrow provides innovative and leading edge solutions to the resource recovery industry in NSW and QLD. Bettergrow specialises in creating innovative organic resource recovery solutions. The company incorporates and continues to trial and develop a range of processes and technologies, and its systems are built on many years of industry experience.

Bettergrow has been contracted by AGL Macquarie Pty Ltd (AGL) to supply purpose manufactured soil ameliorant and rehabilitation products suitable for use in the rehabilitation of the Ravensworth No 2 Mine and Ravensworth South Mines.

1.2 The Landowner

AGL is the landowner and former NSW Government power producer, Macquarie Generation, which was acquired by AGL in September 2014. AGL is an Australian integrated energy company which owns and operates a number of base, peaking and intermediate power generation plants across the country, powered by thermal generation as well as renewable sources. AGL Macquarie currently owns and operates the:

- 2,640 MW Bayswater Power Station;
- 2,000 MW Liddell Power Station;
- 50 MW Hunter Valley gas turbines; and
- Liddell solar thermal project.

Bayswater Power Station produces approximately 15,000 GWh of electricity each year while Liddell Power Station produces in the order of 8,000 GWh of electricity each year. AGL Macquarie plays a prominent role in the Hunter Valley Region, both as a major economic contributor and as an active partner in community development. AGL Macquarie is the largest domestic buyer of NSW coal and employs over 650 people, most of whom live in the Upper Hunter Valley. AGL also owns the Ravensworth No 2 Mine which ceased coal extraction in 1993.

1.3 Context of the Project

AECOM Australian Pty Ltd (AECOM) has been engaged by AGL to undertake a Statement of Environmental Effects (SEE) to support a development application for onsite composting operations at the Ravensworth No 2 Mine.

AGL is currently rehabilitating Voids 1 to 5 at the Ravensworth No 2 and Ravensworth South Mines using the disposal of fly ash from the Bayswater power station in accordance with the following development consents:

- Development consent No. 144/93 granted by Singleton Shire Council on 8 December as modified;
- Development consent No. 138/93 granted by Muswellbrook Shire Council on 13 December 1993 as modified; and
- Development consent No. 86/51 for Ravensworth South Mine granted by the Department of Planning and Environment on 16 December 1986.

The development consents authorise the use of compost as part of the rehabilitation process but do not explicitly authorise onsite composting. AGL is seeking development consent for onsite composting as part of its ongoing rehabilitation at Ravensworth No 2. The land to be rehabilitated would include the mining voids and existing rehabilitated areas which require additional soil improvement.

The proposed composting material would be a mix of garden organics, clean timber, biosolids, hydro excavation and drill slurry, paper pulp, fly ash, lime and manures. This composting material would provide a valuable organic resource to assist in the rehabilitation of the site.

The composting operation will be conducted by Bettergrow. Bettergrow will operate the composting site within Void 3, which has been filled with flyash and capped. This SEE covers the composting operation proposed by the Proponent (Bettergrow) on the Void 3 site.

Bettergrow is under contract to AGL to supply 50,000 tonnes per year of the composted and blended growing media required for the onsite rehabilitation.

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2.0 Project site and Operations

2.1 Project site description

The Project site is located at the Ravensworth No 2 Mine, approximately 20km north of Singleton within the Singleton Local Government Area (LGA) and is shown in Figure 1. Land uses around the Project site are dominated by power generation and mining operations including:

- Liddell and Bayswater Power Station including Lake Liddell to the north west;
- Liddell Coal operations to the north east;
- New England Highway to the east;
- Ravensworth North Open Cut to the west; and
- Integra Coal Mine to the south east.

The Project site is located on part of a capped open cut mining void (Void 3) and is cleared of vegetation. Drainage lines in proximity to the Project site include Bayswater Creek 600 metres to the west, Bowman's Creek 1.5 kilometres to the east and the Hunter River 5 kilometres to the south. The Project site is located on the top of a topographic high point and drains towards the east and the south.

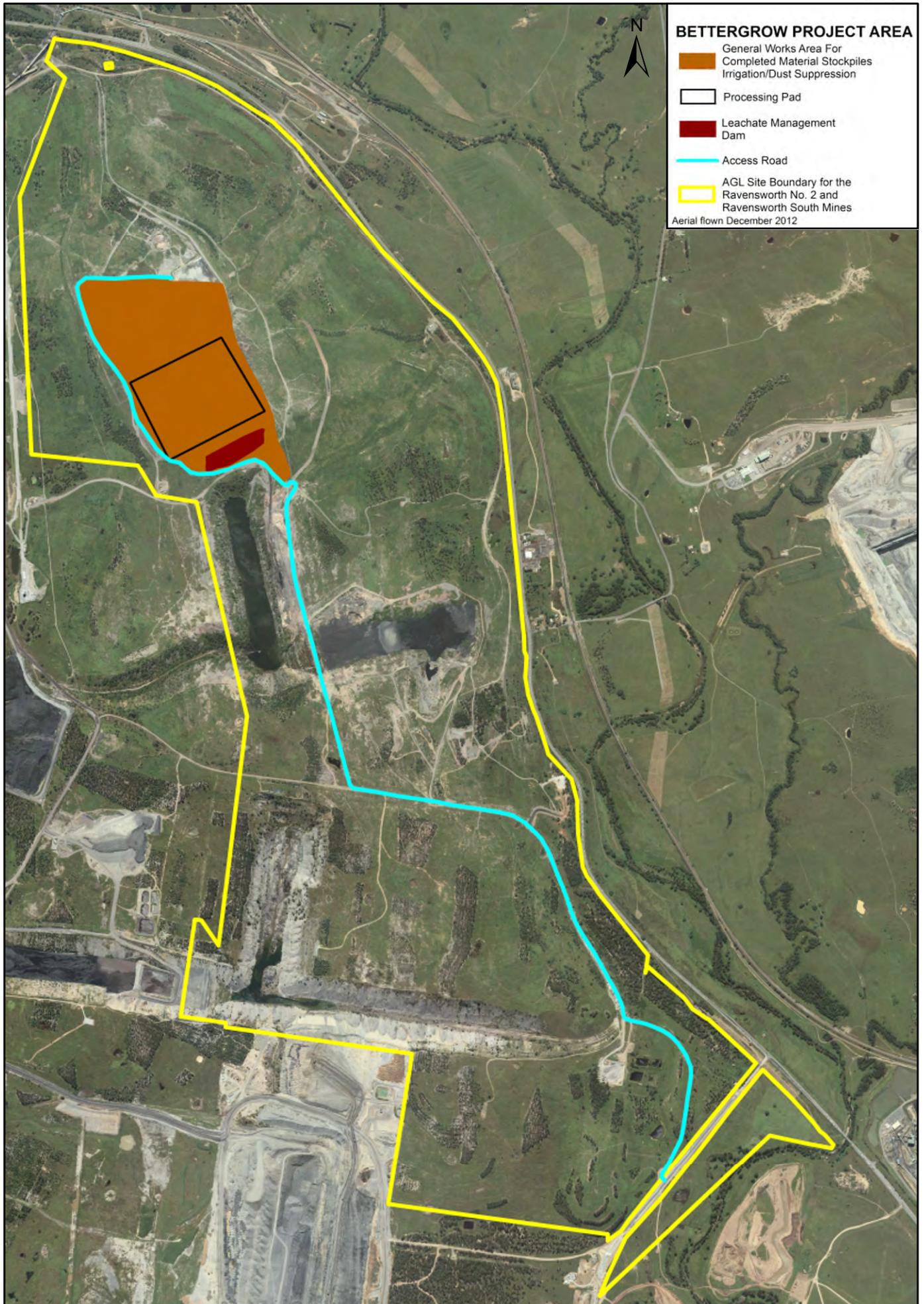
The nearest sensitive receiver to the Project site is located in the village of Camberwell, approximately 7.6 kilometres to the southeast.

2.1.1 Historic and Existing Operations

The Ravensworth No 2 Mine was operated by Peabody Resources Ltd (Peabody) up until 1993 when extraction of coal was completed. Peabody's contractual commitments with respect to the site were completed on 31 December 1993. The decommissioned mine site is currently owned by AGL. AGL is responsible for the rehabilitation of the mine site by filling the voids (Voids 1, 2, 3, 4, and 5) with fly ash from Bayswater Power Station. As mining operations have concluded at the site, in accordance with the consent conditions the site must be restored to its previous use of grazing pasture or native vegetation.

Voids 1 and 2 have been fully filled with ash, capped and rehabilitated. Void 3 was filled with ash and capped in 2014. Void 4 is currently used as a water storage dam and provides capacity for the discharge of surplus water during extreme rainfall events.

Deposition of ash into Void 5 commenced in 2014 and is expected to be completed in 2032. Approximately 1.5 million tonnes of fly ash per annum are currently pumped to the Void 5 in Ravensworth South via a designated ash slurry pipeline from Bayswater power station.



3.0 The Project

3.1 Need for the Project

More than 700 hectares of AGL Macquarie land requires rehabilitation and additional areas may become available in the future as mine voids are filled with fly ash. Historic open cut mining operations have resulted in the removal and disturbance of the topsoil at the site. The current soil has limited value as a plant growth medium due to its poor structure, low levels of nutrients, organic matter and high sodicity and salinity. Current rehabilitation activities have not been able to successfully establish robust vegetation communities. Long term successful rehabilitation at the site depends on developing a biologically active soil with a sustainable carbon and nutrient cycle.

The Project would provide the biologically active organic material required to be added to the topsoil at the Project site in order to facilitate successful rehabilitation at the Ravensworth No 2 and Ravensworth South Mines. Organic material would be used to improve the soil in existing rehabilitated areas and disturbed areas.

3.2 Consideration of alternatives

'Do nothing'

The 'do nothing' option was considered for the Project. The 'do nothing' option would involve the continuation of existing rehabilitation activities at the Project site without the onsite composting of organic material. This option would result in the continuation of rehabilitation issues at the Project site due to the existing condition of topsoil and result in poorer rehabilitation conditions compared to what could be achieved with composted material.

To successfully rehabilitate the Ravensworth No 2 and Ravensworth South Mine voids, the 'do nothing' option would require the purchase and transportation of composted organic material from an external supplier. This would potentially limit the quantity or quality of composted material available for rehabilitation, which would ultimately reduce the quality of future rehabilitation. Composted organic material from an external supplier would still be required to be stored at the Project site and the appropriate environmental controls and water related infrastructure would also still be required.

The processing of compost at the Project site would provide a cost-effective outcome to improve the quality of rehabilitation at the Ravensworth No 2 and Ravensworth South Mines and is therefore the preferred option for the Project.

3.3 Overview of the Project

3.3.1 Project construction

The construction of the Project would involve the following components necessary for the operation of the composting facility:

- Staged construction of one leachate dam for containment of all water runoff from the operational site as in Figure 1. The leachate dam would be initially constructed to manage the capture of flows from the areas shown as Pad 1 and Pad 2. Construction of the full dam would be carried out when there is an operational requirement for the use of Pads 3 and Pad 4 see Pad plan at Appendix A. The pads will be constructed to meet the relevant requirements of the *Environmental Guidelines: Composting and Related Organics Processing Facilities* (Department of Environment and Conservation NSW, 2003) (Composting Guidelines);
- The southern leachate dam would be sized to provide a minimum capacity for a 1 in 25 year 24 hour rainfall event (approximately 50 megalitres of water storage) which is in excess of the requirements of the Composting Guidelines and to provide additional capacity for the storage of water for processing. Whilst the leachate dam has an overall capacity to contain a 1 in 100 year 24 hour rainfall event, Bettergrow is committed to ensuring the containment capacity within the onsite detention basin is sufficient to contain the volume of stormwater runoff generated over the operational catchment area of the site during a 1 in 25 year annual exceedance probabilities (AEP) 24 hour rainfall event (~ 5.99 mm/hr) or less;
- The bed and banks of the leachate dam would be constructed from compacted clay, screened compacted overburden or other approved materials to achieve the required permeability of less than 10^{-9} ms^{-1} . An aeration pump would be installed in the leachate dam if required;
- Bunding and diversion drains would be constructed to divert leachate and runoff to the leachate dam. Perimeter bunding would be constructed around the hardstand area where required to divert clean runoff away from the composting area to the adjacent voids. Bunds would be constructed using overburden and would be stabilised using compost and grass seed; and

- Minor upgrade works to the existing site access including road widening of up to 2 metres to accommodate incoming vehicles, creation of an all-weather road surface, and incorporation of appropriate drainage controls.

Vehicle wash down areas would be provided on site during construction. Chemicals and fuels required during construction would be stored within a bunded enclosure. Construction of the Project is anticipated to take three months. A water tank is located on site to provide water to control dust from access roads and stockpiles.

3.3.2 Project operation

The Project area is shown in Figure 2 and an indicative site layout is provided in Appendix A. The existing hardstand area to be used for the storage and processing of the composting materials is constructed of compacted flyash and spoil. These have been graded to provide the required slope such that rainfall would be directed to the relevant leachate dams.

Operation of the Project would involve receiving a mix of organic material which would be composted and blended at the Project site before being used as part of existing approved rehabilitation activities to create a final compost layer for rehabilitated land.

Organic material would be transported to the site and unloaded directly onto the existing hardstand area of approximately 25 hectares in total. Organic material would comprise generally of garden organics, clean timber, biosolids, hydro excavation and drill slurry, paper pulp, fly ash, lime and manures and would be mixed and composted to create a dry and stable material suitable for rehabilitation.

Biosolids received at the Project site would either be stored for a period to allow for reduction in volatile solids, or would be immediately blended with garden organics and possibly fly ash and placed into windrows for pasteurisation and turning. Windrows would be frequently turned with either a front end loader, or a specialised windrow turner to ensure they remain aerobic and that pasteurisation of all products is achieved. Windrows may initially be covered with previously composted material which would act as an odour filter or odour neutralising agents such as BioActive may be used to aid the process.

The mixed organic material would continue to be composted in windrows and would be turned to maintain aerobic conditions. On windy days, water would be sprayed over the compost or biosolids to prevent dust generation during the turning of windrows. The moisture content of windrows would be monitored and adjusted as required to maintain a moisture content of 45 – 50% w/w during composting.

The temperature of the windrows would be monitored weekly as a minimum to create a temperature profile. The internal temperature of the windrows would need to reach a minimum temperature of 55°C which would be maintained for at least three consecutive days before each turn. It is anticipated that the internal temperature of 55°C would need to be maintained for a minimum of 15 days (with windrows being turned at least 5 times) to create a stabilised product.

Compost windrows may reach temperatures higher than 55 °C during the initial phase of composting. When windrows reach internal temperatures greater than 62 °C, the windrow would be turned to dissipate heat and to provide oxygen which is essential for maintaining aerobic conditions.

Compost windrows would be constructed so as to run parallel with the stormwater flows, in order to minimise the transport of leachate and gross solids to the leachate dams. Dimensions of open windrows would be typically 2.5 m high x 4 m wide x 150 m long.

The composting process is expected to take approximately 8 weeks, after which maturation would occur. Compost must be dried to a moisture content of approximately 35% w/w or less. Finished compost material would be sorted and may be screened and blended with other ingredients to create the required final product. Final compost material would be loaded onto trucks using a front end loader and transported to the relevant area for rehabilitation use.

The existing hardstand processing pad area (see figure 1) would be used for the storage and processing of up to 50,000 tonnes per year of composted material. The existing hardstand area has been constructed for current operations at the Project site. The existing hardstand area would be suitable for the composting activities proposed as part of the Project. Perimeter bunding where required around the hardstand area would prevent clean stormwater flows from entering the composting hardstand area. Stormwater runoff generated as a result of incidental rainfall on the hardstand area would be directed to the leachate dam for capture and management.

An aeration pump in the leachate dam may be installed if it is found that it is required to maintain aerobic conditions. A diesel pump would be installed at the leachate dam and would be used to pump water for spray irrigation or use in the composting process as required. This may include wetting of hardstand pads and roadways, and wetting of dry solid wastes to control the moisture content of windrows.

Access to the Project site would be via an entry gate that connects to Lemington Road to the south. The current access road would require upgrades as outlined in Section 3.3.1. Internal roads would be speed limited to 20 – 40 km/hr.

3.3.3 Plant and Equipment

Plant and equipment to be used for the operation of the Project would include:

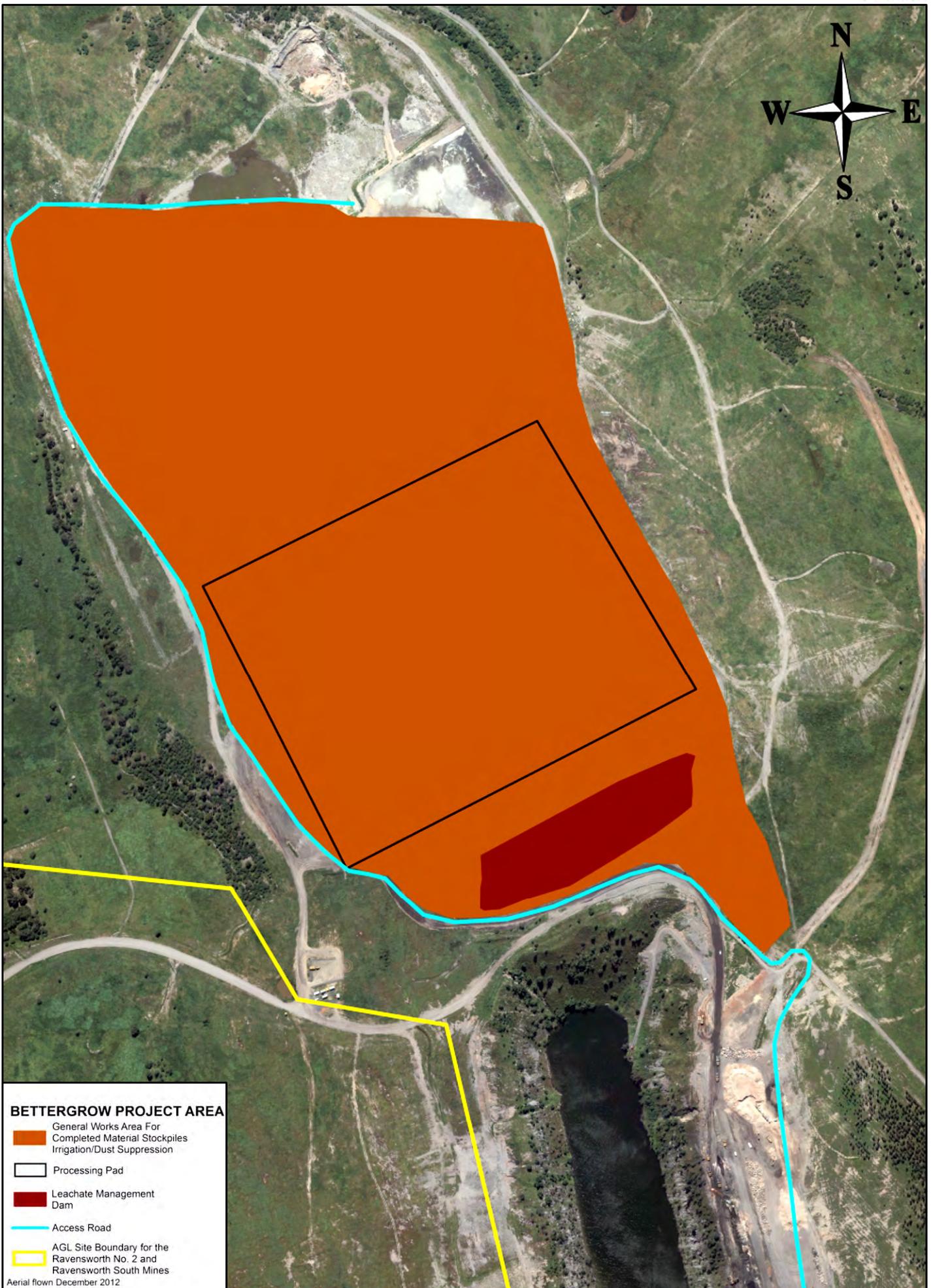
- Green waste shredder;
- Trommel or Stardeck screener;
- 24 tonne excavator;
- 33 tonne front end loader;
- Topturn windrow turner;
- tractor and windrow aerator; and
- Light vehicles.

Designated wash down bays would be located on the Site and all vehicles leaving the facility would be required to wash down. Refuelling of vehicles and machinery would be undertaken within a bunded hardstand area.

3.3.4 Workforce and hours of operation

Approximately 4 - 6 staff would work at the Project site and would be involved in the receiving of organic materials, turning the materials and spreading composted product onto rehabilitated areas.

Hours of operation are expected to be from 6am to 6pm, Monday to Saturday. Deliveries would be received from 6.30am.



Bettergrow Site Layout
Statement of Environmental Effects - Composting Facility, Ravensworth No. 2 Mine
Source: (Bettergrow 2016)

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4.0 Statutory Planning

4.1 Environmental Planning Context

The Environmental Planning and Assessment Act 1979 (EP&A Act) and Environmental Planning and Assessment Regulation 2000 (EP&A Regulation) provide the framework for environmental planning in NSW and include provisions to ensure that development that has the potential to impact the environment are subject to detailed assessment and provide opportunity for public involvement.

This SEE has been prepared to support a development application for composting operations at the Ravensworth No 2 Mine. This development application will be assessed by Singleton Council under Part 4 of the EP&A Act.

4.1.1 Permissibility

The Project site is located within the Singleton LGA and is subject to the provisions of the *Singleton Local Environmental Plan 2013* (LEP 2013). Under the provisions of the LEP 2013, the Project would affect land zoned RU1 Primary Production.

Development that can be characterised as 'open cut mining' is permissible with consent within the RU1 zone. The works associated with the Project are related to the rehabilitation of an open cut coal mine, and are therefore permissible with development consent.

The relevant objectives of the RU1 Primary Production zone are:

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
- To encourage diversity in primary industry enterprises and systems appropriate for the area.
- To minimise the fragmentation and alienation of resource lands.
- To minimise conflict between land uses within this zone and land uses within adjoining zones.

The Project would contribute to the ongoing rehabilitation of Ravensworth No 2 and Ravensworth South Mines. It is therefore consistent with the objectives of the RU1 Primary Production zone as it would enhance the natural resource base of the land in its post-mining state.

4.1.2 State Significant Development

The Project would involve processing a maximum of 50,000 tonnes of organic material and a capital investment of approximately \$1 million. The Project is therefore not classed as State Significant Development under the *State Environmental Planning Policy (State and Regional Development) 2011*.

4.1.3 Designated Development

The EP&A Regulation describe the criteria for development to be classified as designated development under the EP&A Act. Clause 13 of Schedule 3 of the EP&A Regulation identifies that composting facilities or works that process more than 5,000 tonnes of organic material are considered to be designated development unless an exemption applies.

Clause 37A which provides an exemption for development which is ancillary to other development and not proposed to be carried out independently of that other development. The Project would be exempt under Clause 37A because:

- The Project is ancillary to the existing approved rehabilitation activities carried out by the Proponent at Ravensworth No 2 because:
 - The Project would operate only to serve existing rehabilitation activities; and
 - The Project would be considered a 'minor use' considering the size and scale of rehabilitation activities.
- The Project would not be operated independently of approved rehabilitation activities.

4.1.4 Integrated Development

The Project is integrated development under section 91 of the EP&A Act because it would involve the alteration or erection of improvements within a mine subsidence district (section 15 of the *Mine Subsidence Compensation Act 1961*).

4.1.5 Consent Authority

The Project has not been declared to be state significant development through a State Environmental Planning Policy or Ministerial Order or designated development under the EP&A Act. The Project therefore constitutes local development and Singleton Council is the consent authority.

4.1.6 Environmental Planning Instruments and Development Control Plans

State Environmental Planning Policy (SEPP) 55 – Remediation of Land

SEPP 55 provides a state-wide planning approach for the remediation of contaminated land. Clause 7 of the SEPP requires a consent authority to consider whether the land is contaminated and whether it is suitable (or can be made suitable) for the proposed development.

The proposed development is for an existing developed site. There is no known contamination on the site according to a search of the EPA database 'Contaminated Land: Record of Notices' (search undertaken 3 May 2016).

State Environmental Planning Policy (SEPP) 44 – Koala Habitat Protection

SEPP 44 aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population and reverse the current trend of koala population decline. SEPP 44 applies to the Singleton LGA. A consent authority is required to consider whether the land that is the subject of development consent is potential koala habitat.

The land at the Project site is cleared of suitable habitat for Koalas. The Project does not involve the interaction with, or potential impact on any trees adjacent to the Project site. A plan of management is therefore not required under SEPP 44.

Singleton Local Environmental Plan 2013 (LEP 2013)

Relevant zoning and permissibility provisions under LEP 2013 for the Project are outlined in Section 4.1.1. There are no further provisions of relevance in LEP 2013 for the Project.

Singleton Development Control Plan 2014

The *Singleton Development Control Plan 2014* (DCP 2014) applies to all land zoned under the LEP 2013, including the RU1 – Primary Production zone in which the Project site is located. DCP 2014 complements the statutory provisions contained in LEP 2013 by providing detailed guidelines for development within the Singleton LGA.

A review of DCP 2014 was undertaken for the Project including a review of relevant DCP 2014 mapping. Assessment requirements for the Project under DCP 2014 are provided in Table 1.

Table 1 Relevant DCP 2014 assessment requirements

Trigger	Requirement	Document Reference
<i>When a development is likely to generate or be subject to air pollution impacts</i>	Air Quality Assessment	An Air Quality Assessment for potential odour impacts of the Project is provided in Section 6.3.

4.2 Other State Legislation

4.2.1 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operation Act 1997* (POEO Act) prohibits any person from causing pollution of waters or air and provides for penalties for air, water and noise pollution offences. Schedule 1 of the POEO Act identifies 'scheduled activities' that are required to be licensed by the EPA. Composting processing above prescribed thresholds is a scheduled activity identified under Schedule 1 of the POEO Act.

Bettergrow (trading under the name of Bio-Recycle) currently holds an Environment Protection License No 7654, covering the activity of composting on the subject site. This application seeks to align the site consent conditions and existing licence.

4.2.2 Mine Subsidence Compensation Act 1961

The *Mine Subsidence Compensation Act 1961* (MSC Act) provides for the regulation of development on land potentially affected by mine subsidence. The Project would be undertaken within the Patrick Plains Mine

Subsidence District and the extent of works would be classified as an improvement under the MSC Act. Approval from the Mine Subsidence Board prior to the construction and operation of the Project would therefore be required under Section 15 of the MSC Act.

4.3 Commonwealth Legislation

4.3.1 Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) requires the approval of the Commonwealth Minister for the Environment for actions that may have a significant impact on matters of National Environmental Significance (NES). Approval from the Commonwealth Minister is in addition to any approvals under NSW legislation. Other matters protected under the EPBC Act include the protection of the environment where proposed activities are located on Commonwealth land.

An EPBC Act Protected Matters Report was generated for the Project site and is attached at Appendix B. The report identified NES matters that may occur in or may relate to the Project site. The results of the report are summarised in Table 2.

Table 2 Summary of EPBC Act Protected Matters Report

Matter of National Environmental Significance	Number of Matters Identified by Report
World Heritage Properties	None
National Heritage Places	None
Wetlands of International Importance	1
Great Barrier Reef Marine Park	None
Commonwealth Marine Area	None
Listed threatened ecological communities	3
Listed threatened species	17
Listed migratory species	11

The Project will not impact on any NES matters. The Project site is cleared of native vegetation and there is negligible potential for listed threatened species, ecological communities or habitat for listed migratory species. The nearest wetland of international importance, the Hunter Estuary Wetlands, is located over 50km from the Project site.

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5.0 Consultation

AGL undertook consultation with Singleton Council on 13 January 2016 via email to confirm the approval pathway for the Project. Singleton Council confirmed that the Project would not be considered designated development under the EP&A Regulations according to the exemption provided in Clause 37A, because the Project would be considered to be ancillary to rehabilitation activities. Singleton Council confirmed that an Environmental Impact Statement would not be required for the Project. A copy of this consultation is provided at Appendix C.

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6.0 Environmental Impact Assessment

An environmental scoping exercise has been completed for the Project. The scoping exercise has considered the potential environmental impacts of the Project to identify those environmental factors requiring more detailed environmental impact assessment within this SEE. The environmental factors relevant to the Project are summarised in Table 3. For environmental factors that do not require further more detailed environmental assessment, the mitigation measures identified in Section 7.0 would be applied.

Table 3 Applicable Environmental Factors

Environmental Factor	Assessment	Detailed discussion in SEE required?	Document reference
Landforms, geology and soils	Excavations and earthworks are proposed for the construction of the Project. Potential impacts associated with excavations and earthworks would be managed by the implementation of an Erosion and Sediment Control Plan for the construction of the Project.	No	Mitigation Measures in Section 7.0
Surface water	There are potential impacts to surface water for the Project.	Yes	Section 6.1
Groundwater	There are potential impacts to groundwater for the Project.	Yes	Section 6.2
Air quality	There are potential impacts related to odour and dust generation for the operation of the Project. Only minor localised potential impacts from dust are anticipated for the construction Project.	Yes	Section 6.3
Bush Fire	The Project site is located on bush fire prone land and so there are potential impacts related to bush fire risk.	Yes	Section 6.4
Biodiversity	The Project site is cleared of native vegetation and there is negligible potential for listed threatened species, ecological communities or habitat for listed migratory species. Impacts to biodiversity would be unlikely for the Project. The Project would improve the quality of existing and future rehabilitation at the Ravensworth No 2 Mine. The Project would encourage the establishment of native vegetation communities and potential habitat for fauna.	No	Mitigation Measures in Section 7.0
Noise and vibration	The nearest sensitive receiver is located over 7.5 kilometres from the Project site. Noise and vibration impacts are anticipated to be minor for the Project.	No	Mitigation Measures in Section 7.0
Aboriginal and non-Aboriginal heritage	A review of LEP 2013 was undertaken for the Project site. No Aboriginal or non-Aboriginal heritage items were identified at the Project site. A search was undertaken of the Aboriginal Heritage Information Management System for the Project site and is attached at Appendix D.	No	Mitigation Measures in Section 7.0

Environmental Factor	Assessment	Detailed discussion in SEE required?	Document reference
	<p>An Aboriginal site was recorded 500m to the north east of the Project site, on the eastern side of the New England Highway.</p> <p>Due to the historical use of the Project site for mining, it is highly unlikely that the Project site contains any unidentified items of heritage significance.</p> <p>Potential impacts to Aboriginal and Non-Aboriginal heritage from the Project would be unlikely for the Project.</p>		
Waste Management	<p>During construction, waste generated would be limited to spoil and general construction waste.</p> <p>Waste would be managed in accordance with the mitigation measures in Section 7.0.</p>	No	Mitigation Measures in Section 7.0
Contaminated land and hazardous materials	<p>Areas to be disturbed at the Project site are not known to be contaminated. Any contamination encountered during construction would be managed in accordance with the control measures in Section 7.0.</p>	No	Mitigation Measures in Section 7.0
Visual amenity	<p>The works undertaken for the Project would be consistent with the current aesthetic qualities of the site associated with rehabilitation activities. The Project site is not visible from the New England Highway or nearby sensitive receivers.</p>	No	Mitigation Measures in Section 7.0
Socio-economic effects	<p>Surrounding businesses are not anticipated to be impacted during the construction or operation of the Project.</p>	No	Mitigation Measures in Section 7.0
Traffic and access	<p>The Project site would be accessed via Lemington Road to the south of the Project site. The internal roads would be modified (if required) to provide a suitable surface and drainage for the Project.</p> <p>The construction of the Project would not generate additional vehicle movements as all plant and equipment to be used is currently in use on other projects on site.</p> <p>The operation of the Project would generate approximately 8 heavy vehicle movements per day.</p> <p>The New England highway has the capacity to absorb the additional construction and operational traffic volumes.</p> <p>Potential impacts to traffic and access, including impacts to the New England Highway are anticipated to be negligible for the Project.</p>	No	Mitigation Measures in Section 7.0

Environmental Factor	Assessment	Detailed discussion in SEE required?	Document reference
Demand on resources	The Project would use standard construction resources. The works are not anticipated to result in an increased demand on resources.	No	n/a
Cumulative environmental effects	Consultation with Council did not identify the potential for cumulative impacts for the Project with current or future development in Singleton.	No	n/a

6.1 Surface Water

A desktop surface water assessment was undertaken for the construction and operation of the Project to identify potential impacts to surface water and recommend mitigation measures to manage identified impacts.

6.1.1 Existing Environment

Previous open cut mining activity both at the Project site and in the immediate vicinity of the Project site has meant that the existing surface water environment is considered to be highly modified due to historic mining, power generation and agriculture activities.

Rainfall and Climate

The Project site lies on the boundary between the *Summer* (Wet summer and low winter rainfall) and *Uniform* (uniform rainfall) seasonal rainfall zones as defined by the Bureau of Meteorology (BOM). Approximate rainfall data for the Project site is presented in Figure 3, and was sourced from the Bowmans Creek (Grenell) BOM Station No 0601270 located approximately 20 kilometres from the Project site.

Despite being on the cusp of the *Summer* and *Uniform* climate regions, rainfall in the vicinity of the Project shows seasonal patterns consistent with the *Summer* climate zone. Rainfall is typically higher in the warmer months with the highest monthly rainfall of 109 mm recorded during January. Lowest monthly rainfalls occur during July and August with average rainfalls of around 45 mm recorded.

Landform and drainage

The location of the Project site, existing surface water features and mine landforms is provided in Figure 4.

Ravensworth Void 3 sits at the top of a ridge that runs approximately north south. The elevation of the ridge is approximately 120 m AHD falling east and west to around 80 metres AHD on either side of the ridge. On the eastern side of the ridge water drains to Bowmans Creek. On the western side of the ridge, runoff flows to Bayswater Creek. The confluences of both of these Creeks with the Hunter River lie around seven kilometres south of Ravensworth Void 3. The ridge features other mining void spaces including Void 4 to the south. At the top the ridges there is very little catchment draining to each of the voids.

Bayswater Creek is highly modified both physically and hydrologically. Bayswater Creek flows from Lake Liddell to the north and the flow regime is influenced by the presence of the lake and the operational discharges from Bayswater Power Station under the Hunter River Salinity Trading Scheme. Flows in Bayswater Creek are generally low (median 2.4 megalitres per day). Bayswater Creek is highly saline with median electrical conductivities (EC) in the previous two decades recorded at 3118.9 $\mu\text{S}/\text{cm}$ (Bayswater Creek 210110 Station) (NSW Environmental Protection Authority, 2013). This is compared to the ANZECC trigger levels for EC for both upland (> 150m AHD) and lowland south-eastern Australian streams in Table 4 below (ANZECC, 2000).

Bowmans Creek lies to the east of the Project site and is also heavily modified in terms of water quality. The water quality station on Bowmans Creek at Ravensworth (officially *Foy Brook at Ravensworth (210042)*) indicates high salinities in the Creek (median 1412 $\mu\text{S}/\text{cm}$; 80th percentile 2600 $\mu\text{S}/\text{cm}$) (NSW Environmental Protection Authority, 2013). Flows in the creek were indicated at 2 megalitres per day in 2008 (Aquaterra, 2008).

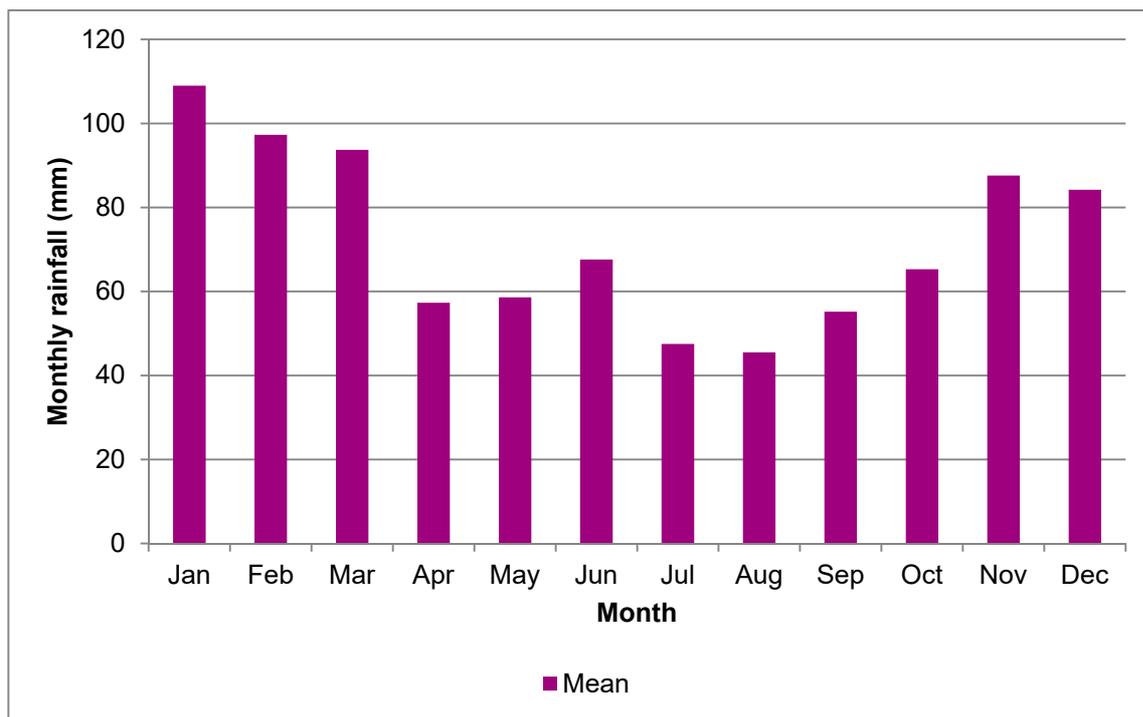
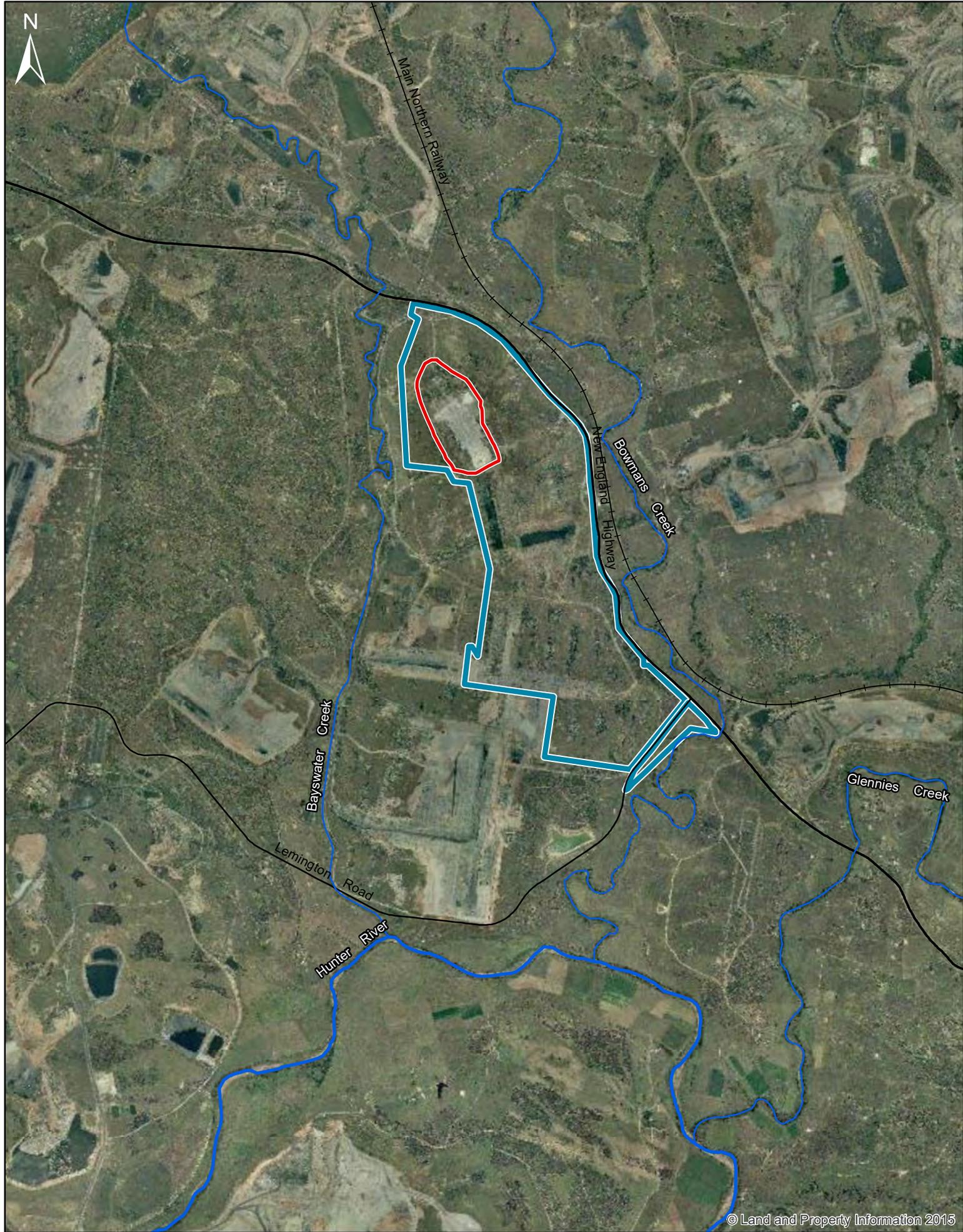


Figure 3 Mean monthly rainfall for the Project site

Table 4 ANZECC water quality trigger values and explanatory notes for south eastern Australian upland and lowland rivers (ANZECC, 2000).

	Bayswater Creek	ANZECC Guideline	
Salinity (µS/cm)	3118.9	30 – 350 (upland streams)	Conductivity in upland streams will vary depending upon catchment geology. High values (350 µS/cm) are found in NSW rivers.
		125 – 220 (lowland rivers)	Lowland rivers may have higher conductivity during low flow periods and if the system receives saline groundwater inputs. NSW coastal rivers are typically in the range 200–300 µS/cm.



© Land and Property Information 2015

- Project site
- AGL Land
- Creek
- River

Existing surface water features
 Composting Facility, Ravensworth No 2 Mine
 Statement of Environmental Effects

6/05/2016
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Fig. 4



6.1.2 Potential Impacts

Construction Impacts

There would be potential impacts to surface water for the construction of the Project. Earthworks would be required for the construction of the leachate dam. If stormwater is inadequately managed during construction there would be potential erosion impacts from bare earth surfaces and for sediment to be discharged into natural surface waters including Bayswater and Bowmans Creek. Potential impacts from sediment discharge into natural surface waters include:

- Increased turbidity and suspended solids with associated ecological and aesthetic effects;
- Increased nutrient load from nutrient adsorbed to the surface of sediment particles which may result in enhanced eutrophication with subsequent effects on creek ecology and aesthetics; and
- Changes to creek hydrology and hydraulics with subsequent effects on creek ecology.

Operational Impacts

Potential impacts to surface water quality during the operation of the Project would include:

- Reduction in aesthetic values of receiving water (notably turbidity from inadequate erosion and sediment control and odour effects from ongoing anaerobic decomposition of organic material);
- Potential health impacts to livestock or persons extracting water from receiving waters; and
- Reduction in health (species richness and biodiversity) of the receiving ecosystems.

Potential impacts to surface water during the operation of the Project primarily relate to potential water pollution from leachate generated by composting operations. Leachate is water that has percolated through a solid material and leached out some of the constituents of that solid material (Department of Environment and Conservation, 2004). In the case of composting material, leachate generated would likely be putrescible organic material. Generally organics processed on site would be Category 1 organics which would not contain sufficient moisture to produce leachate unless water was added externally, such as during rainfall events. Should leachate be generated, potential impacts include a reduction in water quality from oxygen demanding wastes. Oxygen demanding wastes include organic materials washed from the site during or after large rainfall events. Bunding is required around the hardstand area to prevent this from occurring. When deposited into a water body, wastes continue to decompose depleting aqueous oxygen in the water column and creating a low dissolved oxygen (DO) (potentially anaerobic) environment. Composting materials may also be high in nutrient such as phosphorus and nitrogen which may lead to enhanced eutrophication with subsequent effects on water quality and aquatic ecology.

When formed under anaerobic (low DO) conditions, leachates can be acidic. Low pH leachate can cause dissolution of metals and metal compounds into the water column, adversely affecting water quality. In addition to the release of metals and metal compounds into solution, anaerobic conditions may liberate nutrients, including phosphorus and nitrogen which may cause enhanced eutrophication if discharged to receiving waters. Conversely high nitrogen/low carbon ratios (for example from food and animal organics) may cause alkaline leachate solutions.

Potential impacts to surface water may include:

- Release of contaminants to surface water due to a spill being ineffectively managed;
- Release of contaminants to surface water due to overtopping of the two leachate dams during events larger than the design event; and
- Poor maintenance of the bed and banks of stormwater drains and/or the two leachate dams.

6.1.3 Mitigation Measures

Construction Mitigation Measures

Potential construction impacts to surface water for the Project would be associated with erosion and sediment control practices. As such an ESCP would be developed for construction works and implemented and approved by AGL Macquarie environmental staff prior to initiation of construction works. Erosion and sediment control would be at a minimum in accordance with the methods presented in *Managing Urban Stormwater: soils and construction* (Landcom, 2004) ("the Blue Book") and the *Best Practice Erosion and Sediment Control* (IECA Australasia, 2009).

Operational Mitigation Measures

Measures to mitigate potential surface water impacts during operation have been incorporated into the design of the Project in accordance with *Environmental Guidelines: Composting and Related Organics Processing Facilities* (Department of Environment and Conservation NSW, 2003). The windrows would be shaped so as to maximise runoff and hence reduce infiltration of water through to the groundwater system where it is more difficult to manage. Mitigation measures incorporated into the design of the Project and the justification for these measures is provided in Table 5.

Table 5 Operational Mitigation Measures

Mitigation Measures	Justification
Utilisation of a low permeability base in the composting processing areas Lining of leachate pond	Utilisation of a low permeability base in the composting processing areas and lining the leachate pond would reduce risk of infiltration and leaching and would direct water into the surface water system.
Leachate dams	<p>Any leachate dam to be constructed as part of the Project would both have at least the minimum capacity to contain a 1 in 25 year, 24 hour rainfall event in accordance with relevant composting guidelines (Department of Environment and Conservation NSW, 2003). The leachate dams would contain surface water runoff including any water containing leachate.</p> <p>Whilst containment will be assured for rainfall events up to and including a 1 in 25 year 24 hour event, due to the containment capacity of the leachate dam, storage for events > than a 1 in 25 year 24 hour event could be provided whereby it is possible when the dam is nearly empty, that a 1 in 100 year 24 hour rainfall event could be contained. In the event that the leachate dam overtops during a rainfall event greater than a 1 in 25 year event, surface water would either be retained in the leachate dam or would be discharged to a lower storage basin and then ultimately into Void 4 to the south of the Project site and contained entirely on AGL land.</p>
Bunding and arrangement of windrows	Bunding and windrows would be utilised to divert any onsite surface water into the leachate dam at the Project site. Runoff paths on site will be managed so as to reduce transport of composting material to the leachate dams, and to maintain the design volume of the dams. Regular desilting of the leachate dams will be undertaken in order to maintain the design volumes.
Aeration of leachate in the leachate dams where necessary	Maintaining aerobic conditions in the leachate dams would reduce the risk of the formation of acidic leachates and minimise the potential effects to any surface water receiving bodies associated with low pH, in the infrequent event of a discharge from the leachate dam. The pH in the leachate detention basin would be maintained at a level above 6.5 and below 8.5 pH units, by introducing dilute solutions of either sodium hydroxide or sulphuric acid where required.
Reuse of runoff and leachate	Runoff and leachate would be reused on site for re-wetting materials in the active composting phase and for on-site dust suppression. This would recycle nutrients back into the system and reduce the risk of discharge into Bayswater and Bowmans Creeks and ultimately to Hunter River. Excess water from the leachate dams would be reused in the Ravensworth No 2 irrigation areas, next to the Project site. A diesel pump would be used to pump the water either for use in the composting process or for spray irrigation.

Mitigation Measures	Justification
Perimeter bunding and diversion drains	<p>The Project site is at the top of a ridge and so clean water would generally be diverted around the site and downslope to Bayswater and Bowmans Creek. However to further ensure adequate management of offsite water, clean water would be diverted around the composting processing areas through the use of perimeter bunding and diversion drains.</p> <p>Clean water would be directed to the adjacent voids by perimeter bunding and diversion drains as per the hydrology plan for the site. Perimeter bunding would be constructed using overburden and fly ash excavated from the leachate dams and would be stabilised using compost and grass seed. Where clean water is found entering the site through a breach in perimeter bunds, the site manager would be informed and appropriate repairs carried out.</p>

Measures to mitigate potential impacts to surface water would be incorporated into operational environmental management plans.

The implementation of the mitigation measures described would ensure that potential impacts to surface water for the construction and operation of the Project would be minimised.

6.2 Groundwater

A number of groundwater assessments and monitoring programs have previously been undertaken for the Project site and surrounding areas. These previous studies have described the aquifer systems, hydraulic properties and groundwater quality for the local and regional environment.

A desktop groundwater assessment was undertaken which included a review of the following documents:

- *Bayswater Power Station: Fly Ash Disposal in Ravensworth No. 2 Mine Void and Mine Rehabilitation: Environmental Impact Statement*, (Pacific Power, August 1993);
- *Ravensworth Operations Project: Environmental Assessment*, (Umwelt, February 2010);
- *Ashton Coal Bowmans Creek Diversion: Environmental Assessment*, (Evans & Peck, December 2009); and
- *Ashton Coal South East Open Cut Environmental Assessment*, (Wells Environmental Services, November 2009).

6.2.1 Existing Environment

Groundwater Aquifers

The main aquifer systems that have been previously identified at the Project site and surrounds include:

- Coal seam aquifers which are generally confined above and below by impermeable layers of sandstone;
- Aquifers associated with weathered rock and soil overlying base rock (the regolith). These aquifers are mostly depleted during extended dry and drought periods; and
- Alluvial aquifers associated with major drainages such as the Hunter River, Bowmans Creek and Bayswater Creek.

Based on previous measured permeabilities of the rock strata and groundwater monitoring undertaken at the Project site and surrounds, rainfall infiltration and recharge to the shallow regolith and underlying coal seam aquifers are calculated to be very low (less than 1 per cent of annual rainfall).

Rainfall recharge of the alluvial aquifers is considered to be highly variable, as these aquifers vary from clayey-silty material with poor groundwater transmission characteristics, to silty-sandy-gravelly material with good groundwater transmission characteristics.

Groundwater quality

Groundwater quality at the Project site and surrounds is routinely monitored for the basic water quality parameters of pH and total dissolved salts (TDS) / electrical conductivity (EC). Monitoring suggests that groundwater quality is dominated by primary salinity as is typical of the region generally. The pH of groundwater in the area is slightly alkaline, generally between 7.5 and 9.0.

TDS in groundwater at the Project site and surrounds reflect mostly saline groundwaters with an average TDS of about 6100 mg/L. Table 6 summarises the general status of groundwater quality at four nearby groups of aquifers against accepted water quality guidelines. The groundwaters are considered to have no beneficial use.

Table 6 Comparison of aquifer groundwater quality and water quality guidelines

Beneficial use / Aquifer	TDS (mg/L)	Equivalent EC ($\mu\text{S}/\text{cm}$) ¹
Water Quality Guidelines		
Acceptable taste limit for humans ²	1000	1540
General upper limit based on taste	1500	2300
Limit for grass on alluvial lands ³	1300	2000
Limit for poultry and pasture ³	3000	4600
Limit for dairy cattle ³	4000	6100
Sea water	32500	50000
Aquifer Groundwater Quality		
Bayswater seam	5898	8670
Lemington seams	6217	7130
Pikes Gully seams	5282	9140
Liddell seams	7128	7770

1 – Equivalent EC is approximate and depends on specific ions,

2 – *Australian Drinking Water Guidelines 2011*,

3 – *ANZECC Guidelines 2000*

6.2.2 Potential Impacts

As discussed in Section 6.1.2, there are potential water pollution impacts for the Project associated with leachate produced by composting operations. There is the potential for leachate to discharge through to groundwater aquifers located beneath the Project site.

Potential impacts to groundwater would be minimised through the design of the facility to ensure leachate is collected and stored appropriately. As outlined in Section 6.1.3, the composting processing area would have a low permeability base and run-off from the windrows would be diverted by bunding to a lined leachate pond. Windrows would be shaped to maximise run-off and reduce infiltration. These design measures including the other surface water mitigation measures outlined in Section 6.1.3 would prevent leachate from discharging into groundwater aquifers.

In the event that surface water is not managed appropriately and leachate is discharged to groundwater aquifers, potential impacts would be minor considering the existing condition of groundwater at the Project site and surrounds. As shown in Table 6, groundwater is considered to have no beneficial use at the Project site.

Groundwater vulnerability maps have been prepared by the NSW Department of Primary Industries (DPI) for some catchments in NSW. The DPI website was reviewed and a groundwater vulnerability map has not been prepared for the Project site. Given that the Project site and surrounding areas have historically been used for open cut and underground mining, the groundwater in the area surrounding the Project Site is not considered to be vulnerable and therefore a groundwater and subsoil monitoring network is not required.

6.2.3 Mitigation Measures

The implementation of the surface water mitigation measures outlined in Section 6.1.3, the Surface and Groundwater Management Plan and Section 7.0 would ensure that surface water would be effectively contained in the leachate dams at the Project site. Effective management of surface water for the operation of the Project would result in minimal discharge to groundwater systems and therefore minimal impact to groundwater quality.

6.3 Air Quality

A qualitative air quality assessment was undertaken for the operation of the Project to identify potential impacts from dust and odour generation and to recommend mitigation measures to manage identified impacts.

6.3.1 Existing Environment

The nearest sensitive receiver to the Project site is located in the village of Camberwell, approximately 7.6 kilometres to the southeast.

Meteorology

Meteorology plays a vital role in the transport and dispersion of pollution from all emitters of both anthropogenic and natural sources of air pollution including odour and dust. Relevant publicly available meteorological data has been used in the qualitative assessment of the potential odour and dust impacts from the Project.

Meteorological data has been sourced from BoM website from the Jerry's Plains Station (No 0601270). A summary of the data for this monitoring location is provided in Table 7 and annual 9am and 3pm wind roses are provided in Figure 5.

Table 7 Meteorological data for the Project site

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Averaging period
Monthly mean														
Maximum temperature (°C)	31.8	30.9	28.9	25.3	21.3	18.0	17.4	19.4	22.9	26.3	29.1	31.2	25.2	1907 - 2014
Minimum temperature (°C)	17.2	17.1	15.0	11.0	7.4	5.3	3.8	4.4	7.0	10.3	13.2	15.7	10.6	1907 - 2014
Rainfall (mm)	77.1	73.1	59.7	44.0	40.7	48.1	43.4	36.1	41.7	51.9	61.9	67.5	645	1884 - 2014
Monthly mean 9am conditions														
Temperature (°C)	23.4	22.7	21.2	18.0	13.6	10.6	9.4	11.4	15.3	19.0	21.1	23.0	17.4	1940 - 2010
Relative humidity (%)	67	72	72	72	77	80	78	71	65	59	60	61	70	1940 - 2010
Wind speed (km/h)	9.6	9.0	8.8	8.6	9.0	9.4	10.6	11.0	11.7	10.9	10.5	9.9	9.9	1957 - 2010
Calms (%)	8	10	11	10	12	10	8	7	6	5	7	8	8	1957 - 2010
Monthly mean 3pm conditions														
Temperature (°C)	29.8	28.9	27.2	24.1	20.1	17.1	16.4	18.2	21.2	24.2	26.9	29.0	23.6	1940 - 2010
Relative humidity (%)	47	50	49	49	52	54	51	45	43	42	42	42	47	1940 - 2010
Wind speed (km/h)	13.2	13.0	12.4	11.3	11.0	11.5	13.0	14.3	14.7	14.1	14.2	14.2	13.1	1957 - 2010
Calms (%)	4	4	5	6	8	7	6	6	6	5	5	4	5	1957 - 2010

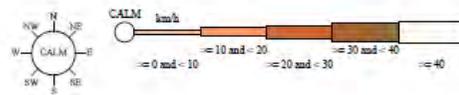
Rose of Wind direction versus Wind speed in km/h (01 Jan 1957 to 30 Sep 2010)

Custom times selected, refer to attached note for details

JERRYS PLAINS POST OFFICE

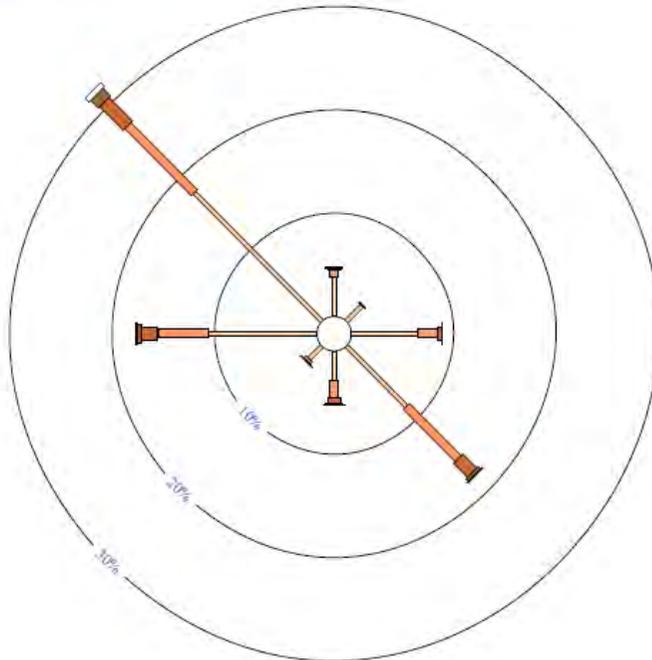
Site No: 061086 • Opened Jan 1884 • Still Open • Latitude: -32.4963° • Longitude: 150.9106° • Elevation 87m

An asterisk (*) indicates that calm is less than 0.5%.
Other important info about this analysis is available in the accompanying notes.



9 am
19165 Total Observations

Calm 8%



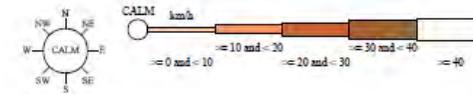
Rose of Wind direction versus Wind speed in km/h (01 Jan 1957 to 30 Sep 2010)

Custom times selected, refer to attached note for details

JERRYS PLAINS POST OFFICE

Site No: 061086 • Opened Jan 1884 • Still Open • Latitude: -32.4963° • Longitude: 150.9106° • Elevation 87m

An asterisk (*) indicates that calm is less than 0.5%.
Other important info about this analysis is available in the accompanying notes.



3 pm
19076 Total Observations

Calm 5%

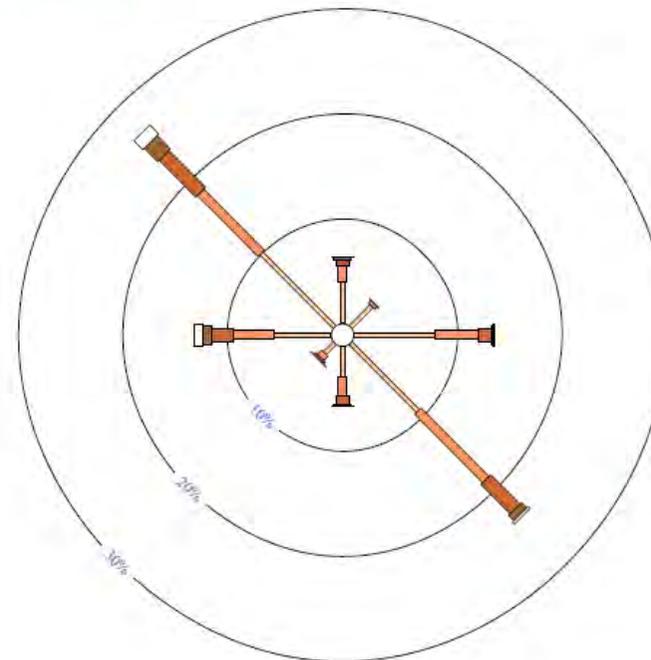


Figure 5 Annual 9am and 3pm wind roses for the Jerrys Plains BoM site

The meteorological data displays the following trends:

- January has the highest average maximum and minimum temperatures whilst July has the lowest;
- 3pm temperatures are higher than 9am temperatures for all months;
- Annual average rainfall is relatively low (645 mm) with January the wettest month and August the driest;
- Calm conditions at 9 am vary from a low of 5% in October to a high of 12% in May with the months of February to June inclusive at or above 10%;
- Calm conditions at 3pm are relatively constant throughout the year at an average of 5%;
- Relative humidity is consistently higher at 9am (70% annual average) than 3pm (47% annual average) for all months;
- Wind direction is similar at both 9am and 3pm, being predominantly along the northwest / southeast axis; and
- Winds tend to be stronger at 3pm (13.1 km/h annual average) than at 9am (9.9 km/h annual average) with the months of July to November inclusive having higher than average wind speeds.

Meteorological data indicates a higher potential for dust impacts during periods of strong dry winds, for example July to September. Meteorological data indicates that there is a higher potential for odour impacts during the morning of months of still, cool, dry conditions, for example April and May.

Topography

The general topography of the local area has been impacted through long term open cut mining and can best be described as slightly undulating with a gentle north west to south east directional drop in elevation. This is the general direction of natural flow from the Project site to the nearest sensitive receiver.

Ambient Dust Levels

The Glencore operation at the neighbouring Ravensworth Mining Complex maintains ambient dust monitoring programs in accordance with the mine's Environment Protection Licence, with monitoring results provided on the company's website on an ongoing monthly basis.

A number of the Ravensworth ambient dust monitoring sites are located to the south of the proposed facility and provide a measure of existing ambient dust levels in the local area. Relevant monitoring locations include dust deposition monitoring sites D9, D12 and D13 and total suspended particulate monitoring sites HV2, HV4 and HV5. The locations of these sites are provided in Figure 6.

Highest and lowest monthly rolling annual average deposited dust and total suspended particulate results for these locations for the period April 2015 to March 2016, are presented in Table 8 and Table 9 respectively below.

Table 8 April 2015 to March 2016 annual rolling average ambient deposited dust monitoring results in the vicinity of the Project

Pollutant	Unit	Averaging ¹ Period	Assessment ¹ Criterion		Site D9	Site D12	Site D13
Deposited dust	g.m ² /month	Annual	4	highest	2.8	2.7	3.0
				lowest	2.2	2.0	2.4

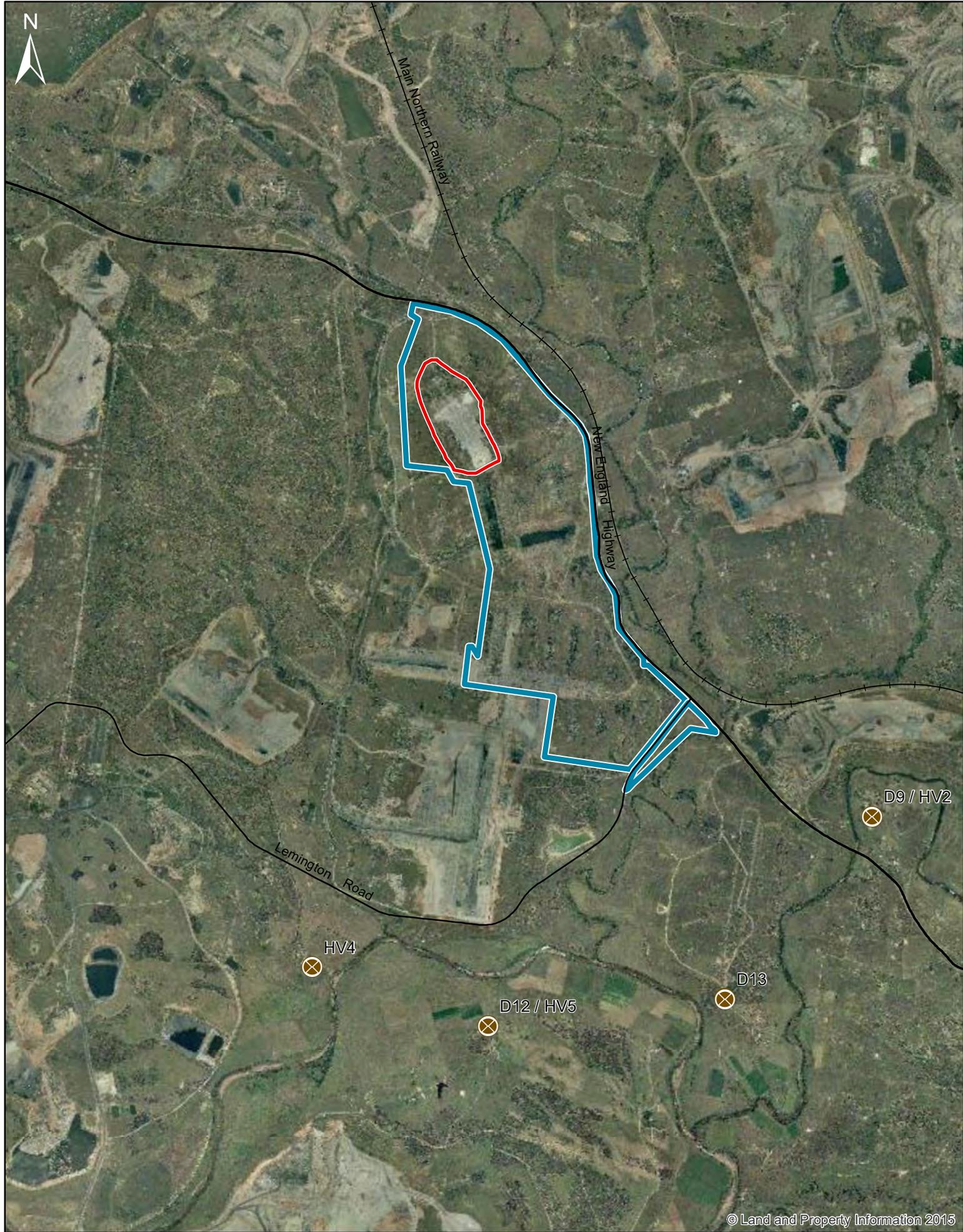
¹ Office of Environment and Heritage, 2005 *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*

Table 9 April 2015 to March 2016 annual rolling average ambient total suspended particulate monitoring results in the vicinity of the Project

Pollutant	Unit	Averaging ¹ Period	Assessment ¹ Criterion		Site HV2	Site HV4	Site HV5
Total Suspended Particulates	µg/m ³	Annual	90	highest	68	73	65
				lowest	54	58	52

¹ Office of Environment and Heritage, 2005 *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*

The data provided suggest that existing ambient dust levels are below regulatory assessment criteria for all relevant monitoring locations.



- Project site
- AGL Land
- X Dust Monitoring Site

Ambient Dust Monitoring Sites
 Composting Facility, Ravensworth No 2 Mine
 Statement of Environmental Effects

6/05/2016
 60493953

Fig. **6**



6.3.2 Potential Impacts

Potential Odour Impacts

The operation of Project would involve the composting of organic material which would comprise generally of garden organics, clean timber, biosolids, hydro excavation and drill slurry, paper pulp, fly ash, lime and manures. There are potential odour impacts associated with the storage and processing of such materials.

Relevant composting guidelines have been reviewed in order to identify buffer distance requirements for potential odour impacts to sensitive receivers for composting activities. As the NSW EPA does not provide buffer distance guidelines with regard to odour from composting works, reference has been made to relevant guidelines from other Australian states for comparison purposes. A summary of the listed buffer guidelines for composting works published by the Western Australia (WA EPA), South Australia (SA EPA), and Australian Capital Territory (ACT EPA) is provided in Table 10 below.

Table 10 Relevant regulatory guideline buffer distances for composting works

Authority	Activity description	Compost material	Buffer distance (metres)
WA EPA	Outdoor uncovered, regularly turned windrows	Manures, mixed food/putrescible & vegetative food waste	1000
		Biosolids	500
		Green waste	150
SA EPA	>200 tonnes per year	Not specified	1000
ACT EPA	>200 tonnes per year	Not specified	1000

The Project site is located approximately 7.6 kilometres from the nearest sensitive receiver and therefore complies with the Western Australian, South Australian and ACT buffer guideline values. Given that the proposed facility meets these guidelines and given the odour mitigation management measures detailed in Section 6.3.3, the proposed buffer distance is likely to be sufficient for minimising odour impacts.

Potential Dust Impacts

The following activities and onsite equipment and facilities have the potential to generate dust during the operation of the Project:

- Materials handling;
- A windrow turner;
- A front end loader and tractor;
- Up to eight truck movements per day along an all-weather road to and from the receiving area; and
- A gravel vehicle turnaround bay at the receival area.

Calm morning periods and strong winds during low rainfall periods may increase the potential for the creation of offsite odour and dust issues respectively. Potential dust impacts would be managed by the mitigation measures detailed in Section 6.3.3. Existing dust monitoring data indicates that ambient dust levels at the Project site are below regulatory assessment criteria. With the implementation of mitigation measures, it is unlikely that the Project would result in cumulative dust impacts to nearby receivers.

6.3.3 Mitigation Measures

The following mitigation measures have been developed to minimise or negate the onsite generation of odour and dust during calm morning periods and strong winds during low rainfall periods and other circumstances where odour or dust has the potential to be generated by the operation of the Project.

Odour Management

The following mitigation measures would be implemented to mitigate potential odour impacts for the operation of the Project:

- Use a windrow heap structure;
- Begin the composting process with a carbon to nitrogen ratio of 25 – 30:1;
- Maintain aerobic microbial activity during the composting process;
- Maintain oxygen supply in the windrows;
- Prevent anaerobic conditions which lead to ammonia and hydrogen sulphide release;
- Monitor the leachate dam for anaerobic conditions regularly;
- Monitoring of runoff from windrows regularly ;
- Maintain correct pH range (i.e. 6.5-8.5 pH units) in the leachate dam to eliminate ammonia and sulphide releases;
- Chemical treatment of the leachate dam if required;
- Direct waste materials to compost windrows when delivered and turning the ingredients;
- Cover odorous loads with previously composted material, fly ash or dried biosolids to act as an odour filter until the load is appropriate for treatment; and
- Use odour neutralising agents such as BioActive.

Dust Management

The following mitigation measures would be implemented to mitigate potential dust impacts for the operation of the Project:

- Restriction of traffic to designated internal roadways;
- Restriction of onsite traffic speeds to minimise wheel dust generation;
- Regular wetting of hardstand pads and internal roadways ;
- Wetting dry solid waste using sprinklers or handheld hoses during unloading;
- Ensuring daily evaporation is taken into account when applying water as a dust suppressant;
- Moisture control of compost and biosolids windrows when being turned;
- Moisture control of compost to be screened; and
- Ceasing of screening, turning or mixing activities when wind speeds are excessive.

6.4 Bush Fire

The Project site is located on land that is classified as bush fire prone land on Singleton Council's Bushfire Prone Land Map. *Planning for Bush Fire Protection* (RFS, 2006) (hereafter referred to as PBP) is the key document used to assess proposals on bush fire prone land. The Project must therefore satisfy the aims and objectives of the PBP and incorporate bush fire protection measures where relevant.

6.4.1 Existing Environment

As noted in Section 2.1, the Project site is located at the Ravensworth No 2 Mine on part of a capped open cut mining void and is cleared of vegetation. There are scattered areas of shrubs and isolated trees south-west and south of the Project site, more than 50m from the perimeter access road. There are no large areas of bushland within the vicinity of the site. The Project site is located at the top of a ridge and drains towards the east and the south.

6.4.2 Compliance with Aims and Objectives of *Planning for Bush Fire Protection*

The aims and objectives of PBP are set out in Section 1.1 of that document. The Project meets the description of "other development" (for example, commercial, industrial, or other subdivisions) as detailed in Section 4.3.6 of PBP and the Project must therefore demonstrate compliance with the aims and objectives of PBP (refer Table 11).

Table 11 Aims and objectives of PBP

Aim / Objectives of PBP	Relevance to the Project and assessment of compliance
Aim of PBP	
To use the NSW development assessment system to provide for the protection of human life (including firefighters) and to minimise impacts on property from the threat of bush fire, while having due regard to development potential, on-site amenity and protection of the environment.	The Project site is cleared of vegetation and there are no large areas of bushland in the near vicinity. Impacts on property from the threat of bushfire would be minimal. A water tank would be located on site and water could also be pumped from the leachate dam in the event of a bushfire. The access road to the Project site would be upgrade as part of the Project and would be suitable for emergency service vehicles.
Objectives of PBP	
(i) afford occupants of any building adequate protection from exposure to a bush fire	No buildings are proposed as part of the Project, and the Project site is cleared of vegetation.
(ii) provide for a defensible space to be located around buildings	No buildings are proposed as part of the Project, and the Project site is cleared of vegetation.
(iii) provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition	No buildings are proposed as part of the Project, and the Project site is cleared of vegetation.
(iv) ensure that safe operational access and egress for emergency service personnel and residents is available	The Project includes an access road which would be widened to accommodate incoming vehicles and trucks. This access road would be suitable for use by emergency service personnel.
(v) provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the asset protection zone (APZ)	Bush fire protection measures to be incorporated into the Project are outlined in Section 6.4.3.
(vi) ensure that utility services are adequate to meet the needs of firefighters (and others assisting in the bush fire fighting)	A water tank would be located on site and water could also be pumped from the leachate dam in the event of a bushfire. The access road to the Project site would be upgrade as part of the Project and would be suitable for emergency service vehicles.

6.4.3 Mitigation Measures

Chapter 3 of PBP outlines six key bush fire protection measures, which relate to APZ, construction standards, appropriate access, water supply, emergency management and landscaping. The Project site is cleared of vegetation and no new buildings are proposed as part of the Project. Measures relevant to the Project site therefore focus on provision of appropriate access for emergency services, adequate water supply, and emergency management procedures. These measures are detailed in Table 12.

Section 4.3 of PBP includes discussion of specific planning controls for infill development and 'other developments' on bush fire prone land. This includes performance criteria and acceptable solutions for relevant bush fire protection measures. It is noted that the specifications and requirements only apply to infill developments and not 'other developments'. However the specifications and requirements can be used to guide the development of bush fire protection measures for 'other development'. Table 12 includes discussion of the performance criteria for specific bush fire protection measures, where relevant,

Table 12 Bush Fire Protection Measures required for the Project

Bush Fire Protection Measure	Performance Criteria	Relevance to the Project
Appropriate access standards for residents, fire fighters, emergency service workers and those involve in evacuation	Safe, operational access is provided (and maintained) for emergency services personnel in suppressing a bush fire while residents are seeking to relocate, in advance of a bush fire.	The perimeter access road would be upgraded and would be provide suitable access for emergency vehicles, including the road surface and width.

Bush Fire Protection Measure	Performance Criteria	Relevance to the Project
Adequate water supply and pressure	Adequate water services are provided for firefighting operations.	A water tank would be located on site and water would also be available to be pumped from the leachate dam for firefighting operations.
Emergency management arrangements for fire protection and / or evacuation	No performance criteria specified.	Emergency management procedures would be set out in the Environmental Management Plan to be prepared for the Project.

7.0 Mitigation Measures

7.1 Summary of Mitigation Measures

The following control measures have either been identified through the assessment undertaken through this SEE or are standard best practice environmental management controls. They will be incorporated into the detailed design phase of the Project and during construction and operation of the Project. These control measures would minimise potential adverse environmental impacts arising from the Project. The controls measures are summarised in Table 13.

Table 13 Summary of Mitigation Measures

Aspect	Potential Impact	Control Measures
Landforms, geology and soils	Construction Soil erosion / stability	An Erosion and Sediment Control Plan (ESCP) would be developed for construction works and implemented and approved by AGL Macquarie environmental staff prior to initiation of construction works.
Groundwater	Operation Groundwater pollution	Implementation of the surface water mitigation measures outlined below.
Surface Water	Construction Pollution Sedimentation Oil spills	Limit fuels and chemicals stored onsite to a minimum. All required chemicals and fuels must be located within a bunded enclosure located away from drainage lines and stormwater drains.
		Plant and equipment must be regularly inspected to check for oil leaks.
		Refuelling of vehicles or machinery is to occur within a containment or hardstand area designed to prevent the escape of spilled substances to the surrounding environment.
		Wash down areas must be appropriately constructed, and the collected material disposed of off-site to a licensed facility.
	Operation Pollution from leachate	Maintain all water related infrastructure designed to maximise runoff and reduce infiltration including: <ul style="list-style-type: none"> - Low permeability base in the composting processing areas - Lining of the leachate dams - Bunding and arrangement of windrows - Perimeter bunding and diversion drains.
		Undertake the aeration of leachate in the leachate dams if required following other control measures being implemented.
		Reuse runoff and leachate collected in the leachate dams during composting activities.
Air quality	Construction Dust Odour and fumes	Emission of dust from unsealed roads and other exposed surfaces such as unprotected earth or soil stockpiles must be controlled by use of surface sealants and/or water spray carts or other appropriate cover material.
		Stockpiles must be appropriately maintained and contained which could include covering with finished compost or regular watering to minimise dust.
		Work must be minimised and/or modified during high wind periods.
		Plant and equipment must be operated in a proper and efficient manner and be switched off when not in use.
		Plant and equipment must be maintained in accordance with manufacturer's specifications to ensure that it is in a proper and efficient condition.
		Plant and equipment must be regularly inspected to ascertain that fitted emission controls are operating efficiently.
	Operation	Use a windrow heap structure.
		Begin the composting process with a carbon to nitrogen ratio of 25 – 30:1.

Aspect	Potential Impact	Control Measures
	Odour	Maintain aerobic microbial activity during the composting process.
		Maintain oxygen supply in the windrows.
		Prevent anaerobic conditions which lead to ammonia and hydrogen sulphide release.
		Monitor the leachate dam for anaerobic conditions regularly.
		Monitoring of runoff from windrows regularly.
		Maintain a correct pH in the leachate pond (ideally between 6.5 and 8.5 pH units).
		Chemical treatment of the leachate pond if required.
		Direct waste materials to compost windrows when delivered and turn the ingredients.
		Cover odorous loads with previously composted material, fly ash or dried biosolids to act as an odour filter until the load is appropriate for treatment.
		Use odour neutralising agents such as BioActive in high odour situations.
	Operation Dust	Restriction of traffic to designated internal roadways.
		Restriction of onsite traffic speeds to minimise wheel dust generation.
		Regular wetting of hardstand pads and internal roadways.
		Wetting dry solid waste using sprinklers or handheld hoses during unloading.
		Ensuring daily evaporation is taken into account when applying water as a dust suppressant.
		Moisture control of compost and biosolids windrows when being turned.
		Moisture control of compost to be screened.
Ceasing of screening, turning or mixing activities when wind speeds are excessive.		
Bush Fire	Operation Access	The perimeter access road would be upgraded and would be provide suitable access for emergency vehicles, including the road surface and width.
	Operation Water supply	A water tank would be located on site and water would also be available to be pumped from the leachate dam for firefighting operations.
	Operation Emergency management	Emergency management procedures would be set out in the Environmental Management Plan to be prepared for the Project.
Biodiversity	Construction Native Vegetation	Should any noxious weeds be encountered, appropriate management and disposal of these weeds must be carried out.
	Threatened Species	Construction works must be stopped if any previously undiscovered threatened species or communities are discovered during works. An assessment of the impact and any required approvals must be obtained.
Noise and vibration	Construction Noise vibration	Construction activities must be conducted during standard construction hours, i.e. Monday to Friday 7am to 6pm; Saturday 8am to 1pm; and no work on Sundays or public holidays.
Heritage	Construction Aboriginal Heritage Non aboriginal Heritage	Should an unexpected historic relic or Aboriginal object be identified during construction, work in the immediate vicinity of the find is to stop and the area must be fenced off with suitable markers (star pickets, flagging or barrier mesh). The Project Manager is to be notified. Engage an archaeologist to determine the significance of the find, and if required, determine the notification, consultation, and approval requirements.

Aspect	Potential Impact	Control Measures
Waste management	Construction Spoil Litter Chemicals Solid waste	Resource management options for the Project must be considered against a hierarchy of the following order embodied in the Waste Avoidance and Resource Recovery Act 2001. <ul style="list-style-type: none"> Avoid unnecessary resource consumption. Recover resources (including reuse, reprocessing, recycling and energy recovery). Dispose (as a last resort).
		All wastes must be classified in accordance with the Waste Classification Guidelines (EPA, 2014) prior to disposal and transported to a licensed waste disposal facility if required.
		Excavated material must be temporarily stored in a bunded area or with appropriate environmental controls in place to prevent run-off of contaminants entering the stormwater system.
		Any spoil or waste material tracked onto paved areas such as roads and car parks must be immediately swept up. No water is to be used to wash any such material tracked onto roads into stormwater drains.
		All waste must be removed from the site on completion of the construction works.
Contaminated land and hazardous materials	Construction Soil contamination Hazardous spills	Fuels, lubricants and chemicals must be stored and, where practicable, used within containment/hardstand areas designed to prevent the escape of spill substances to the surrounding environment, as required by relevant legislation and standards (e.g. AS1940: Australian standard for the storage and handling of flammable and combustible liquids).
		Adequate spill prevention and containment measures (e.g. drip trays) must be used when refuelling equipment on site.
		Construction personnel are to be trained in spill containment and response procedures.
		Appropriate spill response material to be kept on site.
		If a spill occurs, the material is to be contained to the smallest area possible.
		All spills that cause or may cause material harm to the environment are to be reported to the EPA.
Visual aesthetics and urban design	Construction Visual Views and vistas	A high level of housekeeping must be maintained by ensuring that the work site is kept in a clean and tidy condition.
		Waste materials must be removed from site regularly.
Transport	Construction & Operation Traffic and access Transport	Restriction of traffic to designated internal roadways.
		Restriction of onsite traffic speeds to minimise wheel dust generation.

7.2 Implementation Process

The environmental management measures contained in this SEE would be implemented to ensure that the environment is adequately protected and that adverse impacts are avoided or otherwise substantially ameliorated.

A site-specific Environmental Management Plan (EMP) would be prepared for the construction of the Project incorporating environmental mitigation measures for the Project including an ESCP. A copy of this SEE and the EMP is to be retained on site and produced upon request.

Furthermore, measures to mitigate potential environmental impacts during the operational phase of the activity would also be incorporated into separate operational and environmental management plans.

The environmental management plans for the construction and operation of the Project would include the following:

- identification of the environmental issues and risks of the project;

- details of environmental controls to be implemented including location and timing;
- details of statutory requirements including those of any approvals and licences;
- assignment of responsibility for implementation and monitoring of environmental controls;
- reporting, incident notification and emergency procedures;
- contact details for all site personnel and agency contacts; and
- corrective action requirements and their verification.

8.0 Heads of Consideration

In determining the development application for a development, Council is required to consider the matters listed under section 79C of the EP&A Act. A summary of considerations under section 79C is provided in the Table 14. Based on these considerations, the Project is considered appropriate for approval.

Table 14 Considerations under Section 79C of EP&A Act

Head of Consideration	Consideration
The provision of any environmental planning instrument and any proposed instrument that is or has been the subject of public consultation.	Consideration of the provisions of relevant environmental planning instruments is provided in Section 4.0. The Project is consistent with the provisions of these instruments.
The provisions of any development control plan.	DCP 2014 is discussed in Section 4.1.6. The Project is consistent with the relevant provisions of DCP 2014.
The provisions of any planning agreement or draft planning agreement under section 93F.	No planning agreement or draft planning agreement is proposed under section 93F of the <i>Environmental Planning and Assessment Act 1979</i> .
The provisions of the <i>Environmental Planning and Assessment Regulation 2000</i> with respect to prescribed matters.	Clause 92 of the EP&A Regulation prescribes that a consent authority must consider: <ul style="list-style-type: none"> - <i>The application of the Coastal Policy for developments within the coastal zone:</i> The Project site is not located in the coastal zone. - <i>The provisions of AS2601 for developments involving demolition of a building:</i> The proposed development does not involve demolition works; and - <i>The provisions of subdivision orders made under Schedule 5 of the EP&A Act:</i> The proposed development is not subject to such a subdivision order.
The provisions of any coastal zone management plan	The Project is not located in the coastal zone.
The likely impacts of the development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality.	Section 6.0 details the potential environmental impacts of the Project and Section 7.0 mitigation measures proposed to minimise any impacts. The environmental impacts of the proposed development are considered acceptable and are able to be mitigated and managed within acceptable environmental and amenity limits.
The suitability of the site for the development.	The Project site is currently zoned RU1 – Primary Production. The Project would be compatible with the objectives of this land use zone. The Project would contribute to the ongoing rehabilitation of Ravensworth No 2.
Any submissions made in accordance with the EP&A Act.	If the development application is publically displayed and Council receives submissions, Bettergrow / AGL will respond to any particular issues raised.
The public interest.	The Project would contribute to the ongoing rehabilitation of Ravensworth No 2 and provide employment for 4-6 staff involved in composting operations.

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9.0 Conclusion

AGL is currently rehabilitating Voids 1 to 5 at Ravensworth No 2 and Ravensworth South Mines using the disposal of fly ash from the Bayswater power station. More than 700 hectares of AGL Macquarie land requires rehabilitation and additional areas may become available in the future as mine voids are filled with fly ash.

Bettergrow are seeking development consent for onsite composting as part of its ongoing commitment to AGL to provide growing media and rehabilitation materials suitable for use by AGL in their rehabilitation activities (the Project). Bettergrow would provide the biologically active organic material required to be added to the topsoil at the Project site in order to facilitate successful and healthy rehabilitation at the Ravensworth No 2 Mine. Organic material would be used to rehabilitate disturbed areas and improve the soil in existing rehabilitated areas.

This SEE has assessed the potential environmental impacts of the Project, including a detailed assessment of potential impacts to surface water, groundwater and air quality. It is considered that given the Project design and construction and operational mitigation measures to be implemented, the Project would result in only minor potential environmental impacts.

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Appendix A

Indicative Site Layout

Appendix A Indicative Site Layout

Figure A1: Indicative Site Layout 1

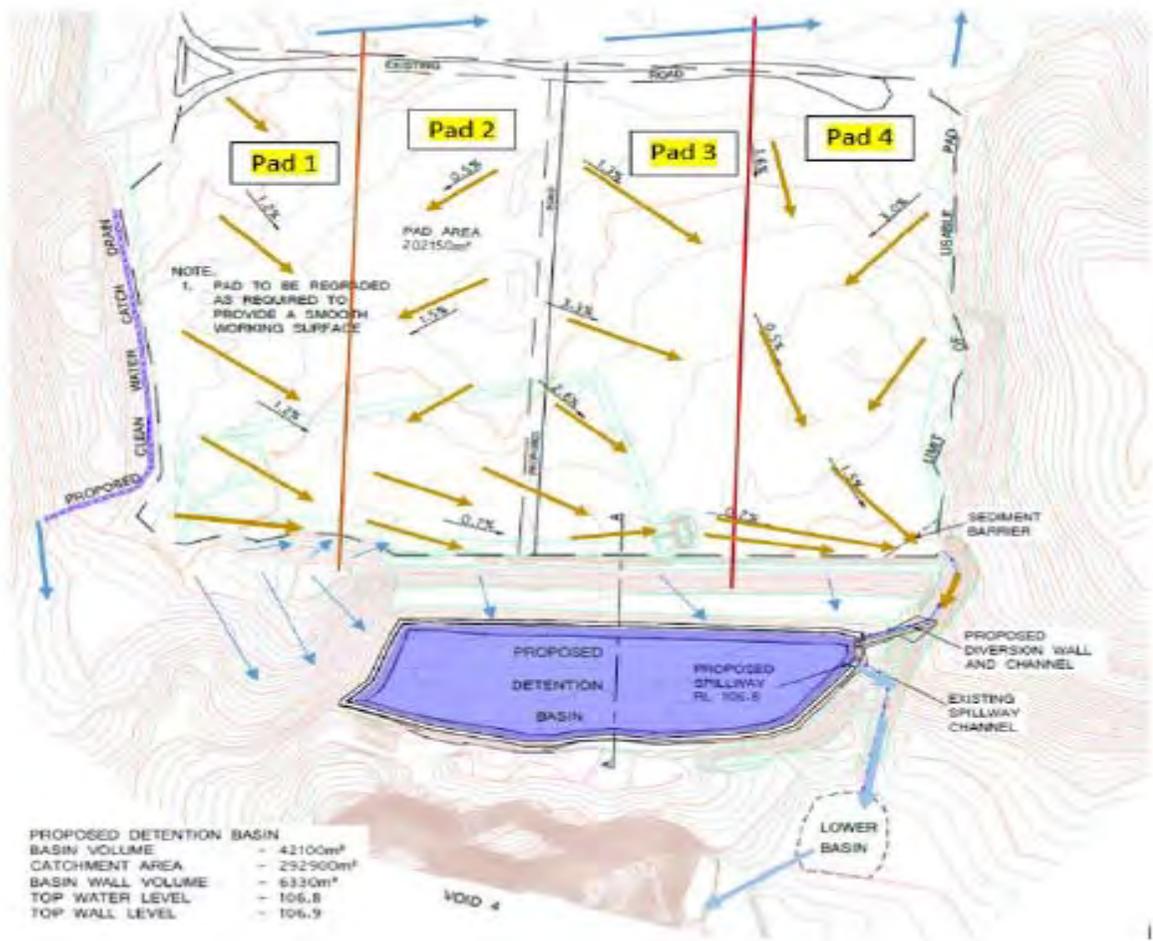
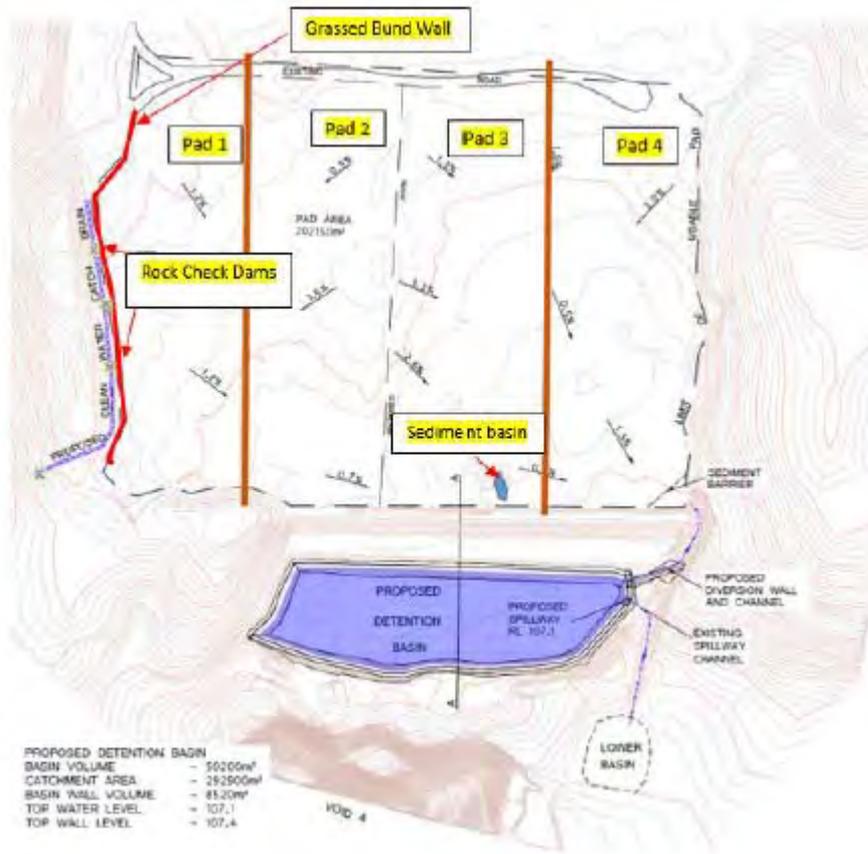


Figure A1: Indicative Site Layout 2



Appendix B

Protected Matters Search

Appendix B Protected Matters Search



EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 02/05/16 13:06:44

[Summary](#)

[Details](#)

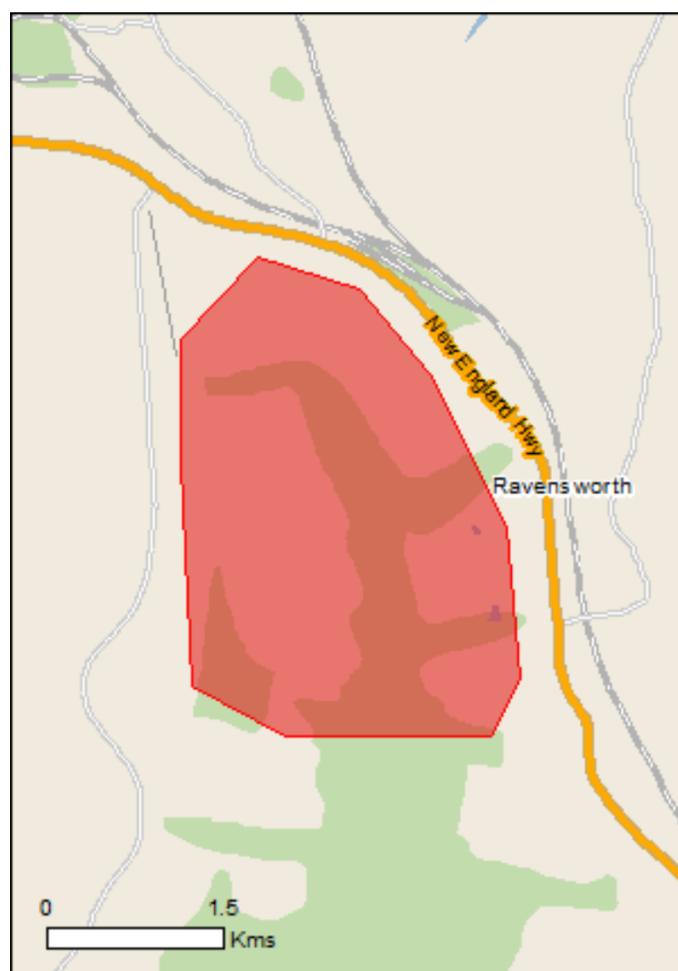
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

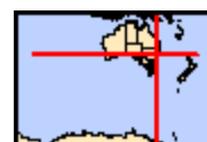
[Acknowledgements](#)



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

[Coordinates](#)

Buffer: 0.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	17
Listed Migratory Species:	11

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	14
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	None
Regional Forest Agreements:	1
Invasive Species:	29
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)	[Resource Information]
Name Hunter estuary wetlands	Proximity 50 - 100km upstream

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Central Hunter Valley eucalypt forest and woodland	Critically Endangered	Community likely to occur within area
Hunter Valley Weeping Myall (Acacia pendula) Woodland	Critically Endangered	Community may occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
------	--------	------------------

Birds

Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area

Frogs

Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat likely to occur within area
Litoria booroolongensis Booroolong Frog [1844]	Endangered	Species or species habitat may occur within area

Mammals

Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll	Endangered	Species or species

Name	Status	Type of Presence
(southeastern mainland population) [75184]		habitat likely to occur within area
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Plants

Euphrasia arguta [4325]	Critically Endangered	Species or species habitat may occur within area
Pterostylis gibbosa Illawarra Greenhood, Rufa Greenhood, Pouched Greenhood [4562]	Endangered	Species or species habitat may occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area

Listed Migratory Species

[[Resource Information](#)]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat likely to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area

Migratory Wetlands Species

Ardea alba Great Egret, White Egret [59541]		Species or species
--	--	--------------------

Name	Threatened	Type of Presence
Ardea ibis Cattle Egret [59542]		habitat likely to occur within area Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [\[Resource Information \]](#)

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat likely to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

Extra Information

Regional Forest Agreements [\[Resource Information \]](#)

Note that all areas with completed RFAs have been included.

Name	State
North East NSW RFA	New South Wales

Invasive Species [\[Resource Information \]](#)

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name	Status	Type of Presence
Birds		
Alauda arvensis Skylark [656]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Dolichandra unguis-cati Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-32.417589 151.032029,-32.41969 151.039926,-32.425051 151.045247,-32.434759 151.051084,-32.44461 151.052114,-32.44816 151.049796,-32.448232 151.034175,-32.444973 151.027137,-32.430775 151.026193,-32.422878 151.026193,-32.417589 151.032029,-32.417589 151.032029

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Parks and Wildlife Commission NT, Northern Territory Government](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Atherton and Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

Appendix C

Consultation with Singleton Council

Appendix C Consultation with Singleton Council

Brett Hayward

From: Carroll, Philip <pcarroll@singleton.nsw.gov.au>
Sent: Wednesday, 13 January 2016 2:47 PM
To: Brett Hayward; Matthew Parkinson
Cc: Wells, Julie
Subject: RE: AGL Macquarie meeting regarding proposed composting facility

Hi Brett and Matt

Apologies for the delay in responding.

I have considered the information provided and I am comfortable that cl37A of Schedule 3 of the EP&A Regs provides an avenue to seek approval for the proposed development without the need for an EIS on the basis that the composting facility is ancillary to the mine rehabilitation works.

I trust this satisfies your inquiry.

Should you wish to discuss the project further please do not hesitate to contact me.

Regards – Phil

Philip Carroll
Manager Development & Regulatory Services

From: Brett Hayward [mailto:BHayward@agl.com.au]
Sent: Monday, 21 December 2015 10:00 AM
To: Carroll, Philip
Cc: Matthew Parkinson
Subject: AGL Macquarie meeting regarding proposed composting facility

Hi Phil,

As per our discussions, and apologies for the late response we moved recently moved offices and I have been on leave moving house.

Below are my details if you need any additional information.

I look forward to Council's feedback on the project information summary that was presented during our meeting.

Regards,

Brett Hayward
Environment Project Manager
Group Operations

M: 0477 360 288
T: (02) 4968 7814
E: bhayward@agl.com.au



This email is intended solely for the use of the addressee
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Appendix D

AHIMS Search

Appendix D AHIMS Searching Management Plan

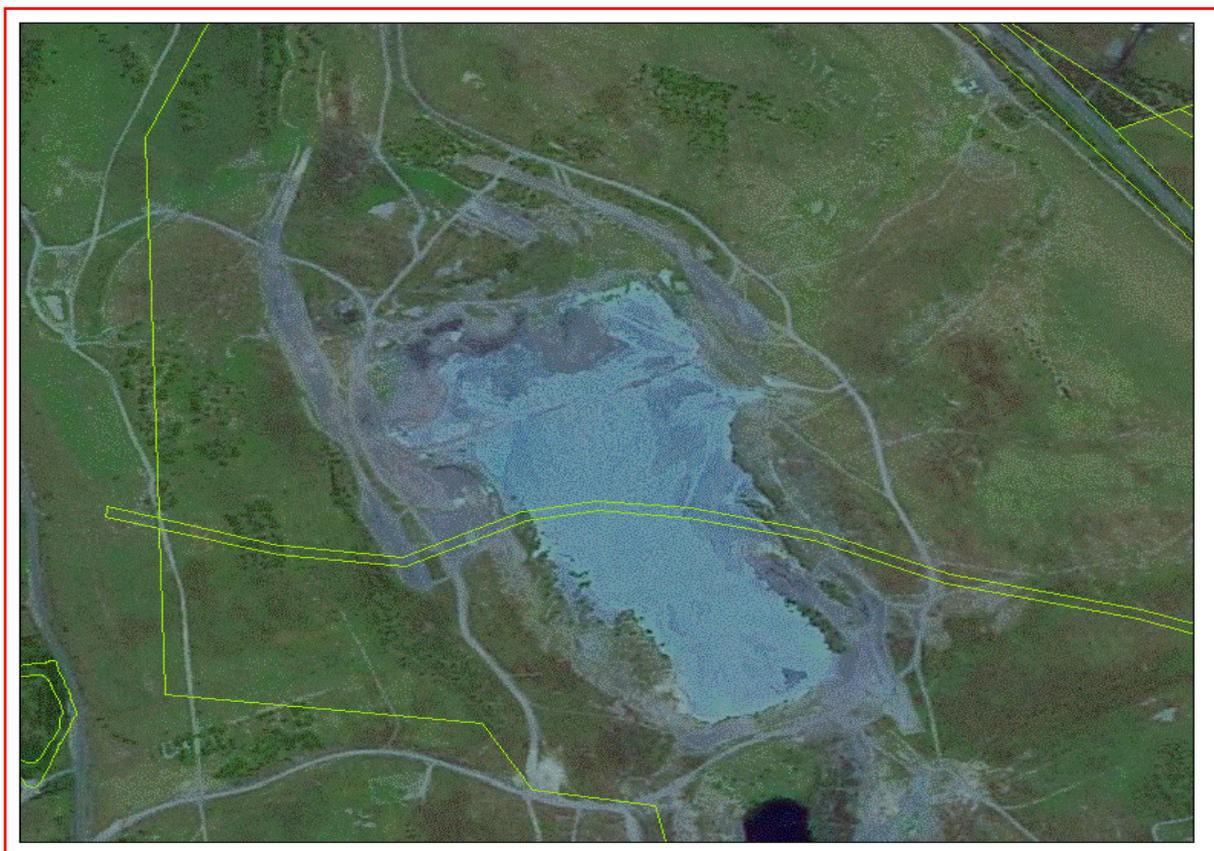
Jack Turner
17 Warabrook Boulevard
Warabrook New South Wales 2304
Attention: Jack Turner
Email: jack.turner@aecom.com

Date: 02 May 2016

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -32.434, 151.0294 - Lat, Long To : -32.4227, 151.0473 with a Buffer of 50 meters, conducted by Jack Turner on 02 May 2016.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

1	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the [NSW Government Gazette \(http://www.nsw.gov.au/gazette\)](http://www.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not to be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

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Ravensworth Composting Facility, Ravensworth

AGL Macquarie Pty Limited on behalf of Bettergrow Pty Ltd

Statement of Environmental Effects

Section 96(2) Modification to DA140/2016

IA172600_01 | Final

6 February 2018



Statement of Environmental Effects Section 96(2) to DA140/2016 – Ravensworth Composting Facility

Project No: IA172600
Document Title: Statement of Environmental Effects
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Project Manager: Thomas Muddle
Author: Brent Devine
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Document history and status

Revision	Date	Description	By	Review	Approved
0	21/12/2017	Draft SoEE to support a s96 modification application	Brent Devine Thomas Muddle	Kim Collings	22/12/2017
1	6/2/2018	Final SoEE to support a s96 modification application	Brent Devine Thomas Muddle	Kim Collings	6/2/2018

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1. Introduction

1.1 Introduction

AGL Macquarie Pty Ltd (AGL) currently host the Ravensworth Composting Facility, a composting operation undertaken by Bettergrow Pty Ltd (Bettergrow) under Development Approval DA140/2016. The composting facility is located on the filled and capped Void 3 of the former Ravensworth No. 2 mine (the site). This Statement of Environmental Effects (SoEE) has been prepared by Jacobs Group (Australia) Pty Limited on behalf of Bettergrow to support a request to Singleton Council (Council) to modify the conditions of consent for development application No. DA140/2016. Development consent for DA140/2016 allows up to 50,000 tonnes of organic waste material to be supplied to the compost facility per year. This modification application seeks approval to increase the amount of organic material supplied to the site by a further 26,000 tonnes per year to 76,000 tonnes per annum and transfer of composted material to other AGL sites such as the Liddell Ash Dam, Liddell Power Station and Bayswater Power Station for use in rehabilitation via Lemington Road and the New England Highway (the proposed modification).

The composting facility would not increase in area as a result of the proposed modification. The additional composted material would be processed within the area originally approved for 50,000 tonnes and using the same equipment currently in use on the site.

The development, as proposed to be modified, is considered to be substantially the same development for which consent was originally granted. The modification request is therefore made pursuant to section 96(2) of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

1.2 Project Background

AECOM Australia Pty Ltd prepared a SoEE (dated July 2016) to support a development application (referred to as DA140/2016) for the establishment and operation of on-site composting to facilitate the rehabilitation of Ravensworth No. 2 mine and Ravensworth South mine.

The application was assessed as integrated development (and not designated development) on the basis that the project was entirely ancillary to the existing rehabilitation works approved as part of the Bayswater Power Station and Ravensworth mine. On 25 November 2016, Council granted consent to DA140/2016, pursuant to Section 80 of the EP&A Act and subject to conditions. A copy of the approval is provided as Appendix A with the approved plans provided as Appendix B.

The Applicant for DA140/2016 was Bettergrow Pty Ltd (Bettergrow). Bettergrow are contracted by AGL (the land owner) to supply manufactured soil ameliorant and rehabilitation products to be used as part of the approved rehabilitation works at Ravensworth No. 2 mine and Ravensworth South mine.

1.3 Need for the Modification

This application proposes to increase the amount of composting material processed at the approved Ravensworth No. 2 mine from 50,000 tonnes to 76,000 tonnes per year. The modification is required in order to expedite rehabilitation of the site, provide compost material for additional AGL rehabilitation activities, to take advantage of organic materials currently available and authorize the transfer composted material to other AGL rehabilitation sites for use in association with existing approvals.

Section 3.2 provides further detail and justification for the proposed modification.

1.4 Report Structure

The SoEE is divided into the following sections:

- Chapter 1 provides background information for the proposed modification
- Chapter 2 provides a description of the site, the surrounding land uses and site history
- Chapter 3 describes the proposed modification and provides justification for the application
- Chapter 4 outlines the statutory considerations relevant to the modification application
- Chapter 5 assess the potential environmental impacts of the modification application
- Chapter 6 summarises the previously approved mitigation measures
- Chapter 7 draws conclusions on the ability of Council to determine the section 96(2) modification application.
- Appendix A containing notice of determination of DA140/2016
- Appendix B containing the approved plans associated with DA140/2016
- Appendix C containing the Leachate Storage Construction Quality Assurance Report
- Appendix D containing the modification Traffic and Transport Impact Assessment

2. Site Description

2.1 Location and Surrounding Land Uses

The site is located at Ravensworth No. 2 mine and is approximately 20 kilometres north of Singleton. The site is formally described as Lot 10 DP1204457 at 74 Lemington Road, Ravensworth in the Singleton local government area (LGA). The site is cleared of native vegetation and is located on part of a capped open cut mining void which has been filled with ash from the AGL Bayswater Power Station. Access to the facility is provided via an internal access road off Lemington Road which connects to the New England Highway. The site location is shown in Figure 2.1.

The composting facility is located on a graded hardstand area, surrounded by perimeter bunding. A sediment barrier is located toward the eastern corner of the facility. A detention basin and spillway are located towards the south. A diversion wall and channel direct surface water runoff from the eastern corner of the facility into the spillway. A spillway channel connects the spillway to the lower basin.

Land uses and activities surrounding the site predominately involve power generation and mining operations including:

- Bayswater and Liddell Power Stations including Lake Liddell to the north west
- Liddell Coal operations to the north east
- Ravensworth North Open Cut to the west
- Integra Coal Mine to the south east.

2.2 Site History

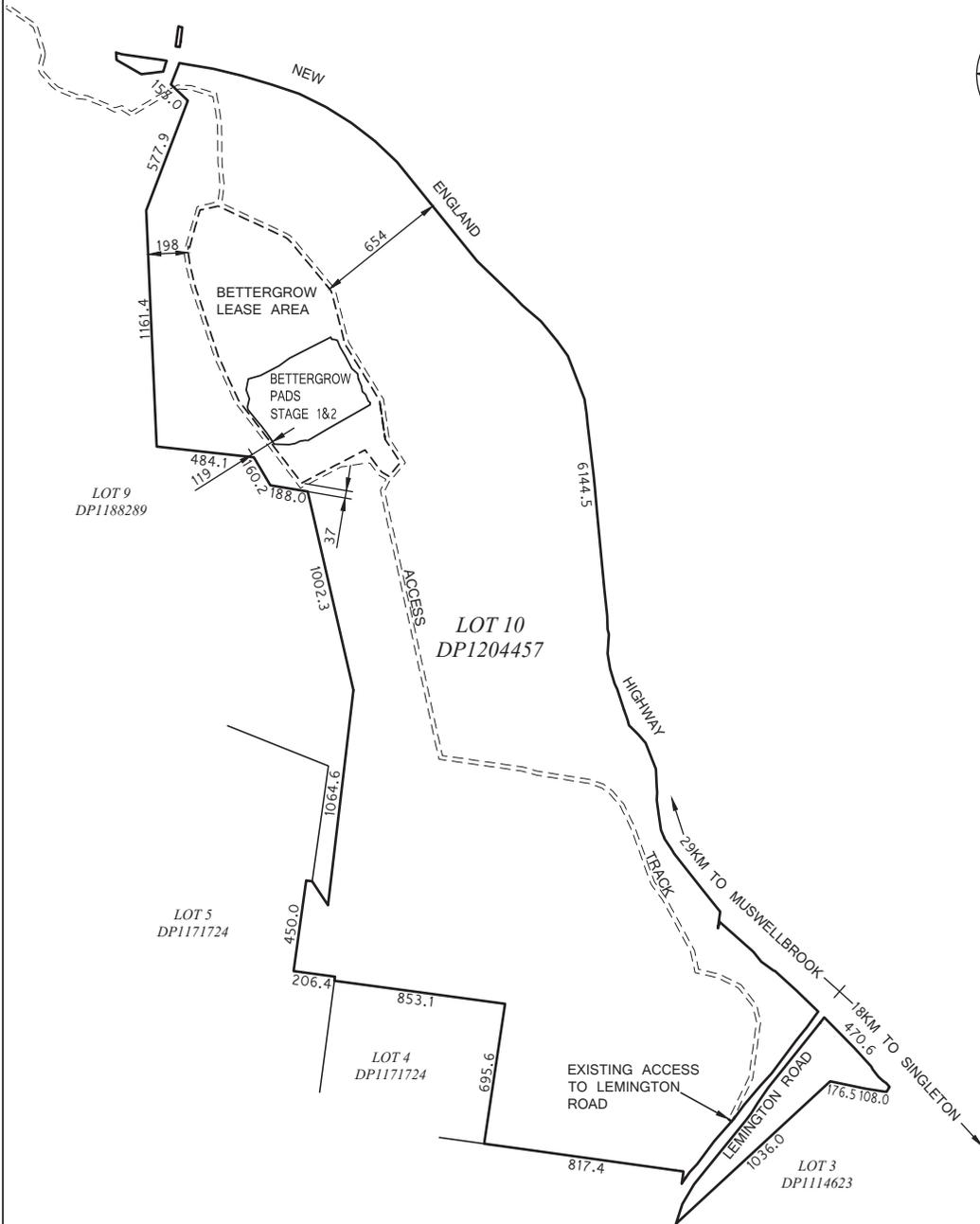
Peabody Resources Ltd (Peabody) was responsible for the operation the Ravensworth No. 2 mine until it was decommissioned in 1993 following the completion of coal. AGL now owns the decommissioned mine and is therefore responsible for its rehabilitation, including five existing mine voids (referred to as voids 1, 2, 3, 4 and 5). Rehabilitation works involve the disposal of fly ash from the nearby Bayswater Power Station.

Voids 1 and 2 on the site have previously been filled with fly ash, capped and rehabilitated. Void 3 was filled with fly ash and capped in 2014. Void 4 is used as a water storage dam and provides additional capacity for surface water runoff during significant rainfall events. The placement of Bayswater Power Station fly ash into void 5 commenced in 2014 and is expected to be completed by 2032.

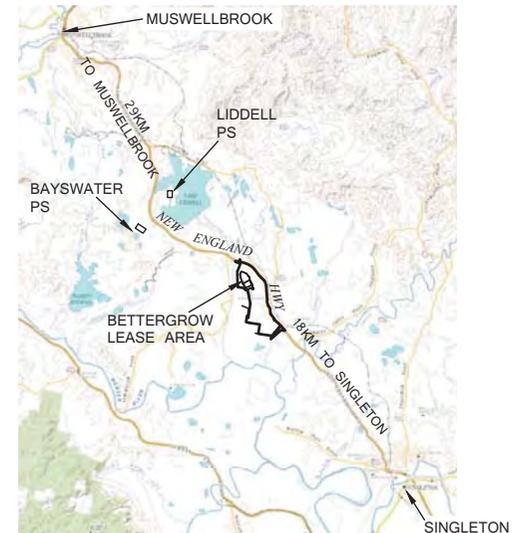
Rehabilitation works at voids 1 to 5 are carried out in accordance with the following development consents:

- DA No. 86/51 for the Ravensworth South mine granted by the NSW Department of Planning and Environment on 16 December 1986
- DA No. 144/93 granted by Singleton Shire Council on 8 December 1993 (as modified)
- DA No. 138/93 granted by Muswellbrook Shire Council on 13 December 1993 (as modified).

The above listed existing development consents issued for the site in the 1980s and 1990s allow the use of composting material as part of the mine rehabilitation process. However, these development consents do not explicitly allow for the on-site processing of composting material. Bettergrow therefore sought consent for composting activities to be conducted at Ravensworth No. 2 mine and Ravensworth South mine under DA140/2016. The application was approved by Council on 25 November 2016.



LOCATION MAP
SCALE 1:400000



CLIENT/OWNER
BETTERGROW

DETAILS		
SURVEYORS REF.	SCALE	SHEET SIZE
14-32	1:25000	A3
DATE OF SURVEY: 23 FEBRUARY 2016		

REVISION NOTES	
18/7/2016 ORIGINAL	0

TITLE
**BETTERGROW RAVENSWORTH
COMPOSTING FACILITY
SHEET 1 OF 6
GENERAL ARRANGEMENT**

2.3 Current Site Operations

AGL has contracted Bettergrow to supply the composted material to support the mine and ash dam rehabilitation works. The hours of operation at the site are from 6am to 6pm Monday to Saturday. Vehicle access to the site is via an entry gate at Lemington Road located to the south.

Organic materials for composting are transported to the site and are unloaded to the existing hardstand area for storage and processing (an area covering approximately 25 hectares in total). The material currently authorized to be accepted comprises a mix of general solid waste (non-putrescible) and liquid waste limited to:

- Urban wood residues Composting (as defined in 'The compost order 2016');
- Wastewater from Bayswater mine void 4;
- Natural organic fibrous Composting material (as defined in Schedule 1 of the POEO Act);
- Coal ash which meets the conditions of 'The coal ash order 2014';
- Biosolids (as defined in Schedule 1 of the POEO Act); and
- Garden Waste (as defined in Schedule 1 of the POEO Act)

The composting process takes approximately eight weeks, after which maturation occurs. The finished compost material is then stored and may be screened and blended with other ingredients to create the final product. The final compost material is then loaded on to trucks and transported to the relevant areas for rehabilitation including mining voids and areas of previously rehabilitated land that requires further soil improvements.

Surface water is currently managed on site through the diversion of clean surface water around the composting operation area and the containment of leachate for reuse in the composting activities.

3. Modification Description and Justification

3.1 Proposed Modification

Development consent for DA140/2016 allows up to 50,000 tonnes of composted material to be supplied to the compost facility per year. This modification application seeks to increase the amount of composted material supplied to the site by a further 26,000 tonnes per year, resulting in a maximum of 76,000 tonnes per year in total supplied to the site for rehabilitation purposes. The proposed modification also includes the transfer of composted materials to other AGL rehabilitation areas including the Liddell Ash Dam although the use of compost at this additional site is subject to a separate approval. No additional construction activities are proposed as the additional compost would be accommodated within the existing authorized and established facility.

3.2 Justification

The processing of material on-site provides a cost-effective option and improved quality of material used for rehabilitation of the site. The additional 26,000 tonnes per year of composted material would be contained wholly within the area currently approved for 50,000 tonnes. As a result, there would be no net increase in site area. Further, the existing on-site leachate dam currently used to collect and store surface water runoff generated during operational works has sufficient capacity to support the proposed increase in on-site composting activity as the catchment area will not increase.

3.3 Conditions Required to be Modified

This application seeks to amend approved development consent Condition 1.1. The proposed amendment would make reference to this section 96(2) modification report in the table of approved plans and supporting documents.

A consolidated version of Condition 1.1 is outlined below (the proposed amendments shown in red text).

A copy of the development consent conditions, approved plans for DA140/2016 and approved Surface and Groundwater Management Plan are included at Appendices A, B and C respectively.

1.1 Approved Plans and Supporting Documents

The development shall be carried out substantially in accordance with the approved stamped and signed plans and/or documentation listed below except where modified by any following condition. Where the plans relate to alteration or additions only those works shown in colour or highlighted are approved.

Reference/Drawing No.	Title/Description	Prepared By	Date/s
Sheet 1 of 6	General Arrangement	Tony Mexon & Associates	23 February 2016
Sheet 3 of 6	Stage 1 Works	Tony Mexon & Associates	23 February 2016
Sheet 4 of 6	Stage 2 Works	Tony Mexon & Associates	23 February 2016
Sheet 5 of 6	Cross Section A-A	Tony Mexon & Associates	23 February 2016
Sheet 6 of 6	Cross Section C-C	Tony Mexon & Associates	23 February 2016

<i>Surface and Groundwater Management Plan Version 7</i>		<i>Bio-Recycle Australia Pty Ltd</i>	<i>3/08/2016</i>
<i>Statement of Environmental Effects</i>		<i>AECOM</i>	<i>15/07/2016</i>
<i>Statement of Environmental Effects</i>	<i>Section 96(2) Modification to DA140/2016 – Ravensworth Composting Facility, Ravensworth</i>	<i>Jacobs Group (Australia) Pty Limited</i>	<i>6 February 2018</i>

Note 1: Modification to the approved plans will require lodgement and consideration by Council of a modification pursuant to Section 96 of the Environmental Planning and Assessment Act, 1979.

Note 2: The approved plans and supporting documentation may be subject to conditions imposed under section 80A(1)(g) of the Act modifying or amending the development (refer to conditions of consent which must be satisfied prior to the issue of any Construction Certificate).

4. Statutory Framework

4.1 Commonwealth Legislation

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) requires the approval of the Commonwealth Minister for the Environment for any actions that may have a significant impact on matter of National Environmental Significance (NES) in addition to any approvals issued under NSW legislation. The EPBC Act also outlines protections of the environment where activities are located on Commonwealth land.

The SoEE prepared for DA140/2016 established that the original project would not impact on any NES matters. This was determined on the basis of the site being cleared of any native vegetation and there being no listed threatened species, ecological communities or habitat for listed migratory species. The Hunter Estuary Wetland which is a wetland of international importance is located over 50 kilometres from the site and would not be impacted by the project.

The proposed modification would not introduce any new activities, beyond those previously granted consent under DA140/2016, that would impact on any NES matters or areas of Commonwealth land.

4.2 NSW State Legislation

4.2.1 Environmental Planning and Assessment Act 1979

The EP&A Act establishes the planning and approvals process in NSW. The EP&A Act provides for the making of Environmental Planning Instruments (EPs) including Local Environmental Plans (LEPs) and State Environmental Planning Policies (SEPPs), which set out requirements for particular localities and/or particular types of development. The applicable EPs and the Regulations made under the EP&A Act determine the relevant planning approval pathway and the associated environmental assessment requirements for proposed development activities.

The SoEE for DA140/2016 determined the project to be integrated development under section 91 of the EP&A Act as it involved the alteration or erection of improvements within a mine subsidence district (the Patrick Plains Mine Subsidence District).

Composting is also a scheduled activity under the *Protection of the Environment Operations Act 1997* and Bettergrow (trading as Bio-Recycle) currently holds Environment Protection License (EPL) number 7654 for the scheduled activity of composting up to 50,000 tonnes per annum. This EPL would need to be varied to increase the volume to 76,000 tonnes per annum.

Section 96(2) of the EP&A Act allows the development consent to be modified if the consent authority is satisfied that the development, as proposed to be modified, is substantially the same development as originally approved. The proposed modification is considered substantially the same development as originally approved as it would result in:

- The expansion of an approved activity (composting operations) that is currently being carried out on the site;
- Would not result in additional activities being carried out, beyond those approved under DA140/2016; and

- Would result in a negligible impact to the existing environment.

In determining an application for modification of a consent, the consent authority must take into consideration such of the matters referred to in Section 79C(1) as are of relevance to the development which is the subject of the application. A summary of these matters is provided in Section 7.2.

4.2.2 Environmental Planning and Assessment Regulation 2000

The *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) contains key operational provisions for the NSW planning system. This includes procedures relating to development applications, requirements for environmental assessments, environmental impact assessments, building regulations and other miscellaneous matters.

Clause 4 and Schedule 3 of the EP&A Regulation identifies development as designated development under specific circumstances. A development application for designated development is required to be accompanied by an Environmental Impact Statement prepared in the form prescribed by the EP&A Regulations.

Clause 13 of Schedule 3 of the EP&A Regulation identifies composting facilities or works that process more than 5,000 tonnes per year of organic materials to be designated development. Clause 37A of Schedule 3 provides an exemption for development that is wholly ancillary to other development and that is not proposed to be carried out independently of that other development.

The SoEE for DA140/2016 determined the project did not comprise designated development as it was exempt under clause 37A of the EP&A Regulation. This was determined on the basis that:

- the project would operate only to serve existing rehabilitation activities; and
- the project would be considered a 'minor use' considering the size and scale of rehabilitation activities.

The proposed modification will remain wholly ancillary to existing rehabilitation works approvals, with the additional composting to support the rehabilitation requirements of the approved Liddell Ash Dam under DA 1/2011 issued by Muswellbrook Council.

4.2.3 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) aims to protect, restore and enhance the quality of the environment in New South Wales, having regard to the need to maintain ecologically sustainable development. The POEO Act prohibits any person from causing pollution of waters or air and applies penalties for pollution offences.

Schedule 1 of the POEO Act identifies scheduled activities that require a license for the premises at which the activity is carried out. In accordance with clause 12 of Schedule 1, the composting activities carried out on the site require an environmental protection license (EPL) as it receives more than 5,000 tonnes per year of non-putrescible organics from an off-site source.

Bettergrow hold EPL 7654 for the premises covering composting and waste activities on the site. The expansion of composting operations proposed as part of the modification application would require a variation to EPL 7654 issued by the Environmental Protection Authority (EPA) in order for the site to receive more than 50,000 tonnes of organic waste per year. Variation of the EPL will be sought in consultation with the EPA, subject to the approval of this modification application.

4.2.4 Mine Subsidence Compensation Act 1961

The *Mine Subsidence Compensation Act 1961* (MSC Act) provides for the regulation of development on land potentially affected by mine subsidence.

The SoEE for DA140/2016 identified the project as being located within the Patrick Plains Mine Subsidence District and that the extent of works would be classified as an improvement under the MSC Act. Under clause 15 of the MSC Act, approval from the Mine Subsidence Board was required prior to the commencement of operations associated with the project. The approved plans provided in Appendix B have been stamped by the Mine Subsidence Board.

4.3 Environmental Planning Instruments

4.3.1 State Environmental Planning Policy (Infrastructure) 2007

Under Clause 121 of the *State Environmental Planning Policy (Infrastructure) 2007*, development for the purpose of waste or resource management facilities, other than development referred to in subclause (2), may be carried out by any person with consent on land in a prescribed zone. Resource management facilities are defined as including composting activities and the Prescribed Zones include the RU1 zone. Composting facilities are not referred to in subclause (2) and as such the existing composting activity and proposed modification are permissible with development consent under *State Environmental Planning Policy (Infrastructure) 2007*.

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

Under clause 23(3) of *State Environmental Planning Policy (State and Regional Development) 2011*, development for the purpose of resource recovery or recycling facilities that handle more than 100,000 tonnes per year of waste is considered state significant development. As the development as modified would remain below 100,000 tonnes per annum the proposed modification is not considered State significant development.

4.3.3 State Environmental Planning Policy No 33 – Hazardous and Offensive Development

State Environmental Planning Policy No 33 – Hazardous and Offensive Development (SEPP 33) aims to ensure that measures are employed to reduce the impact of a development that is a hazardous or offensive industry.

The proposed modification involves the expansion of existing composting operations on a site that is appropriately zoned for such uses. The application does not propose the introduction of any hazardous or offensive development.

4.3.4 State Environmental Planning Policy No 44 – Koala Habitat Protection

State Environmental Planning Policy No 44 – Koala Habitat Protection (SEPP 44) applies to the Singleton LGA. The aim of SEPP 44 is to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline.

The SoEE for the DA140/2016 determined the project site to be cleared of any suitable koala habitat. Further, the project would not involve the interaction with, or potential impact on any habitat trees located adjacent to the site. Preparation of a koala plan of management under SEPP 44 was therefore not required.

The proposed modification involving the expansion of approved operations and contained wholly within the approved site area, would not result in any impacts to core koala habitat.

4.3.5 State Environmental Planning Policy No 55 – Remediation of Land

State Environmental Planning Policy No 55 – Remediation of Land (SEPP 55) aims to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment. Clause 7 of SEPP 55 requires a consent authority to consider whether the land is contaminated and whether it is suitable (or can be made suitable) for the proposed development.

The SoEE for DA140/2016 determined the development to be located on a previously developed site where there is no known contamination. The works proposed as part of the modification would be carried out wholly within the approved site area. Consequently, the conclusions made relating to site contamination for DA140/2016 remain valid for this modification application.

4.3.6 Singleton Local Environmental Plan 2013

Zoning and Permissibility

The site is zoned RU1 Primary Production under the *Singleton Local Environmental Plan 2013* (Singleton LEP). The objectives of the RU1 zone are:

- *to encourage sustainable primary industry production by maintaining and enhancing the natural resource base*
- *to encourage diversity in primary industry enterprises and systems appropriate for the area*
- *to minimise the fragmentation and alienation of resource lands*
- *to minimise conflict between land uses within this zone and land uses within adjoining zones.*

Open-cut mining is permissible with consent in the RU1 zoning and the SoEE for DA140/2016 identified the project as associated with the rehabilitation of open-cut mining. The rehabilitation activities were considered to be consistent with the objectives of the RU1 Primary Production zone as it would enhance the natural resource base of the land in its post-mining state. The proposed modification involving the expansion of existing composting operations would remain consistent with the RU1 zone objectives.

It is further noted that while composting operations are a prohibited land-use within the RU1 zone under the Singleton LEP, resource recovery including composting is permissible with consent within the RU1 zone under *State Environmental Planning Policy (Infrastructure) 2007*. Section 1.9 of the Singleton LEP identifies that it is subject to the provisions of any State environmental planning policy that prevails as provided by section 36 of the EP&A Act. Under Section 36 of the EP&A Act, in the event of an inconsistency between environmental planning instruments and unless otherwise provided, there is a general presumption that a State environmental planning policy prevails over a local environmental plan or other instrument made before or after that State environmental planning policy. As such the proposed development for the purposed of composting and rehabilitation of open-cut mining is permissible within the RU1 zone with consent.

Section 7.1 of the Singleton LEP requires earthworks for which development consent is required to not have a detrimental impact on environmental functions and processes, neighbouring uses, cultural or heritage items or features of the surrounding land.

The proposed modification does not involve additional earthworks. The placement of composted material as originally approved as part of the site rehabilitation works would be carried out in such a way that would avoid disruption to existing drainage patterns and subsequent impacts to nearby waterways.

5. Assessment

5.1 Environmental Impacts

The SoEE for DA140/2016 considered the potential for environmental impacts of the project to identify key impacts requiring additional consideration. This process has been repeated in Table 5.1 below to identify the identified impacts of the original application and implications of the proposed modification.

Table 5.1 : Potential for Environmental Impacts to change as a result of the modification

Environmental factor	Original SoEE	Modification Implications	Further discussion in this SoEE	Reference
Traffic	<p>The project site would be accessed via Lemington Road to the south of the project. The internal roads would be modified (if required) to provide a suitable surface and drainage for the project.</p> <p>The construction of the project would not generate additional vehicle movements as all plant and equipment to be used is currently in use on other projects on site.</p> <p>The operation of the project would generate approximately 8 heavy vehicle movements per day.</p> <p>The New England Highway has the capacity to absorb the additional construction and operational traffic volumes.</p> <p>Potential impacts to traffic and access, including impacts to the New England Highway are anticipated to be negligible for the project.</p>	<p>The proposed modification would generate traffic of up to 19 additional vehicles attending site per day associated with four additional organic material deliveries and up to 15 deliveries of composted material to the Liddell Ash Dam rehabilitation area on a campaign basis.</p>	Yes	Section 5.1.4
Noise and Vibration	<p>The nearest sensitive receiver is located over 7.5 kilometres from the project site.</p> <p>Noise and vibration impacts are anticipated to be minor for the project.</p>	<p>No additional plant or equipment would be required to handle the additional compost volumes. Additional traffic would not have the potential to increase road traffic noise to the extent that it would be noticeable.</p>	No	
Air quality	<p>There are potential impacts related to odour and dust generation for the operation of the project.</p>	<p>The proposed modification would result in increased dust and odour generation potential during operation but</p>	Yes	Section 5.1.3

Environmental factor	Original SoEE	Modification Implications	Further discussion in this SoEE	Reference
	Only minor localised potential impacts from dust are anticipated for the construction project.	would continue to be appropriately located such that impacts to offsite receptors, the nearest identified in the original SoEE as 7.6 km to the south east, would be avoided.		
Visual amenity	The works undertaken for the project would be consistent with the current esthetic qualities of the site associated with rehabilitation activities. The project site is not visible from the New England Highway or nearby sensitive receivers.	No additional structures or increased stockpile heights are proposed and as such no additional visual impacts are considered likely to result from the proposed modification.	No	
Surface water	There are potential impacts to surface water for the project.	The proposed modification would generate leachate and as such has the potential to impact on surface water quality if unmanaged.	Yes	Section 5.1.1
Groundwater	There are potential impacts to groundwater for the project.	The proposed modification would generate leachate and as such has the potential to impact on groundwater quality if unmanaged.	Yes	Section 5.1.2
Landforms, geology and soils	Excavations and earthworks are proposed for the construction of the project. Potential impacts associated with excavations and earthworks would be managed by the implementation of an Erosion and Sediment Control Plan for the construction of the project.	No additional disturbance is proposed.	No	-
Biodiversity	The project site is cleared of native vegetation and there is negligible potential for listed threatened species, ecological communities or habitat for listed migratory species. Impacts to biodiversity would be unlikely for the project. The project would improve the quality of existing and future rehabilitation at the Ravensworth No 2 Mine. The project would encourage the establishment of	No additional clearing is proposed.	No	-

Environmental factor	Original SoEE	Modification Implications	Further discussion in this SoEE	Reference
	native vegetation communities and potential habitat for fauna.			
Non-Aboriginal and Aboriginal Heritage	<p>A review of LEP 2013 was undertaken for the project site. No Aboriginal or non-Aboriginal heritage items were identified at the project site.</p> <p>A search was undertaken of the Aboriginal Heritage Information Management System for the project site.</p> <p>An Aboriginal site was recorded 500m to the north east of the Project site, on the eastern side of the New England Highway.</p> <p>Due to the historical use of the project site for mining, it is highly unlikely that the Project site contains any unidentified items of heritage significance.</p> <p>Potential impacts to Aboriginal and Non- Aboriginal heritage from the Project would be unlikely for the project.</p>	<p>There are no listed Non-Aboriginal heritage items in the vicinity of the facility.</p> <p>An updated search of the Aboriginal Heritage Information Management System (AHIMS) was undertaken in December 2017.</p> <p>The search identified one Aboriginal site in the search area. This site is likely to be the same site identified in the original SoEE.</p> <p>No additional clearing or ground disturbance is proposed and as such no additional impacts to Aboriginal or Non-Aboriginal heritage is likely.</p>	No	-
Bushfire	The project site is located on bush fire prone land and so there are potential impacts related to bush fire risk.	<p>According to the Singleton Council's Bushfire Prone Land Map, New England Highway, Lemington Road and the surrounding access roads are located in bush fire prone land. The facility itself is not mapped as being located on bushfire prone land.</p> <p>The proposed modification is unlikely to increase the bush fire risk of the facility and would be managed by existing bush fire protection measures.</p>	No	
Waste Management	During construction, waste generated would be limited to spoil and general construction waste.	No additional waste streams would be generated. Waste would continue to be received and handled in accordance	No	-

Environmental factor	Original SoEE	Modification Implications	Further discussion in this SoEE	Reference
		with applicable resource recovery orders and exemptions and EPL7654 as proposed to be varied to permit additional compost volumes.		
Contaminated land and hazardous materials	Areas to be disturbed at the project site are not known to be contaminated.	A search of the NSW EPA Contaminated land records of notices and the List of NSW Contaminated Sites Notified to the EPA in December 2017 did not identify any contaminated sites within the vicinity of the project. No additional contamination risks are introduced by the proposed modification.	No	-
Socio-economic effects	Surrounding businesses are not anticipated to be impacted during the construction or operation of the project.	The traffic and amenity impacts of the proposed modification are unlikely to affect any surrounding businesses of private receptors.	No	-
Demand on resources	The project would use standard construction resources. The works are not anticipated to result in an increased demand on resources.	No additional demand on resources would be introduced by the proposed modification.	No	-
Cumulative environmental effects	Consultation with Council did not identify the potential for cumulative impacts for the project with current or future development in Singleton.	The proposed modification is located within the Ravensworth mining complex and is located in an area that is surrounded by mining and power operations. The proposed modification would be minor in nature and is unlikely to have a significant cumulative impact in the area. In facilitating rehabilitation, the project would have a positive contribution to local air quality, land use productivity and habitat potential in the longer term.	No	

On the basis that the proposed modification does not involve any new clearing or ground disturbance and does not involve additional equipment or structures on site, the implications of the proposed modification are considered limited to increase material handling on site with associated increases in delivery and distribution traffic movements, odour generation potential and leachate generation potential and composition.

The assessment of these issues, including conclusions made in the SoEE and potential for further implications generated by the proposed modification, are discussed at Section 5.1.1 to Section 5.1.4. The approved mitigation measures to address the environmental impacts are listed at Section 6.

5.1.1 Surface Water

The existing surface water drainage environment at the site is highly modified due to historic land use activities including mining, power generation and agriculture. Surface water currently drains to both Bowmans Creek and Bayswater Creek located east and west of the site, respectively. Both creeks converge with the Hunter River approximately seven kilometres south of Ravensworth void 3.

The original SoEE described Bayswater Creek as being highly modified with high salinity levels. The flow regime is influenced by the presence of Lake Liddell to the north and discharge from Bayswater Power Station. Bowmans Creek was also described as being highly modified with indications of high salinity levels and generally low flows to the creek.

The original SoEE further described the risk of leachate entering the surface water drainage environment as a result of on-site composting activities. Should this occur, surface water quality may be reduced due to oxygen demanding wastes. Leachate generated from composting activities would likely comprise putrescible organic material that would contain insufficient moisture to produce leachate unless water is added, such as during a significant rainfall event. Other surface water quality impacts that may occur from operation of the project, as identified in the original SoEE, include:

- reduced aesthetic values of receiving waters due to increased turbidity and odour effects from ongoing anaerobic decomposition of organic material
- health impacts to livestock or persons extracting water from the receiving waters
- reduced health (species richness and biodiversity) of the receiving ecosystems.

The proposed modification would result in increased on-site composting operations that may increase the risk of leachate generation and resulting surface water impacts. However, the original SoEE identified that generally organics processed on site would be Category 1 organics which would not contain sufficient moisture to produce leachate unless water was added externally, such as during rainfall events. As the proposed modification does not increase the surface water catchment area for the operation no additional leachate is expected to be generated. Bunding has been constructed around the hardstand area with leachate directed to a leachate management dam to prevent leachate impacting off-site surface water.

Condition 1.5 of the development consent and O7 of EPL7654 required the establishment and verification of leachate containment infrastructure in accordance with the EPA's "Environmental Guidelines for Composting and Related Organics Processing Facilities" 2004. A certified Quality Assurance Report has been prepared for this infrastructure and is attached as Appendix C. On the basis that the catchment area would remain the same and organic material would have a low moisture content on arrival, the leachate containment infrastructure is considered to remain appropriately sized to accommodate the modification.

Environmental mitigation measures were approved under DA140/2016 to ensure the project's impact on surface water quality is adequately managed (reproduced in Table 6.1). These mitigation measures would continue to

be implemented and are considered sufficient in order to manage the increase in composting operations proposed as part of the modification. Further, the project as modified would continue to be regulated under the conditions of EPL No. 7654 issued by the EPA.

5.1.2 Groundwater

The composting activity presents the risk of leachate (produced during on-site composting operations) to discharge to groundwater aquifers beneath the site. The original SoEE proposed design measures to ensure leachate is collected and appropriately stored, including the establishment of a low permeability base for the compost processing area and the diversion of runoff from the windrows to a lined leachate pond. The windrows are shaped to maximise runoff and reduce infiltration. The original SoEE considered the existing groundwater conditions would not be compromised by the project given the site is located in a region where extensive and long-term open cut and underground mining activities have been carried out, with the subsequent filling of mine voids with power station ash forming the composting facility landform.

The expansion of composting operations proposed as part of the modification would continue to make use of the existing leachate dam and approved project design measures that would reduce groundwater infiltration and no additional groundwater risks are considered to result from the proposed modification.

5.1.3 Air Quality

The original SoEE assessed impacts of the composting facility on dust and odour generation. The nearest sensitive receiver was identified approximately 7.6 kilometres to the south-east, in the village of Camberwell.

Meteorological conditions were considered to play a fundamental role in the transportation and dispersion of air pollution sources that includes dust and odour. Data was sourced from the Bureau of Meteorology as part of the air quality assessment which determined there to be a greater potential for dust impacts during periods of strong dry winds (typically from July to September) while there is a greater potential for odour impacts during the morning in months of still, cool, dry conditions (typically from April to May).

The original SoEE considered the projects potential to contribute to local air quality impacts associated with dust and odour finding:

- Existing dust monitoring data indicates that ambient dust levels at the Project site are below regulatory assessment criteria;
- With the implementation of mitigation measures, it is unlikely that the Project would result in cumulative dust impacts to nearby receivers; and
- The distance to existing receivers was likely to be sufficient for minimising odour impacts.

The original SoEE considered dust generation potential resulting from:

- Materials handling;
- A windrow turner;
- A front end loader and tractor;
- Up to eight truck movements per day along an all-weather road to and from the receiving area; and
- A gravel vehicle turnaround bay at the receival area.

Additional traffic movements associated with deliveries and the offsite transfer of compost materials has the potential to increase dust generation in the absence of appropriate management. Under EPL 7654, the

premises is required to be maintained in a condition which minimises or prevents the emission of dust. The proposed modification will be required to continue to comply with this condition.

As a scheduled activity, the site is not permitted to cause or permit the emission of any offensive odour from the premises and is required by EPL7654 Condition O7.6 to implement and Odour Management Plan. BetterGrow has confirmed that monitoring to date has not identified odour releases past the premises boundary attributable to on site product management and that no changes are expected in the odour profile due to the proposed modification.

A suite of air quality mitigation measures for the site were committed to in the original SoEE. These mitigation measures are listed in Table 6.1 and would be maintained as part of the proposed modification.

5.1.4 Traffic

The existing composting operation currently generates 8 truck deliveries from Newcastle and 8 truck return movements per day. The original SoEE found that New England Highway was considered to have sufficient capacity to absorb the additional traffic volumes and that there would be a negligible impact to existing traffic conditions.

The proposed expansion of the Composting Facilities at the site would generate following traffic volumes:

- An additional 4 truck deliveries from Newcastle to the site and 4 return movements per day.
- An additional 15 movements from the site to other AGL rehabilitation projects to the north and 15 return movements per day on a campaign basis.

In total there would be a worst case additional 19 truck movements to the site and 19 trucks movements from the site per day. These additional traffic movements would pass through the intersection of New England Highway and Lemington Road.

As shown in Figure 5.1 and Figure 5.2, this intersection is a seagull intersection, which minimizes the impacts of the right-turn traffic movements on the through traffic flows on New England Highway and allows vehicles turning right out of Lemington Road to do so in two stages.

The total number of additional truck movements will be 38 trucks per day, during offsite rehabilitation campaigns only, which is assumed to be undertaken by 6-8 drivers. It is assumed this would be distributed evenly throughout the day across the 12 hour operation period from 6am to 6pm. The additional truck movements added into the intersection during morning and evening peak hour would likely be 6 trucks per hour distributed as follows:

- 1 truck movement from southern approach turning left onto Lemington Road
- 2 truck movements from northern approach turning right onto Lemington Road
- 1 truck movement from Lemington Road turning right onto New England Highway
- 2 truck movements from Lemington Road turning left onto New England Highway

The relatively low number of additional traffic movements generated by the modification would be within the normal day to day variation of traffic volumes and would have minimal impacts on this intersection.

The project site and surrounding area have no public transport facilities and minimal active transport activities. Therefore, the project would likely have no impacts on public transport and active transport.



Figure 5.1 : Heavy Vehicle Route to Newcastle

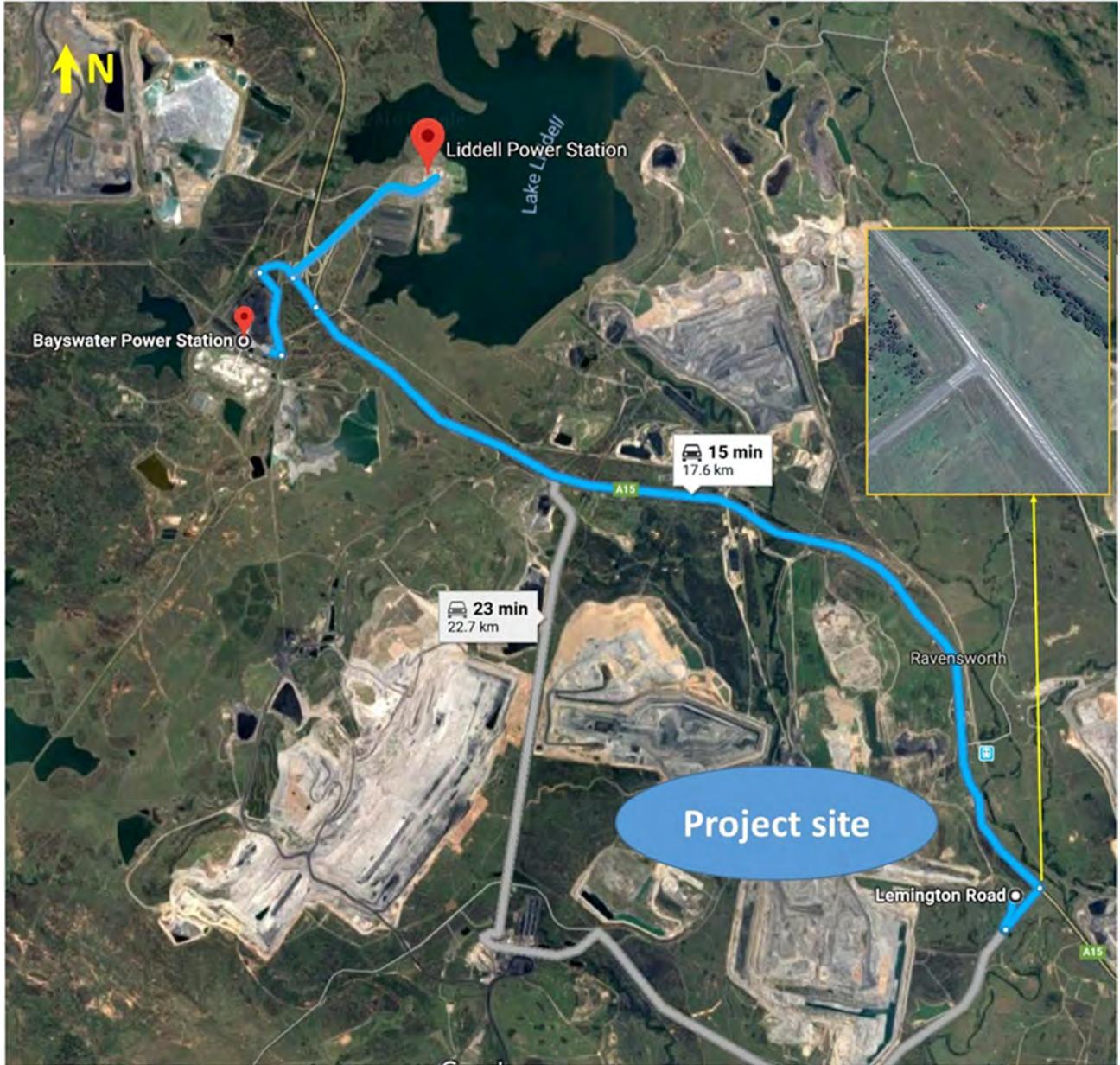


Figure 5.2 : Heavy Vehicle Route from Site to Bayswater Power Station

6. Environmental Mitigation Measures

The facility would continue to be operated in accordance with the mitigation measures provided in the SoEE for DA140/2016, the conditions of the development approval and the requirements of EPL7654. A summary of the environmental mitigation measures provided in the original SoEE for DA140/2016 and subsequently approved by Council is included at Table 6.1. The approved mitigation measures would apply and continue to be maintained as part of the proposed modification.

Table 6.1 : Summary of key environmental issues and approved mitigation measures

Issue	Potential Impact	Mitigation Measures
Landforms, geology and soils	Soil erosion / stability	An Erosion and Sediment Control Plan (ESCP) would be developed for construction works and implemented and approved by AGL Macquarie environmental staff prior to initiation of construction works.
Surface water	Pollution from sedimentation and oil spills	<ul style="list-style-type: none"> Limit fuels and chemicals stored onsite to a minimum. All required chemicals and fuels must be located within a bunded enclosure located away from drainage lines and stormwater drains. Plant and equipment must be regularly inspected to check for oil leaks. Refuelling of vehicles or machinery is to occur within a containment or hardstand area designed to prevent the escape of spilled substances to the surrounding environment. Wash down areas must be appropriately constructed, and the collected material disposed of off-site to a licensed facility.
	Pollution from leachate (operation)	<ul style="list-style-type: none"> Maintain all water related infrastructure designed to maximise runoff and reduce infiltration including: <ul style="list-style-type: none"> Low permeability base in the composting processing areas Lining of the leachate dams Bunding and arrangement of windrows Perimeter bunding and diversion drains. Undertake the aeration of leachate in the leachate dams if required following other control measures being implemented. Reuse runoff and leachate collected in the leachate dams during composting activities.
Groundwater	Groundwater pollution	Implementation of appropriate surface water mitigation measures (as outlined above).
Air Quality	Dust, odour and fumes (Construction)	<ul style="list-style-type: none"> Emission of dust from unsealed roads and other exposed surfaces such as unprotected earth or soil stockpiles must be controlled by use of surface sealants and/or water spray carts or other appropriate cover material.

Issue	Potential Impact	Mitigation Measures
		<ul style="list-style-type: none"> • Stockpiles must be appropriately maintained and contained which could include covering with finished compost or regular watering to minimize dust. • Work must be minimised and/or modified during high wind periods. • Plant and equipment must be operated in a proper and efficient manner and be switched off when not in use. • Plant and equipment must be maintained in accordance with manufacturer’s specifications to ensure that it is in a proper and efficient condition. • Plant and equipment must be regularly inspected to ascertain that fitted emission controls are operating efficiently.
	Odour (Operations)	<ul style="list-style-type: none"> • Use a windrow heap structure. • Begin the composting process with a carbon nitrogen ration of 25 – 30:1. • Maintain aerobic microbial activity during the composting process. • Maintain oxygen supply in the windrows. • Prevent anaerobic conditions which lead to ammonia and hydrogen sulphide release. • Monitor the leachate dam for anaerobic conditions regularly. • Maintain correct pH range (i.e. 6.5-8.5 pH units) in the leachate dam to eliminate ammonia and sulphide releases. • Chemical treatment of the leachate dam if required. • Direct waste materials to compost windrows when delivered and turning the ingredients. • Cover odorous loads with composted material, fly ash or dried biosolids to act as an odour filter until the load is appropriate for treatment. • Use odour neutralising agents such as BioActive.
	Dust (Operations)	<ul style="list-style-type: none"> • Restriction of traffic to designated internal roads. • Restriction of on-site traffic speeds to minimise wheel dust generation. • Regular wetting of hardstand pads and internal roads. • Wetting dry solid waste using sprinklers or handheld hoses during unloading. • Ensuring daily evaporation is taken into account when applying water as a dust suppressant. • Moisture control of compost and biosolids windrows when being turned. • Moisture control of compost to be screened.

Issue	Potential Impact	Mitigation Measures
		<ul style="list-style-type: none"> • Ceasing of screening, turning or mixing activities when wind speeds are excessive.
Bush fire	Access for emergency vehicles	The perimeter access road would be upgraded and would be provide suitable access for emergency vehicles, including the road surface and width.
	Water supply	A water tank would be located on site and water would also be available to be pumped from the leachate dam for firefighting operations.
	Emergency management	Emergency management procedures would be set out in the Environmental Management Plan to be prepared for the Project.
Biodiversity	Construction Native Vegetation Threatened Species	<ul style="list-style-type: none"> • Should any noxious weeds be encountered, appropriate management and disposal of these weeds must be carried out. • Construction works must be stopped if any previously undiscovered threatened species or communities are discovered during works. An assessment of the impact and any required approvals must be obtained.
Noise and vibration	Construction Noise vibration	Construction activities must be conducted during standard construction hours, i.e. Monday to Friday 6am to 6pm; Saturday 8am to 1pm; and no work on Sundays or public holidays.
Heritage	Construction Aboriginal Heritage Non aboriginal Heritage	Should an unexpected historic relic or Aboriginal object be identified during construction, work in the immediate vicinity of the find is to stop and the area must be fenced off with suitable markers (star pickets, flagging or barrier mesh). The Project Manager is to be notified. Engage an archaeologist to determine the significance of the find, and if required, determine the notification, consultation, and approval requirements.
Waste management	Construction spoil, Litter, chemicals, solid waste	<ul style="list-style-type: none"> • Resource management options for the Project must be considered against a hierarchy of the following order embodied in the Waste Avoidance and Resource Recovery Act 2001. • Avoid unnecessary resource consumption. • Recover resources (including reuse, reprocessing, recycling and energy recovery). • Dispose (as a last resort). • All wastes must be classified in accordance with the Waste Classification Guidelines (EPA, 2014) prior to disposal and transported to a licensed waste disposal facility if required. • Excavated material must be temporarily stored in a bunded area or with appropriate environmental controls in place to prevent run-off of contaminants entering the stormwater system. • Any spoil or waste material tracked onto paved areas such as roads and car parks must be immediately swept up. No water is

Issue	Potential Impact	Mitigation Measures
		<p>to be used to wash any such material tracked onto roads into stormwater drains.</p> <ul style="list-style-type: none"> All waste must be removed from the site on completion of the construction works.
Contaminated land and hazardous materials	Soil contamination from hazardous spills (Construction)	<ul style="list-style-type: none"> Fuels, lubricants and chemicals must be stored and, where practicable, used within containment/hardstand areas designed to prevent the escape of spilt substances to the surrounding environment, as required by relevant legislation and standards (e.g. AS1940: Australian standard for the storage and handling of flammable and combustible liquids). Adequate spill prevention and containment measures (e.g. drip trays) must be used when refuelling equipment on site. Construction personnel are to be trained in spill containment and response procedures. Appropriate spill response material to be kept on site. If a spill occurs, the material is to be contained to the smallest area possible. All spills that cause or may cause material harm to the environment are to be reported to the EPA.
Visual aesthetics and urban design	Visual impacts to views and vistas	<ul style="list-style-type: none"> A high level of housekeeping must be maintained by ensuring that the work site is kept in a clean and tidy condition. Waste materials must be removed from site regularly.
Traffic	Construction & Operation Traffic and access Transport	<ul style="list-style-type: none"> Restriction of traffic to designated internal roadways. Restriction of onsite traffic speeds to minimise wheel dust generation.

7. Conclusion

This chapter provides the justification for the proposed works taking into account its biophysical, social and economic impacts, the suitability of the site and whether or not the proposal is in the public interest. The proposal is also considered in the context of the principles of ecologically sustainable development as defined in Schedule 2 of the Environmental Planning and Assessment Regulation 2000.

7.1 Justification

While there will be some environmental impacts as a consequence of the proposed modification such as increased traffic movements and odour generation potential they will be managed through existing site-specific safeguards such that impacts would not be significant. The processing of additional organic materials on site to produce additional compost and support improved rehabilitation outcomes is considered to outweigh the identified potential impacts. The site is considered appropriately located away from sensitive human or ecological receptors such that the project as modified would be unlikely to result in adverse environmental consequences.

While introducing additional material handling and the offsite transfer of composted materials, the nature, scale or intensity of the works and their impacts is not considered to render the proposed works substantially different to those originally approved.

7.1.1 Social factors

The proposal will have some localised social impacts as a result of the increased traffic attending the site. As the site is surrounded by buffer lands controlled by AGL with no private receptors within 1 kilometre, negative social impacts will be limited. Bettergrow required, and are able, to manage impacts to avoid significant impacts to these receptors through the use of standard environmental safeguards specified in Table 6.1 and regulated under the *Protection of the Environment Act 1997* and existing EPL.

Positive social impacts include the provision of additional composting capacity avoiding waste disposal to landfill. The longer-term effect of the proposed modification will be an overall social benefit, through improved rehabilitation outcomes on previously disturbed areas in the locality.

7.1.2 Biophysical factors

The site is already highly disturbed and no additional clearing or ground disturbance is proposed. As such the potential biophysical impacts are limited to ground and surface water quality. The existing development is able to accommodate the increased material quantities and no additional water pollution risks are introduced.

The improved rehabilitation outcomes are expected to lead to improved habitat on site.

7.1.3 Economic factors

No additional capital costs are associated with the proposed modification. In general, the proposed works have been developed to avoid significant costs through the use of existing facilities and equipment. The improved rehabilitation outcomes would provide increased potential for post rehabilitation uses such as grazing.

7.1.4 Public interest

The public interest is best served through development that fulfils the needs of the majority. The proposal represents a cost-efficient private investment in the rehabilitation of disturbed landforms and the management of organic waste streams. The composting and use of organic waste streams avoids the consumption of limited landfill space and uses land appropriately isolated from sensitive receptors.

Although the proposed modification would result in some short-term impacts these would be outweighed by the long-term benefits including improved rehabilitation outcomes and associated longer term amenity and biodiversity and potential economic use of land post rehabilitation. As a result, the proposed modification is considered to be in the public interest.

7.2 Consideration of Section 79C of the EP&A Act

In determining an application for modification of a consent under section 96(2) of the EP&A Act, the consent authority must take into consideration such of the matters referred to in section 79C (1) as are of relevance to the development the subject of the application. The factors listed in Section 79C(1) have been considered in Table 7.1 below in order to summarise the likely impacts of the modification on the natural and built environment.

Table 7.1 : Consideration of Section 79(C) requirements

Matter for consideration	Consideration
<p>The provisions of any environmental planning instrument.</p>	<p>Environmental planning instruments considered in relation to the site and modification has included:</p> <ul style="list-style-type: none"> • <i>State Environmental Planning Policy (Infrastructure) 2007 (ISEEP)</i>; • <i>State Environmental Planning Policy (State and Regional Development) 2013</i> • <i>State Environmental Planning Policy No 33 – Hazardous and Offensive Development 12</i> • <i>State Environmental Planning Policy No 44 – Koala Habitat Protection 12</i> • <i>State Environmental Planning Policy No 55 – Remediation of Land 12</i> • <i>Singleton Local Environmental Plan 2013 13</i> <p>The relevant provisions of applicable environmental planning instruments are considered in Sections 4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.3.5 and 4.3.6. The proposed works are considered permissible under these instruments and able to be considered as a modification to the approved project.</p>
<p>The provisions of any proposed instrument.</p>	<p>No proposed Environmental Planning Instruments are considered to apply to the proposed modification.</p>

Matter for consideration	Consideration
<p>The provisions of any Development Control Plan.</p>	<p>The Singleton Development Control Plan (Singleton DCP) 2014 guides development in the Singleton LGA. A review of the Singleton DCP, and consultation with Council, indicated that the proposed modification application should be supported by a traffic impact assessment as per Schedule 5 of the DCP. The Traffic impact assessment for the proposed modification has been undertaken and is summarised in Section 5.1.4 and is attached as Appendix D.</p>
<p>The provisions of any planning agreement that has been entered into under section 93F, or any draft planning agreement that a developer has offered to enter into under section 93F.</p>	<p>No planning agreements affecting the proposed modification location have been entered into or are proposed.</p>
<p>The provisions of the regulations (to the extent that they prescribe matters for the purposes of this paragraph).</p>	<p>Clause 92 of Environmental Planning and Assessment Regulation 2000 identifies that for the purposes of section 79C (1) (a) (iv) of the Act, the following matters are prescribed as matters to be taken into consideration by a consent authority in determining a development application:</p> <ul style="list-style-type: none"> (a) in the case of a development application for the carrying out of development: <ul style="list-style-type: none"> (i) in a local government area referred to in the Table to this clause (does not include Singleton) and (ii) on land to which the Government Coastal Policy applies, <p>the provisions of that Policy,</p> (b) in the case of a development application for the demolition of a building, the provisions of AS 2601, (c) in the case of a development application for the carrying out of development on land that is subject to a subdivision order made under Schedule 5 to the Act, the provisions of that order and of any development plan prepared for the land by a relevant authority under that Schedule, (d) in the case of the following development, the <i>Dark Sky Planning Guideline</i>:

Matter for consideration	Consideration
	<p>(i) any development on land within the local government area of Coonamble, City of Dubbo, Gilgandra or Warrumbungle Shire,</p> <p>(ii) development of a class or description included in Schedule 4A to the Act, State significant development or designated development on land less than 200 kilometres from the Siding Spring Observatory.</p> <p>No further consideration of matters prescribed by the regulations is required.</p>
The provisions of any coastal zone management plan	The proposed modification is not within the coastal zone.
The likely impacts of the development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality.	Environmental and socio-economic impacts are assessed in Chapter 5.
The suitability of the site for the development	The site is currently used for composting activities, appropriately zoned, and largely devoid of sensitive environmental features due to past disturbance. The site is also appropriately isolated from sensitive receivers. The proposed modification is aimed at improving the environmental outcome for the site and other AGL rehabilitation areas. As such, the site is considered ideal for the composting activities proposed.
Any submissions made in accordance with this Act or the regulations	To be considered by Council following exhibition if required.
The public interest.	The proposed modification is considered to be in the public interest as described in Section 7.1.4.

7.3 Consideration of the Principles of Ecological Sustainable Development

7.3.1 The Precautionary Principle

This principle states: “if there are threats of serious or irreversible damage, lack of scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation”.

The proposal has sought to take a precautionary approach to minimising environmental impact. This has been applied through the development of a range of environmental safeguards to address the impacts identified in Section 5. There is not considered to be any threat of serious or irreversible damage and no impact mitigation measures to reduce risks of offsite impacts with the proposed modification are being deferred.

7.3.2 Intergenerational Equity

The principle states: “the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations”.

The proposed modification assessed in this SoEE is aimed at increasing the rate and extent of AGL’s rehabilitation efforts which is directly aimed at enhancing the health, diversity and productivity of the environment.

It is acknowledged that the proposal may have some adverse impact on the current generation, generally through minor increases in traffic. However, these are not considered to be of a nature or extent that will disadvantage future generations.

7.3.3 Conservation of Biological Diversity and Ecological Integrity

This principle states: “the diversity of genes, species, populations and communities, as well as the ecosystems and habitats to which they belong, must be maintained and improved to ensure their survival”.

An assessment of the existing local environment has been carried out to identify and manage any potential impact of the proposal on local biodiversity. The proposal is located in an area that has previously been modified as a result of mining and the disposal of ash. In the absence of additional clearing or ground disturbance, and with the appropriate management of water quality, no significant impact on any species, populations and communities is considered likely. The rehabilitation works which the proposed modification supports is expected to provide improved biodiversity outcomes for the site.

The proposal will not significantly fragment or isolate any existing large patches of vegetation and will not compromise biological diversity or ecological integrity.

7.3.4 Improved Valuation, Pricing and Incentive Mechanisms

This principle is defined as:

Improved valuation, pricing and incentive mechanisms, namely, that environmental factors should be included in the valuation of assets and services, such as:

(i) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,

(ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,

(iii) environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

Environmental and social issues were considered in the strategic planning and establishment of the composting facility. The value placed on environmental resources is evident in the extent of spend on the overall rehabilitation works. AGL, as the owner of the site and party responsible for rehabilitation, is funding the rehabilitation works and the on-site composting represents the most economical way of achieving the environmental goals for the site.

7.4 Conclusion

This SoEE has been prepared to address the assessment requirements of Section 96(2) of the EP&A Act. The works proposed as part of the modification are considered to be substantially the same development as that originally approved under DA140/2016 as it involves the expansion of existing, and previously approved, on-site composting operations associated with the rehabilitation of AGL lands. The modification would result in negligible environmental impacts and would not impact on any matters of NES, as defined under the EPBC Act.

The proposed modification is considered to be consistent with the relevant EPIs including the Singleton LEP and the Singleton DCP. It is therefore requested that Council grant approval to the Section 96(2) modification application to support the continued and accelerated rehabilitation of the Ravensworth No. 2 mine, Ravensworth South mine and other AGL lands.

References

AECOM, 2016. *Statement of Environmental Effects – Composting Facility, Ravensworth No.2 Mine*. Bettergrow Pty Ltd (July, 2016).

Parsons Brinkerhoff, 2009). *Ravensworth Operations Project, Traffic and Transport Impact Assessment*. Ravensworth Operations Pty Ltd (Xstrata) (November 2009)

Appendix A. Development Consent

Our Ref: DA140/2016

25 November 2016

Bettergrow
PO Box 945 ,
WINDSOR NSW 2756

NOTICE OF DETERMINATION OF DEVELOPMENT APPLICATION

Issued in accordance with Section 80 of the Environmental Planning and Assessment Act, 1979

Development Application No. DA140/2016

Applicant name	Bettergrow
Applicant address	PO Box 945 , WINDSOR NSW 2756

**Land to be Developed
Address**

Lot: 10 DP: 1204457 ,74 Lemington Road,RAVENSWORTH
NSW 2330

Proposed development	Establishment and operation of a composting facility to support the rehabilitation of Ravensworth No.2 mine and Ravensworth South mine.
-----------------------------	---

Determination made on (date)	25/11/2016
-------------------------------------	------------

Determination	Approved
----------------------	----------

Consent to lapse on (date)	25/11/2021
-----------------------------------	------------

Your application was considered under the Environmental Planning and Assessment Act 1979 and is approved subject to the following conditions:

General Conditions

1.1 Approved Plans and Supporting Documents

The development shall be carried out substantially in accordance with the approved stamped and signed plans and/or documentation listed below except where modified by any following condition. Where the plans relate to alteration or additions only those works shown in colour or highlighted are approved.

Reference/Drawing No.	Title/Description	Prepared By	Date/s
Sheet 1 of 6	General Arrangement	Tony Mexon & Associates	23 February 2016
Sheet 3 of 6	Stage 1 Works	Tony Mexon & Associates	23 February 2016
Sheet 4 of 6	Stage 2 Works	Tony Mexon & Associates	23 February 2016
Sheet 5 of 6	Cross Section A-A	Tony Mexon & Associates	23 February 2016
Sheet 6 of 6	Cross Section C-C	Tony Mexon & Associates	23 February 2016
Surface and Groundwater Management Plan Version 7		Bio-Recycle Australia Pty Ltd	3/08/2016
Statement of Environmental Effects		AECOM	15/07/2016

Note 1: Modifications to the approved plans will require the lodgement and consideration by Council of a modification pursuant to Section 96 of the *Environmental Planning and Assessment Act, 1979*.

Note 2: The approved plans and supporting documentation may be subject to conditions imposed under section 80A(1)(g) of the Act modifying or amending the development (refer to conditions of consent which must be satisfied prior to the issue of any Construction Certificate).

1.2 Damage on Council Assets

Any existing infrastructure damaged due to the proposed works including, but not limited to, (roads, services, drainage, pipes, guardrails, etc.) is to be repaired or replaced at the applicant's expense. The Applicant must notify Singleton Council Infrastructure or Development Engineering immediately when the structure is damaged.

1.3 Road Act Approval

In case of any asset damage along Lemington Road (from the New England Highway to the entrance of the mining site) the applicant is to submit a Section 138 application in order to obtain a permit with conditions prior to starting works on Council Road Reserve, and at the end, a Certificate of Compliance from Singleton Council Infrastructure Department is to be obtained. All works are to be carried out in accordance with the Singleton Council Development Construction Specifications and details are to be submitted at the time of the application.

1.4 Legal Drainage Point of Discharge

All stormwater from the working area must be directed to a lawful point of discharge such that it does not adversely affect surrounding or downstream properties.

1.5 Leachate Dam Design

Singleton Council request a Compliance Certificate from a qualified practicing Geotechnical/Dams Engineer stating structural adequacy of the dam and that earthworks have been carried out in accordance with the AS 3798-2007 – Guidelines on Earthworks for Commercial and Residential Developments.

The Compliance Certificate along with any correspondence from the Environmental Protection Authority EPA must be submitted to Council prior to filling of the dam.

Condition during the ongoing use of the development

2.1 Waterways Contamination

All reasonable and practicable measures must be taken to prevent pollution of any existing waterways as a result of silt or untreated leachate run-off, and oil or grease spills from any machinery. Wastewater for cleaning equipment must not be discharged or in-directly to any watercourses or stormwater systems.

Integrated Development Terms of Approval

3.1 Integrated Development General Terms of Approval

The following approval bodies have given general terms of approval in relation to the development, as referred to in Section 93 of the *Environmental Planning and Assessment Act 1979*:

- a) NSW Environment Protection Authority

The applicant is to comply with all general terms of approval provided by the NSW Environment Protection Authority Notice No: 1544342. All records and reports required under the General Terms of Approval must be made available to Council within 48 hours of any request by Council.

A copy of the General Terms of Approval is attached and forms part of the development consent.

Advices

4.1 Lapsing of Consent

In accordance with Section 95 of the *Environmental Planning and Assessment Act 1979* (as amended), this Development Consent lapses five (5) years after the date from which it operates unless building, engineering or construction work has substantially physically commenced. The building must be completed, in accordance with the approved plans and specifications, within five (5) years from the date when the building was substantially physically commenced.

4.2 Process for Modification

The plans and/or conditions of this Consent are binding and may only be modified upon written request to Council under Section 96 of the *Environmental Planning and Assessment Act, 1979* (as amended). The request shall be accompanied by the appropriate fee and application form. You are not to commence any action, works, contractual negotiations, or the like, on the requested modification unless and until the written authorisation of Council is received by way of an amended consent.

4.3 Review of Determination

In accordance with the provisions of Section 82A of the *Environmental Planning and Assessment Act 1979* (as amended) the applicant can request Council to review this determination. The request must be made within a period of 6 months from the date shown on this determination. A fee, as prescribed under Council's current Management Plan - Fees and Charges, is payable for such a review.

4.4 88b Instrument

An 88B Instrument made pursuant to the *Conveyancing Act 1919* applies to the subject land and it is the owners/applicants responsibility to check the compliance of the works with the instrument.

Other Approvals

Local Government Act 1993 approvals granted under s 78A (5) N/A

General terms of other approvals integrated as part of the consent

- Mine Subsidence Compensation Act 1961
- Protection of the Environment Operations Act 1997

Right of Appeal

To the extent provided for by Section 97 of the Act, an applicant who is dissatisfied with the determination of this application may appeal to the Court within six (6) months of the date of this notice.

Section 98 of the Act provides that an appeal to the Court may be made by an objector who is dissatisfied with the determination of an application for designated development. Such an appeal must be made within 28 days of the date on which notice is given and must be in accordance with the regulations and rules of the court.

Sections 97 and 98 of the Act do not apply in respect of a development consent declared to be valid or validly granted under Section 25C of the Land and Environment Court Act 1979.

Signed on behalf of the consent authority

Signature

Title

Name

Date



Development Planner

Joshua Real

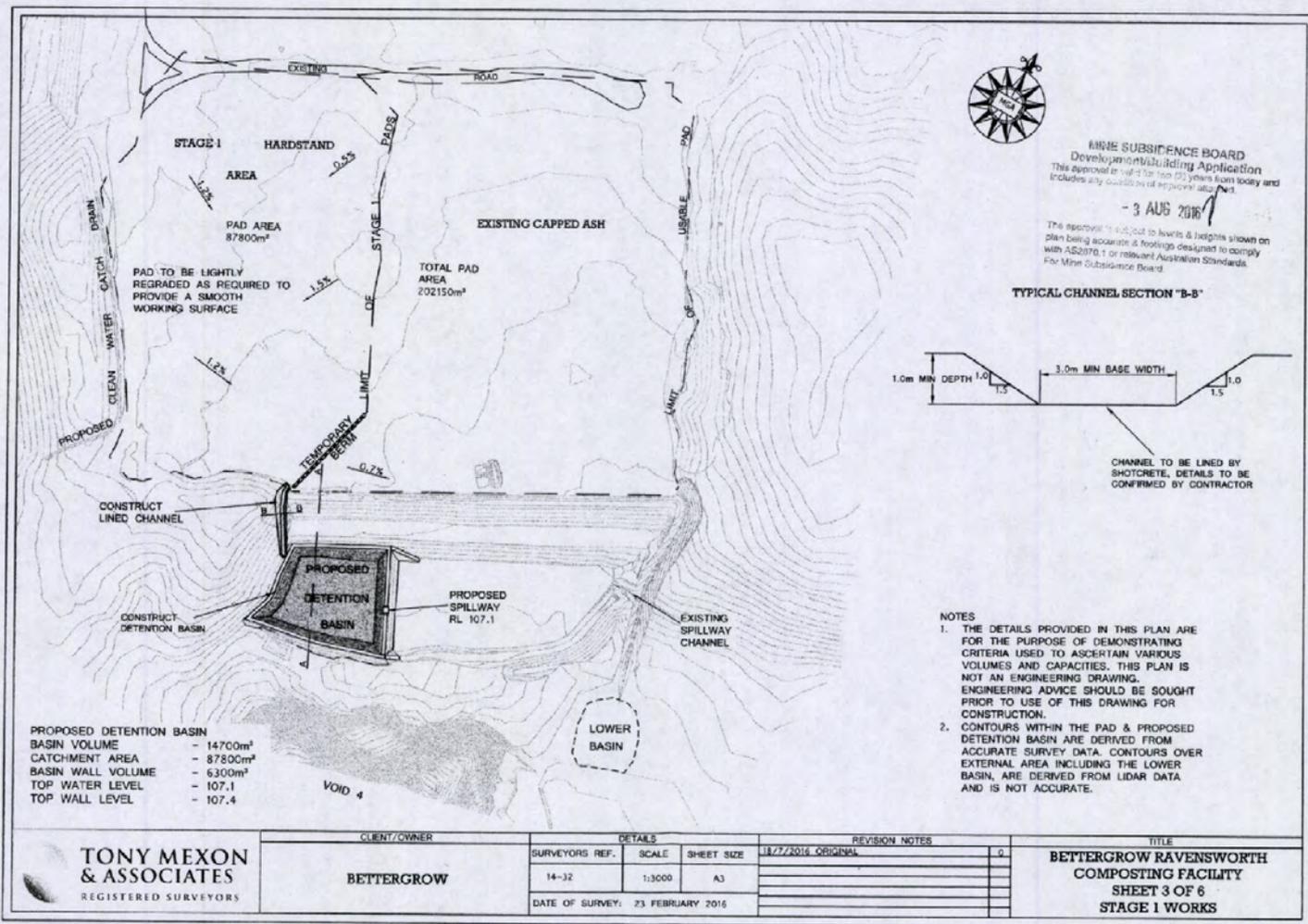
25 November 2016

If you have any inquiries regarding the consent, please contact Joshua Real of Council's Planning & Regulated Services, on (02) 6578 7290.

Note 1

Section 95 of the Act provides that a development consent for the erection of a building does not lapse if the building, engineering or construction work relating to the building is substantially physically commenced on the land to which the consent applies before the date on which consent would otherwise lapse.

Appendix B. Approved Plans



PROPOSED DETENTION BASIN

BASIN VOLUME	- 14700m³
CATCHMENT AREA	- 87800m²
BASIN WALL VOLUME	- 6300m³
TOP WATER LEVEL	- 107.1
TOP WALL LEVEL	- 107.4

- NOTES
1. THE DETAILS PROVIDED IN THIS PLAN ARE FOR THE PURPOSE OF DEMONSTRATING CRITERIA USED TO ASCERTAIN VARIOUS VOLUMES AND CAPACITIES. THIS PLAN IS NOT AN ENGINEERING DRAWING. ENGINEERING ADVICE SHOULD BE SOUGHT PRIOR TO USE OF THIS DRAWING FOR CONSTRUCTION.
 2. CONTOURS WITHIN THE PAD & PROPOSED DETENTION BASIN ARE DERIVED FROM ACCURATE SURVEY DATA. CONTOURS OVER EXTERNAL AREA INCLUDING THE LOWER BASIN, ARE DERIVED FROM LIDAR DATA AND IS NOT ACCURATE.

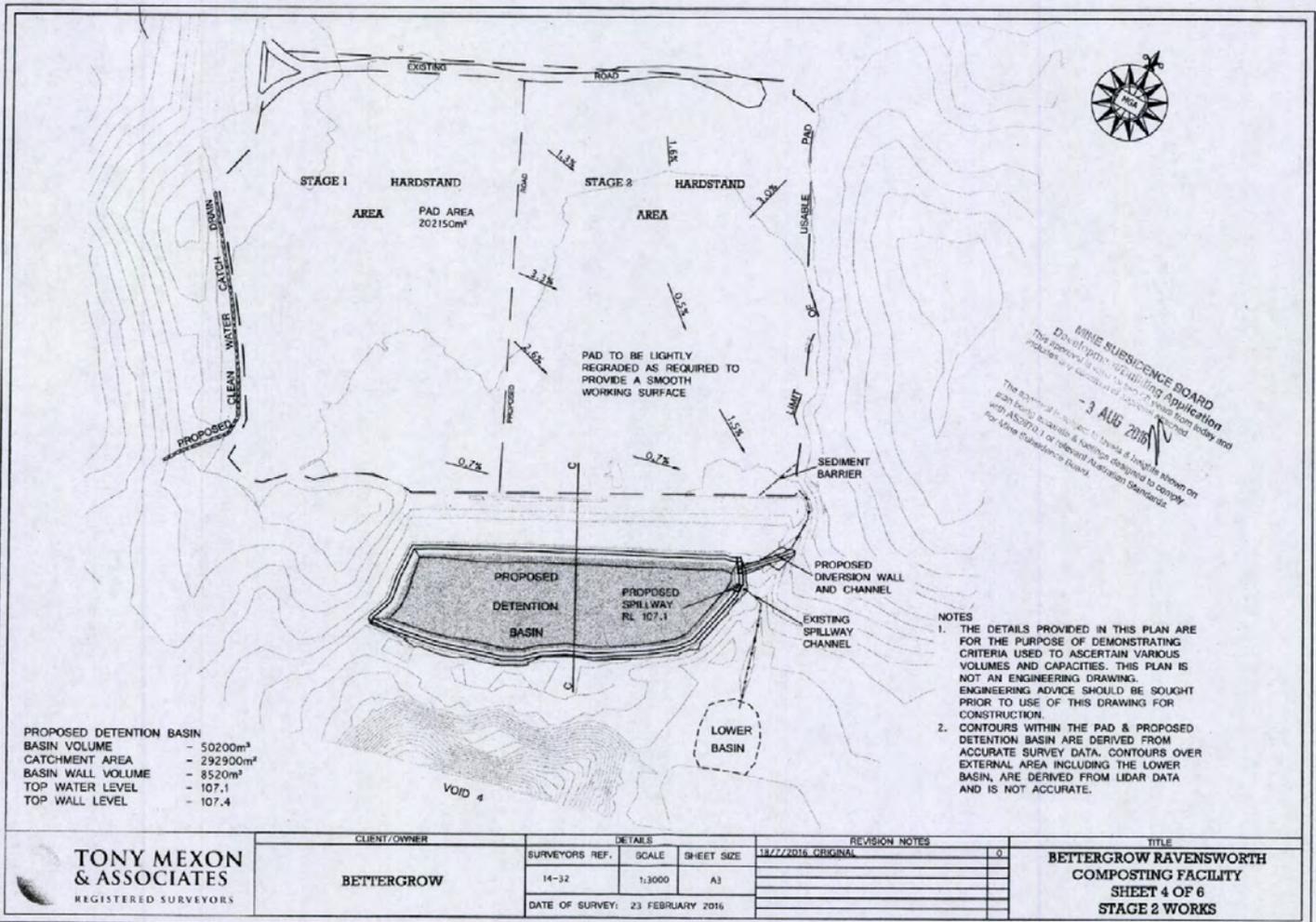
<p>TONY MEXON & ASSOCIATES REGISTERED SURVEYORS</p>	CLIENT/OWNER	DETAILS			REVISION NOTES	TITLE
	BETTERGROW	SURVEYORS REF.	SCALE	SHEET SIZE	1A/7/2016 ORIGINAL	BETTERGROW RAVENSWORTH COMPOSTING FACILITY SHEET 3 OF 6 STAGE 1 WORKS
		14-32	1:3000	A3		
	DATE OF SURVEY: 23 FEBRUARY 2016					

SINGLETON COUNCIL

Approved Plans for Development Consent No: DA140/2016

Date of Approval: 25/11/2016

Assessment Officer: Joshua Real
Title: Development Planner



PROPOSED DETENTION BASIN
 BASIN VOLUME - 50200m³
 CATCHMENT AREA - 292900m²
 BASIN WALL VOLUME - 8520m³
 TOP WATER LEVEL - 107.1
 TOP WALL LEVEL - 107.4

- NOTES
1. THE DETAILS PROVIDED IN THIS PLAN ARE FOR THE PURPOSE OF DEMONSTRATING CRITERIA USED TO ASCERTAIN VARIOUS VOLUMES AND CAPACITIES. THIS PLAN IS NOT AN ENGINEERING DRAWING. ENGINEERING ADVICE SHOULD BE SOUGHT PRIOR TO USE OF THIS DRAWING FOR CONSTRUCTION.
 2. CONTOURS WITHIN THE PAD & PROPOSED DETENTION BASIN ARE DERIVED FROM ACCURATE SURVEY DATA. CONTOURS OVER EXTERNAL AREA INCLUDING THE LOWER BASIN, ARE DERIVED FROM LIDAR DATA AND IS NOT ACCURATE.

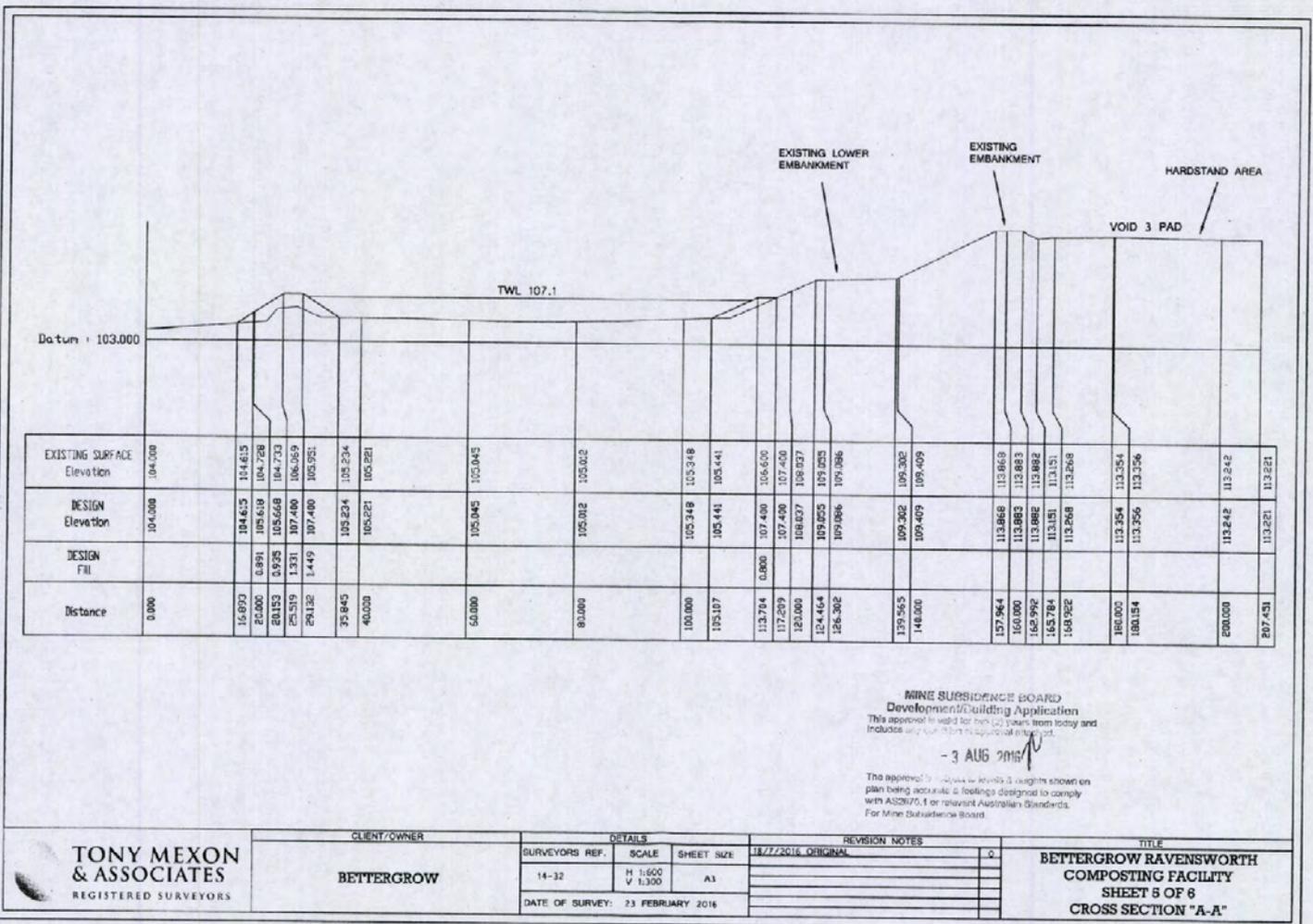
TONY MEXON & ASSOCIATES REGISTERED SURVEYORS	CLIENT/OWNER	DETAILS			REVISION NOTES	TITLE
	BETTERGROW	SURVEYORS REF.	SCALE	SHEET SIZE	18/7/2016 ORIGINAL	BETTERGROW RAVENSWORTH COMPOSTING FACILITY SHEET 4 OF 6 STAGE 2 WORKS
		14-32	1:3000	A3		
	DATE OF SURVEY:	23 FEBRUARY 2016				

SINGLETON COUNCIL

Approved Plans for Development Consent No: DA140/2016

Date of Approval: 25/11/2016

Assessment Officer: Joshua Real
Title: Development Planner



MINE SUBSIDENCE BOARD
 Development/Building Application
 This approval is valid for ten (10) years from today and
 includes any future development applications.
 - 3 AUG 2016
 The approval is subject to the conditions of loading shown on
 plan being accurate & loading designed to comply
 with AS2670.1 or relevant Australian Standards.
 For Mine Subsidence Board.

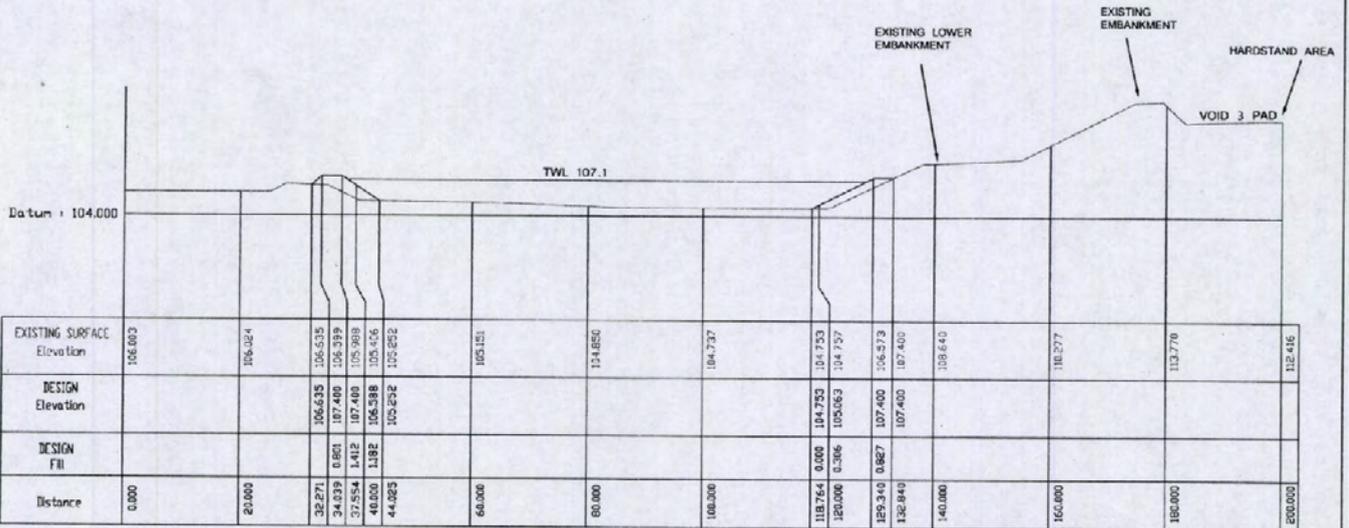
TONY MEXON & ASSOCIATES REGISTERED SURVEYORS	CLIENT/OWNER	DETAILS		REVISION NOTES	TITLE
	BETTERGROW	SURVEYORS REF.	SCALE	SHEET SIZE	18/7/2016 ORIGINAL
		14-32	H 1:600 V 1:300	A3	
	DATE OF SURVEY: 23 FEBRUARY 2016				BETTERGROW RAVENSWORTH COMPOSTING FACILITY SHEET 5 OF 6 CROSS SECTION "A-A"

SINGLETON COUNCIL

**Approved Plans for Development
 Consent No: DA140/2016**

Date of Approval: 25/11/2016

**Assessment Officer: Joshua Real
 Title: Development Planner**



MINE SUBSIDENCE BOARD
 Development Building Application
 This approval is valid for the (5) years from issue and includes any work that is approved as a result.
 - 3 AUG 2016
 The approval is subject to the conditions & heights shown on this plan and any other conditions attached to comply with AS/NZS 1171 or relevant Australian Standards. For Mine Subsidence Board.

TONY MEXON & ASSOCIATES REGISTERED SURVEYORS	CLIENT/OWNER	DETAILS			REVISION NOTES	TITLE
	BETTERGROW	SURVEYORS REF.	SCALE	SHEET SIZE	18/7/2016 ORIGINAL	BETTERGROW RAVENSWORTH COMPOSTING FACILITY SHEET 6 OF 6 CROSS SECTION "C-C"
		14-32	H 1:600 V 1:300	A3		
		DATE OF SURVEY:	23 FEBRUARY 2016			

SINGLETON COUNCIL

Approved Plans for Development Consent No: DA140/2016

Date of Approval: 25/11/2016

Assessment Officer: Joshua Real
Title: Development Planner

Appendix C. Leachate Storage Construction Quality Assurance



**Ravensworth Composting Pad Leachate
Detention Basin**

Construction Report

AGL Macquarie

16 May 2017

Revision: 1

Reference: 224159

*Bringing ideas
to life*

Document control record

Document prepared by:

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Client contact		Matthew Parkinson		Client reference		4500303713	
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0	9 May 2017	Draft for comment	M Ludeke	J Keane		L Karabesinis	
1	16 May 2017	Final version	M Ludeke				
Current revision		1					

Approval			
Author signature		Approver signature	
			
Name		Name	
Matt Ludeke		Loni Karabesinis	
Title		Title	
Dams Engineer		Technical Director, Energy Services	



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3	Inspections	3
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	4.2 Compaction tests	3
5	Conclusion	4

Appendices

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Appendix B	Inspection Reports
Appendix C	Test Certificates
Appendix D	Drawings

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1 Introduction

Aurecon have been engaged by AGL Macquarie to conduct periodic inspections during the construction of the leachate detention basin adjacent to the Ravensworth Void 3 (RWV3) Composting Pad.

The following report summarises the inspections and materials testing undertaken during construction to ensure the specification and design principals have been met. It is understood that this report is required to fulfil approval conditions set by the NSW Environmental Protection Authority (EPA) for the new composting facility.

As part of the approval conditions set for the project, the EPA have referenced the document: 'environmental guidelines: composting and related organics processing facilities'. The key engineering risk identified for this project was to limit the leachate migration from the composting facility, by providing an effective sealing barrier, with a permeability of $10 \text{ e}^{-9} \text{ m/s}$ or less.

2 Design Details

The purpose of the new leachate detention basin is to capture storm runoff from the proposed RWV3 composting facility. The leachate detention basin will be enclosed on the southern and eastern sides by two new embankments up to 1.5 m in height. The northern and western perimeters will have earthfill buttresses added to the existing batters, to separate and seal the pond storage area from the loose overburden.

Runoff will arrive at the north western side of the dam, via a shotcrete lined channel, that connects the composting pad area to the leachate detention basin. This channel has sufficient capacity to discharge the peak flow during a 1 in 100 Annual Exceedance Probability (AEP) storm.

The dam has sufficient storage volume available to detain up to the 1 in 100 AEP, 24 hour storm event, without overtopping. As a protective measure, a small overflow spillway is provided at RL 107.1 m on the eastern wall, to assist in discharging storms above the design level, before overtopping of the embankments.

The leachate detention basin is enclosed and lined by mine overburden material. This overburden material was derived from extremely weathered to fresh, interbedded mudstone, siltstone and medium to fine grained lithic sandstone. This material has been bulk blasted and removed by dragline, producing a mixed spoil with a large range in particle sizes, which are largely coarse grained and up to several metres diameter. The spoil also contains some coal from thin uneconomic coal seams, which were included in the overburden material. As a result, the physical properties of the in-situ spoil are highly variable.

As this project relies on this spoil to form the enclosing embankments, and will be left in place for the floor sealing layer, an understanding of the material permeability is required. Due to the small scale and low risk of this project, spoil properties have been determined from laboratory testing for several other projects in the Ravensworth area, and no detailed sampling and laboratory testing program has been undertaken for the design of this facility (prior to construction). The historical test results are summarised in Table 1.



Table 1 Previous permeability test results

Sample	MDD (t/m ³)	OMC (%)	Permeability (m/s)
606617	1.90	13.0	3 x10 ⁻¹⁰ (sample remoulded to 95 % MDD)
606618	1.88	13.0	6 x10 ⁻¹⁰ (sample remoulded to 98 % MDD)
606619	1.89	13.5	2 x10 ⁻⁹ (sample remoulded to 98 % MDD)

MMD – Maximum Dry Density

OMC – Optimum Moisture Content

Therefore, based on historical testing, it can be demonstrated that by achieving compacting the spoil material to a minimum 95 % MDD, than a satisfactorily low permeability can be achieved.

2.1 Materials specification

The following material specification was developed for the project to ensure

Zone 3A – Select earthfill

This material is processed from existing local overburden deposits.

The material should have a particle size distribution generally in accordance with Table 1.

Table 2 Zone 3A particle size distribution specification

Sieve size (mm)	Percent passing (not less than)
200	80
75	50
2.36	20
0.075	10

The maximum particle size (prior to compaction) of Zone 3A shall be 300 mm.

Material shall be compacted to 98 % maximum dry density at ± 1 % optimum moisture content.

Material shall be dumped and spread in continuous horizontal layers and compacted to a thickness not exceeding 400 mm.

Material shall be watered as required for dust control and moisture content correction.

No fill shall be placed on an area on which free water has ponded. If any area has been softened by wet weather or traffic, the surface of the previous compacted layer shall be scarified to a depth of at least 50 mm.

Zone 4 – Riprap protection

Material to match batter protection in the existing spillway.

This shall be hard, dense and durable rockfill, free of defects that may lead to deterioration in exposed wet conditions.

The maximum particle size shall nominally be 500 mm, with a minimum particle size of 100 mm.

Material shall be dumped and spread in a manner to ensure segregation of large and small rocks does not occur and that rip rap sits stable on the batter without any tendency to slide.

No compaction is required.

3 Inspections

A total of three inspections were completed during the construction of the leachate detention basin.

Each of the inspections confirmed that the construction was proceeding in accordance with the design and specification.

A copy of each of the inspection reports are included in Appendix B.

4 Verification Testing

Material testing was completed during construction to verify the sealing layer underlying the detention pond and composting pad.

Permeability testing was undertaken on samples collected from the overburden material used to construct the composting pad and line the floor of the leachate detention basin. These samples were used to demonstrate the permeability that could be achieved, given that a certain minimum level of compaction is achieved (i.e. compaction to within 95 % of the maximum dry density).

The second set of testing, was to check the density achieved in-situ at the construction site.

The results collected from both these testing sets will verify the in-situ permeability achieved.

4.1 Permeability

Permeability has been tested by undertaking constant head tests using a flexible wall permeameter, appropriately selected for analysing conditions likely to be encountered when the leachate detention basin is full of water after a storm event.

Table 3 Permeability testing

Lab ID	MDD (t/m ³)	OMC (%)	Permeability (m/s)	Preparation
S20884	1.733	15.7	1.8 e ⁻¹⁰	Sample compacted to 95 % MDD
S20885	1.685	17.4	1.8 e ⁻¹⁰	Sample compacted to 95 % MDD
S20886	1.755	13.5	1.6 e ⁻⁹	Sample compacted to 95 % MDD
S20887	1.762	12.8	2.0 e ⁻⁹	Sample compacted to 95 % MDD
S20888	1.676	17.3	2.1 e ⁻¹⁰	Sample compacted to 95 % MDD
S20889	1.689	16.0	1.5 e ⁻¹⁰	Sample compacted to 95 % MDD
S20890	1.818	16.7	2.8 e ⁻⁹	Sample compacted to 95 % MDD
S20891	1.799	16.6	7.4 e ⁻¹⁰	Sample compacted to 95 % MDD

Within the document: 'environmental guidelines: composting and related organics processing facilities', a target permeability of less 10 e⁻⁷ m/s is recommended for any hardstand compost processing area and permeability of less than 10 e⁻⁹ m/s is recommended for any leachate detention pond.

All samples were found to pass both permeability specifications, provided a minimum compaction of 95 % MDD is achieved.

4.2 Compaction tests

It has been established as part of the design, that should 95 % maximum dry density be achieved from the earthworks, this would form a sufficiently low permeability floor for the leachate detention basin.

Hilf density testing (by use of a field nuclear density gauge) has been completed in-situ on prepared surfaces to verify the level of compaction achieved, in comparison to maximum dry density.

Table 4 Summary of hilf density ratio testing

Test ID	Relative Compaction (% MDD)	Moisture Variation (% OMC)
16-2461	103.5	- 5.0
16-2462	99.5	- 4.5
16-2463	100.0	- 5.0
16-2464	102.5	- 4.0
17-1	99.0	- 4.5
17-2	95.5	- 4.5
17-3	101.0	- 4.5
17-4	100.5	- 4.5
17-63	100.5	- 4.5
17-64	100.5	- 4.5
17-65	104.0	- 4.0
17-66	103.0	- 4.5
17-888	100.5	- 3.5
17-889	105.0	- 3.0
17-890	105.0	- 3.0
17-891	105.5	- 4.0
Target	> 95	± 5

While all samples were found to be drier than OMC, this has not affected the soils ability to approach the MDD under compaction effort, as material breakdown has occurred during compaction. This affect should assist in reducing the permeability of the sealing layer.

5 Conclusion

After analysing the results of the site inspections and material testing, it can be concluded that the Leachate detention basin has been constructed to a satisfactory standard and meets the intent of the design and engineering specification.

All tests undertaken to date have met the engineering specification and are well within the acceptable limits presented within the 'environmental guidelines: composting and related organics processing facilities'. As a result, the dam also meets the approval conditions set by the NSW EPA.

Signed,



Senior Dams Engineer

Aurecon Australasia Pty Ltd

Appendix A
Limitations Statement





Appendix A

Limitations Statement

Exclusive Benefit and Reliance

This report has been prepared by Aurecon Pty Ltd, at the request of and exclusively for the benefit and reliance of its Client.

This report is not a warranty or guarantee. It is a report scoped in accordance with the Client's instructions, having due regard to the assumptions that Aurecon Pty Ltd can be reasonably expected to make in accordance with sound engineering practice and exercising the obligations and the level of skill, care and attention required of it under this contract.

Third Parties

It is not possible to make a proper assessment of the report without a clear understanding of the terms of engagement under which the report has to be prepared, including the scope of the instructions and directions given to and the assumptions made by the engineer who has prepared the report.

The report is scoped in accordance with the instructions given by or on behalf of the Client. The report may not address issues which would need to be addressed with a third party if that party's particular circumstances, requirements and experience with such reports were known and may make assumptions about matters of which a third party is not aware.

Aurecon therefore does not assume responsibility for the use of the report by any third party and the use of the report by any third party is at the risk of that party.

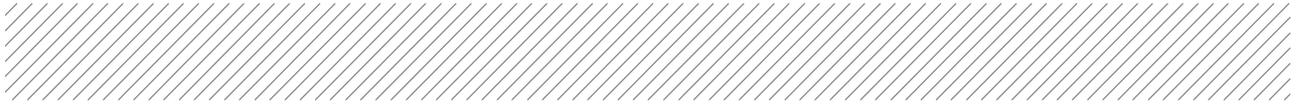
Limits of Investigation and Information

The report is also based on information provided to Aurecon by other parties. The report is provided strictly on the basis that the information that has been provided can be relied on and is accurate, complete and adequate.

Aurecon takes no responsibility and disclaims all liability whatsoever for any loss or damage that the client may suffer resulting from any conclusions based on information provided to Aurecon, except to the extent that Aurecon expressly indicates in the report that it has verified the information to its satisfaction.

Appendix B
Inspection Reports





Appendix B

Inspection Reports

Site inspection report 9 December 2016

Site inspection report 6 January 2017

Site inspection report May 2017

Memorandum

To	John Vyse	From	Matt Ludeke
Copy	Matthew Parkinson	Reference	224159
Date	14 December 2016	Pages (including this page)	5
Subject	Ravensworth Void 3 Sedimentation Dam		

Aurecon have been engaged by AGL Macquarie to conduct periodic inspections during the construction of the Sedimentation Dam adjacent to the Ravensworth Void 3 Composting Pad.

The following report summarises a construction inspection carried out on 8 November 2016. The aim of the current inspection was to check the sealing layer compaction and new embankment foundation areas.

1 Dam Design

The purpose of the new sedimentation dam is to capture storm runoff from the proposed Void 3 composting facility. The sedimentation dam will be enclosed on the southern and eastern sides by two new embankments up to 1.5 m in height. The northern and western perimeters will have earthfill buttresses added to the existing batters, to separate and seal the pond storage area from the loose overburden.

Runoff will arrive at the north western side of the dam, via a shotcrete lined channel, that connects the composting pad area to the sedimentation dam. This channel has sufficient capacity to discharge the peak flow during a 1 in 100 year storm.

The dam has sufficient storage volume available to detain up to the 1 in 100 year, 24 hour storm event, without overtopping. A small overflow spillway will be provided at RL 107.1 m on the eastern wall, to assist in discharging storms above the design level, before overtopping the embankments.

2 Previous Recommendations

None – first inspection.

3 Observations

Photographs collected during the inspection have been provided to the rear of this memo.

- Earthworks have commenced on site, and the full floor of the new sedimentation pond had been cleared and levelled using a dozer.
- A vibrating sheepsfoot roller was being utilised to compact the full pond floor area.
- The areas towards the western edge were well compacted, and should set the target for the remainder of the floor.
- It was observed that a few large boulders had been uncovered in the floor area. It was discussed that these should not be removed, as this activity will significantly disturb a large area and may only uncover additional voids and boulders in the spoil material. It was recommended to leave them in place and compact over the top.
- Topsoil and vegetation had been removed from the areas to receive fill (the new enclosing embankments). All areas appeared satisfactory and ready to receive the first layer of fill.

- Excavations for the spillway connecting the composting pad and the sedimentation dam had commend. Material uncovered appears suitable and should perform satisfactorily under the finishing shotcrete.

4 Design changes

None.

5 Recommendations

The site inspection revealed that preparation works for sedimentation dam were being completed in accordance with the design and specification. The following recommendations were discussed on site:

- Undertake a minimum 6 compaction tests around the sedimentation dam embankments. These should be completed over two trips to site, to ensure sampling at separate fill levels.
- Continue compaction operations around the remainder of the sedimentation dam floor area, to replicate the seal achieved along the western side.
- Leave all boulders in place within the floor and compact over the top.



Photo 1 Looking north from the southern fringe over the prepared floor area



Photo 2 Looking east from the western fringe over the prepared floor area



Photo 3 Looking south along the western perimeter prepared floor



Photo 4 Looking west along the southern embankment



Photo 5 Channel connecting the composting pad and the sedimentation dam

Memorandum

To	John Vyse	From	Matt Ludeke
Copy	Matthew Parkinson	Reference	224159
Date	16 January 2017	Pages (including this page)	6
Subject	Ravensworth Void 3 Sedimentation Dam		

Aurecon have been engaged by AGL Macquarie to conduct periodic inspections during the construction of the Sedimentation Dam adjacent to the Ravensworth Void 3 Composting Pad.

The following report summarises a construction inspection carried out on 6 January 2017. The aim of the current inspection was to check the construction of the new embankments and progress on the channel construction.

1 Dam Design

The purpose of the new sedimentation dam is to capture storm runoff from the proposed Void 3 composting facility. The sedimentation dam will be enclosed on the southern and eastern sides by two new embankments up to 1.5 m in height. The northern and western perimeters will have earthfill buttresses added to the existing batters, to separate and seal the pond storage area from the loose overburden.

Runoff will arrive at the north western side of the dam, via a shotcrete lined channel, that connects the composting pad area to the sedimentation dam. This channel has sufficient capacity to discharge the peak flow during a 1 in 100 year storm.

The dam has sufficient storage volume available to detain up to the 1 in 100 year, 24 hour storm event, without overtopping. A small overflow spillway will be provided at RL 107.1 m on the eastern wall, to assist in discharging storms above the design level, before overtopping of the embankments.

2 Previous Recommendations

- Undertake a minimum 6 compaction tests around the sedimentation dam embankments. These should be completed over two trips to site, to ensure sampling at separate fill levels.
- Continue compaction operations around the remainder of the sedimentation dam floor area, to replicate the seal achieved along the western side.
- Leave all boulders in place within the floor and compact over the top.

3 Observations

Photographs collected during the inspection have been provided to the rear of this memo.

- Earthworks for the sedimentation dam have almost been completed on site. The new embankments along the eastern and southern fringes have been constructed to design level and appear to be well compacted (Photographs 1 and 2).
- The upstream face of each new embankment is well constructed and appropriately battered (Photograph 3).
- The overflow spillway have been provided on the eastern embankment, as per the design.

- It was reported that after some slightly wet weather in the past two weeks, some rainfall had ponded within the sedimentation, towards the eastern end. This indicates that the compaction effort has likely achieved a good result, with respect to sealing of the floor.
- The eastern fringe is well compacted and in good condition (Photograph 4). A small pile of boulders was been stockpiled (won during earthworks activities), to be used as riprap protection in the overflow spillway.
- It is understood that the compaction tests have all been undertaken and initial reports indicate a good level of compaction has been achieved. Test certificates are expected from the contractor within the week.
- Excavations for the spillway channel connecting the composting pad and the sedimentation dam have almost completed (Photograph 5). This channel is to be shotcreted.
- A channel has been excavated at the top side of the spillway channel, exposing bottom ash (Photograph 6). It is intended to backfill this with compacted spoil material. This design change was implemented by site staff, to increase the protection against scouring erosion in this area, as it was found that only limited capping was placed over the ash in this area (approximately 100 mm thick).

4 Design changes

Spillway channel approach:

The approach towards the spillway channel has been over excavated and backfilled with compacted spoil to increase the resistance to scouring erosion in this area.

5 Recommendations

The site inspection revealed that earthworks for sedimentation dam were being completed in accordance with the design and specification. The following recommendations were discussed on site:

- Place rockfill around the upstream (inside) section and crest of the sedimentation basin overflow spillway (located on the eastern embankment).
- Forward compaction test results once they become available.



Photo 1 Looking north along the crest of the eastern sedimentation basin embankment



Photo 2 Looking west along the crest of the southern sedimentation basin embankment



Photo 3 Looking east along the upstream face of the southern sedimentation basin embankment



Photo 4 Looking south along the western fringe of the sedimentation basin



Photo 5 Channel connecting the composting pad and the sedimentation basin



Photo 6 Approach of the overflow spillway channel

Memorandum

To	John Vyse	From	Matt Ludeke
Copy	Matthew Parkinson	Reference	224159
Date	9 May 2017	Pages (including this page)	7
Subject	Ravensworth Void 3 Sedimentation Dam		

Aurecon have been engaged by AGL Macquarie to conduct periodic inspections during the construction of the Sedimentation Dam adjacent to the Ravensworth Void 3 Composting Pad.

The following report summarises a construction inspection carried out on 5 May 2017. The aim of the current inspection was to check the construction of the spillway.

1 Dam Design

The purpose of the new sedimentation dam is to capture storm runoff from the proposed Void 3 composting facility. The sedimentation dam will be enclosed on the southern and eastern sides by two new embankments up to 1.5 m in height. The northern and western perimeters will have earthfill buttresses added to the existing batters, to separate and seal the pond storage area from the loose overburden.

Runoff will arrive at the north western side of the dam, via a shotcrete lined channel, that connects the composting pad area to the sedimentation dam. This channel has sufficient capacity to discharge the peak flow during a 1 in 100 year storm.

The dam has sufficient storage volume available to detain up to the 1 in 100 year, 24 hour storm event, without overtopping. A small overflow spillway will be provided at RL 107.1 m on the eastern wall, to assist in discharging storms above the design level, before overtopping of the embankments.

2 Previous Recommendations

- Place rockfill around the upstream (inside) section and crest of the sedimentation basin overflow spillway (located on the eastern embankment).
- Forward compaction test results once they become available.

3 Observations

Photographs collected during the inspection have been provided to the rear of this memo.

- Earthworks for the detention basin have been completed on site. The new embankments along the eastern and southern fringes have been constructed to design level, show no signs of instability and appear to be well compacted (Photograph 1).
- The rock lined overflow section has been provided on the eastern embankment, as per the design (Photograph 2).
- The spillway that connects the composting pad to the detention basin has been completed by shotcrete lining the channel (Photographs 3 and 4). A few rocks have been placed in the shotcrete as baffles for the flow during heavy storms.
- Two surface drains have been completed along the perimeter of the composting pad (Photographs 5 and 6). The eastern drain is unlined, while the southern drain (leading to the spillway) has been lined by shotcrete.

- Both drains are fairly shallow, so a quick hydrological check has been completed on these drains - see section 5.
- A large section of the composting pad has been completed (Photograph 7).

4 Design changes

None applicable for this inspection.

5 Composting pad

At the request of AGL Macquarie, we have also completed a quick hydrological check on the surface drains around the perimeter of the composting pad. As the pad is currently smaller than the original design, this has limited the catchment area reporting to each drain.

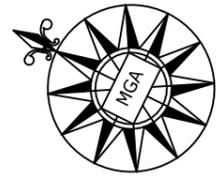
The drains were measured to be roughly between 100 to 250 mm deep, and 900 mm wide at the base.

With reference to the latest survey plan (enclosed to the rear of this memo), the revised catchment areas reporting to each perimeter drain have been estimated. The drains appear to have sufficient capacity to discharge the peak flow resulting from the 1 in 100 AEP storm event.

6 Conclusions

The site inspection revealed that earthworks for the detention basin were being completed in accordance with the design and specification.

There are no recommendations outstanding from this final inspection.



ROAD

ACCESS

SMOOTH

PAD

AREA

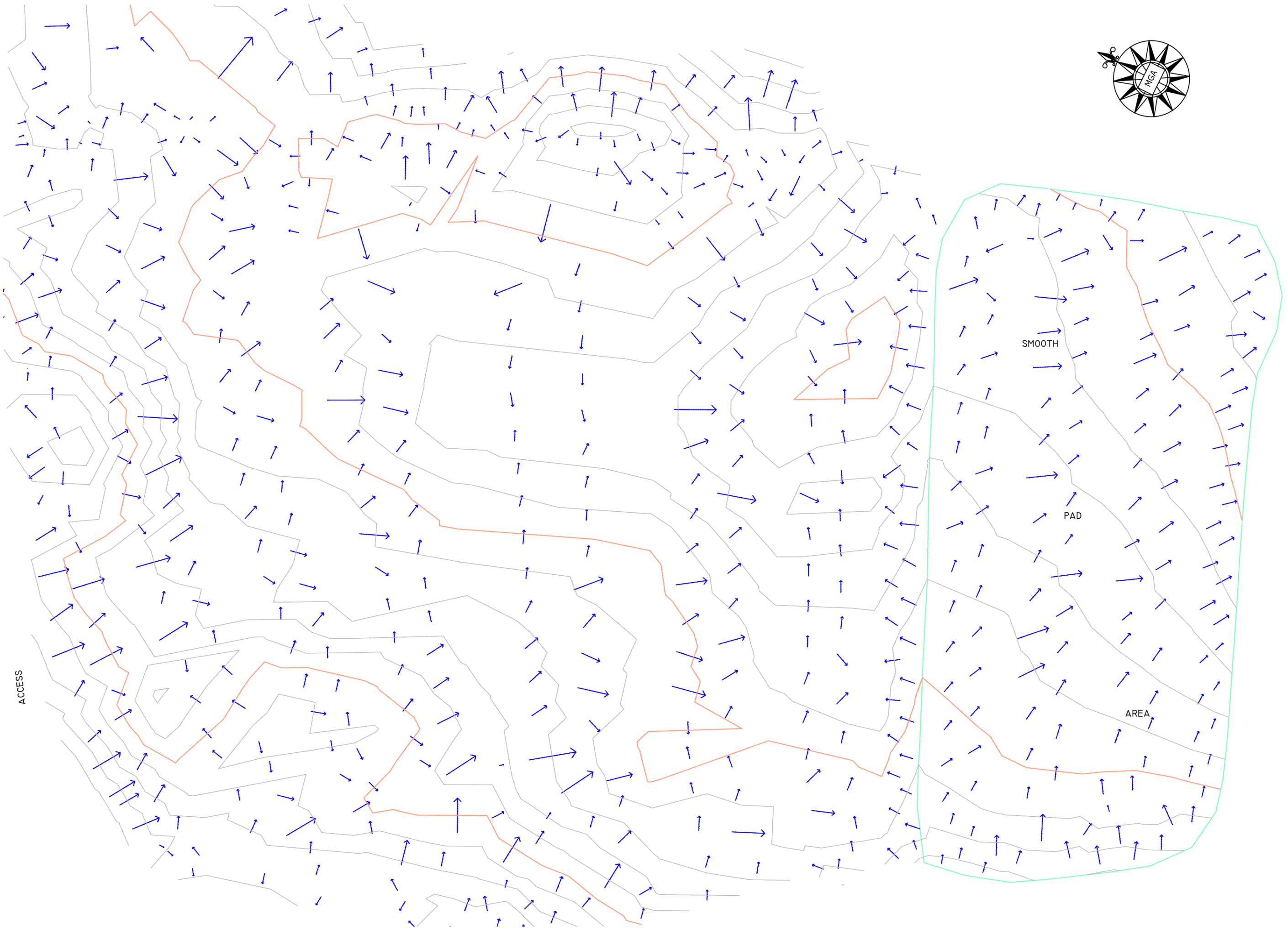




Photo 1 Looking west along the southern upstream face of the detention basin embankment



Photo 2 Rock lined overflow section on the eastern wall of the detention basin



Photo 3 Looking down the shotcreted spillway channel



Photo 4 Looking up the shotcreted spillway channel



Photo 5 Looking along the composting pad eastern perimeter surface drain



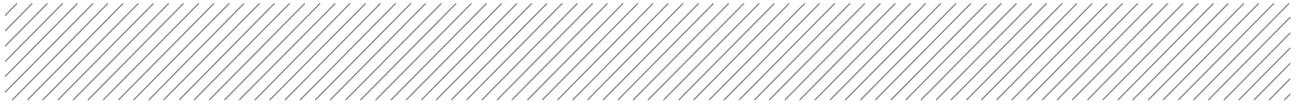
Photo 6 Looking along the composting pad southern perimeter surface drain, leading to the spillway



Photo 7 Looking across the composting pad surface

Appendix C
Test Certificates





Appendix C

Test Certificates

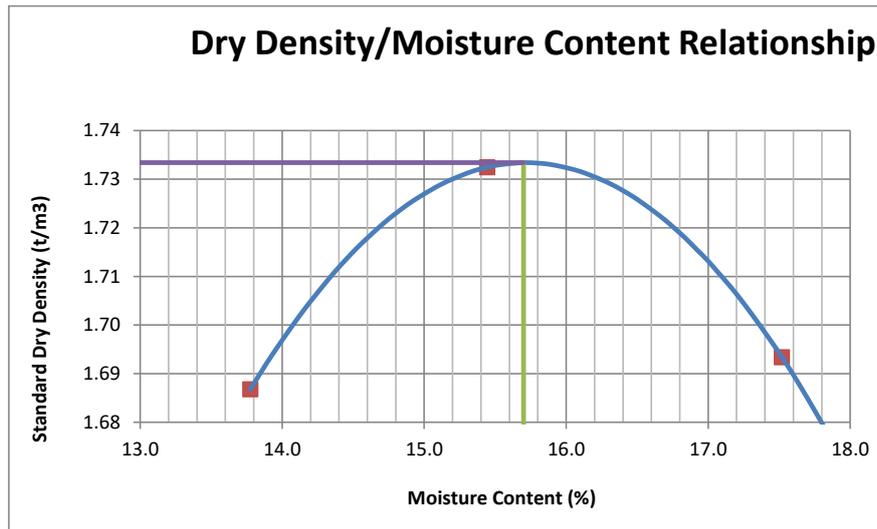
DRY DENSITY / OPTIMUM MOISTURE CONTENT REPORT

Client:	RCA Australia	Source:	Borrow Pit - Location 1
Address:	PO Box 175/ 92 Hill Street, Carrington NSW 2294	Sample Description:	clayey sandy GRAVEL
Project:	Compaction Control Ravensworth Ash Dam (12665)	Report No:	S20884-MDD
Job No:	S17017	Lab No:	S20884

Test Procedure:	<input checked="" type="checkbox"/>	AS1289.5.1.1 Determination of the dry density/moisture content relation of a soil using standard compactive effort
	<input checked="" type="checkbox"/>	AS1289.2.1.1 Determination of the moisture content of a soil - Oven drying method (Standard method)

Sampling:	Sampled by Client	Date Sampled:	16/01/2017
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Preparation:	Prepared in accordance with the test method
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Maximum Dry Density (t/m³)	1.733
Optimum Moisture Content (%)	15.7
Percentage Oversize on 19mm sieve (%)	33
Percentage Oversize on 37.5mm sieve (%)	22

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<p>NATA Accredited Laboratory Number: 14874</p>	<p>Chris Lloyd</p>	<p>Date:</p>	

	<p style="font-size: x-small;">Macquarie Geotechnical Unit 8/10 Bradford Street Alexandria NSW 2015</p>
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DETERMINATION OF PERMEABILITY OF A SOIL - CONSTANT HEAD METHOD USING A FLEXIBLE WALL PERMEAMETER

Client:	RCA Australia	Source:	Borrow Pit - Location 1
Address:	PO Box 175/ 92 Hill Street, Carrington NSW 2294	Sample Description:	clayey sandy GRAVEL
Project:	Compaction Control Ravensworth Ash Dam (12665)	Report No:	S20884-TP
Job No:	S17017	Lab No:	S20884

Test Procedure:	<input checked="" type="checkbox"/>	AS1289 6.7.3	DETERMINATION OF PERMEABILITY OF A SOIL - CONSTANT HEAD METHOD USING A FLEXIBLE WALL PERMEAMETER
	<input checked="" type="checkbox"/>	AS1289 5.1.1	Soil compaction and density tests - Determination of the dry density/moisture content relationship of a soil using standard compactive effort
	<input type="checkbox"/>	AS1289 5.2.1	Soil compaction and density tests - Determination of the dry density/moisture content relationship of a soil using modified compactive effort

Sampling:	Sampled by Client	Date Sampled:	16.1.17
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Preparation:	Prepared in accordance with the test method
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Maximum Dry Density (t/m ³)	1.73	Confining Pressure (kPa)	600
Optimum Moisture Content (%)	15.7	Back Pressure (kPa)	500
Placement Moisture Content (%)	15.7	Mean Effective Stress (kPa)	100
Moisture Ratio (%)	100.0	Material tested passing (mm)	4.75
Placement Dry Density (t/m ³)	1.64	Sample Height (mm)	50.0
Density Ratio (%)	95.0	Sample Diameter (mm)	50.0

PERMEABILITY $k_{(20)} =$ **1.8E-10 (m/sec)**

Comments

Permeant Used: Sydney tap water



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NATA Accredited Laboratory Number: 14874

Authorised Signatory:

[Handwritten Signature]

14/02/2017

Ian Goldschmidt

Date:



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Bradford Street
Alexandria NSW 2015

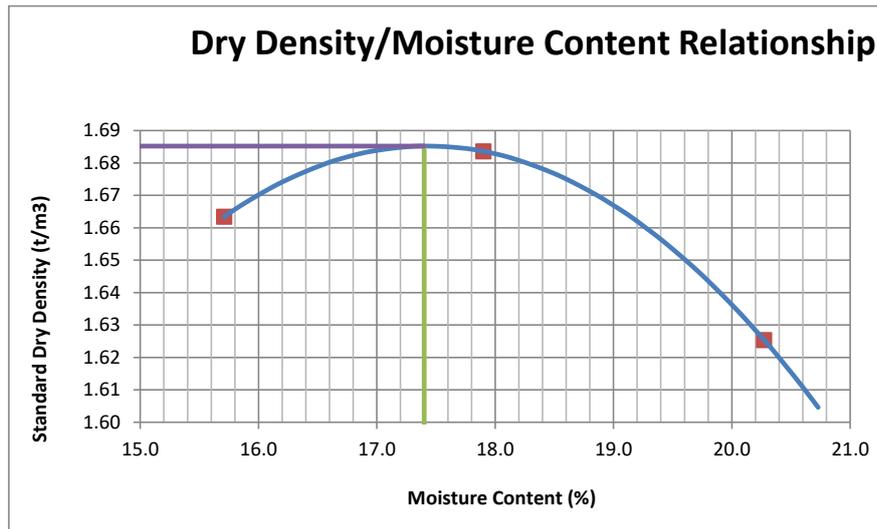
DRY DENSITY / OPTIMUM MOISTURE CONTENT REPORT

Client:	RCA Australia	Source:	Borrow Pit - Location 2
Address:	PO Box 175/ 92 Hill Street, Carrington NSW 2294	Sample Description:	clayey sandy GRAVEL
Project:	Compaction Control Ravensworth Ash Dam (12665)	Report No:	S20885-MDD
Job No:	S17017	Lab No:	S20885

Test Procedure:	<input checked="" type="checkbox"/>	AS1289.5.1.1 Determination of the dry density/moisture content relation of a soil using standard compactive effort
	<input checked="" type="checkbox"/>	AS1289.2.1.1 Determination of the moisture content of a soil - Oven drying method (Standard method)

Sampling:	Sampled by Client	Date Sampled:	16/01/2017
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Preparation:	Prepared in accordance with the test method
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Maximum Dry Density (t/m³)	1.685
Optimum Moisture Content (%)	17.4
Percentage Oversize on 19mm sieve (%)	33
Percentage Oversize on 37.5mm sieve (%)	16

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DETERMINATION OF PERMEABILITY OF A SOIL - CONSTANT HEAD METHOD USING A FLEXIBLE WALL PERMEAMETER

Client:	RCA Australia	Source:	Borrow Pit - Location 2
Address:	PO Box 175/ 92 Hill Street, Carrington NSW 2294	Sample Description:	clayey sandy GRAVEL
Project:	Compaction Control Ravensworth Ash Dam (12665)	Report No:	S20885-TP
Job No:	S17017	Lab No:	S20885

Test Procedure:	<input checked="" type="checkbox"/>	AS1289 6.7.3	DETERMINATION OF PERMEABILITY OF A SOIL - CONSTANT HEAD METHOD USING A FLEXIBLE WALL PERMEAMETER
	<input checked="" type="checkbox"/>	AS1289 5.1.1	Soil compaction and density tests - Determination of the dry density/moisture content relationship of a soil using standard compactive effort
	<input type="checkbox"/>	AS1289 5.2.1	Soil compaction and density tests - Determination of the dry density/moisture content relationship of a soil using modified compactive effort

Sampling:	Sampled by Client	Date Sampled:	16.1.17
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Preparation:	Prepared in accordance with the test method
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Maximum Dry Density (t/m ³)	1.69	Confining Pressure (kPa)	600
Optimum Moisture Content (%)	17.4	Back Pressure (kPa)	500
Placement Moisture Content (%)	17.4	Mean Effective Stress (kPa)	100
Moisture Ratio (%)	100.0	Material tested passing (mm)	4.75
Placement Dry Density (t/m ³)	1.61	Sample Height (mm)	50.0
Density Ratio (%)	95.0	Sample Diameter (mm)	50.0

PERMEABILITY $k_{(20)} =$ **1.8E-10 (m/sec)**

Comments

Permeant Used: Sydney tap water



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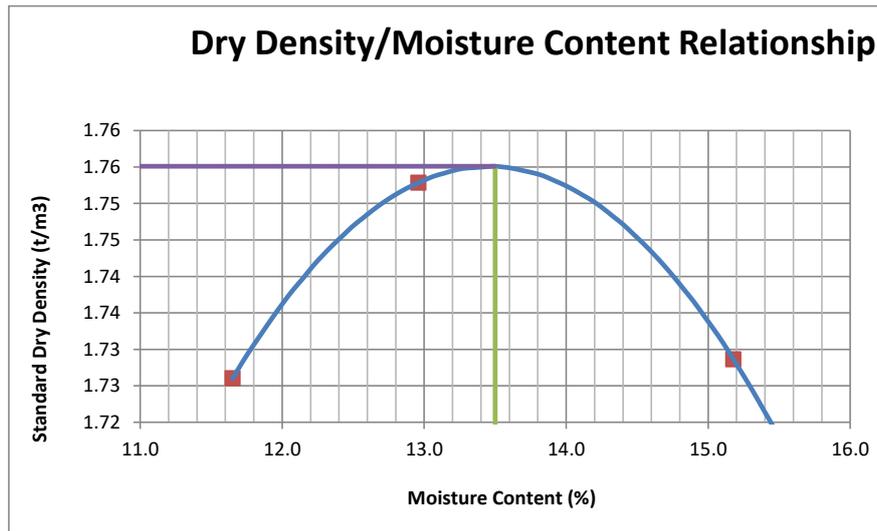
DRY DENSITY / OPTIMUM MOISTURE CONTENT REPORT

Client:	RCA Australia	Source:	Borrow Pit - Location 3
Address:	PO Box 175/ 92 Hill Street, Carrington NSW 2294	Sample Description:	clayey sandy GRAVEL
Project:	Compaction Control Ravensworth Ash Dam (12665)	Report No:	S20886-MDD
Job No:	S17017	Lab No:	S20886

Test Procedure:	<input checked="" type="checkbox"/>	AS1289.5.1.1 Determination of the dry density/moisture content relation of a soil using standard compactive effort
	<input checked="" type="checkbox"/>	AS1289.2.1.1 Determination of the moisture content of a soil - Oven drying method (Standard method)

Sampling:	Sampled by Client	Date Sampled:	16/01/2017
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Preparation:	Prepared in accordance with the test method
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Maximum Dry Density (t/m³)	1.755
Optimum Moisture Content (%)	13.5
Percentage Oversize on 19mm sieve (%)	32
Percentage Oversize on 37.5mm sieve (%)	18

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<p>NATA Accredited Laboratory Number: 14874</p>	<p>Chris Lloyd</p>	<p>Date:</p>	

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DETERMINATION OF PERMEABILITY OF A SOIL - CONSTANT HEAD METHOD USING A FLEXIBLE WALL PERMEAMETER

Client:	RCA Australia	Source:	Borrow Pit - Location 3
Address:	PO Box 175/ 92 Hill Street, Carrington NSW 2294	Sample Description:	clayey sandy GRAVEL
Project:	Compaction Control Ravensworth Ash Dam (12665)	Report No:	S20886-TP
Job No:	S17017	Lab No:	S20886

Test Procedure:	<input checked="" type="checkbox"/>	AS1289 6.7.3	DETERMINATION OF PERMEABILITY OF A SOIL - CONSTANT HEAD METHOD USING A FLEXIBLE WALL PERMEAMETER
	<input checked="" type="checkbox"/>	AS1289 5.1.1	Soil compaction and density tests - Determination of the dry density/moisture content relationship of a soil using standard compactive effort
	<input type="checkbox"/>	AS1289 5.2.1	Soil compaction and density tests - Determination of the dry density/moisture content relationship of a soil using modified compactive effort

Sampling:	Sampled by Client	Date Sampled:	16.1.17
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Preparation:	Prepared in accordance with the test method
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Maximum Dry Density (t/m^3)	1.76	Confining Pressure (kPa)	600
Optimum Moisture Content (%)	13.5	Back Pressure (kPa)	500
Placement Moisture Content (%)	13.5	Mean Effective Stress (kPa)	100
Moisture Ratio (%)	100.0	Material tested passing (mm)	4.75
Placement Dry Density (t/m^3)	1.67	Sample Height (mm)	53.0
Density Ratio (%)	95.0	Sample Diameter (mm)	50.2

PERMEABILITY $k_{(20)} = 1.6E-09$ (m/sec)

Comments

Permeant Used: Sydney tap water



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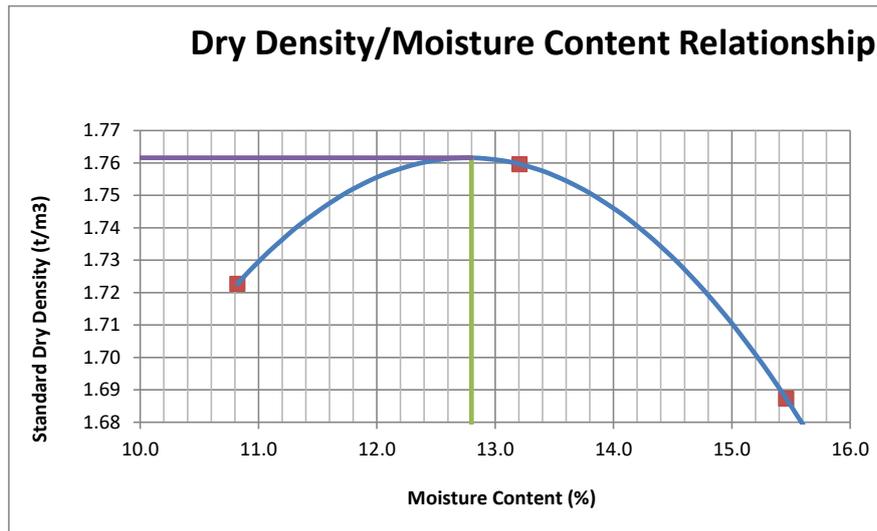
DRY DENSITY / OPTIMUM MOISTURE CONTENT REPORT

Client:	RCA Australia	Source:	Borrow Pit - Location 4
Address:	PO Box 175/ 92 Hill Street, Carrington NSW 2294	Sample Description:	clayey sandy GRAVEL
Project:	Compaction Control Ravensworth Ash Dam (12665)	Report No:	S20887-MDD
Job No:	S17017	Lab No:	S20887

Test Procedure:	<input checked="" type="checkbox"/>	AS1289.5.1.1 Determination of the dry density/moisture content relation of a soil using standard compactive effort
	<input checked="" type="checkbox"/>	AS1289.2.1.1 Determination of the moisture content of a soil - Oven drying method (Standard method)

Sampling:	Sampled by Client	Date Sampled:	16/01/2017
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Preparation:	Prepared in accordance with the test method
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Maximum Dry Density (t/m³)	1.762
Optimum Moisture Content (%)	12.8
Percentage Oversize on 19mm sieve (%)	17
Percentage Oversize on 37.5mm sieve (%)	10

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<p>NATA Accredited Laboratory Number: 14874</p>	<p>Chris Lloyd</p>	<p>Date:</p>	

	<p style="font-size: small;">Macquarie Geotechnical Unit 8/10 Bradford Street Alexandria NSW 2015</p>
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DETERMINATION OF PERMEABILITY OF A SOIL - CONSTANT HEAD METHOD USING A FLEXIBLE WALL PERMEAMETER

Client:	RCA Australia	Source:	Borrow Pit - Location 4
Address:	PO Box 175/ 92 Hill Street, Carrington NSW 2294	Sample Description:	clayey sandy GRAVEL
Project:	Compaction Control Ravensworth Ash Dam (12665)	Report No:	S20887-TP
Job No:	S17017	Lab No:	S20887

Test Procedure:	<input checked="" type="checkbox"/>	AS1289 6.7.3	DETERMINATION OF PERMEABILITY OF A SOIL - CONSTANT HEAD METHOD USING A FLEXIBLE WALL PERMEAMETER
	<input checked="" type="checkbox"/>	AS1289 5.1.1	Soil compaction and density tests - Determination of the dry density/moisture content relationship of a soil using standard compactive effort
	<input type="checkbox"/>	AS1289 5.2.1	Soil compaction and density tests - Determination of the dry density/moisture content relationship of a soil using modified compactive effort

Sampling:	Sampled by Client	Date Sampled:	16.1.17
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Preparation:	Prepared in accordance with the test method
---------------------	---

Maximum Dry Density (t/m ³)	1.76	Confining Pressure (kPa)	600
Optimum Moisture Content (%)	12.8	Back Pressure (kPa)	500
Placement Moisture Content (%)	12.8	Mean Effective Stress (kPa)	100
Moisture Ratio (%)	100.0	Material tested passing (mm)	4.75
Placement Dry Density (t/m ³)	1.67	Sample Height (mm)	52.7
Density Ratio (%)	95.0	Sample Diameter (mm)	50.3

PERMEABILITY $k_{(20)} =$ **2.0E-09 (m/sec)**

Comments

Permeant Used: Sydney tap water



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Date:



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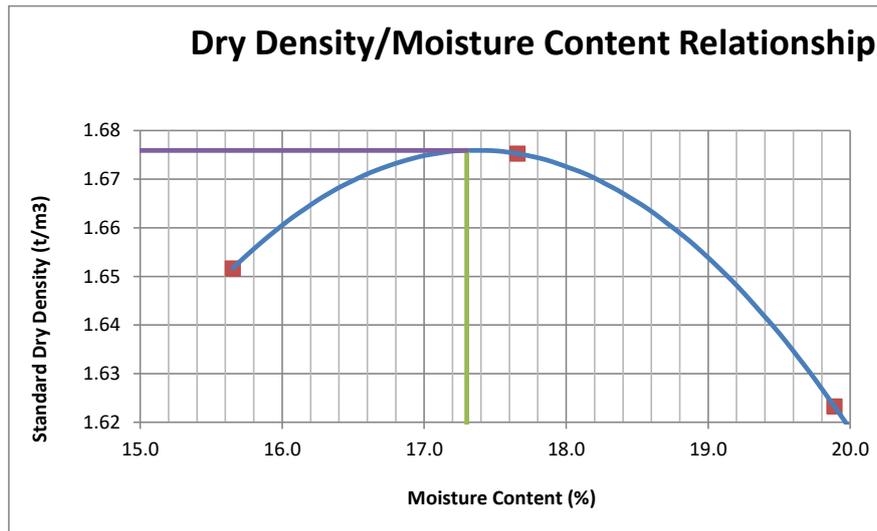
DRY DENSITY / OPTIMUM MOISTURE CONTENT REPORT

Client:	RCA Australia	Source:	Borrow Pit - Location 5
Address:	PO Box 175/ 92 Hill Street, Carrington NSW 2294	Sample Description:	clayey sandy GRAVEL
Project:	Compaction Control Ravensworth Ash Dam (12665)	Report No:	S20888-MDD
Job No:	S17017	Lab No:	S20888

Test Procedure:	<input checked="" type="checkbox"/>	AS1289.5.1.1 Determination of the dry density/moisture content relation of a soil using standard compactive effort
	<input checked="" type="checkbox"/>	AS1289.2.1.1 Determination of the moisture content of a soil - Oven drying method (Standard method)

Sampling:	Sampled by Client	Date Sampled:	16/01/2017
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Preparation:	Prepared in accordance with the test method
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Maximum Dry Density (t/m³)	1.676
Optimum Moisture Content (%)	17.3
Percentage Oversize on 19mm sieve (%)	33
Percentage Oversize on 37.5mm sieve (%)	16

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NATA Accredited Laboratory Number: 14874			

	Macquarie Geotechnical Unit 8/10 Bradford Street Alexandria NSW 2015
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DETERMINATION OF PERMEABILITY OF A SOIL - CONSTANT HEAD METHOD USING A FLEXIBLE WALL PERMEAMETER

Client:	RCA Australia	Source:	Borrow Pit - Location 5
Address:	PO Box 175/ 92 Hill Street, Carrington NSW 2294	Sample Description:	clayey sandy GRAVEL
Project:	Compaction Control Ravensworth Ash Dam (12665)	Report No:	S20888-TP
Job No:	S17017	Lab No:	S20888

Test Procedure:	<input checked="" type="checkbox"/>	AS1289 6.7.3	DETERMINATION OF PERMEABILITY OF A SOIL - CONSTANT HEAD METHOD USING A FLEXIBLE WALL PERMEAMETER
	<input checked="" type="checkbox"/>	AS1289 5.1.1	Soil compaction and density tests - Determination of the dry density/moisture content relationship of a soil using standard compactive effort
	<input type="checkbox"/>	AS1289 5.2.1	Soil compaction and density tests - Determination of the dry density/moisture content relationship of a soil using modified compactive effort

Sampling:	Sampled by Client	Date Sampled:	16.1.17
------------------	-------------------	----------------------	---------

Preparation:	Prepared in accordance with the test method
---------------------	---

Maximum Dry Density (t/m ³)	1.68	Confining Pressure (kPa)	600
Optimum Moisture Content (%)	17.3	Back Pressure (kPa)	500
Placement Moisture Content (%)	17.3	Mean Effective Stress (kPa)	100
Moisture Ratio (%)	100.0	Material tested passing (mm)	4.75
Placement Dry Density (t/m ³)	1.60	Sample Height (mm)	50.4
Density Ratio (%)	95.0	Sample Diameter (mm)	51.2

PERMEABILITY $k_{(20)} =$ **2.1E-10 (m/sec)**

Comments

Permeant Used: Sydney tap water



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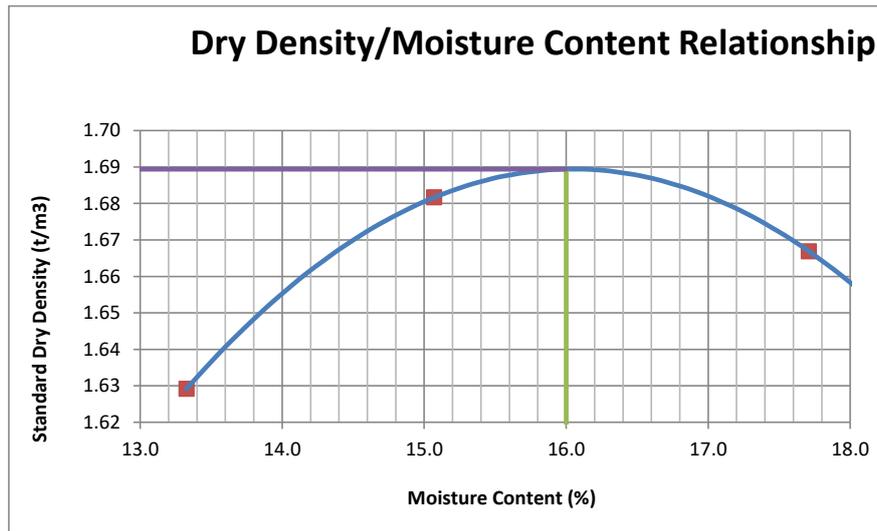
DRY DENSITY / OPTIMUM MOISTURE CONTENT REPORT

Client:	RCA Australia	Source:	Borrow Pit - Location 6
Address:	PO Box 175/ 92 Hill Street, Carrington NSW 2294	Sample Description:	clayey gravelly SAND
Project:	Compaction Control Ravensworth Ash Dam (12665)	Report No:	S20889-MDD
Job No:	S17017	Lab No:	S20889

Test Procedure:	<input checked="" type="checkbox"/>	AS1289.5.1.1 Determination of the dry density/moisture content relation of a soil using standard compactive effort
	<input checked="" type="checkbox"/>	AS1289.2.1.1 Determination of the moisture content of a soil - Oven drying method (Standard method)

Sampling:	Sampled by Client	Date Sampled:	16/01/2017
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Preparation:	Prepared in accordance with the test method
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Maximum Dry Density (t/m³)	1.689
Optimum Moisture Content (%)	16.0
Percentage Oversize on 19mm sieve (%)	19
Percentage Oversize on 37.5mm sieve (%)	8

	<p style="font-size: small;">The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.</p>	<p>Authorised Signatory:</p> 	<p>14/02/2017</p>
<p>NATA Accredited Laboratory Number: 14874</p>	<p>Chris Lloyd</p>	<p>Date:</p>	

	<p style="font-size: x-small;">Macquarie Geotechnical Unit 8/10 Bradford Street Alexandria NSW 2015</p>
---	---

DETERMINATION OF PERMEABILITY OF A SOIL - CONSTANT HEAD METHOD USING A FLEXIBLE WALL PERMEAMETER

Client:	RCA Australia	Source:	Borrow Pit - Location 6
Address:	PO Box 175/ 92 Hill Street, Carrington NSW 2294	Sample Description:	clayey gravelly SAND
Project:	Compaction Control Ravensworth Ash Dam (12665)	Report No:	S20889-TP
Job No:	S17017	Lab No:	S20889

Test Procedure:	<input checked="" type="checkbox"/>	AS1289 6.7.3	DETERMINATION OF PERMEABILITY OF A SOIL - CONSTANT HEAD METHOD USING A FLEXIBLE WALL PERMEAMETER
	<input checked="" type="checkbox"/>	AS1289 5.1.1	Soil compaction and density tests - Determination of the dry density/moisture content relationship of a soil using standard compactive effort
	<input type="checkbox"/>	AS1289 5.2.1	Soil compaction and density tests - Determination of the dry density/moisture content relationship of a soil using modified compactive effort

Sampling:	Sampled by Client	Date Sampled:	16.1.17
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Preparation:	Prepared in accordance with the test method
---------------------	---

Maximum Dry Density (t/m ³)	1.69	Confining Pressure (kPa)	600
Optimum Moisture Content (%)	16.0	Back Pressure (kPa)	500
Placement Moisture Content (%)	16.0	Mean Effective Stress (kPa)	100
Moisture Ratio (%)	100.0	Material tested passing (mm)	4.75
Placement Dry Density (t/m ³)	1.61	Sample Height (mm)	52.2
Density Ratio (%)	95.0	Sample Diameter (mm)	50.2

PERMEABILITY $k_{(20)} =$ **1.5E-10 (m/sec)**

Comments

Permeant Used: Sydney tap water



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NATA Accredited Laboratory Number: 14874

Authorised Signatory:

14/02/2017

Ian Goldschmidt

Date:



Macquarie Geotechnical
Unit 8/10
Bradford Street
Alexandria NSW 2015

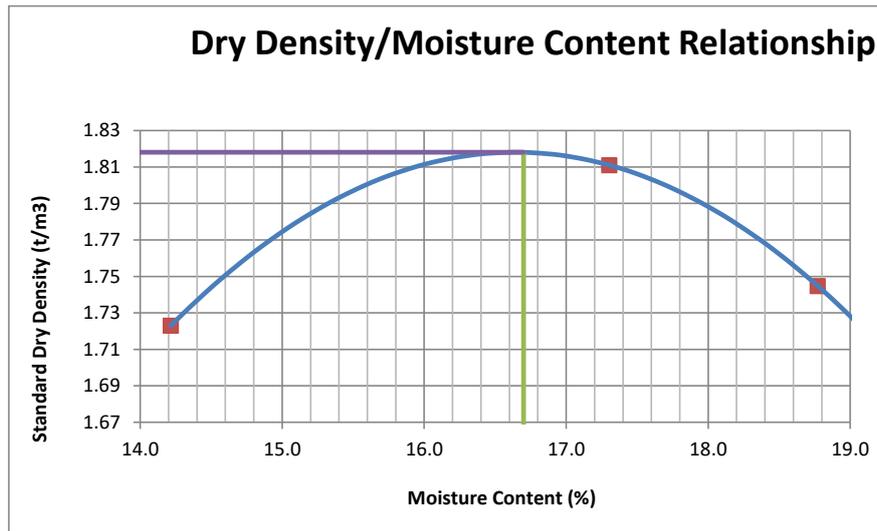
DRY DENSITY / OPTIMUM MOISTURE CONTENT REPORT

Client:	RCA Australia	Source:	Corner of Borrow Pit - Location 7
Address:	PO Box 175/ 92 Hill Street, Carrington NSW 2294	Sample Description:	clayey sandy GRAVEL
Project:	Compaction Control Ravensworth Ash Dam (12665)	Report No:	S20890-MDD
Job No:	S17017	Lab No:	S20890

Test Procedure:	<input checked="" type="checkbox"/>	AS1289.5.1.1 Determination of the dry density/moisture content relation of a soil using standard compactive effort
	<input checked="" type="checkbox"/>	AS1289.2.1.1 Determination of the moisture content of a soil - Oven drying method (Standard method)

Sampling:	Sampled by Client	Date Sampled:	16/01/2017
------------------	-------------------	----------------------	------------

Preparation:	Prepared in accordance with the test method
---------------------	---



Maximum Dry Density (t/m³)	1.818
Optimum Moisture Content (%)	16.7
Percentage Oversize on 19mm sieve (%)	30
Percentage Oversize on 37.5mm sieve (%)	13

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NATA Accredited Laboratory Number: 14874			

		Macquarie Geotechnical Unit 8/10 Bradford Street Alexandria NSW 2015
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DETERMINATION OF PERMEABILITY OF A SOIL - CONSTANT HEAD METHOD USING A FLEXIBLE WALL PERMEAMETER

Client:	RCA Australia	Source:	Corner of Borrow Pit - Location 7
Address:	PO Box 175/ 92 Hill Street, Carrington NSW 2294	Sample Description:	clayey sandy GRAVEL
Project:	Compaction Control Ravensworth Ash Dam (12665)	Report No:	S20890-TP
Job No:	S17017	Lab No:	S20890

Test Procedure:	<input checked="" type="checkbox"/>	AS1289 6.7.3	DETERMINATION OF PERMEABILITY OF A SOIL - CONSTANT HEAD METHOD USING A FLEXIBLE WALL PERMEAMETER
	<input checked="" type="checkbox"/>	AS1289 5.1.1	Soil compaction and density tests - Determination of the dry density/moisture content relationship of a soil using standard compactive effort
	<input type="checkbox"/>	AS1289 5.2.1	Soil compaction and density tests - Determination of the dry density/moisture content relationship of a soil using modified compactive effort

Sampling:	Sampled by Client	Date Sampled:	16.1.17
------------------	-------------------	----------------------	---------

Preparation:	Prepared in accordance with the test method
---------------------	---

Maximum Dry Density (t/m ³)	1.82	Confining Pressure (kPa)	600
Optimum Moisture Content (%)	16.7	Back Pressure (kPa)	500
Placement Moisture Content (%)	16.7	Mean Effective Stress (kPa)	100
Moisture Ratio (%)	100.0	Material tested passing (mm)	4.75
Placement Dry Density (t/m ³)	1.73	Sample Height (mm)	53.0
Density Ratio (%)	95.0	Sample Diameter (mm)	50.1

PERMEABILITY $k_{(20)} =$ **2.8E-09 (m/sec)**

Comments

Permeant Used: Sydney tap water



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NATA Accredited Laboratory Number: 14874

Authorised Signatory:

14/02/2017

Ian Goldschmidt

Date:



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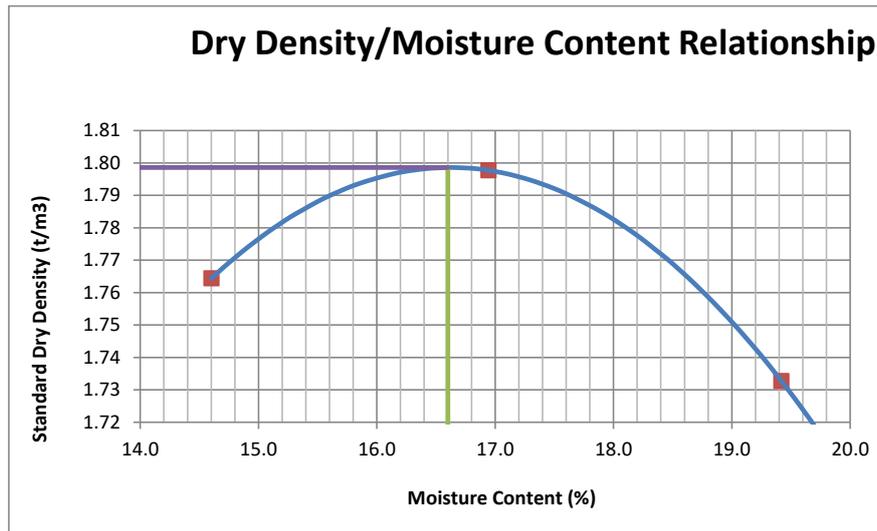
DRY DENSITY / OPTIMUM MOISTURE CONTENT REPORT

Client:	RCA Australia	Source:	Corner of Borrow Pit - Location 8
Address:	PO Box 175/ 92 Hill Street, Carrington NSW 2294	Sample Description:	clayey sandy GRAVEL
Project:	Compaction Control Ravensworth Ash Dam (12665)	Report No:	S20891-MDD
Job No:	S17017	Lab No:	S20891

Test Procedure:	<input checked="" type="checkbox"/>	AS1289.5.1.1 Determination of the dry density/moisture content relation of a soil using standard compactive effort
	<input checked="" type="checkbox"/>	AS1289.2.1.1 Determination of the moisture content of a soil - Oven drying method (Standard method)

Sampling:	Sampled by Client	Date Sampled:	16/01/2017
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Preparation:	Prepared in accordance with the test method
---------------------	---



Maximum Dry Density (t/m³)	1.799
Optimum Moisture Content (%)	16.6
Percentage Oversize on 19mm sieve (%)	24
Percentage Oversize on 37.5mm sieve (%)	6

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NATA Accredited Laboratory Number: 14874			

		Macquarie Geotechnical Unit 8/10 Bradford Street Alexandria NSW 2015
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DETERMINATION OF PERMEABILITY OF A SOIL - CONSTANT HEAD METHOD USING A FLEXIBLE WALL PERMEAMETER

Client:	RCA Australia	Source:	Corner of Borrow Pit - Location 8
Address:	PO Box 175/ 92 Hill Street, Carrington NSW 2294	Sample Description:	clayey sandy GRAVEL
Project:	Compaction Control Ravensworth Ash Dam (12665)	Report No:	S20891-TP
Job No:	S17017	Lab No:	S20891

Test Procedure:	<input checked="" type="checkbox"/>	AS1289 6.7.3	DETERMINATION OF PERMEABILITY OF A SOIL - CONSTANT HEAD METHOD USING A FLEXIBLE WALL PERMEAMETER
	<input checked="" type="checkbox"/>	AS1289 5.1.1	Soil compaction and density tests - Determination of the dry density/moisture content relationship of a soil using standard compactive effort
	<input type="checkbox"/>	AS1289 5.2.1	Soil compaction and density tests - Determination of the dry density/moisture content relationship of a soil using modified compactive effort

Sampling:	Sampled by Client	Date Sampled:	16.1.17
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Preparation:	Prepared in accordance with the test method
---------------------	---

Maximum Dry Density (t/m ³)	1.80	Confining Pressure (kPa)	600
Optimum Moisture Content (%)	16.6	Back Pressure (kPa)	500
Placement Moisture Content (%)	16.6	Mean Effective Stress (kPa)	100
Moisture Ratio (%)	100.0	Material tested passing (mm)	4.75
Placement Dry Density (t/m ³)	1.71	Sample Height (mm)	51.3
Density Ratio (%)	95.0	Sample Diameter (mm)	49.9

PERMEABILITY $k_{(20)} =$ **7.4E-10 (m/sec)**

Comments

Permeant Used: Sydney tap water



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Authorised Signatory:

14/02/2017

Ian Goldschmidt

Date:



Macquarie Geotechnical
Unit 8/10
Bradford Street
Alexandria NSW 2015

Nuclear Hilf Density Ratio Report

Client :	JE & J Robinson	Report Number:	12665 - 001
Client Address:	PO Box 786 Muswellbrook NSW 2333	Report Date:	10/01/2017
Job Number :	12665	Folder Number:	
Project :	Compaction Control	Test Methods:	AS 1289.2.1.1, 5.4.1, 5.7.1, 5.8.1
Location :	Ravensworth Ash Dam ,	Page 1 of 1	

Lab No :	16-2461	16-2462	16-2463	16-2464
ID No :	1	2	3	4
Lot No :	-	-	-	-
Date Sampled :	22/12/2016	22/12/2016	22/12/2016	22/12/2016
Material Source :	Site Won	Site Won	Site Won	Site Won
For Use As :	General Fill	General Fill	General Fill	General Fill
Sample Location :	Retention Basin Layer 1	Retention Basin Layer 1	Retention Basin Layer 1	Retention Basin Layer 1
Test Depth/Layer (mm)	300 / 300	300 / 300	300 / 300	300 / 300
Max Size (mm) :	19	19	19	19
Percent Oversize (%) :	12.1	13.4	14.2	18.4
Field Wet Density (t/m ³) :	1.981	1.927	1.967	1.996
Field Moisture Cont (%) :	9.5	9.8	10.7	10.6
PCWD (t/m ³) :	1.918*	1.940*	1.972*	1.950*
Adjusted Moisture Variation (%) :	4.5*	4.5*	4.5*	3.5*
Optimum Moisture Content (%) :	14.5	14.5	15.5	14.5
Compactive Effort :	Standard	Standard	Standard	Standard
Relative Compaction (%) :	103.5	99.5	100.0	102.5
Minimum Specification :	95%	95%	95%	95%
Moisture Ratio (%) :	65.5	67.5	69.0	73.0
Moisture Specification :	N/A	N/A	N/A	N/A
Moisture Variation (%) :	5% (dryer)	4.5% (dryer)	5% (dryer)	4% (dryer)

Remarks:

* - Denotes adjusted for oversize

Lab Number:	Soil Description
16-2461	Gravelly CLAY
16-2462	Gravelly CLAY
16-2463	Gravelly CLAY
16-2464	Gravelly CLAY



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APPROVED SIGNATORY



Matt Flood
Senior Technician

FORM NUMBER

RP96-19

Nuclear Hilf Density Ratio Report

Client : JE & J Robinson	Report Number: 12665 - 002
Client Address: PO Box 786 Muswellbrook NSW 2333	Report Date: 10/01/2017
Job Number : 12665	Folder Number:
Project : Compaction Control	Test Methods: AS 1289.2.1.1, 5.4.1, 5.7.1, 5.8.1
Location : Ravensworth Ash Dam ,	Page 1 of 1

Lab No :	17-1	17-2	17-3	17-4
ID No :	5	6	7	8
Lot No :	-	-	-	-
Date Sampled :	5/1/2017	5/1/2017	5/1/2017	5/1/2017
Material Source :	Site Won	Site Won	Site Won	Site Won
For Use As :	General Fill	General Fill	General Fill	General Fill
Sample Location :	Retention Basin Finish Layer	Retention Basin Finish Layer	Retention Basin Finish Layer	Retention Basin Finish Layer
Test Depth/Layer (mm)	300 / 300	300 / 300	300 / 300	300 / 300
Max Size (mm) :	19	19	19	19
Percent Oversize (%) :	10.8	12.6	8.8	9.1
Field Wet Density (t/m ³) :	1.894	1.857	1.954	1.961
Field Moisture Cont (%) :	8.3	8.6	10.4	9.3
PCWD (t/m ³) :	1.915*	1.945*	1.939*	1.953*
Adjusted Moisture Variation (%) :	5.0*	4.0*	4.5*	4.5*
Optimum Moisture Content (%) :	13.0	13.0	15.0	14.0
Compactive Effort :	Standard	Standard	Standard	Standard
Relative Compaction (%) :	99.0	95.5	101.0	100.5
Minimum Specification :	95%	95%	95%	95%
Moisture Ratio (%) :	64.0	66.0	69.5	66.5
Moisture Specification :	N/A	N/A	N/A	N/A
Moisture Variation (%) :	4.5% (dryer)	4.5% (dryer)	4.5% (dryer)	4.5% (dryer)

Remarks:

* - Denotes adjusted for oversize

Lab Number:	Soil Description
17-1	Gravelly CLAY
17-2	Gravelly CLAY
17-3	Gravelly CLAY
17-4	Gravelly CLAY



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Senior Technician

FORM NUMBER

RP96-19

Nuclear Hilf Density Ratio Report

Client : JE & J Robinson	Report Number: 12665 - 003
Client Address: PO Box 786 Muswellbrook NSW 2333	Report Date: 18/01/2017
Job Number : 12665	Folder Number:
Project : Compaction Control	Test Methods: AS 1289.2.1.1, 5.4.1, 5.7.1, 5.8.1
Location : Ravensworth Ash Dam ,	Page 1 of 2

Lab No :	17-63	17-64	17-65	17-66
ID No :	9	10	11	12
Lot No :	-	-	-	-
Date Sampled :	13/1/2017	13/1/2017	13/1/2017	13/1/2017
Material Source :	Site Won	Site Won	Site Won	Site Won
For Use As :	General Fill	General Fill	General Fill	General Fill
Sample Location :	Hardstand Final Layer	Hardstand Final Layer	Hardstand Final Layer	Hardstand Final Layer
Test Depth/Layer (mm)	250 / NA	250 / NA	250 / NA	250 / NA
Max Size (mm) :	37.5	37.5	37.5	37.5
Percent Oversize (%) :	12.6	19.8	10.5	11.7
Field Wet Density (t/m ³) :	2.011	2.036	2.111	2.062
Field Moisture Cont (%) :	7.9	7.5	7.8	6.3
PCWD (t/m ³) :	2.000*	2.028*	2.027*	2.005*
Adjusted Moisture Variation (%) :	4.0*	3.5*	4.0*	4.0*
Optimum Moisture Content (%) :	12.5	12.0	12.0	11.0
Compactive Effort :	Standard	Standard	Standard	Standard
Relative Compaction (%) :	100.5	100.5	104.0	103.0
Minimum Specification :	95%	95%	95%	95%
Moisture Ratio (%) :	63.0	62.5	65.0	57.5
Moisture Specification :	N/A	N/A	N/A	N/A
Moisture Variation (%) :	4.5% (dryer)	4.5% (dryer)	4% (dryer)	4.5% (dryer)

Remarks:

* - Denotes adjusted for oversize

Lab Number:	Soil Description
17-63	Clayey Silty GRAVEL
17-64	Clayey Silty GRAVEL
17-65	Clayey Silty GRAVEL
17-66	Clayey Silty GRAVEL



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Senior Technician

FORM NUMBER

RP96-19

Nuclear Hilf Density Ratio Report

Client : JE & J Robinson Client Address: PO Box 786 Muswellbrook NSW 2333 Job Number : 12665 Project : Compaction Control Location : Ravensworth Ash Dam ,	Report Number: 12665 - 003 Report Date: 18/01/2017 Folder Number: Test Methods: AS 1289.2.1.1, 5.4.1, 5.7.1, 5.8.1
Page 2 of 2	

Lab No :	17-67	17-68		
ID No :	13	14		
Lot No :	-	-		
Date Sampled :	13/1/2017	13/1/2017		
Material Source :	Site Won	Site Won		
For Use As :	General Fill	General Fill		
Sample Location :	Hardstand Final Layer	Hardstand Final Layer		
Test Depth/Layer (mm)	250 / NA	250 / NA		
Max Size (mm) :	37.5	37.5		
Percent Oversize (%) :	9.1	5.8		
Field Wet Density (t/m ³) :	2.101	2.021		
Field Moisture Cont (%) :	8.5	7.8		
PCWD (t/m ³) :	1.991*	1.970*		
Adjusted Moisture Variation (%) :	4.0*	4.5*		
Optimum Moisture Content (%) :	12.5	12.5		
Compactive Effort :	Standard	Standard		
Relative Compaction (%) :	105.5	102.5		
Minimum Specification :	95%	95%		
Moisture Ratio (%) :	68.0	62.5		
Moisture Specification :	N/A	N/A		
Moisture Variation (%) :	4% (dryer)	4.5% (dryer)		

Remarks:

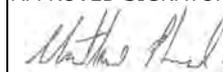
* - Denotes adjusted for oversize

Lab Number:	Soil Description
17-67	Clayey Silty GRAVEL
17-68	Clayey Silty GRAVEL



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Matt Flood
Senior Technician

FORM NUMBER

RP96-19

Nuclear Hilf Density Ratio Report

Client : JE & J Robinson	Report Number: 12665 - 005
Client Address: PO Box 786 Muswellbrook NSW 2333	Report Date: 2/05/2017
Job Number : 12665	Folder Number:
Project : Compaction Control	Test Methods: AS 1289.2.1.1, 5.4.1, 5.7.1, 5.8.1
Location : Ravensworth Ash Dam ,	Page 1 of 2

Lab No :	17-888	17-889	17-890	17-891
ID No :	21	22	23	24
Lot No :	-	-	-	-
Date Sampled :	28/4/2017	28/4/2017	28/4/2017	28/4/2017
Material Source :	Site Won	Site Won	Site Won	Site Won
For Use As :	General Fill	General Fill	General Fill	General Fill
Sample Location :	East Wall Detension Dam Final Layer	East Wall Detension Dam Final Layer	South Wall Detension Dam Final Layer	South Wall Detension Dam Final Layer
Test Depth/Layer (mm)	300 / NA	300 / NA	300 / NA	300 / NA
Max Size (mm) :	19	19	19	19
Percent Oversize (%) :	14.2	13.7	10.2	14.5
Field Wet Density (t/m ³) :	2.029	2.100	2.066	2.088
Field Moisture Cont (%) :	9.7	10.6	12.2	9.9
PCWD (t/m ³) :	2.020*	1.997*	1.966*	1.980*
Adjusted Moisture Variation (%) :	3.0*	3.0*	2.5*	4.0*
Optimum Moisture Content (%) :	13.0	13.5	15.0	14.0
Compactive Effort :	Standard	Standard	Standard	Standard
Relative Compaction (%) :	100.5	105.0	105.0	105.5
Minimum Specification :	95%	95%	95%	95%
Moisture Ratio (%) :	74.5	78.5	81.5	70.5
Moisture Specification :	N/A	N/A	N/A	N/A
Moisture Variation (%) :	3.5% (dryer)	3% (dryer)	3% (dryer)	4% (dryer)

Remarks:

* - Denotes adjusted for oversize

Lab Number:	Soil Description
17-888	Silty GRAVEL
17-889	Silty GRAVEL
17-890	Silty GRAVEL
17-891	Silty GRAVEL



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Timothy Baker
Senior Soil Technician

FORM NUMBER

RP96-19

Nuclear Hilf Density Ratio Report

Client :	JE & J Robinson	Report Number:	12665 - 005
Client Address:	PO Box 786 Muswellbrook NSW 2333	Report Date:	2/05/2017
Job Number :	12665	Folder Number:	
Project :	Compaction Control	Test Methods:	AS 1289.2.1.1, 5.4.1, 5.7.1, 5.8.1
Location :	Ravensworth Ash Dam ,	Page 2 of 2	

Lab No :	17-892	17-893	17-894	17-895
ID No :	25	26	27	28
Lot No :	-	-	-	-
Date Sampled :	28/4/2017	28/4/2017	28/4/2017	28/4/2017
Material Source :	Site Won	Site Won	Site Won	Site Won
For Use As :	General Fill	General Fill	General Fill	General Fill
Sample Location :	West Wall Detension Dam Final Layer	West Wall Detension Dam Final Layer	North Wall Detension Dam Final Layer	North Wall Detension Dam Final Layer
Test Depth/Layer (mm)	300 / NA	300 / NA	300 / NA	300 / NA
Max Size (mm) :	19	19	19	19
Percent Oversize (%) :	11.6	14.0	13.7	13.4
Field Wet Density (t/m ³) :	2.056	2.028	2.000	2.030
Field Moisture Cont (%) :	9.9	9.4	9.8	10.2
PCWD (t/m ³) :	1.968*	1.987*	1.988*	1.981*
Adjusted Moisture Variation (%) :	4.0*	2.5*	2.5*	2.5*
Optimum Moisture Content (%) :	14.0	12.0	12.5	13.0
Compactive Effort :	Standard	Standard	Standard	Standard
Relative Compaction (%) :	104.5	102.0	100.5	102.5
Minimum Specification :	95%	95%	95%	95%
Moisture Ratio (%) :	70.5	78.5	78.5	78.5
Moisture Specification :	N/A	N/A	N/A	N/A
Moisture Variation (%) :	4% (dryer)	2.5% (dryer)	2.5% (dryer)	3% (dryer)

Remarks:

* - Denotes adjusted for oversize

Lab Number:	Soil Description
17-892	Silty GRAVEL
17-893	Silty GRAVEL
17-894	Silty GRAVEL
17-895	Silty GRAVEL



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Timothy Baker
Senior Soil Technician

FORM NUMBER

RP96-19

Appendix D
Drawings



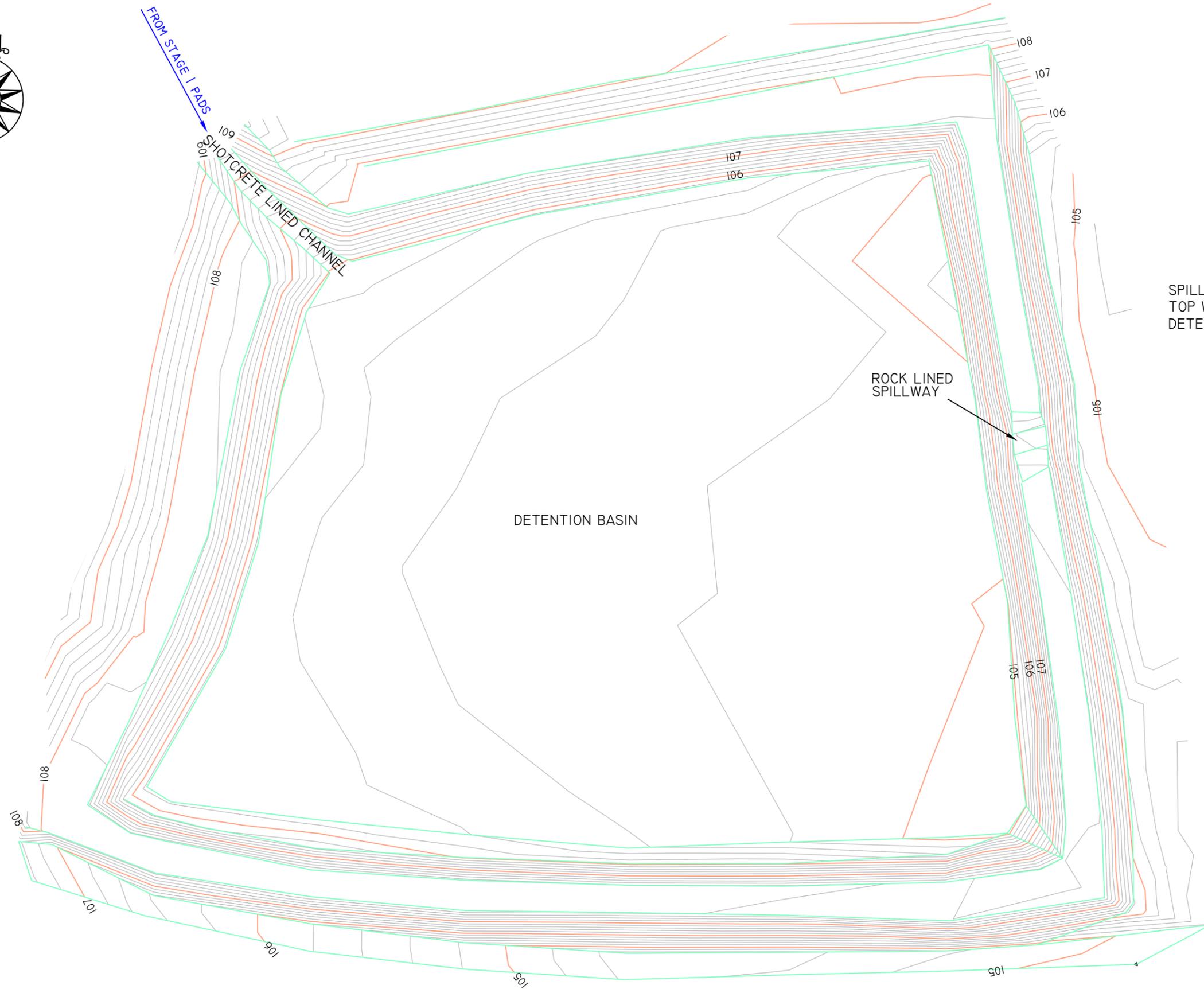


Appendix D

Drawings

List of Drawings

<u>Name</u>	<u>Number</u>
Void 3, Stage 1 Leachate detention basin, as built plan	



SPILLWAY RL - 107.4
 TOP WALL RL - 107.8
 DETENTION BASIN VOLUME - 16200M³

**TONY MEXON
& ASSOCIATES**
 REGISTERED SURVEYORS

CLIENT/OWNER
BETTERGROW

DETAILS		
SURVEYORS REF.	SCALE	SHEET SIZE
14-32	1:500	A3
DATE OF SURVEY: 27 APRIL 2017		

REVISION NOTES	
27/4/2017 ORIGINAL	0

TITLE
VOID 3 STAGE 1 COMPOSTING PADS DETENTION BASIN AS BUILT PLAN



Aurecon Australasia Pty Ltd

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Namibia, New Zealand, Nigeria,
Philippines, Qatar, Singapore, South Africa,
Swaziland, Tanzania, Thailand, Uganda,
United Arab Emirates, Vietnam.

Appendix D. Traffic Impact Assessment



Ravensworth Composting Facility

AGL Macquarie Pty Ltd on behalf of Bettergrow Pty Ltd

Traffic and Transport Assessment

IA172600_02 | Final

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Ravensworth Composting Facility

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1. Introduction

AGL Macquarie Pty Ltd (AGL) currently host a composting operation undertaken by Bettergrow Pty Ltd (Bettergrow) under Development Approval DA140/2016 to support the rehabilitation of Ravensworth No.2 mine and Ravensworth South Mine. This approval allows for up to 50,000 tonnes of organic materials such as biosolids and garden organics to be composted for use in rehabilitation. Bettergrow has identified an opportunity to expand the capacity of the facility to accept an additional 26,000 tonnes of feedstock per annum and support AGL rehabilitation need on additional sites. A modification of DA140/2016 is required to authorize the receipt and processing of this additional feedstock and the transfer of composted material to other AGL rehabilitation sites.

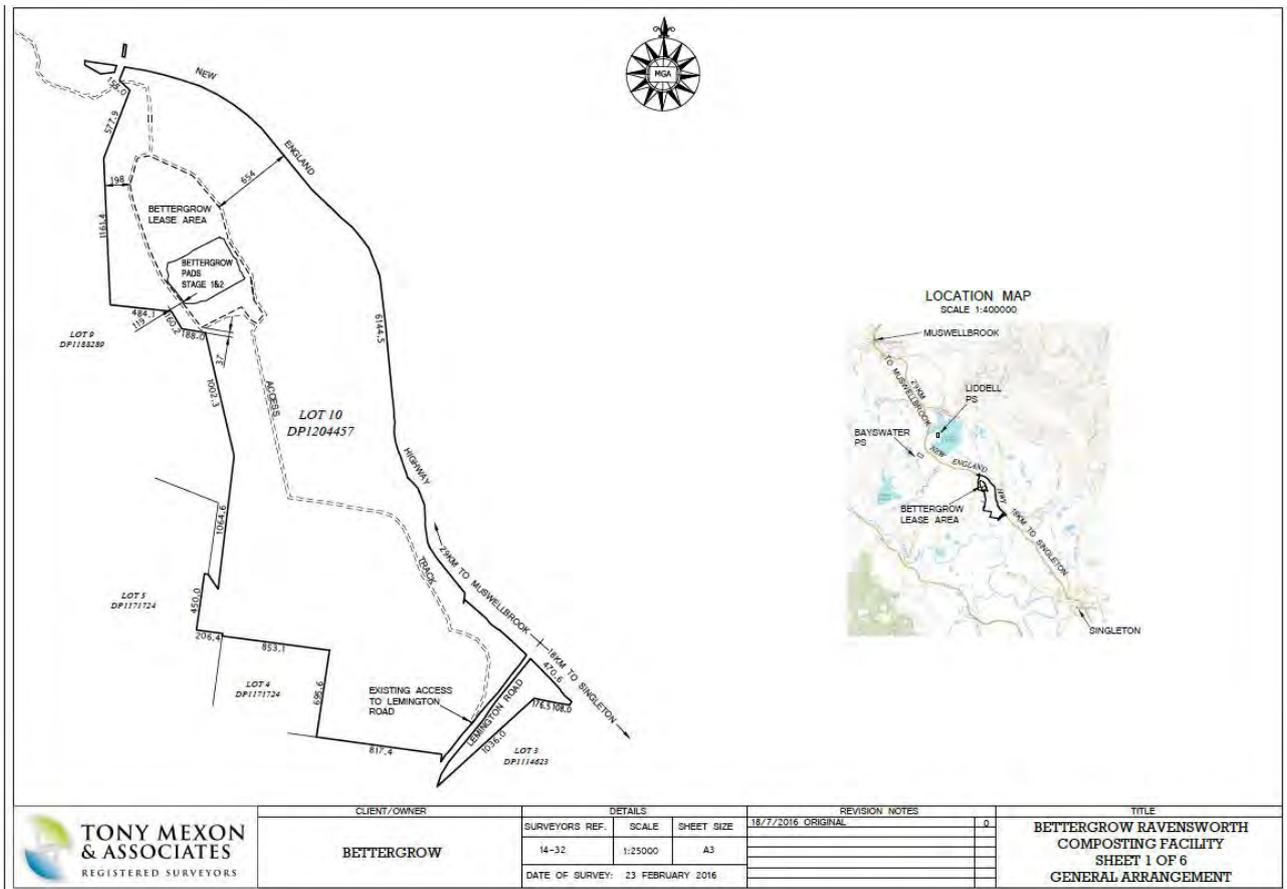
Jacobs Group (Australia) Pty Ltd has been commissioned by AGL on behalf of Bettergrow to prepare a Statement of Environmental Effects (SoEE) assessing the proposed expansion of the composting operation. This document provides an assessment of the traffic and transport impacts of the proposed capacity expansion to support the SoEE and includes an assessment of the existing traffic conditions, forecast traffic generation and potential traffic and transport impacts.

2. Background

The composting facility is situated on the north-west corner of Lemington Road and New England Highway some 20 kilometres north of Singleton (the site). The site is accessed from Lemington Road to the south as shown in Figure 2.1. The existing conditions of consent allow for the processing of up to 50,000 tonnes of composted material.

The major land uses surrounding the composting operation include coal mining and power stations which generate the most significant volumes of traffic.

Figure 2.1 : Site Location



Source: Tony Mexon and Associates

2.1 Road Network

The key roads that provide access to the site are the New England Highway and Lemington Road.

The New England Highway is part of the national highway linking Sydney to Brisbane and is an alternative route to the Pacific Highway. In the vicinity of the site the highway has a speed limit of 100km/h on an undivided carriageway with overtaking lanes. The most recent traffic volume data from the Roads and Maritime Services count station (ID 6156) north of Singleton indicates the average daily traffic volumes are 13 293 vehicles per day (two way).

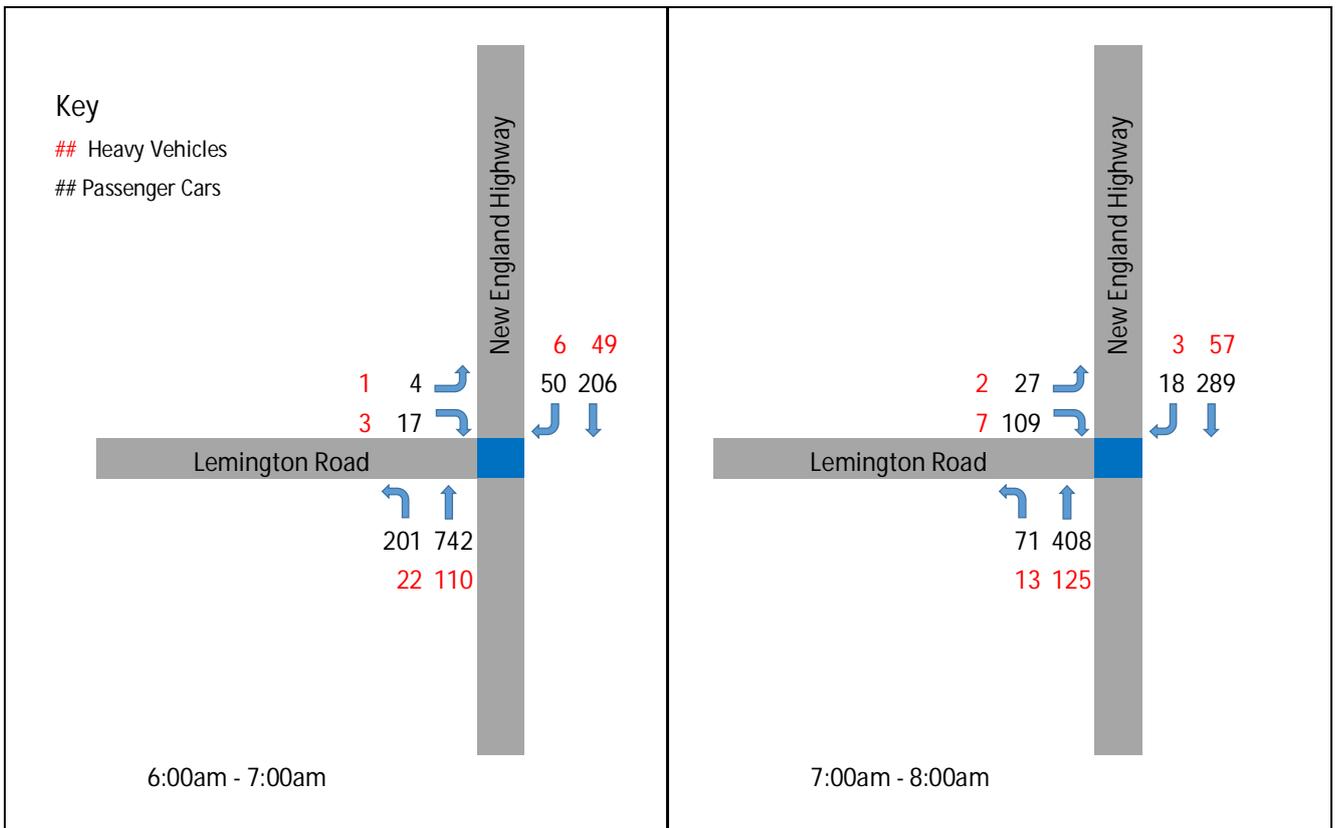
Lemington Road is a rural two way two lane road that predominantly provides access to the various coal mines in the area. It has a speed limit of 100km/h and provides links between The Golden Highway and the New England Highway.

2.2 Traffic Volumes

No traffic data was collected as part of this assessment as the traffic volumes generated by the project would be relatively low compared to that generated by the surrounding land uses. In preparing this assessment we were provided with the 'Ravensworth Operations Project', Traffic and Transport Impact Assessment (Parsons Brinkerhoff, November 2009). This report assessed the provision of the new Lemington Road alignment.

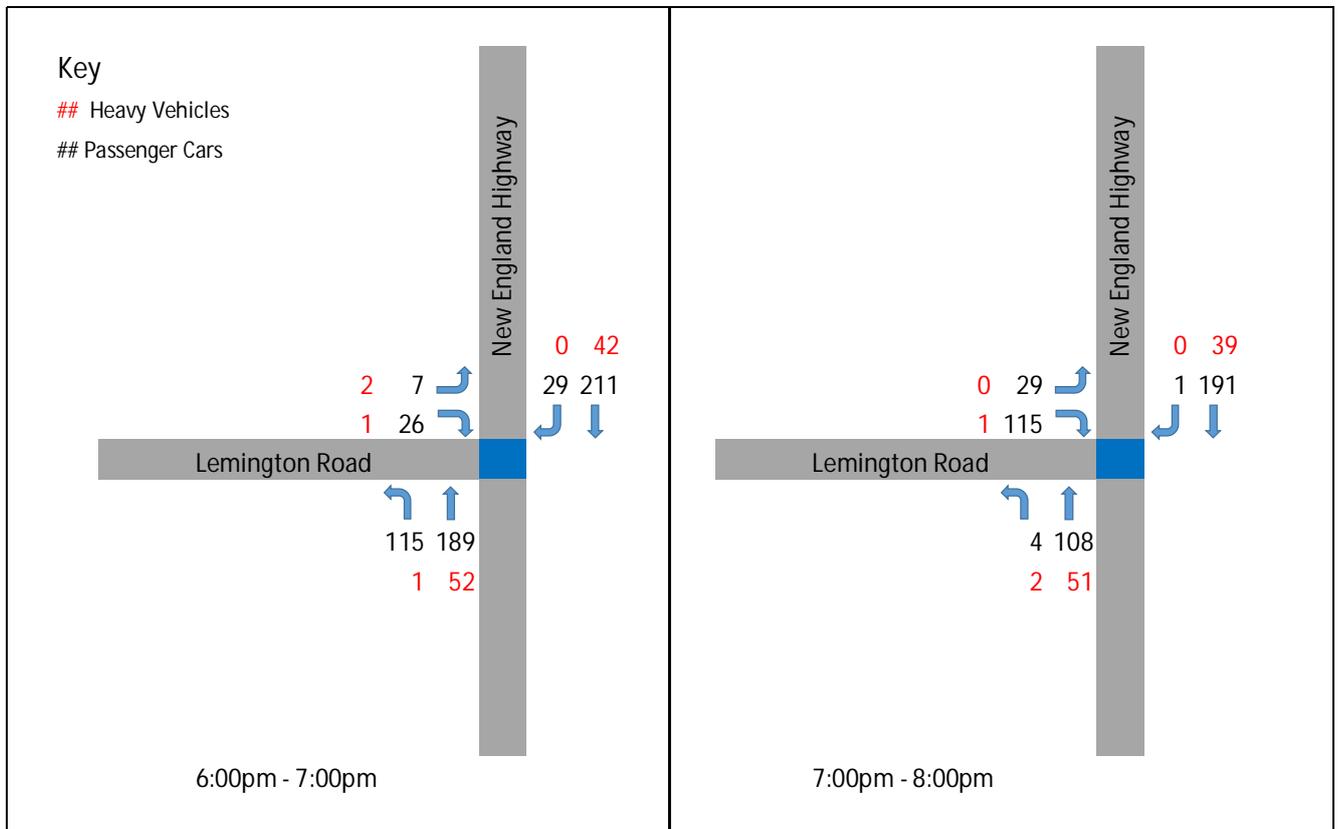
The estimated traffic volumes after the construction of the new Lemington Road alignment at the intersection with the New England Highway are shown in Figure 2.2 and Figure 2.3.

Figure 2.2 : Lemington Road New Alignment Forecast Traffic Volumes (Morning Peak)



Source: Parsons Brinkerhoff, 2009

Figure 2.3 : Lemington Road New Alignment Forecast Traffic Volumes (Evening Peak)



Source: Parsons Brinkerhoff, 2009

2.3 Existing Network Performance

The traffic modelling by Parsons Brinkerhoff (2009) of the intersection of the new Lemington Road alignment showed Level of Service C and D for the worst movement which was the right turn out of Lemington Road onto the New England Highway. Since this modelling was undertaken, and the construction of the new Lemington Road alignment completed, the intersection of Lemington Road and the New England Highway has been upgraded to a seagull intersection arrangement. This allows for right turns out of Lemington Road onto the New England Highway to be undertaken in two movements, giving way to one direction of traffic at a time. This is considered likely to reduce the delays for right turning vehicles and improve intersection safety.

3. Traffic Impacts

3.1 Construction Traffic

The modification does not involve construction activities and as such would not generate any additional construction vehicle movements.

3.2 Operational Traffic Generation

The existing composting facility operation currently generates 8 truck deliveries from Newcastle and 8 truck return movements per day. The proposed expansion of the Composting Facilities at the site would generate following traffic volumes:

- An additional 4 truck deliveries from Newcastle to the site and 4 return movements per day.
- An additional 15 movements from the site to other AGL rehabilitation projects accessed via the Bayswater Power Station and Liddell Power Station) to the north and 15 return movements per day on a campaign basis.

In total there would be a worst case additional 19 truck movements to the site and 19 trucks movements from the site per day during rehabilitation campaigns. The truck routes are shown in Figure 3.1 and Figure 3.2.

Figure 3.1 : Heavy Vehicle Route to Newcastle

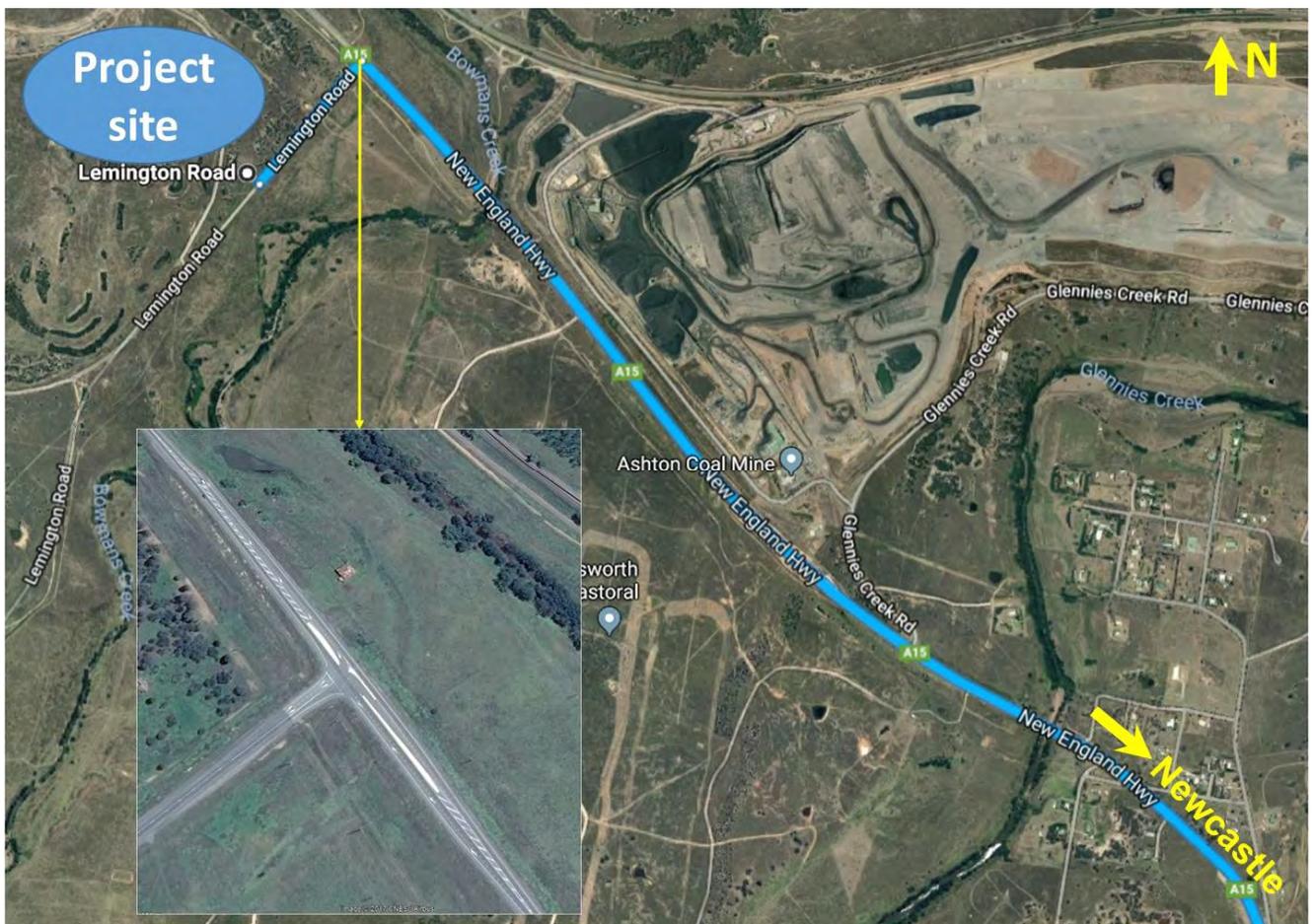
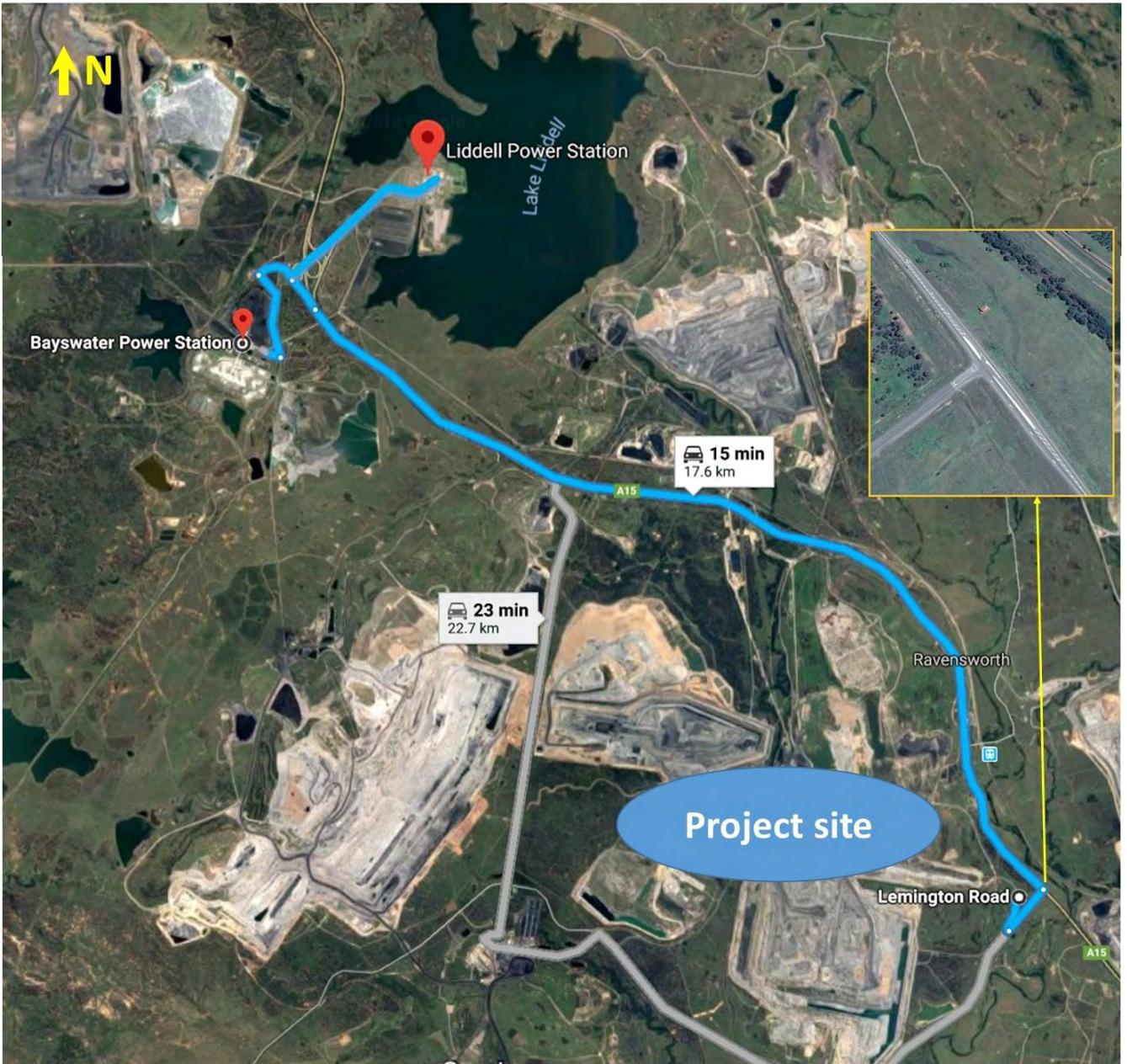


Figure 3.2 : Heavy Vehicle Route from Site to Bayswater Power Station and Liddell Power Station



3.3 Assessment of Operational Traffic Impacts

The additional traffic movements on these routes would pass through the intersection of New England Highway and Lemington Road.

As shown in Figure 3.1 and Figure 3.2, this intersection is a seagull intersection, which minimizes the impacts of the right-turn traffic movements on the through traffic flows on New England Highway and allows vehicles turning right out of Lemington Road to do so in two stages.

The total number of additional truck movements will be 38 trucks per day, during offsite rehabilitation campaigns only, which is assumed to be undertaken by 6-8 drivers. It is assumed this would be distributed evenly throughout the day across the 12 hour operation period from 6am to 6pm. The additional truck movements added into the intersection during morning and evening peak hour would likely be 6 trucks per hour distributed as follows:

- 1 truck movement from southern approach turning left onto Lemington Road
- 2 truck movements from northern approach turning right onto Lemington Road
- 1 truck movement from Lemington Road turning right onto New England Highway
- 2 truck movements from Lemington Road turning left onto New England Highway

The relatively low number of additional traffic movements generated by the modification would be within the normal day to day variation of traffic volumes and would have minimal impacts on this intersection.

The project site and surrounding area have no public transport facilities and minimal active transport activities. Therefore, the project would likely have no impacts on public transport and active transport.

4. Conclusions

It is proposed to increase the capacity of the Ravensworth Composting Facility by 26,000 tonnes per year to 76,000 tonnes per year and transport composted materials from the site to the Bayswater and Liddell power stations for use in rehabilitation activities.

The proposal modification would generate an additional 19 inbound truck movements and 19 outbound truck movements per day during rehabilitation campaigns, and four inbound movements and 4 outbound movements per day during normal operations. These movements would all pass through the seagull intersection of New England Highway and Lemington Road. In the peak hour during the rehabilitation campaigns this would add 1 or 2 vehicles per hour for each of turning movement of the intersection. Given the efficient operation of seagull intersections and its existing performance, the impact of the proposal on the intersection would be minimal.

The proposed modification does not involve additional construction activities and as such would not generate additional construction traffic.

In summary, the traffic generated from the proposed expansion of the capacity of the composting facility would have minimal impacts on the local road network.

References

Parsons Brinckhoff (2009) *Ravensthorpe Operations Project, Traffic and Transport Impact Assessment*.
Ravensthorpe Operations Pty Ltd (Xstrata)



GreenSPOT Composting Facility Modification 2
Bettergrow Pty Ltd

Statement of Environmental Effects
Modification 2

IA197800_01| Final

19 September 2018



Statement of Environmental Effects Section 4.55 to DA140/2016 – Ravensworth Composting Facility

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Appendix A. Development Consent

Appendix B. Approved Plans

Appendix C. Road Dilapidation Survey

Appendix D. Environmental Protection License Annual Return 2017-2018

1. Introduction

1.1 Introduction

This Statement of Environmental Effects (SoEE) has been prepared by Jacobs Group (Australia) Pty Limited on behalf of Bettergrow to support a request to Singleton Council (Council) to modify the conditions of consent for development application No. DA140/2016.2.

AGL Macquarie Pty Ltd (AGL) currently hosts the Ravensworth Composting Facility, a composting operation undertaken by Bettergrow Pty Ltd (Bettergrow) originally under Development Approval DA140/2016. The composting facility is located on the filled and capped Void 3 of the former Ravensworth No. 2 mine (the site). Development consent for the original development (DA140/2016.1), consisting of approval to receive and compost material up to 50,000 tonnes per annum wholly ancillary to rehabilitation of the site, was granted by Council on the 16th of November 2016, after reviewing an SoEE prepared by AECOM in 2016.

DA140/2016.1 was modified by Council on 16 April 2018 (DA140/2016.2) to allow up to 76,000 tonnes of organic waste material to be supplied to the compost facility per year wholly ancillary for the rehabilitation of AGL owned land. The modification also allowed for additional truck movements, to facilitate the increased organic waste received, as well as to facilitate the transfer of compost products to additional AGL sites, including the areas associated with the Liddell power station (referred to as modification 1).

This modification application (modification 2) seeks to change the conditions of consent with regards to which entities can receive compost outputs from the Ravensworth Composting Facility. Instead of supplying mulches and composted products only to AGL owned sites, the proponent seeks to allow the sale of the composting facility outputs to third parties in the region.

The composting facility would not increase in area as a result of the proposed modification, nor would traffic to and from the site increase. The composted material intended for sale would be removed from the site in the same number of trucks and site visits as approved in modification 1 of the development application.

The development, as proposed to be modified, is considered to be substantially the same development for which consent was originally granted. The modification request is therefore made pursuant to Section 4.55 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

1.2 Project Background

AECOM Australia Pty Ltd prepared a SoEE (dated July 2016) to support a development application (referred to as DA140/2016) for the establishment and operation of on-site composting to facilitate the rehabilitation of Ravensworth No. 2 mine and Ravensworth South mine.

The application was assessed as an integrated development (and not designated development) on the basis that the project was entirely ancillary to the existing rehabilitation works approved as part of the Bayswater Power Station and Ravensworth mine. On 25 November 2016, Council granted consent to DA140/2016, pursuant to Section 80 (now Section 4.16) of the EP&A Act and subject to conditions.

The Applicant for DA140/2016 was Bettergrow Pty Ltd (Bettergrow). Bettergrow are contracted by AGL Macquarie Pty Ltd (the land owner) to supply manufactured soil ameliorant and rehabilitation products to be used as part of the approved rehabilitation works at Ravensworth No. 2 mine and Ravensworth South mine.

The SoEE for modification 1 was prepared by Jacobs Group (Australia) Pty Ltd (dated February 2018) and was to increase the amount of organic waste the facility could receive from 50,000 tonnes per annum to 76,000 tonnes per annum. The increased intake of waste would allow compost and mulch to be provided to additional AGL owned rehabilitation sites outside of Ravensworth. The number of trucks and visits made to the site required an increase under the proposal, however the size of the site and scale of the composting operation remained the same as the original approved development. On 19 April 2018, Council approved the modification to the development application, DA140/2016.2. A copy of the approval for modification 1 is provided in Appendix A with the approved plans provided in Appendix B.

1.3 Need for the Modification

This application proposes to allow the proponent to supply compost products to third parties. The modification is required as the current compost output is higher than the current rate of application across the AGL owned sites, leading to an excess production of compost at the facility. In order to prevent a buildup in compost, excess compost would be sold to third parties in the region.

Section 3.1 provides further detail and justification for the proposed modification.

1.4 Report Structure

The SoEE is divided into the following sections:

- Chapter 1 provides background information for the proposed modification
- Chapter 2 provides a description of the site, the surrounding land uses and site history
- Chapter 3 describes the proposed modification and provides justification for the application
- Chapter 4 outlines the statutory considerations relevant to the modification application
- Chapter 5 assess the potential environmental impacts of the modification application
- Chapter 6 summarises the previously approved mitigation measures
- Chapter 7 draws conclusions on the ability of Council to determine the Section 4.55 modification application
- Appendix A containing notice of determination of DA140/2016.2
- Appendix B containing the approved plans associated with DA140/2016.2
- Appendix C containing the Road Dilapidation Survey
- Appendix D containing the annual return for EPL7654 for the period of 2017-2018

2. Site Description

2.1 Location and Surrounding Land Uses

The site is located at Ravensworth No. 2 mine and is approximately 20 kilometres north of Singleton. The site is formally described as Lot 10 DP1204457 at 74 Lemington Road, Ravensworth in the Singleton local government area (LGA). The site is cleared of native vegetation and is located on part of a capped open cut mining void which has been filled with ash from the AGL Bayswater Power Station. Access to the facility is provided via an internal access road off Lemington Road which connects to the New England Highway. The site location is shown in Figure 2.1.

The composting facility is located on a graded hardstand area, surrounded by perimeter bunding. A sediment barrier is located toward the eastern corner of the facility. A detention basin and spillway are located towards the south. A diversion wall and channel direct surface water runoff from the eastern corner of the facility into the spillway. A spillway channel connects the spillway to the lower basin.

Land uses and activities surrounding the site predominately involve power generation and mining operations including:

- Bayswater and Liddell Power Stations including Lake Liddell to the north west
- Liddell Coal operations to the north east
- Ravensworth North Open Cut to the west
- Integra Coal Mine to the south east.

2.2 Site History

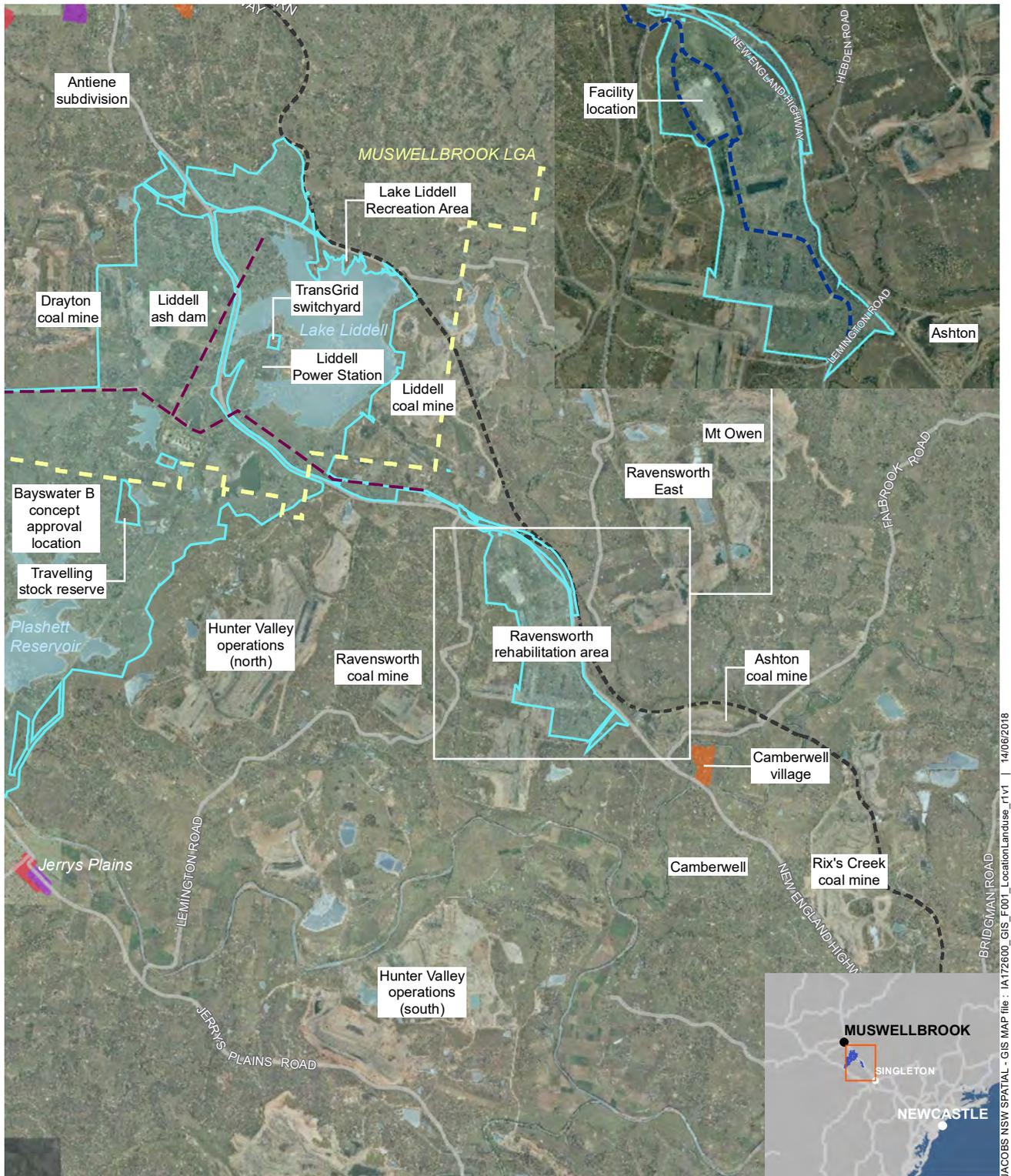
Peabody Resources Ltd (Peabody) was responsible for the operation the Ravensworth No. 2 mine until it was decommissioned in 1993 following the completion of coal extraction. AGL now owns the decommissioned mine and is therefore responsible for its rehabilitation, including five existing mine voids (referred to as voids 1, 2, 3, 4 and 5). Rehabilitation works involve the disposal of fly ash from the nearby Bayswater Power Station.

Voids 1 and 2 on the site have previously been filled with fly ash, capped and rehabilitated. Void 3 was filled with fly ash and capped in 2014. Void 4 is used as a water storage dam and provides additional capacity for surface water runoff during significant rainfall events. The placement of Bayswater Power Station fly ash into void 5 commenced in 2014 and is expected to be completed by 2032.

Rehabilitation works at voids 1 to 5 are carried out in accordance with the following development consents:

- DA No. 86/51 for the Ravensworth South mine granted by the NSW Department of Planning and Environment on 16 December 1986
- DA No. 144/93 granted by Singleton Shire Council on 8 December 1993 (as modified)
- DA No. 138/93 granted by Muswellbrook Shire Council on 13 December 1993 (as modified).

The above listed existing development consents issued for the site in the 1980s and 1990s allow the use of composting material as part of the mine rehabilitation process. However, these development consents do not explicitly allow for the on-site processing of composting material. Bettergrow therefore sought consent for composting activities to be conducted at Ravensworth No. 2 mine and Ravensworth South mine under DA140/2016. The application was approved by Council on 25 November 2016.



JACOBS NSW SPATIAL - GIS MAP file : IAT2600_GIS_F001_LocationLandscape_r1v1 | 14/06/2018

A modification to the terms of approval was lodged by Bettergrow in February 2018. The modification allows Bettergrow to increase its waste intake from 50,000 tonnes per annum to 76,000 tonnes per annum. The modification was approved by Council on 16 April 2018 under DA140/2016.2.

2.3 Current Site Operations

AGL has contracted Bettergrow to supply composted material to support the mine and ash dam rehabilitation works. The hours of operation at the site are from 6am to 6pm Monday to Saturday only. Vehicle access to the site is via an entry gate at Lemington Road located to the south.

Approximately 76,000 tonnes of organic material for composting are transported to the site annually, which is then unloaded at the existing hardstand area for storage and processing (an area covering approximately 25 hectares in total). The material currently authorised to be accepted comprises a mix of general solid waste (non-putrescible) and liquid waste limited to:

- Paper Crumble (General or Specific Exempted Waste)
- Urban wood residues Composting (as defined in 'The compost order 2016');
- Wastewater from Bayswater mine void 4;
- Natural organic fibrous Composting material (as defined in Schedule 1 of the POEO Act);
- Coal ash which meets the conditions of 'The coal ash order 2014';
- Biosolids (as defined in Schedule 1 of the POEO Act); and
- Garden Waste (as defined in Schedule 1 of the POEO Act)

The composting process takes approximately eight weeks, after which maturation occurs. The finished compost material is then stored and may be screened and blended with other ingredients to create the final product. The final compost material is then loaded on to trucks and transported to AGL owned sites undergoing rehabilitation, including mining voids and areas of previously rehabilitated land that requires further soil improvements.

Surface water is currently managed on site through the diversion of clean surface water around the composting operation area and the containment of leachate for reuse in the composting activities.

3. Modification Description and Justification

The proposed modification seeks only to authorise the sale of composting materials delivered in bulk to third parties whilst continuing to satisfy AGL’s annual requirements.

3.1 Justification

Modification 1 (DA140/2016.2) allowed for an increased intake of waste for composting of up to 76,000 tonnes per annum. The reason for this was to take advantage of available compostable materials and expand compost and mulch usage beyond the Ravensworth No. 2 mine and Ravensworth South mine, to other AGL owned sites undergoing rehabilitation in the area. This application proposes to allow the proponent to supply compost products to third parties in addition to AGL. The modification is required due to an inconsistent demand for compost materials from AGL, leading to seasonal peaks of stocks and a periodic excess of composted material at the facility. In order to prevent a buildup in compost and even out the flow of material, excess compost would be sold to third parties, allowing Bettergrow to continue to take advantage of organic materials currently available and contribute to assisting in the rehabilitation of disturbed sites in the region.

The composting activity would remain wholly consistent with the methods, location and scale of modification 1, hence the anticipated impacts as assessed for modification 1 would also remain unchanged. All compost sold would off-set compost previously destined for AGL sites and be delivered on a campaign basis as per modification 1. Only the potential destination would change with no additional truck movements required.

3.2 Conditions Required to be Modified

This application seeks to amend approved development consent Condition 1.1. The proposed amendment would make reference to this Section 4.55 modification report in the table of approved plans and supporting documents.

A consolidated version of Condition 1.1 is outlined below (the proposed amendments shown in red text).

A copy of the development consent conditions, approved plans for DA140/2016.2 and approved Surface and Groundwater Management Plan are included at Appendices A, B and C respectively.

1.1 Approved Plans and Supporting Documents

The development shall be carried out substantially in accordance with the approved stamped and signed plans and/or documentation listed below except where modified by any following condition. Where the plans relate to alteration or additions only those works shown in colour or highlighted are approved.

Reference/Drawing No.	Title/Description	Prepared By	Date/s
Sheet 1 of 6	General Arrangement	Tony Mexon & Associates	23 February 2016
Sheet 3 of 6	Stage 1 Works	Tony Mexon & Associates	23 February 2016
Sheet 4 of 6	Stage 2 Works	Tony Mexon & Associates	23 February 2016
Sheet 5 of 6	Cross Section A-A	Tony Mexon & Associates	23 February 2016
Sheet 6 of 6	Cross Section C-C	Tony Mexon & Associates	23 February 2016

<i>Surface and Groundwater Management Plan Version 7</i>		<i>Bio-Recycle Australia Pty Ltd</i>	<i>3/08/2016</i>
<i>Statement of Environmental Effects</i>		<i>AECOM</i>	<i>15/07/2016</i>
<i>Statement of Environmental Effects</i>	<i>Section 96(2) Modification to DA140/2016 – Ravensworth Composting Facility, Ravensworth</i>	<i>Jacobs Group (Australia) Pty Limited</i>	<i>6 February 2018</i>
<i>Statement of Environmental Effects</i>	<i>Section 4.55 Modification 2 to DA140/2016 – Ravensworth Composting Facility, Ravensworth</i>	<i>Jacobs Group (Australia) Pty Limited</i>	

Note 1: *Modification to the approved plans will require lodgment and consideration by Council of a modification pursuant to Section 4.55 of the Environmental Planning and Assessment Act, 1979.*

Note 2: *The approved plans and supporting documentation may be subject to conditions imposed under Section 4.17(1)(g) of the Act modifying or amending the development (refer to conditions of consent which must be satisfied prior to the issue of any Construction Certificate).*

Under the *Environmental Planning and Assessment Regulations 2000*, clause 37A of Section 3 exempts a proposal from being considered a Designated Development so long as it operates wholly ancillary to other developments, and does not work independently of those developments. This proposal would break clause 37A as selling material means it is now operating independently. The proposal could be assessed under clause 35 of Section 3, which states a development can remain exempt if a proposed addition or alteration, in the eyes of the consent authority, does not increase the environmental impacts of the overall development. This is explained further in Section 4.2.2.

4. Statutory Framework

4.1 Commonwealth Legislation

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) requires the approval of the Commonwealth Minister for the Environment for any actions that may have a significant impact on matter of National Environmental Significance (NES) in addition to any approvals issued under NSW legislation. The EPBC Act also outlines protections of the environment where activities are located on Commonwealth land.

The SoEE prepared for DA140/2016.2 established that modification 1 would not impact on any NES matters. This was determined on the basis of the site being cleared of any native vegetation and there being no listed threatened species, ecological communities or habitat for listed migratory species. The Hunter Estuary Wetland which is a wetland of international importance is located over 50 kilometres from the site and would not be impacted by the project.

The proposed modification would not introduce any new activities, beyond those previously granted consent under DA140/2016.2, that would impact on any NES matters or areas of Commonwealth land.

4.2 NSW State Legislation

4.2.1 Environmental Planning and Assessment Act 1979

The EP&A Act establishes the planning and approvals process in NSW. The EP&A Act provides for the making of Environmental Planning Instruments (EPs) including Local Environmental Plans (LEPs) and State Environmental Planning Policies (SEPPs), which set out requirements for particular localities and/or particular types of development. The applicable EPs and the Regulations made under the EP&A Act determine the relevant planning approval pathway and the associated environmental assessment requirements for proposed development activities.

The SoEE for DA140/2016 determined the project to be integrated development under Section 91 (now Section 4.46) of the EP&A Act as it involved the alteration or erection of improvements within a mine subsidence district (the Patrick Plains Mine Subsidence District). The SoEE for DA140/2016.2 found that modification 1 did not change the project's designation as an integrated development.

Composting is also a scheduled activity under the *Protection of the Environment Operations Act 1997* and Bettergrow (trading as Bio-Recycle) currently holds Environment Protection License (EPL) number 7654 for the scheduled activity of composting up to 76,000 tonnes per annum.

Section 4.55 of the EP&A Act allows the development consent to be modified if the consent authority is satisfied that the development, as proposed to be modified, is substantially the same development as originally approved. The proposed modification is considered substantially the same development as originally approved as there are no changes to the on-site activities or its operation. Changes to the potential delivery routes to third parties would not constitute a substantial change in local traffic and therefore the proposed modification would be considered substantially the same development.

In determining an application for modification of a consent, the consent authority must take into consideration such of the matters referred to in Section 4.15 (1) as are of relevance to the development which is the subject of the application. A summary of these matters is provided in Section 7.2.

4.2.2 Environmental Planning and Assessment Regulation 2000

The *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) contains key operational provisions for the NSW planning system. This includes procedures relating to development applications, requirements for environmental assessments, environmental impact assessments, building regulations and other miscellaneous matters.

Clause 4 and Schedule 3 of the EP&A Regulation identifies development as designated development under specific circumstances. A development application for designated development is required to be accompanied by an Environmental Impact Statement prepared in the form prescribed by the EP&A Regulations.

Clause 13 of Schedule 3 of the EP&A Regulation identifies composting facilities or works that process more than 5,000 tonnes per year of organic materials to be designated development. Clause 37A of Schedule 3 provides an exemption for development that is wholly ancillary to other development and that is not proposed to be carried out independently of that other development and was the basis of the original application and modification 1 not being classified as designated development. As modification 2 would involve selling compost material to outside entities, the composting would no longer be considered wholly ancillary to the other approved development.

Clause 35 of Schedule 3 of the EP&A Regulation identifies that a development involving alterations or additions to development is not designated development if the alterations or additions do not increase the environmental impacts of the overall development in the eyes of the consent authority. Clause 36 lists the criteria for how clause 35 is to be considered by Council.

It is considered open to Council to consider the development exempted under Clause 35 due to the minimal change in environmental impacts of the proposed modification (refer to Section 5 for an assessment of potential impacts). Table 4.1 considers the existing operations and modification 2 against the factors listed in Clause 36.

Table 4.1: Action Required for Clause 36

Clause 36 Factors		Action required
(a) The impact of the existing development having regard to factors including:	(i) Previous environmental management performance, including compliance with the conditions of any consents, licences, leases or authorisations by a public authority and compliance with any relevant codes of practice, and	Bettergrow has confirmed it fully complies with and acts in accordance with the development consent and consent modification 1 as evidenced by the documentation supplied to Council (attached at Appendix C). Bettergrow has also confirmed that it fully complies with all EPA licence conditions as verified through EPA officer site inspections on 13 March and 8 August 2018 and the EPA annual returns copies attached at Appendix D.
	(ii) Rehabilitation or restoration of any disturbed land, and	While the composting operation facilitates the rehabilitation of AGL lands, the existing

Clause 36 Factors		Action required
		<p>operations have not resulted in any incidents where land has required rehabilitation.</p> <p>Bettergrow has confirmed that no land area has been disturbed, other than that required and approved through the plans approved as part of DA140/2016.2, as a result of the operation. There have been no incidents, spillages or other issues of concern on surrounding lands.</p>
	(iii) The number and nature of all past changes and their cumulative effects, and	<p>Refer to Section 1.2. The composting operation was originally approved on 25 November 2016 (DA140/2016) and was modified on 19 April 2018 (DA140/2016.2) to allow for the acceptance of an additional 26,000 tonnes per annum of material and transfer of composted materials to other approved AGL rehabilitation works.</p>
(b) The likely impact of the proposed alterations or additions having regard to factors including:	(i) the scale, character or nature of the proposal in relation to the development, and	<p>Modification 2 does not seek changes to onsite operations or vehicle movements. The character, scale and nature of the development will remain the same with the only change being the ultimate destination of a portion of composted material being independent third parties.</p>
	(ii) the existing vegetation, air, noise and water quality, scenic character and special features of the land on which the development is or is to be carried out and the surrounding locality, and	<p>No impact to existing environment, as no change to onsite operations. Mitigation measures of current development approval would remain applicable. The surrounding environment remains consistent with the context in which the original development was assessed and approved.</p>
	(iii) the degree to which the potential environmental impacts can be predicted with adequate certainty, and	<p>As there are no changes to on-site operations, predicted impacts align with the <i>Jacobs Ravensworth Composting Facility, Statement of Environmental Effects Section 96(2) Modification to DA140/2016 (2018)</i> and performance outcomes currently experienced as a result of the approved development would be expected to remain the same.</p>
	(iv) the capacity of the receiving environment to accommodate changes in environmental impacts, and	<p>The proposed modification would not result in any changed environmental impacts as to those assessed as part of modification 1. The location of the facility remains appropriate based on the existing separation distances to</p>

Clause 36 Factors		Action required
		receivers and the implementation of existing on site environmental controls.
(c) any proposals:	(i) to mitigate the environmental impacts and manage any residual risk, and	As per <i>Ravensworth Composting Facility, Statement of Environmental Effects Section 96(2) Modification to DA140/2016 (2018)</i> . Bettergrow has confirmed it has in place a detailed compost management plan including mitigation measures designed to address the requirements of Resource Recovery Orders, AS4454 and The Composting Guidelines. These are outlined in Section 6.
	(ii) to facilitate compliance with relevant standards, codes of practice or guidelines published by the Department or other public authorities.	The proposed modification has no implications on the Singleton LEP or the Singleton DCP. The proposed modification does not have any implications on EPL 7654 as it would not change the onsite operations. Bettergrow, under EPL 7654, adheres to the <i>Composting Guidelines: composting and related organics processing facilities, 2004</i> Bettergrow has confirmed that it adheres to the <i>Biosolids Guidelines: Use and Disposal of Biosolids Products, 1997</i> . Resource Recovery Orders in relation to the proposed modification have been addressed in Section 4.3.1. Bettergrow has confirmed that current composting operations are managed in accordance with the principles of <i>Australian Standard: AS 4454 (2012): Composts, soil conditioners and mulches</i>

4.2.3 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) aims to protect, restore and enhance the quality of the environment in New South Wales, having regard to the need to maintain ecologically sustainable development. The POEO Act prohibits any person from causing pollution of waters or air and applies penalties for pollution offences.

Schedule 1 of the POEO Act identifies scheduled activities that require a license for the premises at which the activity is carried out. In accordance with clause 12 of Schedule 1, the composting activities carried out on the

site require an environmental protection license (EPL) as it receives more than 5,000 tonnes per year of non-putrescible organics from an off-site source.

Bettergrow holds EPL 7654 for the premises covering composting and waste activities on the site. The selling of materials offsite as proposed in this modification application would not require a variation to the EPL.

4.2.4 Mine Subsidence Compensation Act 1961

The *Mine Subsidence Compensation Act 1961* (MSC Act) provides for the regulation of development on land potentially affected by mine subsidence.

The SoEE for DA140/2016 identified the project as being located within the Patrick Plains Mine Subsidence District and that the extent of works would be classified as an improvement under the MSC Act. Under clause 15 of the MSC Act, approval from the Mine Subsidence Board was required prior to the commencement of operations associated with the project. The approved plans provided in Appendix B have been stamped by the Mine Subsidence Board.

4.3 Environmental Planning Instruments

4.3.1 Protection of the Environment Operations (Waste) Regulation 2014

Resource Recovery Orders under Part 9, Clause 93 of the Protection of the *Environment Operations (Waste) Regulation 2014* impose requirements onto the proposed modification. These include:

- The compost order 2016¹
- The biosolids order 2014²

4.3.1.1 The compost order 2016

The compost order 2016 imposes the requirements that must be met by suppliers of compost. The order applies to any entity who supplies compost that has been processed or generated by that entity. The requirements imposed by the order states that the processor must ensure the supplied compost is free of asbestos, engineered wood products and treated/coated wood, that the compost is not crushed or ground in any way that may reduce the size of contaminants, and that the compost must be supplied ready for application. In addition to these requirements, the processor must also prepare a written sampling plan to sample compost for contamination, and assure that contaminants are not in a higher concentration than those listed in Table 4.2.

Table 4.2: Absolute Maximums for Compost Contaminants

Attribute	Absolute Maximum (% in dry weight unless otherwise specified)
Glass, metal and rigid plastics > 2 mm	0.5
Plastics – light, flexible or film > 5 mm	0.005

¹ <https://www.epa.nsw.gov.au/~media/EPA/Corporate%20Site/resources/wasteregulation/RRO16-compost.ashx>

² <https://www.epa.nsw.gov.au/~media/EPA/Corporate%20Site/resources/waste/rro14-biosolids.ashx>

Attribute	Absolute Maximum (% in dry weight unless otherwise specified)
Salmonella spp	Absent in 25g
Escherichia Coli (E. Coli)	<100MPN/g*
Faecal coliforms	<1000MPN/g*

*MPN = most probable number

As the proposed modification involves supplying compost for more than ancillary use, Bettergrow would be required to follow The Compost Order 2016 and perform the above requirements. Bettergrow has confirmed it currently adheres to The Compost Order 2016 through the Compost Management and Testing Plan and an independent testing regime is currently undertaken on all composted product supplied by the facility. As Bettergrow adheres to these requirement, no changes will need to be made under the proposed modification.

4.3.1.2 The biosolids order 2014

The biosolids order 2014 imposes requirements that must be met by any person who generates, processes or recovers biosolids. The order requires a supplier of biosolids to report and record:

- All test results in relation to the biosolids used
- The quantity of biosolids used
- The name and address of each person who has been supplied biosolids.

The order additionally requires a supplier to provide, on or before every transaction, a buyer with:

- A written statement of compliance certifying all requirements of this order have been met
- A copy of the biosolids exemption, or a link to the EPA website where the biosolids exemption can be found
- A copy of the biosolids order, or a link to the EPA website where the biosolids order can be found.

As the proposed modification involves supplying compost for more than ancillary use, Bettergrow would be required to follow The Biosolids Order 2014 and perform the above requirements.

Bettergrow has confirmed it currently adheres to The biosolids order 2014 and operates in full compliance with the NSW EPA biosolids guidelines. All composts containing biosolids are tested in accordance with the NSW EPA guidelines and AS4454 to ensure full environmental compliance prior to release of any batch of product. Detailed records are retained in accordance with both the order and guidelines and are provided to the consumer as required

Under the Resource Recovery Order under Part 9, Clauses 91 and 92 (“The Compost Exemption 2016”), a consumer of compost will be exempt from the provisions of the POEO Act and the Waste Regulation so long as the purchased compost is intended for land application. The conditions for exemption require that the purchased compost meets the chemical and material requirements for compost outlined in The Compost Order 2016, that the compost is only for land application, that the consumer can ensure that they do not cause or permit the migration of leachate off the application site and that the consumer can ensure the purchased compost will be applied in a reasonable period of time.

As the compost produced by Bettergrow meets the requirements for compost outlined in The Compost Order 2016, and that the intended buyers will use the compost for land rehabilitation, purchasers of Bettergrow's compost should meet the conditions for The Compost Exemption 2016.

4.3.2 State Environmental Planning Policy (Infrastructure) 2007

Under Clause 121 of the *State Environmental Planning Policy (Infrastructure) 2007*, development for the purpose of waste or resource management facilities, other than development referred to in subclause (2), may be carried out by any person with consent on land in a prescribed zone. Resource management facilities are defined as including composting activities and the Prescribed Zones include the RU1 zone. Composting facilities are not referred to in subclause (2) and as such the existing composting activity and proposed modification are permissible with development consent under *State Environmental Planning Policy (Infrastructure) 2007*.

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

Under clause 23(3) of *State Environmental Planning Policy (State and Regional Development) 2011*, development for the purpose of resource recovery or recycling facilities that handle more than 100,000 tonnes per year of waste is considered state significant development. As the development as modified would remain below 100,000 tonnes per annum the proposed modification is not considered State significant development.

4.3.4 State Environmental Planning Policy No 33 – Hazardous and Offensive Development

State Environmental Planning Policy No 33 – Hazardous and Offensive Development (SEPP 33) aims to ensure that measures are employed to reduce the impact of a development that is a hazardous or offensive industry.

Under SEPP 33 a consent authority must not consent to the carrying out of any development on land without considering:

- Current circulars or guidelines published by the Department of Planning and Environment relating to hazardous or offensive development;
- Whether any public authority should be consulted concerning any environmental and land use safety requirements with which the development should comply;
- In the case of development for the purpose of a potentially hazardous industry—a preliminary hazard analysis prepared by or on behalf of the applicant;

Any feasible alternatives to the carrying out of the development and the reasons for choosing the development the subject of the application (including any feasible alternatives for the location of the development and the reasons for choosing the location the subject of the application), and any likely future use of the land surrounding the development.

The proposed modification involves the selling of compost material offsite. The proposed modification does not change operations in any way nor does it introduce the use of hazardous chemicals or activities that would trigger consideration as potentially hazardous development. Additionally, the site is located upon extensive buffer lands owned by AGL and is appropriately zoned to prevent encroachment of development incompatible with the ongoing operations of the composting facility.

4.3.5 State Environmental Planning Policy No 44 – Koala Habitat Protection

State Environmental Planning Policy No 44 – Koala Habitat Protection (SEPP 44) applies to the Singleton LGA. The aim of SEPP 44 is to encourage the proper conservation and management of areas of natural vegetation

that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline.

The SoEE for the DA140/2016 determined the project site to be cleared of any suitable koala habitat. Further, the project would not involve the interaction with, or potential impact on any habitat trees located adjacent to the site. Preparation of a koala plan of management under SEPP 44 was therefore not required.

The proposed modification will not involve any form of land clearing, and hence there are no impacts to core koala habitat.

4.3.6 State Environmental Planning Policy No 55 – Remediation of Land

State Environmental Planning Policy No 55 – Remediation of Land (SEPP 55) aims to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment. Clause 7 of SEPP 55 requires a consent authority to consider whether the land is contaminated and whether it is suitable (or can be made suitable) for the proposed development.

The SoEE for DA140/2016 determined the development to be located on a previously developed site where there is no known contamination. The SoEE for DA140/2016.2 determined that the works proposed as part of modification 1 would be carried out wholly within the approved site area and consequently, the conclusions made relating to site contamination for DA140/2016 remained valid. As this proposed modification does not involve any changes to storage or operations at the site, there is no associated risk of contamination.

4.3.7 Singleton Local Environmental Plan 2013

Zoning and Permissibility

The site is zoned RU1 Primary Production under the *Singleton Local Environmental Plan 2013* (Singleton LEP). The objectives of the RU1 zone are:

- *to encourage sustainable primary industry production by maintaining and enhancing the natural resource base*
- *to encourage diversity in primary industry enterprises and systems appropriate for the area*
- *to minimise the fragmentation and alienation of resource lands*
- *to minimise conflict between land uses within this zone and land uses within adjoining zones.*

Open-cut mining is permissible with consent in the RU1 zoning and the SoEE for DA140/2016 identified the project as associated with the rehabilitation of open-cut mining. The rehabilitation activities were considered to be consistent with the objectives of the RU1 Primary Production zone as it would enhance the natural resource base of the land in its post-mining state. The proposed modification involving the expansion of existing composting operations would remain consistent with the RU1 zone objectives.

It is further noted that while composting operations are a prohibited land-use within the RU1 zone under the Singleton LEP, resource recovery including composting is permissible with consent within the RU1 zone under *State Environmental Planning Policy (Infrastructure) 2007*. Section 1.9 of the Singleton LEP identifies that it is subject to the provisions of any State environmental planning policy that prevails as provided by Section 3.28 of the EP&A Act. Under Section 3.28 of the EP&A Act, in the event of an inconsistency between environmental planning instruments and unless otherwise provided, there is a general presumption that a State environmental planning policy prevails over a local environmental plan or other instrument made before or after that State environmental planning policy. As such the proposed development for the purposed of composting and rehabilitation of open-cut mining is permissible within the RU1 zone with consent.

Section 7.1 of the Singleton LEP requires earthworks for which development consent is required to not have a detrimental impact on environmental functions and processes, neighbouring uses, cultural or heritage items or features of the surrounding land.

The proposed modification does not involve additional earthworks. The placement of composted material as originally approved as part of the site rehabilitation works would be carried out in such a way that would avoid disruption to existing drainage patterns and subsequent impacts to nearby waterways.

5. Assessment

5.1 Environmental Impacts

The SoEE for DA140/2016 considered the potential for environmental impacts of the project to identify key impacts requiring additional consideration. The SoEE for DA140/2016.2 considered any additional impacts associated with the changes in modification 1. This process has been repeated in Table 5.1 below to describe the identified impacts for the original application and in modification 1, and implications of the proposed modification (modification 2).

Table 5.1 : Potential for Environmental Impacts to change as a result of the modification

Environmental factor	Original SoEE	Modification 1 Implications	Modification 2 Implications	Further discussion in this SoEE	Reference
Traffic	<p>The project site would be accessed via Lemington Road to the south of the project. The internal roads would be modified (if required) to provide a suitable surface and drainage for the project. The construction of the project would not generate additional vehicle movements as all plant and equipment to be used is currently in use on other projects on site. The operation of the project would generate approximately 8 heavy vehicle movements per day. The New England Highway has the capacity to absorb the additional construction and operational traffic volumes. Potential impacts to traffic and access, including impacts to the New England</p>	<p>The proposed modification would generate traffic of up to 19 additional vehicles attending site per day associated with four additional organic material deliveries and up to 15 deliveries of composted material to the Liddell Ash Dam rehabilitation area on a campaign basis.</p>	<p>No additional truck movements above current approvals in and out of the site would be required. Existing trucks exiting the site empty would instead be used to transport material for sale. Trucks will travel new routes to deliver compost; however, this is unlikely to cause noticeable impacts on the traffic in those areas. Refer to Section 5.1.1 for further details.</p>	Yes	Section 5.1.1

Environmental factor	Original SoEE	Modification 1 Implications	Modification 2 Implications	Further discussion in this SoEE	Reference
	Highway are anticipated to be negligible for the project.				
Noise and Vibration	The nearest sensitive receiver is located over 7.5 kilometres from the project site. Noise and vibration impacts are anticipated to be minor for the project.	No additional plant or equipment would be required to handle the additional compost volumes. Additional traffic would not have the potential to increase road traffic noise to the extent that it would be noticeable.	No additional plant or equipment would be required for this modification.	No	
Air quality	There are potential impacts related to odour and dust generation for the operation of the project. Only minor localised potential impacts from dust are anticipated for the construction project.	The proposed modification would result in increased dust and odour generation potential during operation but would continue to be appropriately located such that impacts to offsite receptors, the nearest identified in the original SoEE as 7.6 km to the south east, would be avoided.	No impacts are expected as there is no change in site operations or truck movements.	No	
Visual amenity	The works undertaken for the project would be consistent with the current esthetic qualities of the site associated with rehabilitation activities. The project site is not visible from the New England	No additional structures or increased stockpile heights are proposed and as such no additional visual impacts are considered likely to result from the proposed modification.	No additional structures or increased stockpile heights are proposed and as such no additional visual impacts are considered likely to result from the proposed modification.	No	

Environmental factor	Original SoEE	Modification 1 Implications	Modification 2 Implications	Further discussion in this SoEE	Reference
	Highway or nearby sensitive receivers.				
Surface water	There are potential impacts to surface water for the project.	The proposed modification would generate leachate and as such has the potential to impact on surface water quality if unmanaged.	The proposed modification would not impact leachate generation and hence would have no impact on surface water quality.	No	
Groundwater	There are potential impacts to groundwater for the project.	The proposed modification would generate leachate and as such has the potential to impact on groundwater quality if unmanaged.	The proposed modification would not impact leachate generation and hence would have no impact on groundwater quality.	No	
Landforms, geology and soils	Excavations and earthworks are proposed for the construction of the project. Potential impacts associated with excavations and earthworks would be managed by the implementation of an Erosion and Sediment Control Plan for the construction of the project.	No additional disturbance is proposed.	No additional disturbance is proposed.	No	
Biodiversity	The project site is cleared of native vegetation and there is negligible potential for listed threatened species, ecological communities or habitat for listed migratory species. Impacts to biodiversity would be unlikely for the project.	No additional clearing is proposed.	No additional clearing is proposed.	No	

Environmental factor	Original SoEE	Modification 1 Implications	Modification 2 Implications	Further discussion in this SoEE	Reference
	The project would improve the quality of existing and future rehabilitation at the Ravensworth No 2 Mine. The project would encourage the establishment of native vegetation communities and potential habitat for fauna.				
Non-Aboriginal and Aboriginal Heritage	<p>A review of LEP 2013 was undertaken for the project site. No Aboriginal or non-Aboriginal heritage items were identified at the project site.</p> <p>A search was undertaken of the Aboriginal Heritage Information Management System for the project site.</p> <p>An Aboriginal site was recorded 500m to the north east of the Project site, on the eastern side of the New England Highway.</p> <p>Due to the historical use of the project site for mining, it is highly unlikely that the Project site contains any unidentified items of heritage significance.</p> <p>Potential impacts to Aboriginal and Non-Aboriginal heritage from the Project</p>	<p>There are no listed Non-Aboriginal heritage items in the vicinity of the facility.</p> <p>An updated search of the Aboriginal Heritage Information Management System (AHIMS) was undertaken in December 2017.</p> <p>The search identified one Aboriginal site in the search area. This site is likely to be the same site identified in the original SoEE.</p> <p>No additional clearing or ground disturbance is proposed and as such no additional impacts to Aboriginal or Non-Aboriginal heritage is likely.</p>	<p>There are no listed non-Aboriginal heritage items in the vicinity of the facility.</p> <p>An updated search of the Aboriginal Heritage Information Management System (AHIMS) was undertaken in December 2017 for DA140/2016.2.</p> <p>The search identified one Aboriginal site in the search area. This site is likely to be the same site identified in the original SoEE.</p> <p>No additional clearing or ground disturbance is proposed and as such no additional impacts to Aboriginal heritage is likely.</p>	No	

Environmental factor	Original SoEE	Modification 1 Implications	Modification 2 Implications	Further discussion in this SoEE	Reference
	would be unlikely for the project.				
Bushfire	The project site is located on bush fire prone land and so there are potential impacts related to bush fire risk.	<p>According to the Singleton Council's Bushfire Prone Land Map, New England Highway, Lemington Road and the surrounding access roads are located in bush fire prone land. The facility itself is not mapped as being located on bushfire prone land.</p> <p>The proposed modification is unlikely to increase the bush fire risk of the facility and would be managed by existing bush fire protection measures.</p>	The proposed modification would not increase the bush fire risk of the facility as the site would continue to be managed by existing bush fire protection measures.	No	
Waste Management	During construction, waste generated would be limited to spoil and general construction waste.	No additional waste streams would be generated. Waste would continue to be received and handled in accordance with applicable resource recovery orders and exemptions and EPL7654 as proposed to be varied to permit additional compost volumes.	Waste would continue to be received and handled in accordance with applicable resource recovery orders and exemptions, AS4454 and EPL7654. Sampling and testing would continue to be carried out in accordance with AS4454, The NSW biosolids guidelines and The Compost Order 2016.	Yes	Section 5.1.2.

Environmental factor	Original SoEE	Modification 1 Implications	Modification 2 Implications	Further discussion in this SoEE	Reference
Contaminated land and hazardous materials	Areas to be disturbed at the project site are not known to be contaminated.	A search of the NSW EPA Contaminated land records of notices and the List of NSW Contaminated Sites Notified to the EPA in December 2017 did not identify any contaminated sites within the vicinity of the project. No additional contamination risks are introduced by the proposed modification.	No additional contamination risks would be introduced by the proposed modification. Compost supplied for sale would be managed in accordance with The compost order 2016, as outlined in Section 4.3.1.	No	Section 4.3.1-
Socio-economic effects	Surrounding businesses are not anticipated to be impacted during the construction or operation of the project.	The traffic and amenity impacts of the proposed modification are unlikely to affect any surrounding businesses or private receptors.	The proposed modification would not change current operational or traffic impacts and hence is unlikely to affect any surrounding businesses or private receptors. The compost sold offsite would be used for soil amelioration and rehabilitation and would continue to aid in landfill avoidance.	No	
Demand on resources	The project would use standard construction resources. The works are not anticipated to result in an increased demand on resources.	No additional demand on resources would be introduced by the proposed modification.	No additional demand on resources would be introduced by the proposed modification.	No	

Environmental factor	Original SoEE	Modification 1 Implications	Modification 2 Implications	Further discussion in this SoEE	Reference
Cumulative environmental effects	Consultation with Council did not identify the potential for cumulative impacts for the project with current or future development in Singleton.	The proposed modification is located within the Ravensworth mining complex and is located in an area that is surrounded by mining and power operations. The proposed modification would be minor in nature and is unlikely to have a significant cumulative impact in the area. In facilitating rehabilitation, the project would have a positive contribution to local air quality, land use productivity and habitat potential in the longer term.	The proposed modification would not change operational or traffic impacts and would therefore not have a cumulative impact in the area.	No	

On the basis that the proposed modification does not involve any new clearing or ground disturbance, does not involve additional equipment or structures on site and does not change the facility and product management and testing procedures, the implications of the proposed modification are limited to potential changes in traffic direction leaving the site.

The assessment of these issues, including conclusions made in the SoEE and potential for further implications generated by the proposed modification, are discussed in Section 5.1.1. The approved mitigation measures to address the environmental impacts are listed at Section 6.

5.1.1 Traffic

The existing composting operation after modification 1 currently generates 12 truck deliveries from Newcastle and 12 return truck movements per day, in addition to 15 movements from the site to other AGL rehabilitation projects to the north and 15 return truck movements per day on a campaign basis.

The modification 1 SoEE (Jacobs 2018) found that the additional traffic movements generated would be within the normal day to day variation of traffic volumes and would have minimal impact on nearby traffic.

The proposed modification aims to use pre-existing deliveries and returns from the site, avoiding the use of additional trucks or visits to the site. The delivery routes would be the only aspect that may change due to the sale to third parties. Due to this, the proposed modification would not result in an increased impact on local traffic compared to modification 1. The project site and surrounding area have no public transport facilities and minimal active transport activities. Therefore, the project would likely have no impacts on public transport and active transport.

5.1.2 Waste Management

Bettergrow has confirmed that the facility is currently compliant with all resource recovery orders and exemptions relevant to the proposed modification, as well as compliant with EPL 7654. Additionally, Bettergrow has confirmed that its testing regime at the site is using a higher standard than the NSW Biosolids Guideline or the Australian Standard for Composts, Soil Conditioners and Mulches 2012 (AS4454).

6. Environmental Mitigation Measures

The facility would continue to be operated in accordance with the mitigation measures provided in the SoEE for DA140/2016 and SoEE for modification 1, the conditions of the development approval and the requirements of EPL7654. A summary of the environmental mitigation measures provided in the original SoEE for DA140/2016 and subsequently approved by Council is included at Table 6.1. The approved mitigation measures would apply and continue to be maintained as part of the proposed modification. Mitigation measures in **bold** are new mitigation measures added to address the impacts of this proposal.

Table 6.1 : Summary of key environmental issues and approved mitigation measures

Issue	Potential Impact	Mitigation Measures
Landforms, geology and soils	Soil erosion / stability	An Erosion and Sediment Control Plan (ESCP) would be developed for construction works and implemented and approved by AGL environmental staff prior to initiation of construction works.
Surface water	Pollution from sedimentation and oil spills	<ul style="list-style-type: none"> Limit fuels and chemicals stored onsite to a minimum. All required chemicals and fuels must be located within a bunded enclosure located away from drainage lines and stormwater drains. Plant and equipment must be regularly inspected to check for oil leaks. Refuelling of vehicles or machinery is to occur within a containment or hardstand area designed to prevent the escape of spilled substances to the surrounding environment. Wash down areas must be appropriately constructed, and the collected material disposed of off-site to a licensed facility.
	Pollution from leachate (operation)	<ul style="list-style-type: none"> Maintain all water related infrastructure designed to maximise runoff and reduce infiltration including: <ul style="list-style-type: none"> Low permeability base in the composting processing areas Lining of the leachate dams Bunding and arrangement of windrows Perimeter bunding and diversion drains. Undertake the aeration of leachate in the leachate dams if required following other control measures being implemented. Reuse runoff and leachate collected in the leachate dams during composting activities.
Groundwater	Groundwater pollution	Implementation of appropriate surface water mitigation measures (as outlined above).
Air Quality	Dust, odour and fumes (Construction)	<ul style="list-style-type: none"> Emission of dust from unsealed roads and other exposed surfaces such as unprotected earth or soil stockpiles must be controlled by use of surface sealants and/or water spray carts or other appropriate cover material.

Issue	Potential Impact	Mitigation Measures
		<ul style="list-style-type: none"> • Stockpiles must be appropriately maintained and contained which could include covering with finished compost or regular watering to minimize dust. • Work must be minimised and/or modified during high wind periods. • Plant and equipment must be operated in a proper and efficient manner and be switched off when not in use. • Plant and equipment must be maintained in accordance with manufacturer’s specifications to ensure that it is in a proper and efficient condition. • Plant and equipment must be regularly inspected to ascertain that fitted emission controls are operating efficiently.
	Odour (Operations)	<ul style="list-style-type: none"> • Use a windrow heap structure. • Begin the composting process with a carbon nitrogen ration of 25 – 30:1. • Maintain aerobic microbial activity during the composting process. • Maintain oxygen supply in the windrows. • Prevent anaerobic conditions which lead to ammonia and hydrogen sulphide release. • Monitor the leachate dam for anaerobic conditions regularly. • Maintain correct pH range (i.e. 6.5-8.5 pH units) in the leachate dam to eliminate ammonia and sulphide releases. • Chemical treatment of the leachate dam if required. • Direct waste materials to compost windrows when delivered and turning the ingredients. • Cover odorous loads with composted material, fly ash or dried biosolids to act as an odour filter until the load is appropriate for treatment. • Use odour neutralising agents such as BioActive.
	Dust (Operations)	<ul style="list-style-type: none"> • Restriction of traffic to designated internal roads. • Restriction of on-site traffic speeds to minimise wheel dust generation. • Regular wetting of hardstand pads and internal roads. • Wetting dry solid waste using sprinklers or handheld hoses during unloading. • Ensuring daily evaporation is taken into account when applying water as a dust suppressant. • Moisture control of compost and biosolids windrows when being turned. • Moisture control of compost to be screened.

Issue	Potential Impact	Mitigation Measures
		<ul style="list-style-type: none"> • Ceasing of screening, turning or mixing activities when wind speeds are excessive.
Bush fire	Access for emergency vehicles	The perimeter access road would be upgraded and would be provide suitable access for emergency vehicles, including the road surface and width.
	Water supply	A water tank would be located on site and water would also be available to be pumped from the leachate dam for firefighting operations.
	Emergency management	Emergency management procedures would be set out in the Environmental Management Plan to be prepared for the Project.
Biodiversity	Construction Native Vegetation Threatened Species	<ul style="list-style-type: none"> • Should any noxious weeds be encountered, appropriate management and disposal of these weeds must be carried out. • Construction works must be stopped if any previously undiscovered threatened species or communities are discovered during works. An assessment of the impact and any required approvals must be obtained.
Noise and vibration	Construction Noise vibration	Construction activities must be conducted during standard construction hours, i.e. Monday to Friday 6am to 6pm; Saturday 8am to 1pm; and no work on Sundays or public holidays.
Heritage	Construction Aboriginal Heritage Non aboriginal Heritage	Should an unexpected historic relic or Aboriginal object be identified during construction, work in the immediate vicinity of the find is to stop and the area must be fenced off with suitable markers (star pickets, flagging or barrier mesh). The Project Manager is to be notified. Engage an archaeologist to determine the significance of the find, and if required, determine the notification, consultation, and approval requirements.
Waste management	Construction spoil, Litter, chemicals, solid waste	<ul style="list-style-type: none"> • Resource management options for the Project must be considered against a hierarchy of the following order embodied in the Waste Avoidance and Resource Recovery Act 2001. • Avoid unnecessary resource consumption. • Recover resources (including reuse, reprocessing, recycling and energy recovery). • Dispose (as a last resort). • All wastes must be classified in accordance with the Waste Classification Guidelines (EPA, 2014) prior to disposal and transported to a licensed waste disposal facility if required. • Excavated material must be temporarily stored in a bunded area or with appropriate environmental controls in place to prevent run-off of contaminants entering the stormwater system. • Any spoil or waste material tracked onto paved areas such as roads and car parks must be immediately swept up. No water is

Issue	Potential Impact	Mitigation Measures
		<p>to be used to wash any such material tracked onto roads into stormwater drains.</p> <ul style="list-style-type: none"> All waste must be removed from the site on completion of the construction works.
Contaminated land and hazardous materials	Soil contamination from hazardous spills (Construction)	<ul style="list-style-type: none"> Fuels, lubricants and chemicals must be stored and, where practicable, used within containment/hardstand areas designed to prevent the escape of spilt substances to the surrounding environment, as required by relevant legislation and standards (e.g. AS1940: Australian standard for the storage and handling of flammable and combustible liquids). Adequate spill prevention and containment measures (e.g. drip trays) must be used when refuelling equipment on site. Construction personnel are to be trained in spill containment and response procedures. Appropriate spill response material to be kept on site. If a spill occurs, the material is to be contained to the smallest area possible. All spills that cause or may cause material harm to the environment are to be reported to the EPA.
	Soil and Compost Contamination (Operational)	<ul style="list-style-type: none"> Monitor biosolid inputs to ensure supplier has tested biosolids in accordance with The Biosolid Order 2014. Screen all inputs entering the facility and products leaving the facility in accordance with the, the Compost Order 2016, AS4454, and the NSW biosolids guidelines
Visual aesthetics and urban design	Visual impacts to views and vistas	<ul style="list-style-type: none"> A high level of housekeeping must be maintained by ensuring that the work site is kept in a clean and tidy condition. Waste materials must be removed from site regularly.
Traffic	Construction & Operation Traffic and access Transport	<ul style="list-style-type: none"> Restriction of traffic to designated internal roadways. Restriction of onsite traffic speeds to minimise wheel dust generation.

7. Conclusion

This chapter provides the justification for the proposed works taking into account its biophysical, social and economic impacts, the suitability of the site and whether or not the proposal is in the public interest. The proposal is also considered in the context of the principles of ecologically sustainable development as defined in Schedule 2 of the Environmental Planning and Assessment Regulation 2000.

7.1 Justification

As there will be no change in the on site operations, no additional environmental impacts are considered likely to result as a consequence of the proposed modification. Impacts will continue to be managed through existing site-specific safeguards. The sale of compost offsite will have no environmental effects given that no extra trucks or deliveries will occur at the facility, nor will operations change. The site is considered appropriately located away from sensitive human or ecological receptors such that the project as modified would be unlikely to result in adverse environmental consequences.

The nature, scale and intensity of the works and their impacts is not considered to render the proposed works substantially different to those approved in modification 1 or originally approved under DA140/2016.1.

7.1.1 Social factors

The proposal may have some localised social impacts as a result of the alternative truck routes being used to effect deliveries. As the site is surrounded by buffer lands controlled by AGL with no private receptors within 1 kilometre, negative social impacts will be limited. Bettergrow are required, and are able, to manage impacts to avoid significant impacts to these receptors through the use of standard environmental safeguards specified in Table 6.1 and regulated under the *Protection of the Environment Act 1997* and the existing EPL.

Positive social impacts include the provision of additional compost to assist in rapid local vegetation establishment and reduction in dust generation due to bare soils. The longer-term effect of the proposed modification will be an overall social benefit, through improved rehabilitation outcomes on previously disturbed areas in the locality.

7.1.2 Biophysical factors

The site is already highly disturbed and no additional clearing or ground disturbance is proposed. As such the potential biophysical impacts are limited to ground and surface water quality. The existing development is able to accommodate the increased material quantities and no additional water pollution risks are introduced.

The improved rehabilitation outcomes are expected to lead to improved habitat on site.

7.1.3 Economic factors

Some profits are expected to be made in the short term due to this proposal. Profits coming from the sale of compost to third parties will be reinvested progressively on site improvements. The proposed sale of product to third parties has been proposed to better manage the continuous flow of finished composted products on site and to avoid a build-up of compost at the site due to the nature of AGL's current requirements. Ongoing supply of finished compost to AGL for onsite rehabilitation remains the primary purpose of the facility.

7.1.4 Public interest

The public interest is best served through development that fulfils the needs of the majority. The proposal represents a cost-efficient private investment in the rehabilitation of disturbed landforms and the management of organic waste streams. The composting and use of organic waste streams avoids the consumption of limited landfill space and uses land appropriately isolated from sensitive receptors.

Although the development results in some impacts these have been found to be manageable and appropriate within the site context and outweighed by the long-term benefits including improved rehabilitation outcomes and associated longer term amenity and biodiversity and potential economic use of land post rehabilitation. As a result, the proposed modification is considered to be in the public interest.

7.2 Consideration of Section 4.15 of the EP&A Act

In determining an application for modification of a consent under Section 4.55 of the EP&A Act, the consent authority must take into consideration such of the matters referred to in Section 4.15(1) as are of relevance to the development the subject of the application. The factors listed in Section 4.15(1) have been considered in Table 7.1 below in order to summarise the likely impacts of the modification on the natural and built environment.

Table 7.1 : Consideration of Section 4.15(1) requirements

Matter for Consideration	Consideration
<p>The provisions of any environmental planning instrument.</p>	<p>Environmental planning instruments considered in relation to the site and modification has included:</p> <ul style="list-style-type: none"> • <i>State Environmental Planning Policy (Infrastructure) 2007 (ISEEP);</i> • <i>State Environmental Planning Policy (State and Regional Development) 2013</i> • <i>State Environmental Planning Policy No 33 – Hazardous and Offensive Development 12</i> • <i>State Environmental Planning Policy No 44 – Koala Habitat Protection 12</i> • <i>State Environmental Planning Policy No 55 – Remediation of Land 12</i> • <i>Singleton Local Environmental Plan 2013 13</i> <p>The relevant provisions of applicable environmental planning instruments are considered in Sections 4.3.1, 4.3.3, 4.3.4, 4.3.5, 4.3.6 and 4.3.7. The proposed works are considered permissible under these instruments and able to be considered as a modification to the approved project.</p>
<p>The provisions of any proposed instrument.</p>	<p>No proposed Environmental Planning Instruments are considered to apply to the proposed modification.</p>

Matter for Consideration	Consideration
<p>The provisions of any Development Control Plan.</p>	<p>The Singleton Development Control Plan (Singleton DCP) 2014 guides development in the Singleton LGA. A review of the Singleton DCP, and consultation with Council, indicated that the proposed modification application should be supported by a traffic impact assessment as per Schedule 5 of the DCP. The Traffic impact assessment for the proposed modification has been undertaken and is summarised in Section 5.1.1 and is attached as Appendix D.</p>
<p>The provisions of any planning agreement that has been entered into under Section 7.4, or any draft planning agreement that a developer has offered to enter into under Section 7.4.</p>	<p>No planning agreements affecting the proposed modification location have been entered into or are proposed.</p>
<p>The provisions of the regulations (to the extent that they prescribe matters for the purposes of this paragraph).</p>	<p>Clause 92 of Environmental Planning and Assessment Regulation 2000 identifies that for the purposes of Section 4.15(1) (a) (iv) of the Act, the following matters are prescribed as matters to be taken into consideration by a consent authority in determining a development application:</p> <ul style="list-style-type: none"> (a) in the case of a development application for the carrying out of development: <ul style="list-style-type: none"> (i) in a local government area referred to in the Table to this clause (does not include Singleton) and (ii) on land to which the Government Coastal Policy applies, the provisions of that Policy, (b) in the case of a development application for the demolition of a building, the provisions of AS 2601, (c) in the case of a development application for the carrying out of development on land that is subject to a subdivision order made under Schedule 5 to the Act, the provisions of that order and of any development plan prepared for the land by a relevant authority under that Schedule, (d) in the case of the following development, the <i>Dark Sky Planning Guideline</i>:

Matter for Consideration	Consideration
	<p>(i) any development on land within the local government area of Coonamble, City of Dubbo, Gilgandra or Warrumbungle Shire,</p> <p>(ii) development of a class or description included in Schedule 4A to the Act, State significant development or designated development on land less than 200 kilometres from the Siding Spring Observatory.</p> <p>No further consideration of matters prescribed by the regulations is required.</p>
The likely impacts of the development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality.	Environmental and socio-economic impacts are assessed in Chapter 5.
The suitability of the site for the development	The site is currently used for composting activities, appropriately zoned, and largely devoid of sensitive environmental features due to past disturbance. The site is also appropriately isolated from sensitive receivers. The proposed modification is aimed at improving the environmental outcome for the site and other AGL rehabilitation areas. As such, the site is considered ideal for the composting activities proposed.
Any submissions made in accordance with this Act or the regulations	To be considered by Council following exhibition if required.
The public interest.	The proposed modification is considered to be in the public interest as described in Section 7.1.4.

7.3 Consideration of the Principles of Ecological Sustainable Development

7.3.1 The Precautionary Principle

This principle states: “if there are threats of serious or irreversible damage, lack of scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation”.

The proposal has sought to take a precautionary approach to minimising environmental impact. This has been applied through the development of a range of environmental safeguards to address the impacts identified in Section 5. There is not considered to be any threat of serious or irreversible damage and no impact mitigation measures to reduce risks of offsite impacts with the proposed modification are being deferred.

7.3.2 Intergenerational Equity

The principle states: “the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations”.

The proposed modification assessed in this SoEE will not impact the rate and extent of AGL’s rehabilitation efforts which is directly aimed at enhancing the health, diversity and productivity of the environment.

The proposed modification would not impact the current generation in an adverse way, nor would it disadvantage future generations.

7.3.3 Conservation of Biological Diversity and Ecological Integrity

This principle states: “the diversity of genes, species, populations and communities, as well as the ecosystems and habitats to which they belong, must be maintained and improved to ensure their survival”.

An assessment of the existing local environment has been carried out to identify and manage any potential impact of the proposal on local biodiversity. The proposal is located in an area that has previously been modified as a result of mining and the disposal of ash. In the absence of additional clearing or ground disturbance, and with the appropriate management of water quality, no significant impact on any species, populations and communities is considered likely. The rehabilitation works which the proposed modification supports is expected to provide improved biodiversity outcomes for the site.

The proposal will not significantly fragment or isolate any existing large patches of vegetation and will not compromise biological diversity or ecological integrity.

7.3.4 Improved Valuation, Pricing and Incentive Mechanisms

This principle is defined as:

Improved valuation, pricing and incentive mechanisms, namely, that environmental factors should be included in the valuation of assets and services, such as:

(i) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,

(ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,

(iii) environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

Environmental and social issues were considered in the strategic planning and establishment of the composting facility. The value placed on environmental resources is evident in the extent of spend on the overall rehabilitation works. AGL, as the owner of the site and party responsible for rehabilitation, is funding the rehabilitation works and the on-site composting represents the most economical way of achieving the environmental goals for the site.

7.4 Conclusion

This SoEE has been prepared to address the assessment requirements of Section 4.55 of the EP&A Act. The works proposed as part of the modification are considered to be substantially the same development as that originally approved under DA140/2016.1 and DA140/2016.2 as it does not involve any change to the size or operation of the facility. The modification would result in negligible environmental impacts and would not impact on any matters of NES, as defined under the EPBC Act.

The proposed modification is considered to be consistent with the relevant EPIs including the Singleton LEP and the Singleton DCP. It is therefore requested that Council grant approval to the Section 4.55 modification application to support the continued and accelerated amelioration and rehabilitation of disturbed lands in the Hunter region.

References

AECOM, 2016. *Statement of Environmental Effects – Composting Facility, Ravensworth No.2 Mine*. Bettergrow Pty Ltd (July, 2016).

Parsons Brinkerhoff, 2009). *Ravensworth Operations Project, Traffic and Transport Impact Assessment*. Ravensworth Operations Pty Ltd (Xstrata) (November 2009)

Appendix A. Development Consent



Our Ref: DA140/2016.2

16/04/2018

Bettergrow
PO Box 945
WINDSOR NSW 2756

NOTICE OF DETERMINATION

S4.55 (2) APPLICATION

This approval has been modified pursuant to *Section 4.55 (2) of the Environmental Planning and Assessment Act, 1979*. Notice is hereby given that the application has been determined by granting of consent, subject to conditions (as modified).

Development Application No. DA140/2016.1

Modification Application No. DA140/2016.2

Development Application

Applicant name Bettergrow

Applicant address PO Box 945 WINDSOR NSW 2756

Land to be Developed:

Address 74 Lemington Road RAVENSWORTH
Lot: 10 DP: 1204457

Surface and Groundwater Management Plan Version 7		Bio-Recycle Australia Pty Ltd	3/08/2016
Statement of Environmental Effects		AECOM	15/07/2016
Statement of Environmental Effects	Section 96 Application – Ravensworth Composting Facility	JACOBS	6 February 2018

Note 1: Modifications to the approved plans will require the lodgement and consideration by Council of a modification pursuant to Section 4.55 of the Environmental Planning and Assessment Act, 1979.

Note 2: The approved plans and supporting documentation may be subject to conditions imposed under section 4.17(1)(g) of the Act modifying or amending the development (refer to conditions of consent which must be satisfied prior to the issue of any Construction Certificate).

1.2 Damage on Council Assets

Any existing infrastructure damaged due to the proposed works including, but not limited to, (roads, services, drainage, pipes, guardrails, etc.) is to be repaired or replaced at the applicant's expense. The Applicant must notify Singleton Council Infrastructure or Development Engineering immediately when the structure is damaged.

1.3 Road Act Approval

In case of any asset damage along Lemington Road (from the New England Highway to the entrance of the mining site) the applicant is to submit a Section 138 application in order to obtain a permit with conditions prior to starting works on Council Road Reserve, and at the end, a Certificate of Compliance from Singleton Council Infrastructure Department is to be obtained. All works are to be carried out in accordance with the Singleton Council Development Construction Specifications and details are to be submitted at the time of the application.

1.4 Legal Drainage Point of Discharge

All stormwater from the working area must be directed to a lawful point of discharge such that it does not adversely affect surrounding or downstream properties.

1.5 Leachate Dam Design

Singleton Council request a Compliance Certificate from a qualified practicing

Geotechnical/Dams Engineer stating structural adequacy of the dam and that earthworks have been carried out in accordance with the AS 3798-2007 – Guidelines on Earthworks for Commercial and Residential Developments.

The Compliance Certificate along with any correspondence from the Environmental Protection Authority EPA must be submitted to Council prior to filling of the dam

Condition 1.6 is amended and shall read as follows:

1.6 Leachate Management Dam Capacity

Singleton Council request a Compliance Certificate from a qualified practicing Hydraulic Engineering Consultancy Company stating that the capacity of the existing dam is adequate to cope with the increment of leachate.

The Compliance Certificate along with any correspondence from the Environmental Protection Authority EPA must be submitted to Council prior to increasing the amount of composting material

Condition 1.7 is amended and shall read as follows:

1.7 Road Impact Assessment

Prior to the commencement of the on-site composting increment, the applicant/contractor is to prepare a Road Condition Report of Lemington Road (from the New England Highway to the entrance of the mining site), identifying all existing problems with this section of the roadway. On completion, a joint inspection between the applicant and Council Officers to identify any further damage is to be carried out. If any additional damage has occurred, all rectification works shall be at the applicant's expense, to the satisfaction of the Council Infrastructure Department. The report is to contain (but not limited to): location of existing deficiencies of the roadway and site photos, especially at areas where turning movements will occur.

Condition during the ongoing use of the development

2.1 Waterways Contamination

All reasonable and practicable measures must be taken to prevent pollution of any existing waterways as a result of silt or untreated leachate run-off, and oil or grease spills from any machinery. Wastewater for cleaning equipment must not be discharged or in-directly to any watercourses or stormwater systems.

Integrated Development Terms of Approval

3.1 Integrated Development General Terms of Approval

The following approval bodies have given general terms of approval in relation to the development, as referred to in Section 7.4 of the Environmental Planning and Assessment

Act 1979:

1. NSW Environment Protection Authority

The applicant is to comply with all general terms of approval provided by the NSW Environment Protection Authority Notice No: 1544342. All records and reports required under the General Terms of Approval must be made available to Council within 48 hours of any request by Council.

A copy of the General Terms of Approval is attached and forms part of the development consent.

Advices

4.1 Lapsing of Consent

In accordance with Section 4.53 of the Environmental Planning and Assessment Act 1979 (as amended), this Development Consent lapses five (5) years after the date from which it operates unless building, engineering or construction work has substantially physically commenced. The building must be completed, in accordance with the approved plans and specifications, within five (5) years from the date when the building was substantially physically commenced.

4.2 Process for Modification

The plans and/or conditions of this Consent are binding and may only be modified upon written request to Council under Section 4.55 of the Environmental Planning and Assessment Act, 1979 (as amended). The request shall be accompanied by the appropriate fee and application form. You are not to commence any action, works, contractual negotiations, or the like, on the requested modification unless and until the written authorisation of Council is received by way of an amended consent.

4.3 Review of Determination

In accordance with the provisions of Section 8.2 of the Environmental Planning and Assessment Act 1979 (as amended) the applicant can request Council to review this determination. The request must be made within a period of 6 months from the date shown on this determination. A fee, as prescribed under Council's current Management Plan - Fees and Charges, is payable for such a review.

4.4 88b Instrument

An 88B Instrument made pursuant to the Conveyancing Act 1919 applies to the subject land and it is the owners/applicants responsibility to check the compliance of the works with the instrument.

4.5 Other Permits and Approvals

Approval shall be sought from the New South Wales Environment Protection Authority for the amendment of Environment Protection License number 7654, to allow for the composting of up to 76,000 tonnes per annum. An amended Environment Protection License must be granted by the New South Wales Environment Protection Authority prior to the increase of composting above 50,000 tonnes per annum.

Other Approvals

**Local Government Act 1993
approvals granted under s
4.12 (5)** N/A

**General terms of other
approvals integrated as part
of the consent (list
approvals)**

- Mine Subsidence Compensation Act 1961
- Protection of the Environment Operations Act 1997

Right of Appeal

The applicant has the right to appeal this determination in accordance with the provisions of Section 8.9 of the *Environmental Planning and Assessment Act, 1979* within six (6) months of the date of this notice.

Right of Review

The applicant has the right to request a review of the determination of this Section 4.55 Application in accordance with the provisions of Section 8.2 of the *Environmental Planning and Assessment Act, 1979*.

Signed

on behalf of the consent authority

Signature



Title

Development Planner

Name

Mr R Gounder

Date

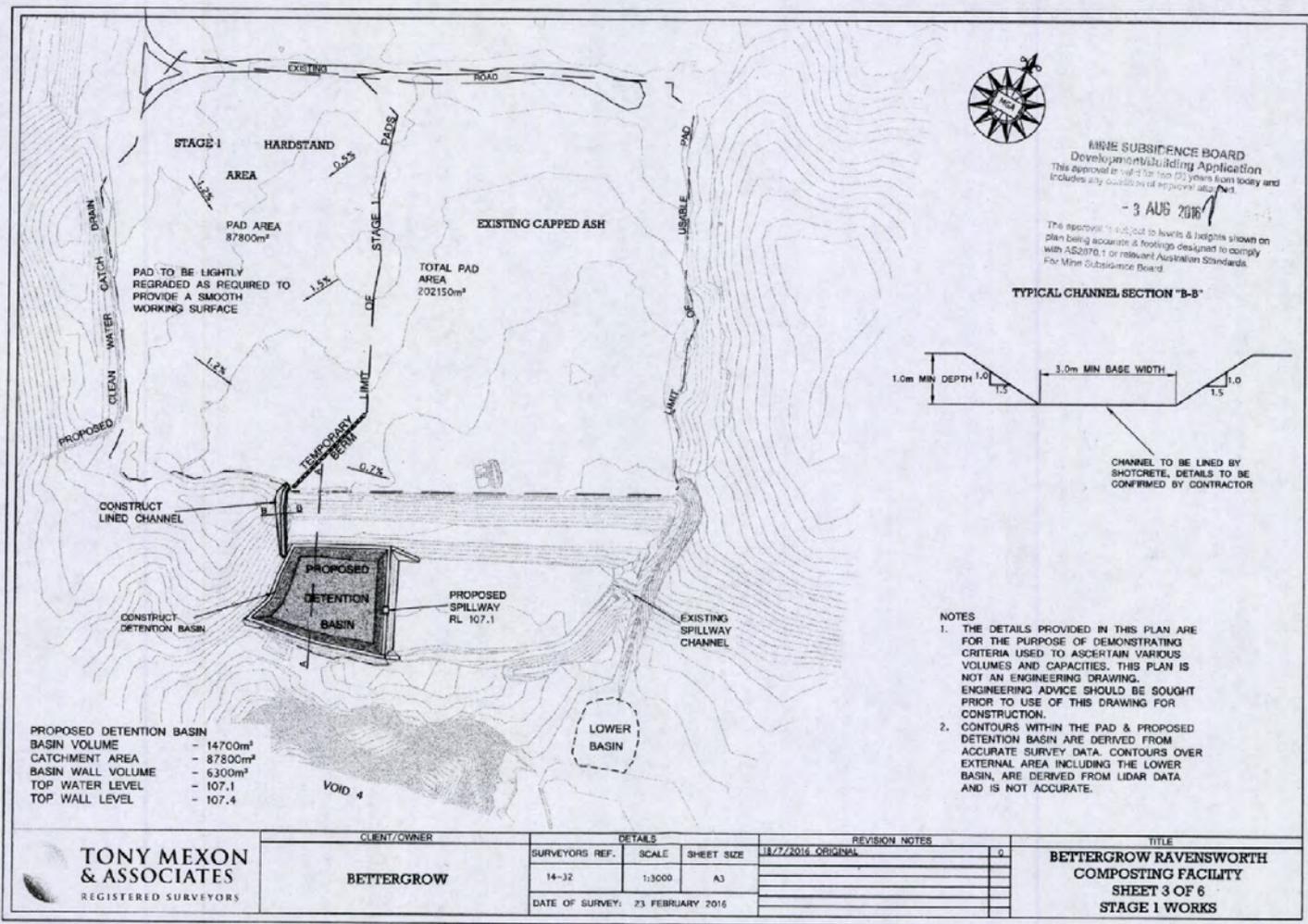
23/04/2018

If you have any inquiries regarding the consent, please contact Mr R Gounder of Council's Planning & Regulated Services, on (02) 6578 7290.

Note 1

The approval of this Application does not amend the timeframe of the validity of Development Consent, which will lapse on the specified date. Sections 4.53(4) and 4.53(5) of the *Environmental Planning and Assessment Act, 1979* provides that a development consent for the erection of a building does not lapse if the building, engineering or construction work relating to the building is commenced on the land to which the consent applies before the date on which consent would otherwise lapse.

Appendix B. Approved Plans



PROPOSED DETENTION BASIN

BASIN VOLUME	- 14700m³
CATCHMENT AREA	- 87800m²
BASIN WALL VOLUME	- 6300m³
TOP WATER LEVEL	- 107.1
TOP WALL LEVEL	- 107.4

- NOTES
1. THE DETAILS PROVIDED IN THIS PLAN ARE FOR THE PURPOSE OF DEMONSTRATING CRITERIA USED TO ASCERTAIN VARIOUS VOLUMES AND CAPACITIES. THIS PLAN IS NOT AN ENGINEERING DRAWING. ENGINEERING ADVICE SHOULD BE SOUGHT PRIOR TO USE OF THIS DRAWING FOR CONSTRUCTION.
 2. CONTOURS WITHIN THE PAD & PROPOSED DETENTION BASIN ARE DERIVED FROM ACCURATE SURVEY DATA. CONTOURS OVER EXTERNAL AREA INCLUDING THE LOWER BASIN, ARE DERIVED FROM LIDAR DATA AND IS NOT ACCURATE.

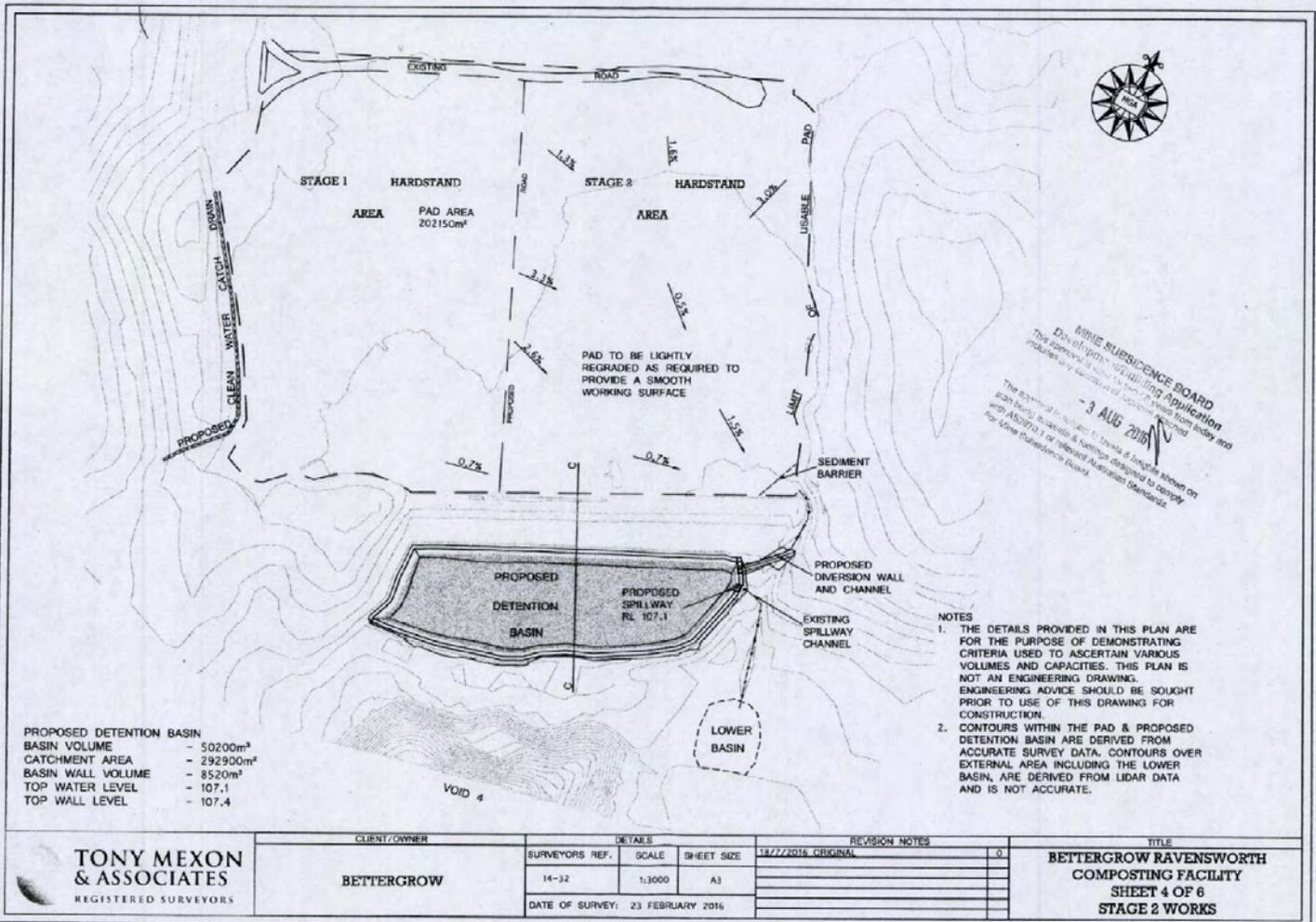
TONY MEXON & ASSOCIATES REGISTERED SURVEYORS	CLIENT/OWNER	DETAILS			REVISION NOTES	TITLE
	BETTERGROW	SURVEYORS REF.	SCALE	SHEET SIZE	1A/7/2016 ORIGINAL	BETTERGROW RAVENSWORTH COMPOSTING FACILITY SHEET 3 OF 6 STAGE 1 WORKS
		14-32	1:3000	A3		
	DATE OF SURVEY: 23 FEBRUARY 2016					

SINGLETON COUNCIL

Approved Plans for Development Consent No: DA140/2016

Date of Approval: 25/11/2016

Assessment Officer: Joshua Real
Title: Development Planner



PROPOSED DETENTION BASIN
 BASIN VOLUME - 50200m³
 CATCHMENT AREA - 292900m²
 BASIN WALL VOLUME - 8520m³
 TOP WATER LEVEL - 107.1
 TOP WALL LEVEL - 107.4

- NOTES
1. THE DETAILS PROVIDED IN THIS PLAN ARE FOR THE PURPOSE OF DEMONSTRATING CRITERIA USED TO ASCERTAIN VARIOUS VOLUMES AND CAPACITIES. THIS PLAN IS NOT AN ENGINEERING DRAWING. ENGINEERING ADVICE SHOULD BE SOUGHT PRIOR TO USE OF THIS DRAWING FOR CONSTRUCTION.
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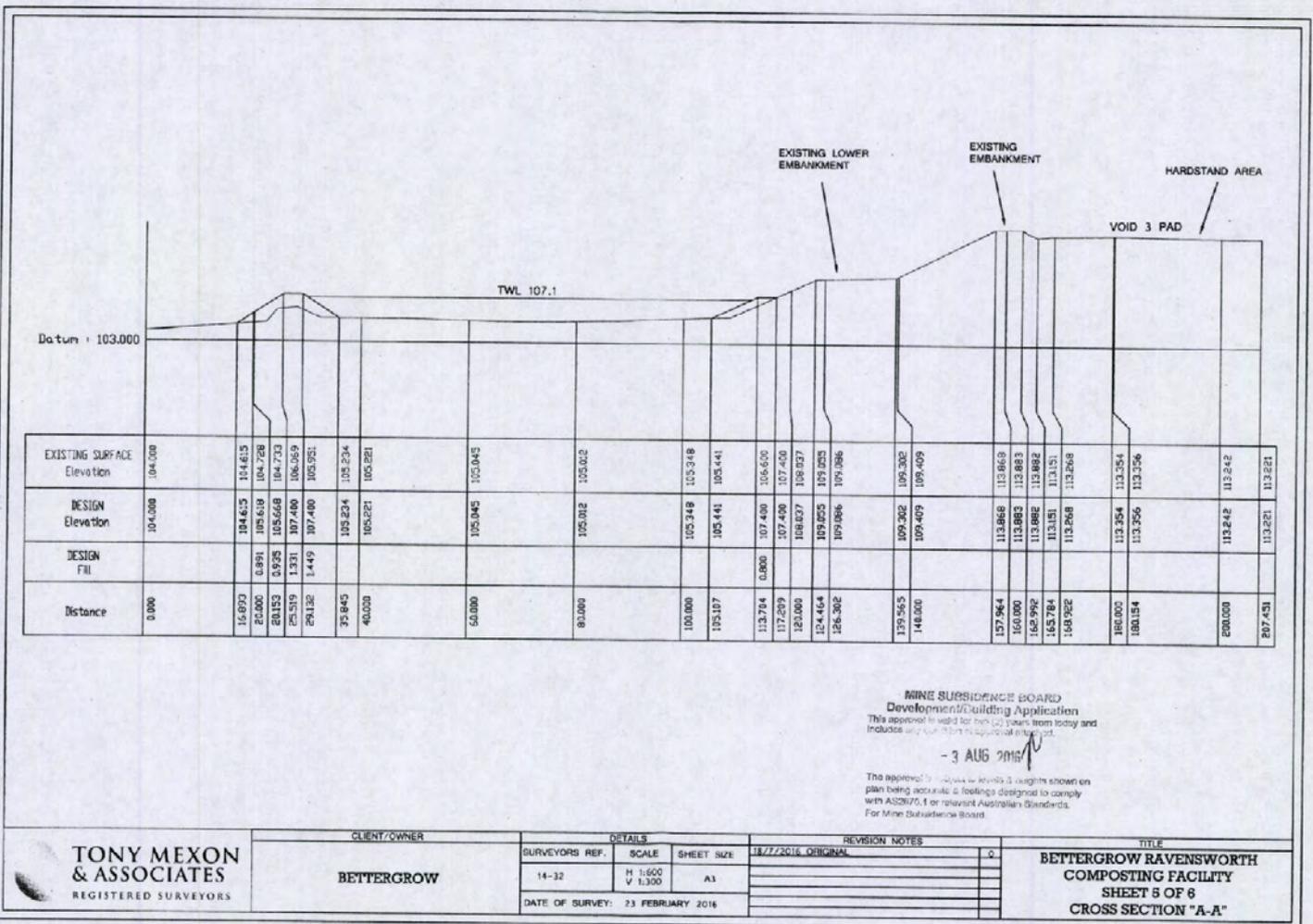
TONY MEXON & ASSOCIATES REGISTERED SURVEYORS	CLIENT/OWNER	DETAILS			REVISION NOTES	TITLE
	BETTERGROW	SURVEYORS REF.	SCALE	SHEET SIZE	18/7/2016 ORIGINAL	BETTERGROW RAVENSWORTH COMPOSTING FACILITY SHEET 4 OF 6 STAGE 2 WORKS
		14-32	1:3000	A3		
	DATE OF SURVEY:	23 FEBRUARY 2016				

SINGLETON COUNCIL

Approved Plans for Development Consent No: DA140/2016

Date of Approval: 25/11/2016

Assessment Officer: Joshua Real
Title: Development Planner



MINE SUBSIDENCE BOARD
Development/Building Application
This approval is valid for ten (10) years from today and
includes any future development applications.

- 3 AUG 2016

This approval is subject to the conditions of sightlines shown on
plan being accurate & footings designed to comply
with AS2670.1 or relevant Australian Standards.
For Mine Subsidence Board.

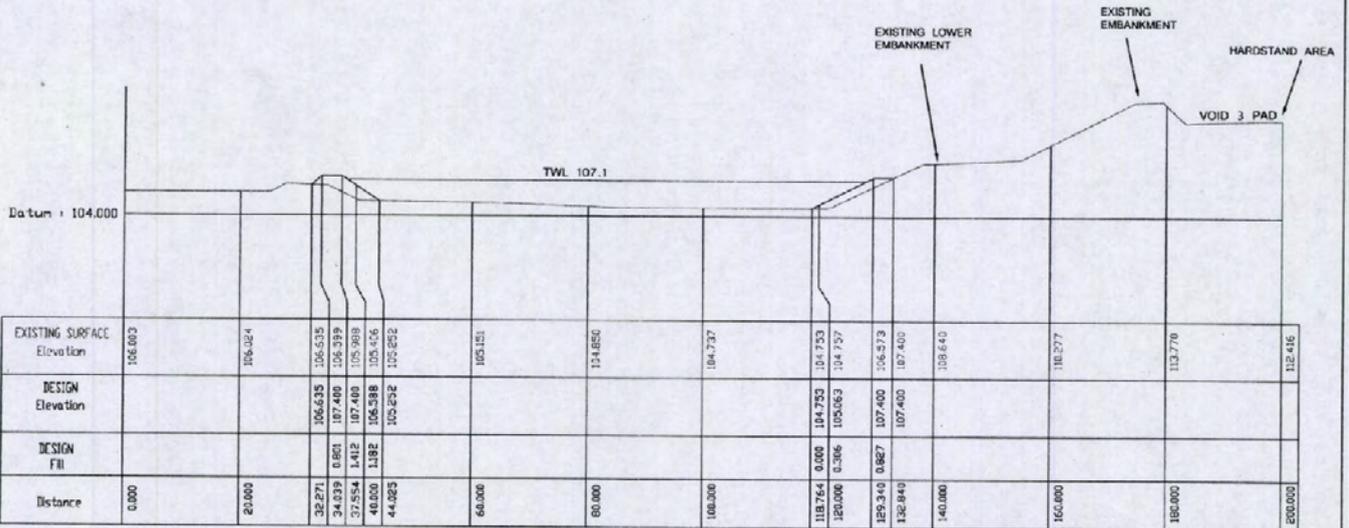
TONY MEXON & ASSOCIATES REGISTERED SURVEYORS	CLIENT/OWNER	DETAILS		REVISION NOTES	TITLE
	BETTERGROW	SURVEYORS REF.	SCALE	SHEET SIZE	18/7/2016 ORIGINAL
		14-32	H 1:600 V 1:300	A3	
	DATE OF SURVEY: 23 FEBRUARY 2016				BETTERGROW RAVENSWORTH COMPOSTING FACILITY SHEET 5 OF 6 CROSS SECTION "A-A"

SINGLETON COUNCIL

**Approved Plans for Development
Consent No: DA140/2016**

Date of Approval: 25/11/2016

**Assessment Officer: Joshua Real
Title: Development Planner**



MINE SUBSIDENCE BOARD
 Development Building Application
 This approval is valid for the (5) years from issue and includes any work that is approved as a result.
 - 3 AUG 2016
 The approval is subject to the conditions & heights shown on this plan and any other conditions attached to comply with AS/NZS 1171 or relevant Australian Standards. For Mine Subsidence Board.

TONY MEXON & ASSOCIATES REGISTERED SURVEYORS	CLIENT/OWNER	DETAILS			REVISION NOTES	TITLE
	BETTERGROW	SURVEYORS REF.	SCALE	SHEET SIZE	18/7/2016 ORIGINAL	BETTERGROW RAVENSWORTH COMPOSTING FACILITY SHEET 6 OF 6 CROSS SECTION "C-C"
		14-32	H 1:600 V 1:300	A3		
DATE OF SURVEY: 23 FEBRUARY 2016						

SINGLETON COUNCIL

Approved Plans for Development Consent No: DA140/2016

Date of Approval: 25/11/2016

Assessment Officer: Joshua Real
Title: Development Planner

Appendix C. Road Dilapidation Survey

DILAPIDATION REPORT
GreenSpot Organics Composting Facility – DA 140/2016.2

Prepared for **Bettergrow Pty Ltd**

25 JULY 2018





Prepared by:

RPS AUSTRALIA EAST PTY LTD

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Client Manager: Nick Linford
Report Number: PR140737
Version / Date: Ver 1 | 25/07/2018

Prepared for:

BETTERGROW PTY LTD

PO Box 945
Windsor NSW 2756

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In preparing this report we have made certain assumptions. We have assumed that all information and documents provided to us by the Client or as a result of a specific request or enquiry were complete, accurate and up-to-date. Where we have obtained information from a government register or database, we have assumed that the information is accurate. Where an assumption has been made, we have not made any independent investigations with respect to the matters the subject of that assumption. We are not aware of any reason why any of the assumptions are incorrect.

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- (a) this report may not be relied on by a Third Party; and
- (b) RPS Australia East Pty Ltd will not be liable to a Third Party for any loss, damage, liability or claim arising out of or incidental to a Third Party publishing, using or relying on the facts, content, opinions or subject matter contained in this report.

If a Third Party uses or relies on the facts, content, opinions or subject matter contained in this report with or without the consent of RPS Australia East Pty Ltd, RPS Australia East Pty Ltd disclaims all risk and the Third Party assumes all risk and releases and indemnifies and agrees to keep indemnified RPS Australia East Pty Ltd from any loss, damage, claim or liability arising directly or indirectly from the use of or reliance on this report.

In this note, a reference to loss and damage includes past and prospective economic loss, loss of profits, damage to property, injury to any person (including death) costs and expenses incurred in taking measures to prevent, mitigate or rectify any harm, loss of opportunity, legal costs, compensation, interest and any other direct, indirect, consequential or financial or other loss.

Document Status

Version	Purpose of Document	Orig	Review	Review Date
1	Original Issue	MM	SS	July 2018

Approval for Issue

Name	Signature	Date
M.MISIKIC		25 July 2018



Contents

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1.1	Location	1
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Appendices

Appendix 1 Plan of Lemington Road

Appendix 2 Coordinates Table

1.0 Introduction

RPS Australia East Pty Ltd ('RPS') has been commissioned by Bettergrow Pty Ltd ('Bettergrow') to undertake a pre-development condition survey of Council road assets adjacent to a proposed expansion of an existing composting organics facility on Lot 10 DP 1204457, 74 Lemington Road, Ravensworth. This condition survey was undertaken through the visual inspection of the associated road assets and the preparation of the subject pictorial and written dilapidation report.

The specific purpose of this report is to document the general condition of the structures present on Lemington Road prior to the commencement of increased operations at the site and to compare these to the general condition at completion of construction activities. This report has also been prepared to satisfy Condition 1.7 of DA 140/2016.2.

As we are not structural engineers we have not inspected, assessed, recorded or commented on any property or structure in terms of its structural capability or suitability.

1.1 Location

The site is located at Ravensworth No. 2 mine and is approximately 20 kilometres north of Singleton. The site is formally described as Lot 10 DP1204457, 74 Lemington Road, Ravensworth in the Singleton Local Government area (LGA). The site is generally clear of native vegetation and is located on part of a capped open cut mining void which has been filled with ash from the AGL Bayswater Power Station. Access to the facility is provided via an internal access road off Lemington Road which connects to the New England Highway. The site location is shown as **Figure 1**.

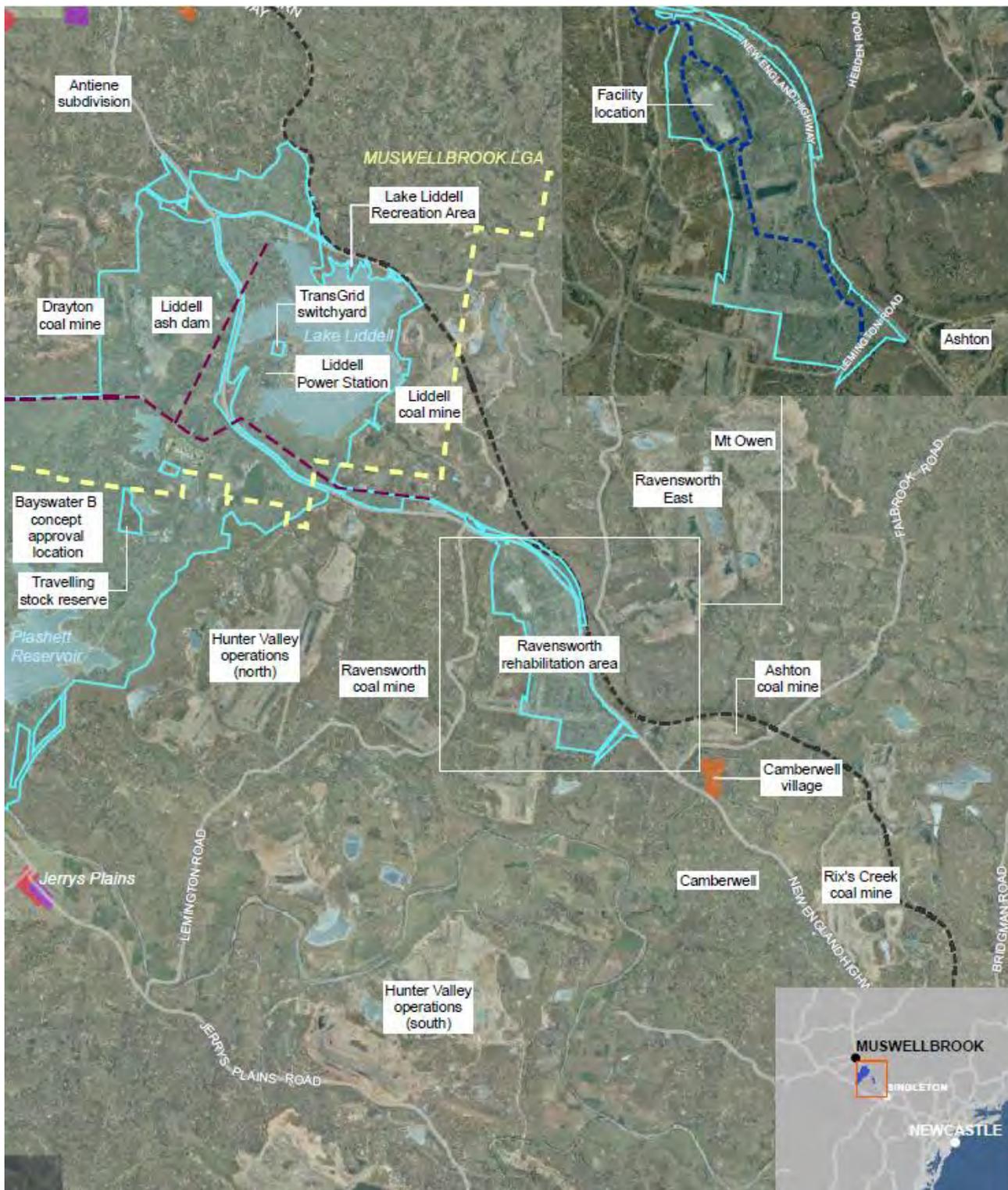


Figure 1 - Site location (extract from JACOBS “GreenSPOT Hunter Valley Nutrient Recycling Facility” Report - 14 June 2018

2.0 Inspection

On 23 July 2018 a visual inspection was undertaken of the Council controlled road which is the main access to the project site, namely Lemington Road (from the intersection with New England Highway in the north and approximately 1 km south-west to the proposed access to the site). The inspection was completed over 3 hours with the weather conditions fine and clear. The road was inspected on foot in both directions and a handheld GPS unit and camera were used to record locations of any damage or deficiency. Provided GPS Coordinates are in WGS84 format. No geotechnical investigation of the existing pavement was undertaken as part of this investigation.

Photographs that have been included in this report were taken on the day of the inspection. Photographs have not been edited other than the addition of descriptions of the nominated items for the attention of the reader.

A plan indicating the locations and direction of the photos taken is shown in **Appendix 1**.

A table indicating the coordinates of the photos taken is shown in **Appendix 2**.



Figure 2 - Looking South-West, no visible defects in laneway, minor wear in shoulder



Figure 3 - Looking North-East, no visible defects in laneway, minor wear in shoulder



Figure 4 - Looking North-East, connection of 2 pavements, defects in shoulder and patchwork



Figure 5 - Looking North-East, connection of 2 pavements, cracked area approximately 2m long by 1m wide



Figure 6 - Looking North-East, no defects in laneway, minor wear in shoulder



Figure 7 - Looking South, no defects in laneway, barrier damaged



Figure 8 - Looking North-East, no defects in laneway, minor wear in shoulder



Figure 9 - Looking North-East, cracking in shoulder with small potholes developing



Figure 10 – Looking North-East, small depression in laneway where wheels travel, uneven shoulder



Figure 11 – Looking North-East, small depression in laneway where wheels travel, 40cm round pothole developing

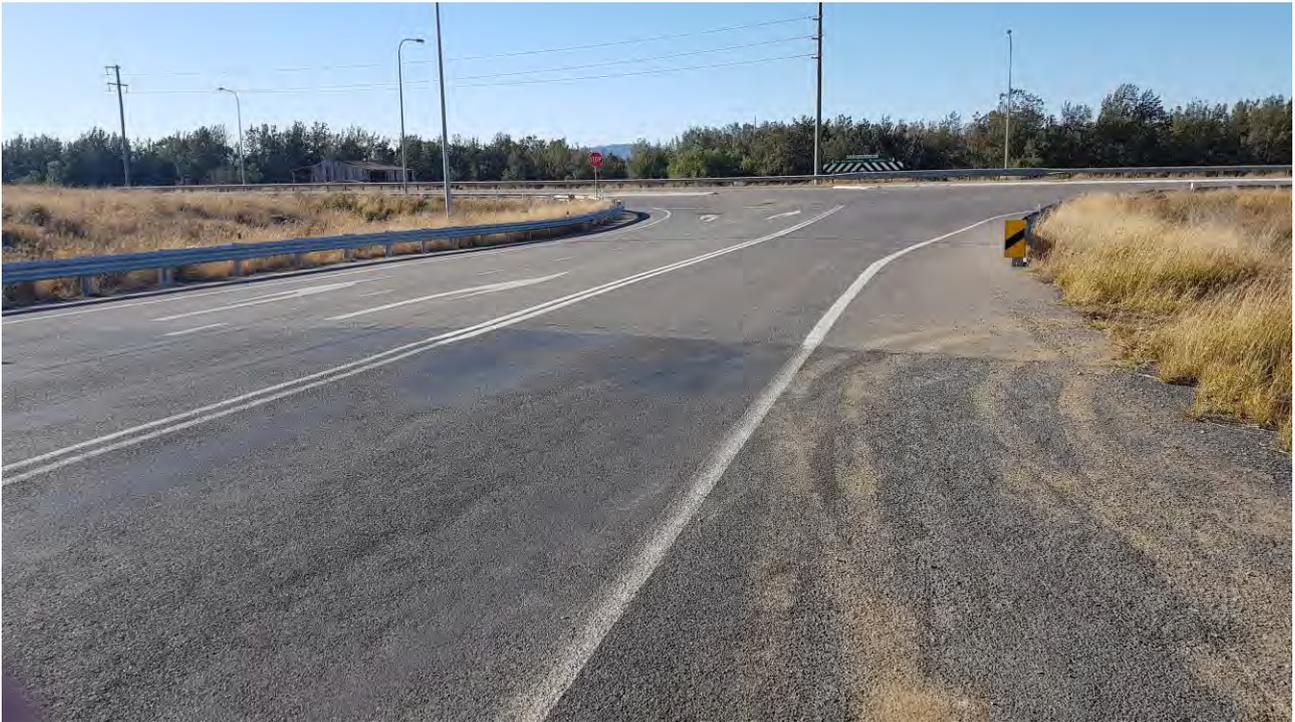


Figure 12 - Looking North-East, joining of 2 pavements, road uneven small depressions



Figure 13 - Looking North-West, joint of 2 pavements, small cracking at joint and lead up to joint, one lane wide

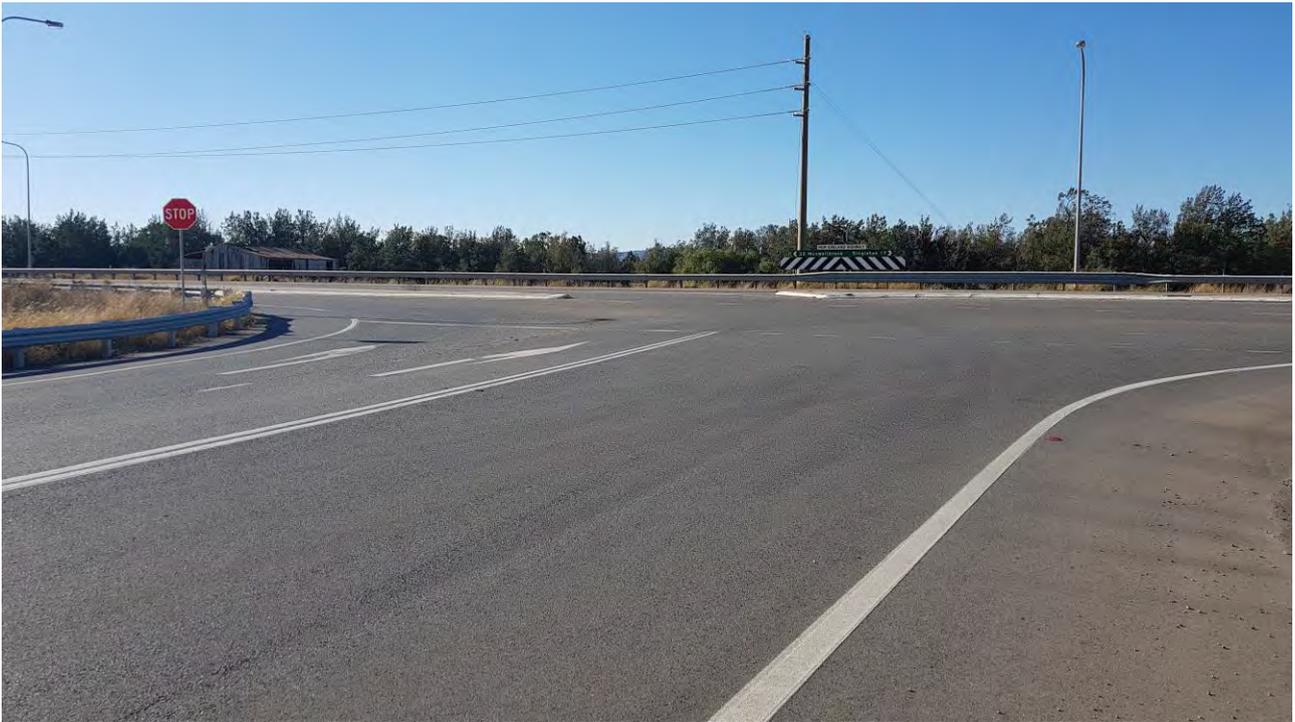


Figure 14 - Looking North-West, intersection of New England Highway and Lemington Road, in good condition no visible defects



Figure 15 - Looking South-West, no visible defects



Figure 16 - Looking North-East, small wear in laneway and shoulder



Figure 17 - Looking South-West, no visible defects



Figure 18 - Looking South-West, no visible defects



Figure 19 - Looking South, Access to site, joint of 2 pavements, no visible defects



Figure 20 - Looking South-West, South Access Road in good condition



Figure 21 - Looking South, joint of 2 pavements, no defects visible



Figure 22 - Looking North-East, no defects in laneway, minor wear in shoulder

3.0 Condition assessment

Lemington Road is currently in good condition, with isolated areas containing minor defects or wear, and the main area with minor wear in in the shoulder.

No other discernible damage was visible to Council infrastructure that was inspected.

Appendix I

Plan of Lemington Road



Appendix 2

Coordinates Table

Photo No.	Easting	Northing
2	317648	6406372
3	317660	6406347
4	317755	6406471
5	317783	6406505
6	317809	6406539
7	317853	6406600
8	317903	6406656
9	317970	6406740
10	318090	6406889
11	318168	6406984
12	318189	6407010
13	318206	6407028
14	318217	6407043
15	318215	6407072
16	318180	6407024
17	318148	6406986
18	317835	6406602
19	317782	6406538
20	317773	6406524
21	317754	6406507
22	317660	6406396

Note: Coordinates only accurate to $\pm 5m$.

Appendix D. Environmental Protection License Annual Return 2017-2018

Annual Return

BIO-RECYCLE AUSTRALIA PROPRIETARY LIMITED



ANNUAL RETURN

LICENCE NO	7654
LICENCE HOLDER	BIO-RECYCLE AUSTRALIA PROPRIETARY LIMITED
REPORTING PERIOD	22-Jun-2017 to 21-Jun-2018

If your licence has been transferred, suspended, surrendered or revoked by the EPA during this reporting period, cross out the dates above and specify the new dates to which this Annual Return relates below:

REVISED REPORTING PERIOD ____ / ____ / ____ to ____ / ____ / ____

(Note: the revised reporting period also needs to be entered in Section H)

THIS ANNUAL RETURN MUST BE RECEIVED BY THE EPA BEFORE 21-Aug-2018

Your Annual Return must be completed, including certification in Section H, and submitted to the EPA no later than 60 Days after the end of the reporting period for your licence.

Failure to submit this Annual Return within 60 days after the reporting period ends may result in:

- the issue of a Penalty Notice for \$1500 (individuals) or \$3000 (corporations);
- OR
- prosecution.

Please send your completed Annual Return by **Registered Post** to:

**Regulatory and Compliance Support Unit
Environment Protection Authority
PO Box A290
SYDNEY SOUTH NSW 1232**

It is an offence to supply any information in this form to the EPA that is false or misleading in a material respect, or to certify a statement that is false or misleading in a material respect.

THERE IS A MAXIMUM PENALTY OF \$250,000 FOR A CORPORATION OR \$120,000 FOR AN INDIVIDUAL.

Details provided in this Annual Return will be available on the EPA's Public Register in accordance with section 308 of the *Protection of the Environment Operations Act 1997*.

Annual Return

BIO-RECYCLE AUSTRALIA PROPRIETARY LIMITED



Use the checklist below to ensure that you have completed your Annual Return correctly.

(✓ the boxes)

CHECKLIST		
<input checked="" type="checkbox"/>	Section A:	All licence details are correct
<input checked="" type="checkbox"/>	Section B1:	You have entered the correct number in the complaints table
<input checked="" type="checkbox"/>	Section B2 – B3:	If there are tables, you have provided the required details
<input checked="" type="checkbox"/>	Section C:	You have answered question 1, and 2 if applicable
<input checked="" type="checkbox"/>	Section D:	If applicable, you have completed all load calculation worksheets
<input checked="" type="checkbox"/>	Section E:	You have answered question 1, 2, 3, 4, 5 and 6 if applicable
<input checked="" type="checkbox"/>	Section F:	You have answered question 1, 2 and 3 if applicable
<input checked="" type="checkbox"/>	Section G:	You have answered question 1 and question 2, 3 and 4 or question 5 through to 11 if applicable
<input checked="" type="checkbox"/>	Section H:	The Annual Return has been signed by appropriate person(s) and, if applicable, the revised reporting period entered
<input checked="" type="checkbox"/>	Make a copy of the completed Annual Return and keep it with your licence records	

Please send your completed Annual Return by **Registered Post** to:

**Regulatory and Compliance Support Unit
Environment Protection Authority
PO Box A290
SYDNEY SOUTH NSW 1232**

A Statement of Compliance - Licence Details

ALL licence holders must check that the licence details in Section A are correct

If there are changes to any of these details you must advise the EPA and apply as soon as possible for a variation to your licence or for a licence transfer.

Licence variation and transfer application forms are available on the EPA website at: <http://www.epa.nsw.gov.au/licensing>, or from regional offices of the EPA, or by contacting us on telephone 02 9995 5700.

If you are applying to vary or transfer your licence you must still complete this Annual Return.

A1 Licence Holder

Licence Number 7654
Licence Holder BIO-RECYCLE AUSTRALIA PROPRIETARY LIMITED
Trading Name (if applicable)
ABN 62 062 888 082

A2 Premises to which Licence Applies (if applicable)

Common Name (if any) "RAVENSWORTH"
Premises 74 LEMINGTON ROAD RAVENSWORTH NSW 2330

A3 Activities to which Licence Applies

Composting

A4 Other Activities (if applicable)

A5 Fee-Based Activity Classifications

Note that the fee based activity classification is used to calculate the administrative fee.

Fee-based activity	Activity scale	Unit of measure
Composting	> 50,000.00	T annual capacity to receive organics

A6 Assessable Pollutants (Not Applicable)

Annual Return

BIO-RECYCLE AUSTRALIA PROPRIETARY LIMITED



B Monitoring and Complaints Summary

B1 Number of Pollution Complaints

<p>Number of complaints recorded by the licensee during the reporting period.</p> <p>If no complaints were received enter nil in the attached box, otherwise complete the table below.</p>	NIL
--	-----

Pollution Complaint Category	Number of Complaints
Air	
Water	
Noise	
Waste	
Other	

B2 Concentration Monitoring Summary

For each monitoring point identified in your licence complete all the details for each pollutant listed in the tables provided below.

If concentration monitoring is **not** required by your licence, **no tables** will appear below.

Note that this does not exclude the need to conduct appropriate concentration monitoring of assessable pollutants as required by load-based licensing (if applicable).

→ Dam empty on 1st Sample dated
 3 date sample taken Bottom Corner of Dam (Not much water)
 Monitoring Point 1 Only once sample could be taken

Leachate dam characterisation, South of site

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	3	1		183	

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BIO-RECYCLE AUSTRALIA PROPRIETARY LIMITED



Ammonia	milligrams per litre	3	1		17	
Calcium	milligrams per litre	3	1		190	
Chloride	milligrams per litre	3	1		640	
Electrical conductivity	microsiemens per centimetre	3	1		2191	
Fluoride	milligrams per litre	3	1		14	
Iron	milligrams per litre	3	1		1.5	
Magnesium	milligrams per litre	3	1		120	
Manganese	milligrams per litre	3	1		33	
Nitrogen (total)	milligrams per litre	3	1		19	
pH	pH	3	1		7.11	
Phosphorus	milligrams per litre	3	1		86	
Polycyclic aromatic hydrocarbons	milligrams per litre	3	1		<1	
Potassium	milligrams per litre	3	1		160	
Sodium	milligrams per litre	3	1		390	
Sulfate	milligrams per litre	3	1		1000	
Total organic carbon	milligrams per litre	3	1		140	

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BIO-RECYCLE AUSTRALIA PROPRIETARY LIMITED



Total petroleum hydrocarbons	milligrams per litre	3	1		< 50	
Total Phenolics	milligrams per litre	3	1		0.01	
Total suspended solids	milligrams per litre	3	1		315	

Discharge & Monitoring Point 2 *No Discharge*
 Leachate dam emergency spillway, Northeast corner of leachate dam

No samples could be taken

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre					*
Ammonia	milligrams per litre					
Calcium	milligrams per litre					
Chloride	milligrams per litre					
Electrical conductivity	microsiemens per centimetre					
Fluoride	milligrams per litre					
Iron	milligrams per litre					
Magnesium	milligrams per litre					
Manganese	milligrams per litre					
Nitrogen (total)	milligrams per litre					*

** See Notes*

Annual Return

BIO-RECYCLE AUSTRALIA PROPRIETARY LIMITED



pH	pH					*
Phosphorus	milligrams per litre					
Polycyclic aromatic hydrocarbons	milligrams per litre					
Potassium	milligrams per litre					
Sodium	milligrams per litre					
Sulfate	milligrams per litre					
Total organic carbon	milligrams per litre					
Total petroleum hydrocarbons	milligrams per litre					
Total Phenolics	milligrams per litre					*
Total suspended solids	milligrams per litre					

*See Note **

Monitoring Point 3

Process water tank, Eastern edge of premises

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Boron	milligrams per litre	3	3	3	3.3	3.8
Cadmium	milligrams per litre	3	3	.0006	.46	.6
Copper	milligrams per kilogram	3	3	1	1	1

Annual Return

BIO-RECYCLE AUSTRALIA PROPRIETARY LIMITED



Electrical conductivity	microsiemens per centimetre	3	3	3660	5083	7070
Iron	milligrams per litre	3	3	.042	10.34	19
Molybdenum	milligrams per litre	3	3	.410	.400	.440
Nickel	milligrams per litre	3	3	.008	.0083	.009
pH	pH	3	3	8.36	8.51	8.64
Silver	milligrams per litre	3	3	<.001	<.001	<.001
Total suspended solids	milligrams per litre	3	3	5	14	21

Discharge & Monitoring Point 4

~~⊗~~ NO WATER in SEDIMENT BASIN

Sediment Basin, Sediment Basin outlet - TBC

NO SAMPLE COULD BE TAKEN

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Ammonia	milligrams per litre					
Electrical conductivity	microsiemens per centimetre					
Nitrogen (total)	milligrams per litre					
pH	pH					
Total organic carbon	milligrams per litre					
Total petroleum hydrocarbons	milligrams per litre					

See Note

Annual Return

BIO-RECYCLE AUSTRALIA PROPRIETARY LIMITED



Total suspended solids ⊗	milligrams per litre	<i>See note</i>				
-------------------------------------	----------------------	-----------------	--	--	--	--

B3 Volume or Mass Monitoring Summary

For each monitoring point identified in your licence complete the details of the volume or mass monitoring indicated in the tables provided below.

If volume or mass monitoring is not required by your licence, **no tables** will appear below.

Note that this does not exclude the need to conduct appropriate concentration monitoring of assessable pollutants as required by load-based licensing (if applicable).

N/A

C Statement of Compliance - Licence Conditions

C1 Compliance with Licence Conditions

(the boxes)

- 1 Were all conditions of the licence complied with (including monitoring and reporting requirements)? Yes No

(a box)

- 2 If you answered 'No' to question 1, please supply the following details for each non-compliance in the format, or similar format, provided on the following page.

Please use a separate page for each licence condition that has not been complied with.

- a) What was the specific licence condition that was not complied with?
- b) What were the particulars of the non-compliance?
- c) What were the date(s) when the non-compliance occurred, if applicable?
- d) If relevant, what was the precise location where the non-compliance occurred?

Attach a map or diagram to the Statement to show the precise location.
- e) What were the registration numbers of any vehicles or the chassis number of any mobile plant involved in the non-compliance?
- f) What was the cause of the non-compliance?
- g) What action has been, or will be, taken to mitigate any adverse effects of the non-compliance?
- h) What action has been, or will be, taken to prevent a recurrence of the non-compliance?

3. How many pages have you attached?

Each attached page must be initialled by the person(s) who signs Section G of this Annual Return

Annual Return

BIO-RECYCLE AUSTRALIA PROPRIETARY LIMITED



C2 Details of Non-Compliance with Licence *NIL*

Licence condition number not complied with
Summary of particulars of the non-compliance (NO MORE THAN 50 WORDS)
If required, further details on particulars of non-compliance
Date(s) when the non-compliance occurred, if applicable
If relevant, precise location where the non-compliance occurred (attach a map or diagram)
If applicable, registration numbers of any vehicles or the chassis number of any mobile plant involved in the non-compliance
Cause of non-compliance
Action taken or that will be taken to mitigate any adverse effects of the non-compliance
Action taken or that will be taken to prevent a recurrence of the non-compliance

D Statement of Compliance - Load-Based Fee Calculation Worksheets

If you are not required to monitor assessable pollutants by your licence, no worksheets will appear below. Please go to Section E.

If assessable pollutants have been identified on your licence (see licence condition L2), complete the following worksheets for each assessable pollutant to determine your load-based fee for the licence fee period to which this Annual Return relates.

Loads of assessable pollutants must be calculated using any of the methods provided in the EPA's Load Calculation Protocol for the relevant activity. A Load Calculation Protocol would have been sent to you with your licence. If you require additional copies you can download the Protocol from the EPA's website or you can contact us on telephone 02 9995 5700.

You are required to keep all records used to calculate licence fees for four years after the licence fee was paid or became payable, whichever is the later date.

PENALTIES APPLY FOR SUPPLYING FALSE OR MISLEADING INFORMATION

D1 - D8 (Not Applicable)

E Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan (PIRMP) Under Section 153A of the POEO Act 1997

- 1 Have you prepared a PIRMP as required under s153A of the Protection of the Environment Operations Act 1997?
- (✓ a box) Yes No

If you answered 'Yes' to question 1, please tick the appropriate box to indicate the following:

- 2 Is the PIRMP available at the premises?
- (✓ a box) Yes No
- 3 Is the PIRMP available in a prominent position on a publicly accessible web site?
- (✓ a box) Yes No

If the PIRMP is available on a publicly accessible web site please indicate clearly below the address of the web site where the PIRMP can be accessed:

Web site Address

www.bettergrow.com.au Contact Page

- 4 Has the PIRMP been tested in the last 12 months?
- (✓ a box) Yes No

If you answered 'Yes' to question 4 please indicate clearly below the date that the PIRMP was last tested:

The PIRMP was last tested on

09/10/2017

+ 14/4/2018

- 5 Has the PIRMP been updated?
- (✓ a box) Yes No

If you answered 'Yes' to question 5 please indicate clearly below the date that the PIRMP was last updated:

The PIRMP was last updated on

03/05/2018

- 6 How many times has the PIRMP been activated in this reporting period?

2

If the PIRMP has been activated, please indicate clearly below the date/s when the PIRMP was activated:

The PIRMP was activated on

__/__/__

as above 9/10/2017

+ 14/4/2018

The EPA's guidelines for preparation of pollution incident response management plans are available at

<http://www.epa.nsw.gov.au/legislation/20120227egpreppirmp.htm>

F Statement of Compliance - Requirement to Publish Pollution Monitoring Data Under Section 66(6) of the POEO Act 1997

1 Are there any conditions attached to your licence that require pollution monitoring to be undertaken?

(✓ a box)

Yes

No

If you answered 'Yes' to question 1, please tick the appropriate box to indicate the following:

2 Do you operate a web site?

(✓ a box)

Yes

No

3 Is the pollution monitoring data published on your web site in accordance with the EPA's written requirements for publishing pollution monitoring data?

(✓ a box)

Yes

No

If you publish pollution monitoring data on a web site please indicate clearly below the address of the web site where the pollution monitoring data can be accessed:

Web site address

The EPA's written requirements for publishing pollution monitoring data are available at <http://www.epa.nsw.gov.au/legislation/20120263reqpubpmdata.htm>

Note - if you do not maintain a web site, you must provide a copy of any monitoring data that relates to pollution, to any person requests a copy of the data at no charge to the person requesting the data.

G Statement of Compliance - Environmental Management Systems and Practices

1 Do you have an environmental management system (EMS) certified to ISO 14001 or any other demonstrated equivalent system¹? (see note below on demonstrated equivalent)

(✓ a box)

Yes

No

If your answer to question 1 is 'No', please proceed to question 5. If your answer to question 1 is 'Yes', please proceed to question 2.

2 When was the last check of the EMS² completed (see note below on check of EMS)?

3 Were there any non-conformances related to environmental issues identified in the last check of the EMS?

(✓ a box)

Yes

No

4 If there were non-conformances identified, were these non-conformances rectified?

(✓ a box)

Yes

No

If you answered 'No' to question 1, please answer questions 5 - 11. If you answered 'Yes' to question 1 please proceed to section H. Questions 5-11 relate to any documented environmental practices, procedures and systems in place. Refer to <http://www.epa.nsw.gov.au/licensing/EMCP.htm> for guidance on how to complete questions 5 to 11. If unsure of the answer, tick No.

5 Have you conducted an assessment of your activities and operations to identify the aspects that have a potential to cause environmental impacts and implemented operational controls to address these aspects?

(✓ a box)

Yes

No

6 Have you established and implemented an operational maintenance program, including preventative maintenance?

(✓ a box)

Yes

No

7 Do you keep records of regular inspections and maintenance of plant and equipment?

(✓ a box)

Yes

No

8 Do you conduct regular site audits to assess compliance with environmental legal requirements and assess conformance to the requirements of any documented environmental practices, procedures and systems in place?

(✓ a box)

Yes

No

9 Are the audits of documented environmental practices, procedures and systems undertaken by a third party?

(✓ a box)

Yes

No

10 Have you established and implemented an environmental improvement or management plan?

(✓ a box)

Yes

No

11 Do you train staff in environmental issues that may arise from your activities and operations and keep records of this

(✓ a box)

Yes

No

¹ Demonstrated equivalent refers to an environmental management system that the EPA considers is equivalent to the accountability, procedures, documentation and record keeping requirements of an ISO 14001 system. For further information go to:

<http://www.epa.nsw.gov.au/resources/licensing/150402-environmental-management-systems-guidelines.pdf>

² Undertaking a 'check of an EMS' refers to the ISO 14001 requirements that an organisation demonstrates conformity to the requirements of its EMS and to the standard, these checks require third-party certification that requirements have been met.

X

Revised Return Declaration Form

This declaration may only be signed by a person(s) with legal authority to sign it.

The various ways in which the Annual Return/declaration may be signed, and the people who may sign the annual Return/declaration, are set out in the categories below.

Please tick (✓) the box next to the category that describes how this declaration is being signed. If you are uncertain about who is entitled to sign or which category to tick, please contact us on telephone 02 9995 5700

If the licence holder is	the Annual Return must be signed and certified:
an individual	<input type="checkbox"/> by the individual licence holder, or <input type="checkbox"/> by a person approved in writing by the EPA to sign on the licence holder's behalf
a company	<input type="checkbox"/> by affixing the common seal in accordance with the Corporations Act 2001, or <input type="checkbox"/> by 2 directors, or <input type="checkbox"/> by a director and a company secretary, or <input checked="" type="checkbox"/> if a proprietary company that has a sole director who is also the sole company secretary -- by that director, or <input type="checkbox"/> by a person delegated to sign on the company's behalf in accordance with the Corporations Act 2001 and approved in writing by the EPA to sign on the company's behalf.
a public authority (other than a council)	<input type="checkbox"/> by the Chief Executive Officer of the public authority, or <input type="checkbox"/> by a person delegated to sign on the public authority's behalf in accordance with its legislation and approved in writing by the EPA to sign on the public authority's behalf.
a local council	<input type="checkbox"/> by the General Manager in accordance with s.377 of the Local Government Act 1993, or <input type="checkbox"/> by affixing the seal of the council in a manner authorised under that Act

PLEASE TICK THE APPROPRIATE BOX AND SIGN ACCORDINGLY

It is an offence to supply any information in this form that is false or misleading in a material respect, or to certify a statement that is false or misleading in a material respect. There is a maximum penalty of \$250,000 for a corporation or \$120,000 for an individual..

I/We

- declare that the information in the Monitoring and Complaints Summary in section B of this Annual Return is correct and not false or misleading in a material respect, and
- certify that the information in the Statement of Compliance in sections A, C, D, E, F, and G and any pages attached to Section C is correct and not false or misleading in a material respect.

SIGNATURE: 

SIGNATURE: _____

NAME: (printed) NEIL SCHEMBRI

NAME: (printed) _____

POSITION: SOLE DIRECTOR SECRETARY

POSITION: _____

DATE: 21/ 08/ 18

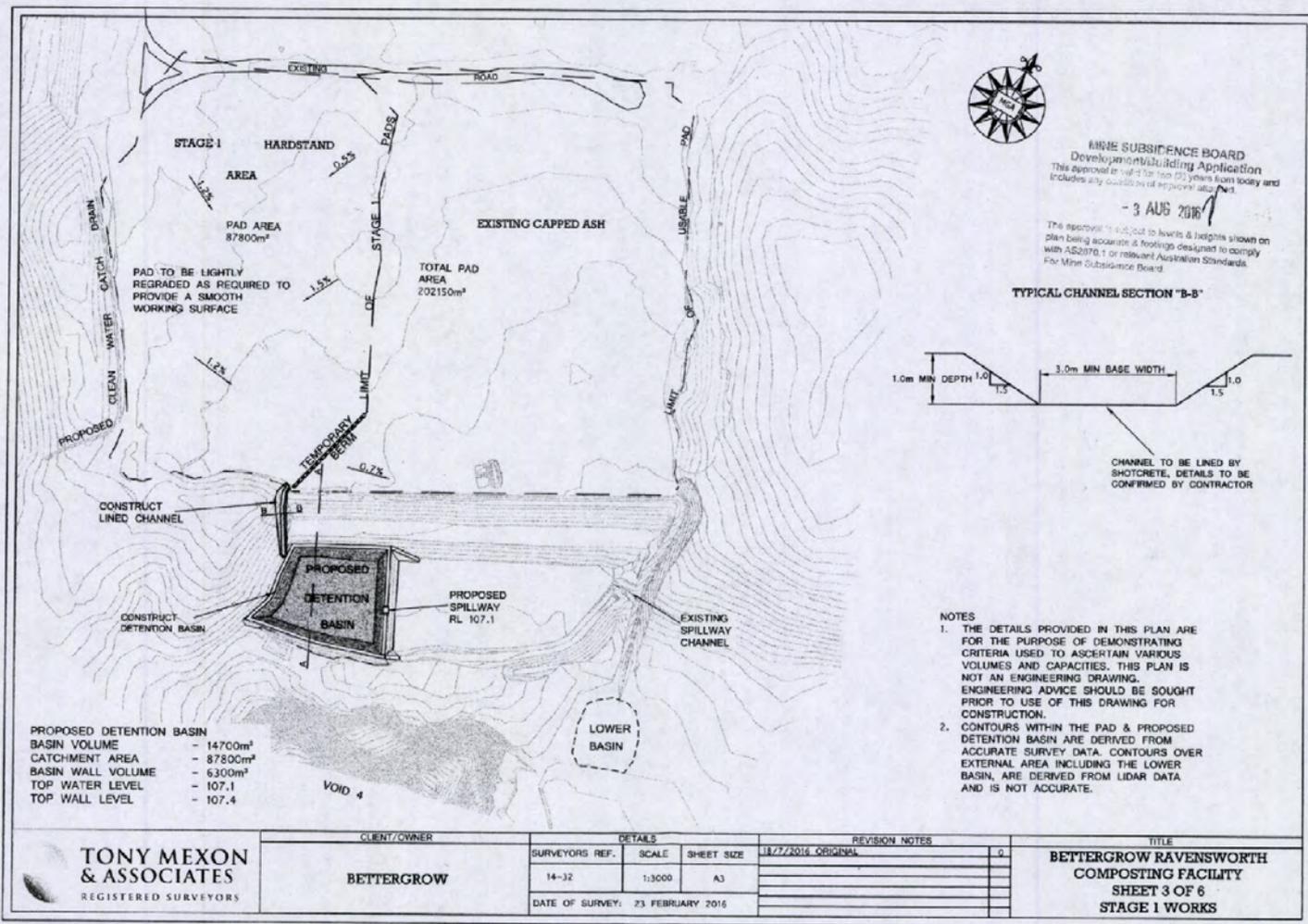
DATE: ____/____/____

SEAL (if signing under seal)

Reporting Period..... 22 / 06 / 17.....to.....21 / 06 / 18.....

Licence Number.....7654.....

Figures and Plans



PROPOSED DETENTION BASIN

BASIN VOLUME	- 14700m³
CATCHMENT AREA	- 87800m²
BASIN WALL VOLUME	- 6300m³
TOP WATER LEVEL	- 107.1
TOP WALL LEVEL	- 107.4

- NOTES
1. THE DETAILS PROVIDED IN THIS PLAN ARE FOR THE PURPOSE OF DEMONSTRATING CRITERIA USED TO ASCERTAIN VARIOUS VOLUMES AND CAPACITIES. THIS PLAN IS NOT AN ENGINEERING DRAWING. ENGINEERING ADVICE SHOULD BE SOUGHT PRIOR TO USE OF THIS DRAWING FOR CONSTRUCTION.
 2. CONTOURS WITHIN THE PAD & PROPOSED DETENTION BASIN ARE DERIVED FROM ACCURATE SURVEY DATA. CONTOURS OVER EXTERNAL AREA INCLUDING THE LOWER BASIN, ARE DERIVED FROM LIDAR DATA AND IS NOT ACCURATE.

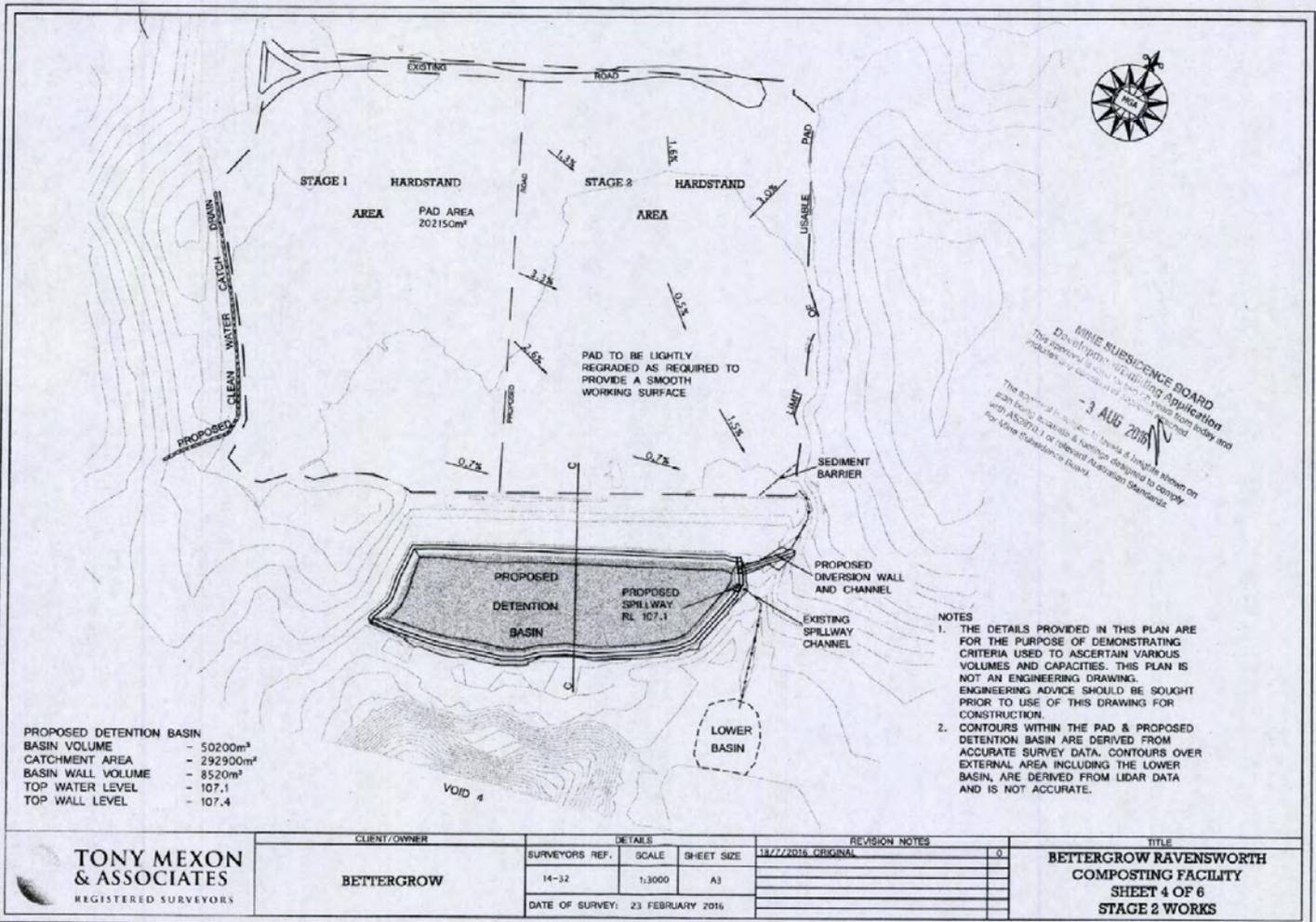
TONY MEXON & ASSOCIATES REGISTERED SURVEYORS	CLIENT/OWNER	DETAILS			REVISION NOTES	TITLE
	BETTERGROW	SURVEYORS REF.	SCALE	SHEET SIZE	1A/7/2016 ORIGINAL	BETTERGROW RAVENSWORTH COMPOSTING FACILITY SHEET 3 OF 6 STAGE 1 WORKS
		14-32	1:3000	A3		
	DATE OF SURVEY: 23 FEBRUARY 2016					

SINGLETON COUNCIL

**Approved Plans for Development
 Consent No: DA140/2016**

Date of Approval: 25/11/2016

**Assessment Officer: Joshua Real
 Title: Development Planner**



MINE SUBSIDENCE BOARD
 Drawn with: 10/11/16 Application
 The proposed works are shown in this plan from today and
 includes any necessary application for approval.
 - 3 AUG 2016
 The responsible engineer is invited to inspect and approve on
 each being successful & suitable designed to comply
 with AS2970.1 of relevant Australian Standards.
 for Mine Subsidence Board

- NOTES
1. THE DETAILS PROVIDED IN THIS PLAN ARE FOR THE PURPOSE OF DEMONSTRATING CRITERIA USED TO ASCERTAIN VARIOUS VOLUMES AND CAPACITIES. THIS PLAN IS NOT AN ENGINEERING DRAWING. ENGINEERING ADVICE SHOULD BE SOUGHT PRIOR TO USE OF THIS DRAWING FOR CONSTRUCTION.
 2. CONTOURS WITHIN THE PAD & PROPOSED DETENTION BASIN ARE DERIVED FROM ACCURATE SURVEY DATA. CONTOURS OVER EXTERNAL AREA INCLUDING THE LOWER BASIN, ARE DERIVED FROM LIDAR DATA AND IS NOT ACCURATE.

PROPOSED DETENTION BASIN
 BASIN VOLUME - 50200m³
 CATCHMENT AREA - 292900m²
 BASIN WALL VOLUME - 8520m³
 TOP WATER LEVEL - 107.1
 TOP WALL LEVEL - 107.4

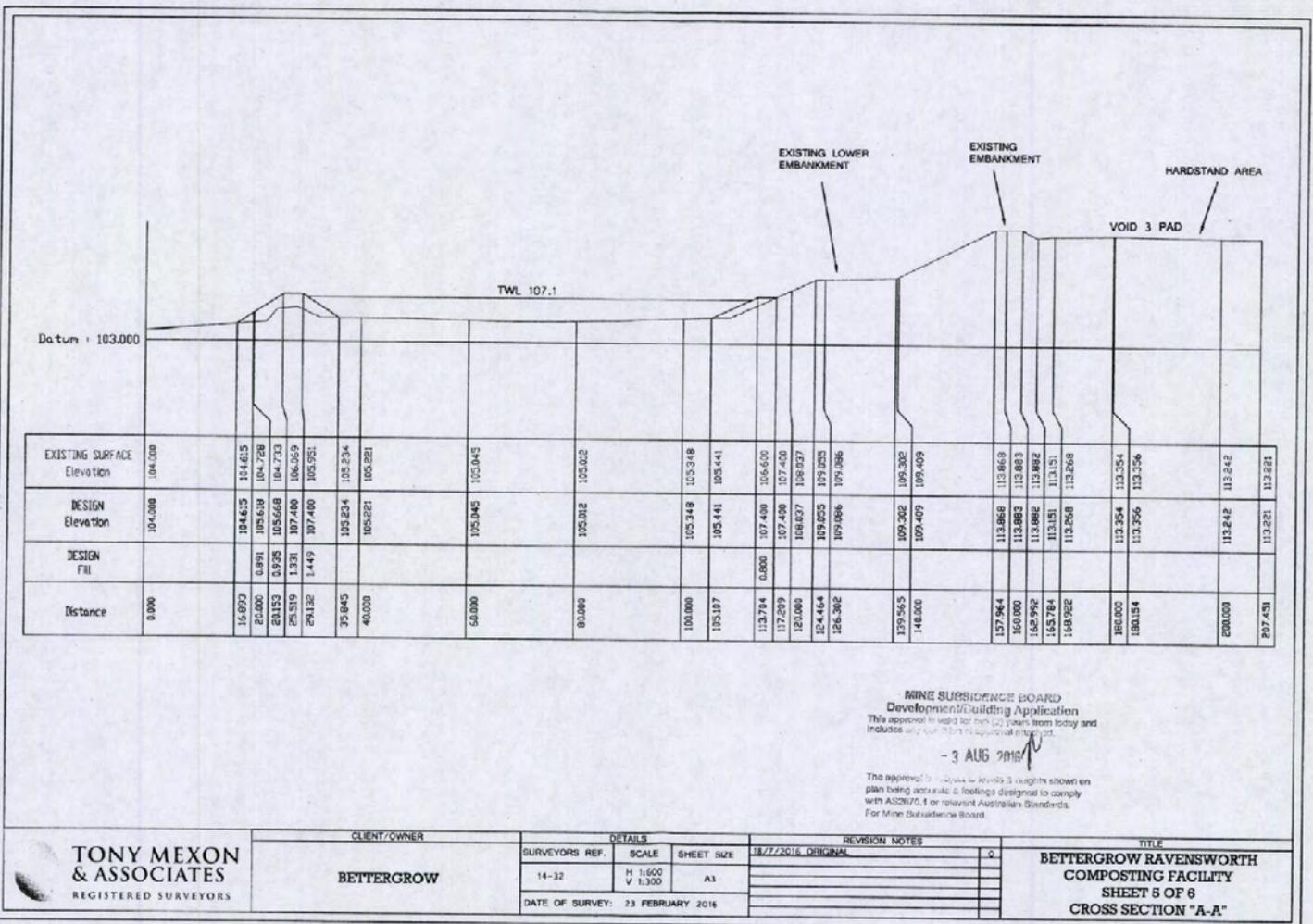
TONY MEXON & ASSOCIATES REGISTERED SURVEYORS	CLIENT/OWNER	DETAILS			REVISION NOTES	TITLE
	BETTERGROW	SURVEYORS REF.	SCALE	SHEET SIZE	18/7/2016 ORIGINAL	BETTERGROW RAVENSWORTH COMPOSTING FACILITY SHEET 4 OF 6 STAGE 2 WORKS
		14-32	1:3000	A3		
	DATE OF SURVEY: 23 FEBRUARY 2016					

SINGLETON COUNCIL

**Approved Plans for Development
 Consent No: DA140/2016**

Date of Approval: 25/11/2016

**Assessment Officer: Joshua Real
 Title: Development Planner**



MINE SUBSIDENCE BOARD
Development/Building Application
This approval is valid for ten (10) years from today and
includes any future minor amendments.

- 3 AUG 2016

This approval is subject to the conditions of c/sights shown on
plan being accurate & findings designed to comply
with AS2670.1 or relevant Australian Standards.
For Mine Subsidence Board.

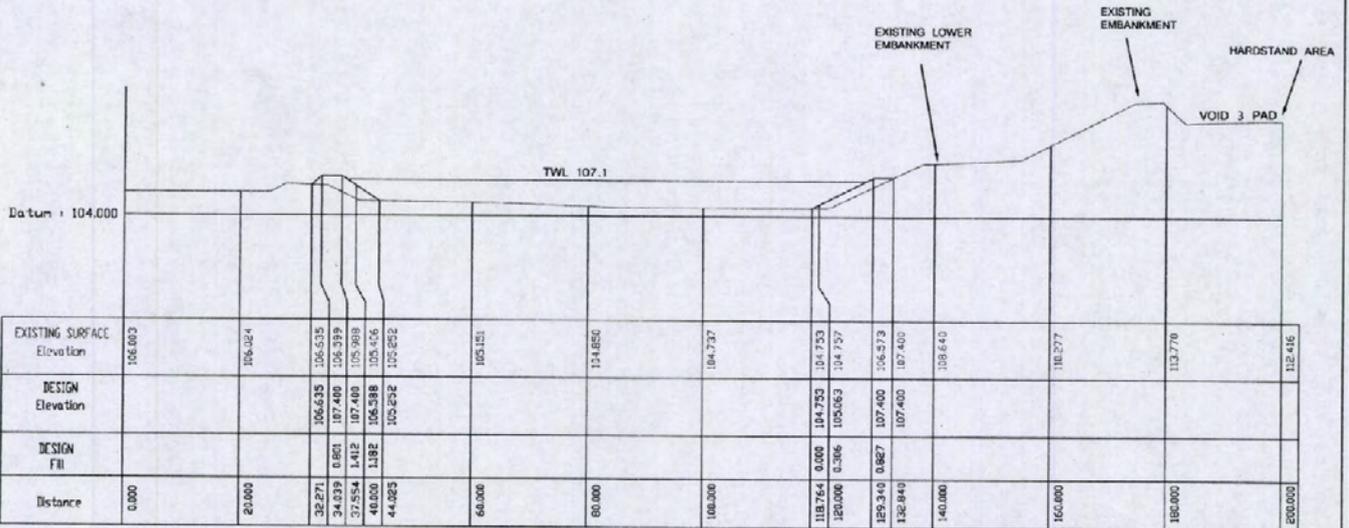
TONY MEXON & ASSOCIATES REGISTERED SURVEYORS	CLIENT/OWNER	DETAILS		REVISION NOTES	TITLE
	BETTERGROW	SURVEYORS REF.	SCALE	SHEET SIZE	18/7/2016 ORIGINAL
		14-32	H 1:600 V 1:300	A3	
	DATE OF SURVEY: 23 FEBRUARY 2016				BETTERGROW RAVENSWORTH COMPOSTING FACILITY SHEET 5 OF 6 CROSS SECTION "A-A"

SINGLETON COUNCIL

**Approved Plans for Development
Consent No: DA140/2016**

Date of Approval: 25/11/2016

**Assessment Officer: Joshua Real
Title: Development Planner**



MINE SUBSIDENCE BOARD
 Development Building Application
 This approval is valid for the (5) years from issue and includes any work that is approved as a result.
 - 3 AUG 2016
 The approval is subject to the conditions & heights shown on this plan and any other conditions attached to comply with AS/NZS 1171 or relevant Australian Standards. For Mine Subsidence Board.

TONY MEXON & ASSOCIATES REGISTERED SURVEYORS	BETTERGROW	DETAILS		REVISION NOTES		TITLE BETTERGROW RAVENSWORTH COMPOSTING FACILITY SHEET 6 OF 6 CROSS SECTION "C-C"	
		SURVEYORS REF. 14-32	SCALE H 1:600 V 1:300	SHEET SIZE A3	18/7/2016 ORIGINAL		
		DATE OF SURVEY: 23 FEBRUARY 2016					

SINGLETON COUNCIL

Approved Plans for Development Consent No: DA140/2016

Date of Approval: 25/11/2016

Assessment Officer: Joshua Real
Title: Development Planner