Riverina Oils and BioEnergy

Section 75W Modification

Environmental Assessment

September 2015

Table of contents

1. Introduction 4
   - 1.1 Background 4
   - 1.2 The proponent 5
   - 1.3 Site location and surrounding land use 5
   - 1.4 Existing approval 8
2. Proposal description 9
   - 2.1 Overview and Description of proposed MoA 9
   - 2.2 Quantification of proposed materials production increase 10
   - 2.3 Utility consumption 11
   - 2.4 Solid Waste Generation 11
3. Statutory planning context 12
   - 3.1 Environmental Planning and Assessment Act 1979 12
   - 3.2 Protection of the Environment Operations Act 13
   - 3.3 Commonwealth 14
4. Issue Identification 15
   - 4.1 Stakeholder consultation 15
   - 4.2 Environmental risk assessment 16
   - 4.3 Methodology 16
   - 4.4 Environmental risk analysis 17
5. Impact Assessment 26
   - 5.1 Air quality 26
   - 5.2 Noise 31
   - 5.3 Traffic and transport 38
   - 5.4 Greenhouse Gas 41
6. Proposed changes to existing conditions 43
   - 6.1 Limits on Approval 43
   - 6.2 Greenhouse Gas 43
   - 6.3 Air Quality 43
   - 6.4 EPL 13097 43
7. Environmental Management 45
   - 7.1 Overview 45
   - 7.2 Mitigation measures 45
   - 7.3 Environmental Audit - EnviroAg 45
   - 7.4 Environmental Management Strategy – SKM 45
8. Conclusion 47
9. References 48
10. Limitations 48

Table index

Table 1 Quantification of materials..... 11
Table 2 - Facility Consumption..... 11
Table 3 - List of DP&E Comments..... 15
Table 4 – Likelihood of occurrence definitions..... 16
Table 5 – Consequence of impact..... 17
Table 6 - Impact priority matrix..... 17
Table 7 – Preliminary Environmental Assessment..... 18
Table 8 - In stack concentrations of pollutants..... 27
Table 9 – Proposed Increases in Production Rate..... 28
Table 10 - Maximum predicted impacts – odour..... 29
Table 11 - Existing approval noise limits..... 34
Table 12 - Surrounding sensitive receivers..... 35
Table 13 - Site noise monitoring results, dB(A)..... 36
Table 14 - Noise levels at surrounding sensitive receivers from existing operations, dB(A)..... 37
Table 15 - Estimated annual Greenhouse Emissions..... 42
Table 16 - Estimated and proposed scope 1, 2, and 3 emissions..... 42

Figure index

Figure 1 – Locaiton of the ROBE Site..... 6
Figure 2 – Site Layout..... 7
Figure 3 – ROBE AWS Annual Wind Rose distribution..... 28
Figure 4 - Site boundary and surrounding sensitive receivers..... 35
Figure 5 - Surrounding Road Network..... 40
Figure 6 - Heavy Vehicle Truck Routes..... 41

Appendices

Appendix A – Design Drawings
Appendix B – Traffic Impact Assessment
Appendix C – Riverina Water County Council
Appendix D – DP&E Comments

Appendix E – Air Quality Assessment

Appendix F – Noise Impact Assessment

1. Introduction

1.1 Background

Riverina Oils & Bio Energy Pty Ltd (ROBE) operate the Integrated Oilseed Processing Plant (IOPP) located in Bomen in NSW. The site is located approximately 10 kilometres north from the city of Wagga Wagga in the Riverina region of Southern NSW.

Development consent for the construction and operation of an IOPP was granted by the then Minister for Planning on the 4th November 2008. This consent was undertaken in accordance with Part 3A of the *Environmental Planning and Assessment Act 1979 (*EP&A Act*).*

On 22nd October 2010, ROBE submitted a section 75W modification application to modify the project approval to the then Department of Planning. This modification sought to remove the biodiesel component of the project and increase the vegetable oil processing activities on the site, with subsequent infrastructure changes required on-site. Modification consent (07_0146 MOD 1) was granted on 28th November 2011. A further Modification of Approval (MoA) is being sought by ROBE to:

- Increase the seed crushing capacity from 500 to 600 tonnes per day, which equates to an increase from 165,000 to 200,000 tonnes per annum
- Increase the refining capacity from 200 to 250 tonnes per day, which equates to an increase from 66,000 to 82,500 tonnes per annum and
- Increase the vegetable protein meal production from 293.5 to 352 tonnes per day which equates to an increase from 90,000 to 116,000 tonnes per annum.

The increase in capacity will require process optimization by augmentation or replacement of a range of equipment within the process including the flaker, hoppers, conveyors, screens, oil tanks, pumps and filters. The augmentation of the plant will be undertaken predominately within the existing layout of the plant and will not introduce any substantial environmental risks to the operation of the facility. The proposed modifications are not consistent with the exiting project approval or development described in the Environmental Assessment undertaken for the site. Therefore, a further modification under Section 75 W of the EP&A Act is required.

The Preliminary Environmental Assessment (PEA) for the proposed MoA was lodged with the Department of Planning and Environment (DP&E) on the 23rd July 2015. Comments were received from on the 29th July 2015 directing this Environmental Assessment (EA).

GHD Pty Ltd (GHD) has been engaged by ROBE to prepare this EA. This EA will accompany a Section 75W modification application to be lodged with the DP&E for the proposed increase in production at IOPP. This EA describes the proposed modifications, reviews the applicable legislative framework, and includes a detailed assessment to determine the potential environmental impacts of the proposed modification. Based around existing baseline studies/ investigations undertaken, the EA seeks to determine how the proposed modification would impact upon the surrounding environment and the findings of the original assessment.

The EA subsequently proposes management measures to be implemented to mitigate any impacts associated with the proposed MoA, as well as identifying possible environmental impacts of concern arising from the proposed MoA.

1.2 The proponent

ROBE is the proponent for the new modification to the exiting approval. With an annual turnover of approximately $105 Million AUD, ROBE employs a total of 56 employees and has been in operation in the Riverina area since 2008.

1.3 Site location and surrounding land use

The site is located at 177 Trahairs Road at the intersection of Trahairs and Byrnes Road, 10 kilometres north of the city of Wagga Wagga, NSW within the Wagga Wagga Local Government Area (WWLGA). The IOPP has been constructed on Lot 12 DP 1130519 on property legally owned by ROBE.

The site forms part of the broader Bomen Business Park, with surrounding land use consisting of similar industrial/ agricultural developments and cleared farming land. For example, the Metroll Industrial development and Buckman Laboratories lie to the immediate south, with several farm homesteads scattered throughout the surrounding area. The Olympic Highway is situated approximately one kilometre to the west of the site.

Specifically, the site is zoned **IN1 General Industrial** under the Wagga Wagga Local Environmental Plan (WWLEP). **Figure 1** below shows the site location and **Figure 2** shows the site layout.

LEGEND

- ROBE access route
- Railway line
- Highway
- ROBE property boundary
- Road

1: 15,000 @ paper size A3

0 200 400 800

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

ROBE
Riverina Oils & BioEnergy

Riverina Oils & BioEnergy
Oilseed crushing and refining plant

Location map

G:\23\14931\GIS\Maps\ROBE_location_map.mxd

Prepared by GHD Suite 3, Level 1, 161-169 Baylis Street Wagga Wagga NSW 2650 Australia **T** 61 2 6923 7400 **F** 61 2 6971 9565 **E** wgamail@ghd.com **W** www.ghd.com

Data source: NSW Government: Roads, railways, lot boundary, river - 2012; Google: Google Earth aerial imagery - extracted July 2013. Created by:rtrobinson

539,000 539,200 539,400 539,600

6,122,200 6,122,000 6,121,800 6,121,600

Great Southern Railway

Byrnes Road

Seed storage building

Meal storage building

Seed processing plant (SPP)

Solvent extraction plant (SEP)

Oil storage

Wastewater treatment plant

Refinery

Automatic weather station

Administration buildings

Trahairs Road

©2010 Google™

LEGEND

- Arterial road
- Road
- Railway line
- ROBE property boundary

Paper Size A3

0 25 50 100

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

Riverina Oils & BioEnergy

Job Number 23-15587
Revision 0

ROBE key site features

G:\23\14931\GIS\Maps\231493102_ROBE_Fig2_KeySiteFeatures.mxd

Suite 3, Level 1, 161-169 Baylis Street Wagga Wagga NSW 2650 Australia **T** 61 2 6923 7400 **F** 61 2 6971 9565 **E** wgamail@ghd.com **W** www.ghd.com

Data source: NSW Government: Roads, railways, lot boundary - 2012; Google: Google Earth aerial imagery - extracted November 2013. Created by:rtrobinson

1.4 Existing approval

1.4.1 Approval history

Development consent for the construction and operation of an IOPP was granted by the then Minister for Planning on 4th November 2008. This consent was undertaken in accordance with Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

On 22nd October 2010, ROBE submitted a Section 75W modification application to modify the project approval to the then Department of Planning. This modification sought to remove the biodiesel component of the project and increase the vegetable oil processing activities on the site, with subsequent infrastructure changes required on-site. Modification consent (07_0146 MOD 1) was granted on 28th November 2011.

1.4.2 Need for the modification

The increase in capacity will require process optimization by augmentation or replacement of a range of equipment within the process including the flaker, hoppers, conveyors, screens, oil tanks, pumps and filters. The augmentation of the plant will be undertaken predominately within the existing layout of the plant and will not introduce substantially new environmental risks to the operation of the facility.

The proposed MoA will allow the IOPP to operate at a level consistent with the demand for canola oil. The addition of the production equipment will allow ROBE to continue to meet market demands for vegetable/canola oil through maintenance periods, and alleviate any production down times. Moreover, the MoA will assist ROBE to avoid mechanical disruption and achieve smooth running of the facility.

The proposed modifications are not consistent with the exiting project approval or development described in the Environmental Assessment undertaken for the site. Therefore, a further modification under Section 75 W of the EP&A Act is required.

1.4.3 Compliance and complaints

ROBE and the IOPP are currently compliant with the approval dated 28th April 2011. Throughout the history of the facility there have been three exceedances recorded, specifically in relation to Air Quality at EPA Point 14 (2nd, 4th Quarter 2014, 2nd Quarter 2015). As outlined in correspondence from EPA dated 14th July 2015, the non-compliance related to Volatile Organic Compounds (VOC) and was attributed to sampling or laboratory error following a suite of inter-laboratory testing. Since these exceedances were recorded, consultants were engaged to undertake spot monitoring with concerns raised regarding the validity of the original sampling.

In November 2013, an anonymous complaint was received with respect to odour from the evaporation pond and relayed to ROBE via the EPA. As a result of the complaint, ROBE engaged Environmental Project Consulting to undertake a review, with Transpacific engaged to pump/remove any floating soaps and gums from the pond itself. The EPA was advised of the course of action and there have been no further odour complaints.

1.4.4 Alternatives

The ‘do-nothing’ alternative is not considered suitable as the current facility will not be able to meet current market demand. The proposed MoA will adequately address the future demand and production at the site. Accordingly, no alternatives were required to be investigated as part of the proposed MoA.

2. Proposal description

2.1 Overview and Description of proposed MoA

A further MoA is being sought by ROBE seeking to:

- Increase the seed crushing capacity from 500 to 600 tonnes per day, which equates to an increase from 165,000 to 200,000 tonnes per annum
- Increase the refining capacity from 200 to 250 tonnes per day, which equates to an increase from 66,000 to 82,500 tonnes per annum
- Increase the vegetable protein meal production from 293.5 to 352 tonnes per day which equates to an increase from 90,000 to 116,000 tonnes per annum.

The proposed increases in crushing and refining for process optimisation require the modification/ augmentation to some of the existing infrastructure on the IOPP site. Design details of the proposed MoA have been included in as Appendix A. GHD understands that all of the proposed infrastructure works will be undertaken within the existing enclosed facilities:

2.1.1 Preparation Plant

In order to account for the increase in seed crushing, there are several proposed modifications required to the preparation plant at the IOPP site. This includes the installation of new equipment and the capacity alteration of existing infrastructure including:

- Flaker - Additional Flaker 704-3 proposed with a capacity of 400TPD
- Flaker Feed Hooper - new feed hopper to be provided for the new flaker
- Flaker Discharge Hopper - new discharge hopper for the flaker
- Flaker feed conveyor – increase in the length of the conveyor to feed the new flaker
- Flaker Aspiration Ducts - ducts modified to suit the vents for three flakers
- Flaker discharge conveyor - the length of the conveyor is to be increased to receive the flakes
- Permanent magnet for cooker - new magnets will be supplied to match with the modified chute
- Sterling Pre Press - installation of variable frequency drive to the main 350kw motor.

2.1.2 Refining Process

In order to account for the increase in refining to 250 TPD, the following augmentations are required:

- Oil feed tank (T501) – original 2 inch diameter sprayers to be replaced by 2.5 inch sprayers
- Oil feed pump (PT501) – to be replaced by Impeller with a diameter of 216 mm
- Heat exchange PHE (T521A) – increased to 4.73 m^2 to meet additional heat load
- Heat exchange PHE (T521B) – increased to 3.04 m^2 to meet additional heat load
- Oil feed pump (PT503AC) – replaced by larger impeller with a diameter of 140 mm to meet additional flow load
- Oil feed pump (P682B) – replaced by larger impeller with a diameter of 178 mm to meet additional flow load

- Safety filter –to meet the 250 TPD capacity
- Dearator transfer pump – replaced by larger impeller with a diameter of 230 mm to meet additional flow load
- Deoderiser oil pump – replaced by larger impeller with a diameter of 243 mm to meet additional flow load
- Deoderiser oil final cooler - increased from 19.32 m^2 to 23 m^2 to meet additional heat load
- Final cooler tempered water pump - replaced by larger impeller with a diameter of 138 mm to meet additional flow load
- Additional polishing filter.

2.1.3 Construction

Construction of the proposed MoA is expected to be undertaken in a total of 15 days. This includes 10 days of physical construction and another 5 for testing of the additional machinery. The construction will consist of two primary disciplines:

- Mechanical – equipment change, piping fabrication, welding, cutting and erection in SPP and refinery
- Electrical – cabling, modification or electrical panels, cable trays etc.

The construction workforce will include 23 tradesman including fitters, electricians, fabricators and supervisors. The proposed breakdown of this workforce includes 15 during day and 8 during night time construction activities.

Construction traffic has been assessed and found to be negligible to the overall network. A summary of the Traffic Assessment can be found in Section 5.3 of this report, with full details included in Appendix B.

2.2 Quantification of proposed materials production increase

The proposed modification outlined above will allow for an increase in production of seed crushed from 500 TPD to 600 TPD. Table 1 below indicates the quantified changes resulting from the proposed modification.

Table 1 Quantification of materials

Material	Existing materials resultant from production (TPD)	Proposed materials resultant from modification (TPD)
Canola seed crushed	500	600
Seed cake	363.5	436
Vegetable protein meal	293.5	352
Total extracted canola oil	206.5	248
Refined oil	200.5	241
Oil by-product	6	7

2.3 Utility consumption

The proposed MoA will result in an increase consumption of power, water, hexane and natural gas as summarised in Table 2:

Table 2 - Facility Consumption

Utility	500 TPD (Current) Seed crushed	600 TPD (Proposed) Seed crushed	Increase
Power	45,500 KWHr/d	48,844 KWHr/d	3,344KWHr/d
Water	6,750 m^3/ month	8,100 m^3/month	1,350 m^3/month
Hexane	30,000 litres/month	36,000 litres/month	6,000 litres/month
Natural Gas	15,500 Nm^3/d Seed crushed	16,800 Nm^3/d Seed crushed	1300 Nm^3

2.3.1 Riverina Water County Council

ROBE consulted with Riverina Water County Council (RWCC) as part of the 2011 Modification process. This correspondence has been included as Appendix C to this report.

Based on the supplied information, RWCC concluded that the proposed facility would have a maximum water demand of 300 K litres/day or 9000 m^3/month. As highlighted in Table 2 above, the proposed MoA will result in a maximum monthly use of 8,100 m^3/month. Therefore it is concluded that the proposed MoA is within the allowable limits by 9000 m^3/month and capacity of the water utility network as previously agreed with RWCC.

2.4 Solid Waste Generation

The proposed MoA is not expected to result in any net increase in solid waste.

3. Statutory planning context

3.1 Environmental Planning and Assessment Act 1979

3.1.1 Approval Framework

The original approval for the IOPP site was granted by the Minister for Planning on the 4th November 2008, with consent for a subsequent modification granted on 28th April 2011. Both approvals were granted under the former Part 3A of the EP&A Act.

Part 3A of the EP&A Act was repealed and a new assessment system for projects of State significance commenced in NSW on 1 October 2011. Despite this, Schedule 6A of the EP&A *Act* contains transitional arrangements for the repeal of Part 3A. Under Schedule 6A an approved project is considered a transitional Part 3A project and Part 3A of the EP&A Act (as in force immediately before the repeal of that Part) continues to apply to and in respect of a transitional Part 3A project.

Therefore, Section 75W of Part 3A continues to apply for the purposes of modification and the request for modification of this consent is made under section 75W of the EP&A Act to the DP&E for approval by the Minister.

Section 75W of the EP&A Act applied to ministerial approvals (included in part below):

75W Modification of Minister's approval

(1) In this section:

Minister's approval means an approval to carry out a project under this Part, and includes an approval of a concept plan.

Modification of approval means changing the terms of a Minister's approval, including:

(a) revoking or varying a condition of the approval or imposing an additional condition of the approval, and

(b) changing the terms of any determination made by the Minister under Division 3 in connection with the approval.

(2) The proponent may request the Minister to modify the Minister's approval for a project. The Minister's approval for a modification is not required if the project as modified will be consistent with the existing approval under this Part.

(3) The request for the Minister's approval is to be lodged with the Director-General. The Director-General may notify the proponent of environmental assessment requirements with respect to the proposed modification that the proponent must comply with before the matter will be considered by the Minister.

(4) The Minister may modify the approval (with or without conditions) or disapprove of the modification.

The intention to submit a Section 75W modification to 07 0146 Mod 1 was provided to the NSW DP&E on the 23rd July 2015. This concluded the provision of a PEA which included an overview of the proposal and a high level risk assessment to provide consideration of the potential impacts associated with the proposal. The application for modification and PEA was subsequently formally lodged to the DP&E.

A formal response was received from DP&E on the 29th July 2015 and has been included for reference in Appendix D to this report.

3.1.2 State Environmental Planning Policy (Infrastructure)

The proposed MoA being assessed is contained entirely within the approved site and is not considered to trigger the definition of traffic generating development. Irrespective, the heavy vehicle movements to and from the site are predicted to be negligible. Accordingly, SEPP (Infrastructure) does not apply to the proposed MoA.

3.1.3 State Environmental Planning Policy 33 – Hazardous and Offensive Development

SEPP 33 presents a systematic approach to planning and assessing proposals for potentially hazardous and offensive development for the purpose of industry or storage. Through the policy, the permissibility of a proposal to which the policy applies is linked to its safety and pollution control performance. The policy ensures that only those proposals which are suitably located, and able to demonstrate that they can be built and operated with an adequate level of safety and pollution control are permitted to proceed.

As the ROBE plant operations store and handle Dangerous Goods in quantities that exceed the threshold levels listed in SEPP 33, a Final Hazard Analysis (FHA) was prepared by SKM (2012). This document identifies potential risks and recommends mitigation strategies to which the ROBE facility currently employs. Whilst applicable to the original development, SEPP 33 does not apply to the proposed MoA as the levels of Dangerous Goods will not increase. Moreover, SEPP 33 states that in most cases compliance with the EPA requirements should be sufficient to demonstrate that the proposal is not an offensive industry. The information provided through this EA satisfies these requirements and demonstrates that the proposal is not considered an offensive industry.

3.1.4 Wagga Wagga Local Environmental Plan 2010

Under the WWLEP 2010, the proposed site is zoned **IN1 General Industrial**. The objectives of the IN1 zoning are:

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

The proposal is located entirely within the boundary of the approved site and is considered to be consistent with the objectives of the RU1 land zoning. For example, the proposed MoA will ensure the future of the current industrial use, provide short-term employment and support and protect the existing industrial land within the area. However, given the previous approval processes the proposed development will still be assessed as a modification in accordance with Section 75W of the EP&A Act.

3.2 Protection of the Environment Operations Act

The objectives of the Protection of the Environment and Operations Act 1997 (PoEO Act) are to protect, restore and enhance the quality of the environment, in recognition of the need to maintain ecologically sustainable development.

The PoEO Act provides for an integrated system of licencing and contains a core list of activities requiring Environmental Protection Licences (EPL) from the Environmental Protection Authority (EPA). These activities are called 'scheduled activities' and are listed in Schedule 1 of the Act.

The IOPP currently operates to EPA Licence No 13097 granted under Section 58(5) of the PoEO Act. This licence was last updated on the 23rd February 2015.

3.3 Commonwealth

The *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. The EPBC Act also requires Commonwealth approval for certain actions on Commonwealth land. Matters of national environmental significance under the Act comprise:

- World Heritage areas
- National Heritage Places
- Ramsar wetlands of international importance
- Threatened species or ecological communities listed in the EPBC Act
- Migratory species listed in the EPBC Act
- Commonwealth marine environments
- Great Barrier Reef Marine Park
- Nuclear actions
- A water resource in relation to a coal seam gas or large coal mining development.

The proposed is located entirely within the approved development for the ROBE facility and is not considered to have potential to impact upon any matters of national environmental significance hence a referral under the EPBC Act is not considered to be warranted.

4. Issue Identification

4.1 Stakeholder consultation

Consultation and liaison with government agencies has been integral in refining the proposal and development of the assessment methodology for the completion of the EA. Consultation has been undertaken with DP&E, EPA and RWCC in the preparation of the EA. Specifically, this consultation has been undertaken primarily by ROBE Environmental Officers with additional support by GHD staff as required.

A PEA was prepared which provided an overview of the proposal and a high level risk assessment to provide consideration of the potential impacts associated with the proposal. The application for modification and PEA was formally lodged with the DP&E on the 23rd July 2015 following further liaison and correspondence with DP&E staff.

DP&E subsequently issued a review of the PEA and issued requirements on the 29th July 2015. This correspondence has been included as Appendix D to this report. The below Table 3 provides details as to the GHD reply to the DP&E requirements:

Table 3 - List of DP&E Comments

DP&E Comment	Addressed in Report
Construction and operational employment	Section 2.1.3
Traffic Impact Assessment	Appendix B, 5.3
Air Quality Impact Assessment	Section 5.1 Appendix E
Greenhouse gas emissions	Section 5.4
Water capacity, consumption and process wastewater.	Section 2.3
Riverina Water Country Council consultation.	Section 2.3.1 Appendix C
Quantification of existing versus proposed material balance	Section 2.1
Noise Impact Assessment	Section 5.2 Appendix F
Solid waste generation.	Section 2.4
Utilities Consumption	Section 2.2
All plans should be provided at a minimum of A3 size to scale.	Appendix A
Proposed Conditions of Approval	Section 6
Compliance (Odour Complaint)	Section 1.4.3

4.2 Environmental risk assessment

A preliminary environmental risk assessment was undertaken at the commencement of the investigation to screen the potential environmental impacts that may arise as a result of the proposed modification. This was submitted to the DP&E as part of the PEA for the project.

The analysis was undertaken in the form of a preliminary, desktop-level risk assessment, to broadly assess the potential environmental risks that may arise. Moreover, the analysis assessed both the construction and operation of the proposed modification to in order to identify key areas for the assessment and assist in streamlining the assessment process. Key issues identified within the risk assessment include air and noise emissions, which have therefore been adopted as the keys issues for assessment within this EA.

The risk assessment from the PEA has been reproduced below:

4.3 Methodology

The environmental risk assessment for the proposed modification involved:

- Identifying environmental aspects
- Identifying the source of potential risks associated with each of these aspects
- Identifying the potential impact associated with each risk
- Evaluating the likelihood of occurrence and consequence of each risk with the definitions provided below
- Assigning a risk ranking
- Identifying priority issues for a further detailed assessment.

The potential risks were given a ranking with the regard to the likelihood of it occurring (assuming that the proposed modification is designed and implemented with standard environmental controls) in accordance with the definitions provided in Table 4 and Table 5.

Table 4 – Likelihood of occurrence definitions

Likelihood	Description
Almost certain	Expected to occur in most circumstances
Likely	Will probably occur in most circumstances
Possible	Could occur
Unlikely	Could occur but not expected
Rare	Occurs only in exceptional circumstances

Potential risks were given a ranking with regard to the perceived consequence if left unmanaged, in accordance with the following definitions:

Table 5 – Consequence of impact

Consequence	Definition
Extreme	Irreparable/long-term damage/ widespread environmental effects may include major pollution incident, unauthorised damage to significant cultural or heritage sites. Occurrence may result in significant regulatory intervention
High	Serious damage to the environment, medium-long term impact, rehabilitation at considerable expense. Possible legal non-compliance and/or damage to corporate reputation.
Medium	Localised, short term damage/disturbance to the environment requiring relatively short-term remedial action (<1 month)
Low	Noticeable impact on the natural environment/corporate reputation requiring little to no remedial action
Negligible	Negligible impact on the environment which is difficult to notice and does not require remedial action

Based on the assessment of likelihood and consequence, a foreseeable impact/risk was assigned a risk rating. This enabled higher rating risks to be identified early in the process for the purpose of focusing the preliminary environmental assessment process. The matrix shown in Table 6 as used to prioritise potential environmental risk.

Table 6 - Impact priority matrix

	Consequence level				
Likelihood level	Negligible	Low	Medium	High	Extreme
Almost certain	*Medium*	*High*	*Extreme*	*Extreme*	*Extreme*
Likely	*Low*	*Medium*	*High*	*Extreme*	*Extreme*
Possible	*Negligible*	*Low*	*Medium*	*High*	*Extreme*
Unlikely	*Negligible*	*Negligible*	*Low*	*Medium*	*High*
Rare	*Negligible*	*Negligible*	*Negligible*	*Low*	*Medium*

4.4 Environmental risk analysis

Table 7 provides the environmental risk analysis for the proposed modification. This includes:

- A summary of the potential key impacts/risks
- Likelihood of occurrence and consequence levels
- The risk ranking that were assigned
- A discussion regarding the findings of the risk analysis.

The table below displays the potential environmental aspect, risk, likelihood and associated discussion. For consistency, the environmental aspects that have been selected from the DP&E Assessment Report for the Section 75 W Modification (07_0146 MOD 1):

Table 7 – Preliminary Environmental Assessment

Environmental aspect	Source of risk	Potential impact (without mitigation)	Likelihood	Consequence	Risk rating	Discussion
Traffic and transport	Increased traffic movements during construction.	Increase in traffic on the local road network as a result of construction.	Possible	Low	Low	The proposed MoA will involve the augmentation to the on-site infrastructure. As the majority of the required components are to be delivered assembled, this will result in a minor increase in traffic during construction, which would be considered negligible. Any construction traffic would be managed with the implementation of the Construction Traffic Management Plan from the Section 75W Modification (2011).
	Movement of heavy vehicles during operations and increased use of transport infrastructure	Increase in traffic as a result of operation impacting safety and traffic along the local road network.	Unlikely	Low	Low	An Operational and Construction Traffic Management Plan was undertaken by SKM Consulting for the Section 75W Modification (2011). Whilst the operation of IOPP was considered likely to generate additional traffic, the impact was found to be within the existing capacity of the network. As per DoP&E DA Mod-1 07_0146, ROBE has consent for 75 heavy vehicles in a day. With that, the proposed modification is not expected to increase the current traffic levels during operation. For example, truck/tanker movements are expected to increase from 33 to 37 per day. Moreover, the proposed modification will capitalise on the existing traffic recommendations, specifically the road safety treatment works at the intersection of Byrnes Road and Trahairs Road.

Environmental aspect	Source of risk	Potential impact (without mitigation)	Likelihood	Consequence	Risk rating	Discussion
Odour	Odour from additional infrastructure and housing of machinery and plant	Odour emissions with the potential for offsite impacts	Unlikely	Medium	Low	The proposed modification is not likely to result in an increase in odours from the site. Environment Protection Licence (EPL) (#13097) applies to the site and its activities. Condition L6.3 of the EPL and Conditions 38, 39 and 39a of the Conditions of Approval require that a source emission monitoring program and a post commissioning emissions validation report be undertaken. In addition, any potential odour from the proposed modification will be addressed in accordance with ROBE's Odour Management Plan (January 2014). ROBE's Environmental Complaint Register indicates that throughout the operation of the facility there has only been one odour complaint (November 2013). This complaint was received during the facility commissioning and stabilisation period and was investigated by the EPA with Transpacific engaged to pump floating soaps and gum from the evaporation pond.

Environmental aspect	Source of risk	Potential impact (without mitigation)	Likelihood	Consequence	Risk rating	Discussion
Air Quality	Air emissions (dust and exhaust) during construction and operations	Dust and exhaust emissions causing nuisance to receptors	Possible	Medium	Medium	As part of the conditions of consent, air quality at IOPP was originally required to be tested at quarterly intervals. This testing resulted in an exceedance at EPA point 14 (Filter Blowing Vapour Scrubber) during testing in October 2013. However, due to detailed diligence and further mitigation measures there has not been an exceedance since. This has resulted in a reduction in their air emission stacks sampling requirements (from 7 stacks to 3) due to extremely low and consistent results. Further to this, ROBE has built housing infrastructure to minimise dust emissions off site in response to the findings in their Independent Environmental Audit undertaken by EnviroAg in 2014. Given the existing low results and site diligence, the proposed modification is not likely to result in any substantial increase in air emissions outside of the existing approval.

Environmental aspect	Source of risk	Potential impact (without mitigation)	Likelihood	Consequence	Risk rating	Discussion
Solid Waste	Increased solid waste	Increased solid waste as a result of increase in production.	Possible	Low	Low	A Waste Management Plan was prepared by SKM for the 2011 S75 W modification. This plan covers statutory requirements for waste management during both construction and operation of the project in accordance with the Minister for Planning's Conditions of Approval, the *Waste Avoidance and Resource Recovery Act 2001* and the *Protection of the Environment Operations Act 1997.* The plan outlines the following solid wastes which are currently generated during the operation of the IOPP: Sludge from the WWTP; Sludge from the Evaporation Pond; • Solid waste from the Design Packaged Black Water Treatment System; General Waste; and Recycled waste. The proposed MoA is not likely to result in a substantial increase in solid waste. With the exception of general domestic waste, currently WWTP is the only waste generated on the IOPP site. This is classified as 'food waste' and is currently composted by CarbonMate via transportation from Transpacific – Clean away in accordance with EPA requirements.

Environmental aspect	Source of risk	Potential impact (without mitigation)	Likelihood	Consequence	Risk rating	Discussion
Noise	Increased noise emissions during construction	Increase in noise levels from the additional plant impacting on neighbouring properties and sensitive receptors.	Unlikely	Medium	Low	Construction activities would generate only minimal noise emissions as the proposed modification would be undertaken within the existing facility shielded from surrounding land uses. All proposed development associated with the modification will be within the walls of the existing facility. Irrespective, all construction will be undertaken in accordance with the hours prescribed in Clause L4.3 of the existing EPL Licence (13097): Monday – Friday: 7:00am to 6:00pm Saturday: 7:00am to 5:00pm Sunday and Public Holidays: Nil
Hazards	Dust explosion, Chemical spill	Environmental impacts, human safety	Possible	Medium	Medium	The Preliminary Hazard Analysis (PHA) for the S 75W 2011 modification concluded that the IOPP operation is not considered potentially hazardous or offensive. However, in accordance with the consent conditions, SKM were engaged to produce a Hazards Analysis for the site. The primary hazards identified were Dust Explosion and Chemical (corrosives) spills, with appropriate mitigation measures currently implemented per the recommendations on the site. As an augmentation of the existing operation, the MoA is not expected to increase the likelihood of such hazards or introduce any additional hazards to the site.

Environmental aspect	Source of risk	Potential impact (without mitigation)	Likelihood	Consequence	Risk rating	Discussion
Fire Risk	Increased likelihood of fire event	Destruction of property, safety.	Possible	Medium	Medium	The proposed modification is not expected to increase the likelihood of fire risk on the site. As part of the 2011 Modification, ROBE undertook analysis for the potential for plant fire events in accordance with the Hazardous Industry Planning Advisory Paper No2. This analysis concluded that all fire events would be contained within the site. This assessment was formally accepted by NSW Fire and Rescue on the 12 December 2012. Moreover, a Fire Engineering Report was produced by Raw Fire Fire Safety Engineering as part of the 2011 modification. This report outlines: Fire hazards and protective measures; BCA compliance; Fire scenarios and parameters; and Evacuation scenarios and parameters. As a modification to the existing operating procedures, fire risks associated with the proposed MoA have been adequately addressed by both the abovementioned reports.
Water	Increased freshwater demand	Increase freshwater demand and impact on local rivers and catchment	Unlikely	Medium	Low	The proposed MoA will result in an increase of 1,350 Kl/month in water consumption. It is anticipated that this water will be supplied by Riverina Water Country Council (RWCC). Current supply terms between ROBE and RWCC are up to 9,000 Kl/m. Irrespective, this increase is considered negligible with respect to the overall operations of the site.

Environmental aspect	Source of risk	Potential impact (without mitigation)	Likelihood	Consequence	Risk rating	Discussion
	Stormwater	Increase in stormwater run-off	Unlikely	Low	Low	All existing stormwater is currently captured and directed to the detention basins as part of the on-site Waste Water Treatment system. As an augmentation to existing infrastructure, the proposed MoA will not increase the amount of impermeable ground on the site and will not result in an increase of stormwater runoff. Irrespective, the WWTP is currently operating at only 35-40% capacity.
	Process Wastewater	Increase in wastewater and potential environmental damage.	Unlikely	Medium	Low	Under the current approval, waste water is conveyed by gravity to the Waste Water Treatment Plant (WWTP) through an underground conveyance pipeline. Following a process of separation, equalisation, secondary treatment and filtration 75 – 80% of the water is recycled back into the ROBE utilities. Sludge is then collected, stored and eventually disposed of in the form of compost. ROBE has advised that the WWTP has the following design capacities: Primary and Secondary Treatment - 230m^3/d; and Tertiary Treatment – 350 m^3/d. With this, the WWTP is currently operating at 35-40% of design capacity whilst evaporation ponds are at 25% capacity. Accordingly, the existing WWTP facility on site has capacity to accommodate any minor increase in the waste water. The MoA is not expected to have any adverse environmental impacts with respect to process wastewater.

Environmental aspect	Source of risk	Potential impact (without mitigation)	Likelihood	Consequence	Risk rating	Discussion
Visual amenity	Additional buildings and infrastructure on site.	Visual impacts on neighbours	Rare	Low	Negligible	The proposed modification would be located within the existing structures and is consistent with the existing land use/operations of the facility. There would be no visual impacts on adjoining lands. All seven receptor precincts were previously identified as part of the Visual Impact Assessment for the facility. This assessment concluded that whilst the site is located on a ridge and would be visible from the north, east and west, receptors are well removed from the site and views to the development are from a distance. Existing mitigation measures, such as vegetation screening, remain in place. Accordingly, as the proposed MoA only involves development within the existing facility, visual impacts are considered to be minimal.
Socio-economic	Construction/augmentation of facility and operation.	Impacts to community through noise and traffic.	Unlikely	Medium	Low	Construction activities would be minor and temporary in nature and would be appropriately mitigated with the implementation of controls provided in the S 75 W Modification.

5. Impact Assessment

GHD has prepared the below impact assessment in response to DP&E's comments for review of Modification 07 0146 MO2. Accordingly, the primary focus of the impact assessment has involved:

- Air quality
- Noise
- Greenhouse Gas
- Transport and traffic.

Other issues such as Heritage, Flora and Fauna and Visual have been assessed in the PEA for the MoA. Accordingly, such issues have not been addressed in this impact assessment as it is considered they require no further investigation.

5.1 Air quality

GHD has prepared a detailed Air Quality Assessment which has been included as Appendix E to this report. Below is a summary of the key findings:

5.1.1 Air Quality requirements

Correspondence from DP&E stipulates the following requirements in relation to Air Quality:

A more detailed air quality impact assessment is required to quantify any impacts as a result of the increase production capacity. Explain existing emissions limits, relevant conditions, EPL licence requirements, and relevant air pollutants and confirm that existing emission limits will not be exceeded. EPA has requested that the EA includes an assurance that hexane emission limits will not be exceeded.

5.1.2 Existing Approval and Environment

Existing EPL Requirements

Currently the EPL requires ROBE to minor discharge to air at three monitoring points. These are at Combined Vent (EPA ID Point 2), Solvent extraction plant scrubber combined vent (EPA ID Point 3) and filter blowing vapour scrubber (EPD ID Point 14). A Notice to Variation of Licence No 13097 was provided on 23 February 2015 to remove the requirement to monitor NOx from gas powered boilers (EPA ID point 4), particulates from the bag house and no longer required monitoring at sources 7, 13 and 15. The update to the licence in February 2015 also removed the requirement to monitor the following sources:

- Point 4 – Boiler house stack for Boiler 1
- Point 7 – Combined vent stack TSP; previously measured at <2 mg/m^3 on all dates except for January 2015, where it recorded a value of 9.7 mg/m^3 (still at a level considered to have a minor impact)
- Point 13 – Earth conveying system
- Point 15 – High pressure stream generator.

In-stack Concentration limits

The emissions to air from the ROBE plant are permitted at seven discharge points and the in-stack concentration limits for specified pollutants at each point are specified in section L2 of the EPL. They are repeated in Table 8 below.

Table 8 - In stack concentrations of pollutants

Discharge Point	Type of monitoring	Location Description	Air concentration limit 100 percentile limit
2	Discharge to air	Combined vent servicing	TSP – 50 mg/m^3 H_2S – 5 mg/m^3
3	Discharge to air	Solvent extraction plant scrubber	VOCs - 40 mg/m^3 H_2S – 5 mg/m^3
4	Discharge to air	Boiler house stack	NO_x – 350 mg/m^3
7	Discharge to air	Combined vent	TSP – 50 mg/m^3
13	Discharge to air	Earth conveying system	TSP – 50 mg/m^3
14	Discharge to air	Filter blowing vapour scrubber	VOC – 40 mg/m^3 H_2S – 5 mg/m^3
15	Discharge to air	High pressure steam generator	NO_x – 350 mg/m^3

Meteorology

Local wind climate will largely determine the pattern of off-site impacts of air pollutants from the ROBE facility. The characterisation of local wind patterns requires accurate site-representative hourly recordings of wind direction and speed over a period of at least a year.

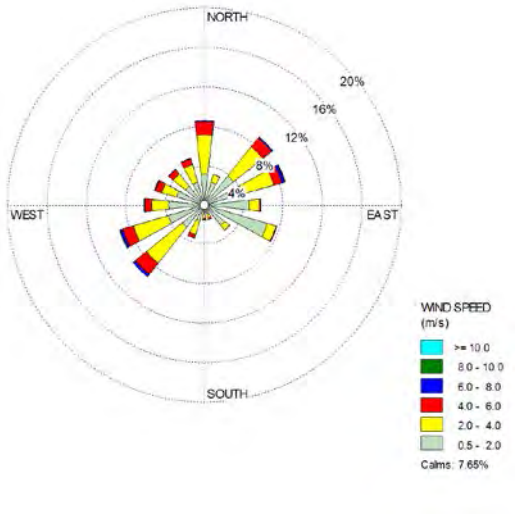
Wind rose distributions for the ROBE facility were compiled based on data obtained from the automatic weather station (AWS) located on the ROBE site. This data has been used to create a 12 month data file for the period 01 October 2012 to 30 September 2013. The anemometer sensors for wind direction and speed were a wind vane and rotating cups respectively.

The effect of wind on dispersion patterns can be examined using the general wind climate and atmospheric stability class distributions. The features of particular interest in this assessment are:

- the prevailing wind directions
- the relative incidence of more stable light wind conditions.

With some seasonal variation, the site has a prevailing wind direction from the west- southwest (Refer Figure 3 below). Details of the sites Atmospheric Stability have been included in the Appendix E to this report.

Figure 3 – ROBE AWS Annual Wind Rose distribution



5.1.3 Potential Impacts

Increases in the operational capacity and production of the plant have the potential to result in increases to both in-stack concentrations and flowrates of certain pollutants and to peak ground level concentrations of the pollutants.

Recent in-stack testing allows for the accurate quantification of impacts for existing operations. To account for future operations, a linearly proportional increase to in-stack concentration of relevant pollutants has been assumed for the relevant operation at the stack discharge point. All other factors including temperature, velocity and physical stack characteristics have been assumed to remain unchanged. A summary of these predicted increases is given below in Table 9

Table 9 – Proposed Increases in Production Rate

Update	% increase	Likely Impacts
Increase seed crushing capacity from 500 to 600 TPD	20 %	Increase of odour in seed crushing plant (combined vent servicing - DP 2
Increase refining capacity from 200 to 250 TPD	25 %	Increase of odour in refinery (filter blowing vapour scrubber) – DP 14
Increase vegetable protein meal production from 293.5 to 352 TPD	20 %	Solvent Oil extraction plant and scrubber combined vent - DP 3)

As a result of an approximate 25 % increase in operations across the plant, the measurements of all pollutants can be scaled up by this factor to predict future concentrations. For H_2S and NO_x, this still results in comfortable compliance. The maximum predicted concentrations of the pollutants scaled up based on this 25% increase in throughput of the plant is summarised below in Table 9.

The following observations have been noted:

- In-stack concentration limits for NO_x and H_2S are comfortably met at all sources, providing justification for the removal of the condition to monitor sources 4 and 15, where the maximum concentration was around 35% percent of the criterion

- In-stack concentration limits of H_2S were comfortably met at all sources, with all concentrations recorded below the limits of reporting
- In-stack concentration limits for TSP are readily met at locations 2, 7 and 13, with the highest concentration occurring at 13 still less than 50% of the criterion
- Some measured concentrations of total VOCs (as n-propane) are well above the permissible 40 mg/m^3 licence limit for point source 14. These exceedances have been investigated and audited in the past. As some analytical errors occurred in the laboratory, measures have been put in place to ensure accurate sampling
- The July 2014 measurement of VOCs was conducted with quadruplicate values, and thus can be reliably used.

Odour

The impact assessment criterion for mixtures of odours pollutant for a nose-response-time average, 99th percentile for single rural residences is given in the NSW Approved Methods as 7.0 odour units. When the April 2015 measurements are applied to existing operations and projected into the future, the odour criterion is met at all sensitive receptors, with the greatest impact occurring at R3 (4.1 OU predicted in future operations).

Table 10 - Maximum predicted impacts – odour

Receptor	Existing impacts – OU Nose-response-time average (99th percentile)		Predicted future impacts (25 % increase in throughput) Nose-response-time average (99th percentile)	
	April 2015 measurements	Maximum recorded measurements	April 2015 measurements	Maximum recorded measurements
Maximum on Grid array (outside site boundary)	15.0	92	18.8	115
R1	1.8	10.6	2.3	13.3
R2	2.2	13.2	2.8	16.5
R3	3.3	19.6	4.1	24.5
R4	2.5	14.8	3.1	18.5
R5	2.1	12.5	2.6	15.6
R6	1.4	8.9	1.8	11.1
R7	1.0	6.1	1.3	7.6
R8	1.1	6.5	1.4	8.1
R9	0.9	5.5	1.1	6.9

Hexane

Hexane emission limits were not specifically set in the EPL, however total VOCs have a concentration limit of 40 mg/m^3 (100 percentile). Major emissions sources of VOCs are due to the burning of natural gas fuel and during the filling of the hexane tanks. Hexane emissions may come from a number of sources within the facility:

- Emissions from its use as a solvent in the plant, including as vapours from the hexane tanks, either through leaks in the tanks or during filling operations which occurs a few times a year
- Non-routine emissions of hexane occur when hexane is released from the separator extractor purge fans during plant shutdowns, when hot work is required to be done.

Hexane from oil refining process

ROBE has indicated to GHD that the proposed operations for the plant do not involve any additional deliveries nor an increase in volume of hexane used at the plant.

Hexane emissions have been identified within the plant through in-stack testing by ETC at DP3 and DP14 prior to 2015. Hexane has been demonstrated to make up the majority of measured VOCs from DP3, while it also represents a significant proportion of VOCs measured at DP14. The exact sources of these hexane emissions have not been identified and should be quantified and assessed as to the likely changes as a result of proposed plant operations.

Hexane as part of total VOCs

VOCs are produced when natural gas in burned. According to the National Pollutant Inventory (v3.6) Estimation Technique Manual for Combustion in Boilers, total volatile organic compounds (VOCs) have an emission factor of 0.119 kg/tonne of natural gas burned (DSEWPC. 2011). Hexane has not previously been measured from the boiler from in-stack testing, as it is considered a relatively minor component of total VOCs. Whilst VOCs make up some proportion of emissions from the boiler house, they did not have any air concentration limit specified in ROBE's environmental protection licence in 2013, nor in its current licence, for the boiler house. Measurements of hexane are reported at the facility in regards to its use as a solvent to extract oils from the seeds as part of the oil refining and production process, and as such are more pertinent to the solvent extraction plant scrubber (ID3) and filter blowing vapour scrubber (ID14).

ROBE has indicated that natural gas consumption would increase from 15,500 to 16,800 Nm^3/day, an increase of roughly 8 % (although natural gas per unit consumption decreases). This increase would likely lead to an increase of around the same proportion in total VOC emissions as a result of this increased combustion of natural gas.

Total hexane

On the conservative assumption that all VOCs from DP 14 are represented with hexane-equivalence, modelled ground level concentrations at the nearest sensitive receptors from the contribution of DP3 and DP14 are demonstrated to comfortably comply with the hexane criterion.

Conclusion

ROBE has demonstrated improving practices to management of emissions through their plant as evidenced by a reduction in licence conditions for monitoring requirements and ongoing communication with EPA to address concerns in relation to plant operations. The following conclusions have been made based on an assessment of the information provided to GHD:

- In-stack concentration limits have been demonstrated to comfortably meet compliance limits for TSP, NO_x, and H_2S for existing operations based on the quarterly testing conducted in recent years
- In-stack concentration limits for VOCs at DP 14 have experienced some exceedances over the past few years, with spikes in concentrations identified by previous testing, albeit with questions over the validity of the laboratory testing. The most recent testing conducted in 2015 (two rounds) has indicated compliance with the in-stack concentrations for VOCs, and if these conditions continue into the future then conditions will continue to be met for existing operations
- The predicted increase in air quality emissions was based on conservative assumptions that the concentration of each pollutant would increase linearly with the increase in throughput (of around 25 %). Based on this assumption, it is predicted that the increased concentrations of TSP, NO_x and H_2S would comply with the concentration limits.

In order to comply with in-stack concentrations of VOCs according to their EPL, ROBE should demonstrate that:

(a) Despite higher mass emissions, concentrations of VOCs would not increase; and

(b) Management practices are in place to reduce VOC emissions through identification of the sources of VOCs at source ID DP 14.

Furthermore, modelling has demonstrated:

- Low predicted ground level concentrations for TSP and VOCs for both existing and future proposed operations, meeting NSW criteria for impacts at the nearest sensitive receptors
- Compliance with NSW odour criteria based on April 2015 odour measurements for existing and future proposed operations, at the nearest sensitive receptors. However, it should be noted that past measurements of odour have indicated much higher concentrations and, under these conditions, the criteria for odour would result in an exceedance of the criteria at most of the nearby receptors.

5.1.4 Mitigation Measures

The following mitigation measures are recommended in relation to the proposed MoA:

- If exceedances or higher odour concentrations are experienced, further monitoring must be undertaken by ROBE
- In the unlikely event that further exceedances are experienced, investigation into additional measures will need to be undertaken into the design of the facility to ensure compliance with the NSW Odour Criteria.

5.2 Noise

GHD has prepared a Noise Impact Assessment which has been included as Appendix F to this report. Below is a summary of the key findings.

5.2.1 Noise requirements

Correspondence from the Department of Planning and Environment (DP&E) stipulates the following requirements in relation to noise:

Quantification of construction noise impacts in a noise impact assessment, with reference to the EPA's 'Interim Construction Noise Guideline (DEC 2009)'.

Information provided by ROBE confirms that the construction period will be approximately 10-15 days.

The *Interim Construction Noise Guideline* (DEC 2009) has two assessment methods as follows:

- The quantitative assessment method is used for works that have the potential to affect sensitive receivers and land uses for more than three weeks
- The qualitative assessment method is applicable for short term works that are likely to affect sensitive receivers and land uses for less than three weeks in total. The qualitative assessment does not require noise predictions or assessment against a noise criteria but rather provides appropriate mitigation measures to manage noise and complaints if noise impacts are expected.

Since the construction is to occur for less than 3 weeks the qualitative assessment method has been used.

Construction noise impacts

Construction works are expected to occur for less than 3 weeks and are limited to replacement and installation of new equipment located within the building. Construction works should not significantly impact surrounding sensitive receivers. Construction noise mitigation measures have been recommended and are provided below.

Recommended construction noise mitigation measures

The following construction noise mitigation measures are recommended:

- Noise generating construction activities shall be undertaken in accordance with the *Interim Construction Noise Guideline* (DECC, 2009) and during the recommended standard hours for construction work:
  - 7 am – 6 pm Monday to Friday
  - 8 am – 1 pm Saturdays
  - No work on Sundays or Public Holidays.

- Construction work outside normal hours would only comprise:
  - Outage related works where system outages are unavailable during daylight hours (for example cut over works)
  - The delivery of oversized loads if requested by police or other authorities for safety reasons
  - Emergencies
  - Other non-construction activities that are not audible at the substation boundary, including testing and commissioning activities.

- All site workers should be sensitised to the potential for noise impacts on local residents and encouraged to take practical and reasonable measures to minimise the impact during the course of their activities. This should include:
  - Avoid the use of loud radios
  - Avoid shouting and slamming doors
  - Where practical, machines should be operated at low speed or power and switched off when not being used rather than left idling for prolonged periods

- Keep truck drivers informed of designated vehicle routes, parking locations and delivery hours
- Minimise reversing
- Avoid dropping materials from height
- Avoid metal to metal contact on material
- All engine covers should be kept closed while equipment is operating.

5.2.2 Existing Approval and Environment

The DP&E CoA 24 and EPL 13097 Clause L4.1 specify the following noise limits for the existing ROBE facility as Table 11:

Table 11 - Existing approval noise limits

Day	Evening	Night	Night	Location
$LA_{eq\ (15\ minute)}$	$LA_{eq\ (15\ minute)}$	$LA_{eq\ (15\ minute)}$	$LA1_{(1\ minute)}$ or LA_{max}	
35	35	35	45	At any residence or other sensitive receiver

Note:

a) To determine compliance with the $L_{Aeq\ (15\ min)}$ noise level limits in the above table, noise from the project is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of a dwelling where the dwelling (rural situations) is more than 30 metres from the boundary. To determine compliance with the $L_{A1\ (1\ minute)}$ noise level limits in the above table, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the EPA may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).

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

b) The noise emission limits identified in the above table apply under meteorological conditions of:

- *Wind speeds of up to 3 m/s at 10 metres above ground level and*
- *Temperature inversion conditions of up to 3˚C/100m, and wind speeds of up to 2 m/s at 10 metres above the ground level.*

L4.2 For the purpose of the above condition:

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

Existing environment

The nearest residential receivers to the site have been identified in Table 12 and Figure 4.

Table 12 - Surrounding sensitive receivers

Receiver	Easting	Northing	Distance to site boundary (km)
R1	537248	6121739	1.5
R2	537625	6121799	1.9
R3	538090	6121848	1.0
R4	537968	6122862	1.5
R5	537760	6123116	1.75
R6	538140	6123263	1.5
R7	538268	6123807	1.9
R8	540329	6119814	1.9
R9	540594	6119575	2.25

Figure 4 - Site boundary and surrounding sensitive receivers

Attended noise measurements were undertaken at the site boundary to determine the existing ROBE facility operational noise emissions. The measurements were undertaken:

- During the night-time period
- At four locations on the site boundary
- On the 17 and 18 June 2015

- With the plant running under typical operational capacity
- Using a B&K 2250 Light Type 1 sound level meter (Serial number 2722377).

The sound level meter was calibrated before and after the measurement period using a SVAN SV-30 acoustic calibrator (Serial No.39467) and was found to be within the acceptable tolerance of ± 0.5 dB(A). The noise monitoring locations on the property boundary were taken at each boundary corner (L1 – NW corner, L2 – NE corner, L3 – SE corner, and L4 – SW corner). Table 13 details the noise monitoring results at the four boundary locations (L1 to L4) for each 15-minute measurement (M1 and M2).

No tonal, low frequency or impulsive noise sources were observed during the attended monitoring period.

Table 13 - Site noise monitoring results, dB(A)

	Location 1 (L1)		Location 2 (L2)		Location 3 (L3)		Location 4 (L4)	
	M1	M2	M1	M2	M1	M2	M1	M2
$LA_{eq,15\ minute}$	59.3	45.2	54.9	57.1	49.8	50.0	50.2	45.4
Site contribution $LA_{eq,15\ minute}$	39.7	40.2	47.1	47.2	49.8	49.9	44.9	45.4
Measurement commenced	21:56	22:11	22:34	22:49	23:15	23:30	23:58	00:13
Measurement ceased	22:11	22:26	22:49	23:04	23:30	23:45	00:13	00:28
Weather observations (at ground level)	Temp: 11 °C Wind: 0 m/s Rain: Light mist		Temp: 11 °C Wind: 0 m/s Rain: NIL		Temp: 11 °C Wind: 0 m/s Rain: NIL		Temp: 11 °C Wind: 0 m/s Rain: NIL	
Noise emission observations L_{Ap}	**Site hum: 39 - 44** Road traffic: 45 - 79		**Site hum: 45 - 48** Road traffic: 48 - 77 Birds: 49 - 59		**Site hum: 48 - 52** Car door: 52 – 55		**Site hum: 43 - 48** Road traffic: 48 - 52 Rail traffic: 48 - 72	

The noise measurement results were taken on the property boundary at each corner, and have been used to calibrate the noise model which has been used to predict the noise emissions from the existing ROBE facility at the identified surrounding sensitive receivers (R1 to R9). Noise modelling was undertaken using CadnaA v4.4 which calculates environmental noise propagation according to ISO 9613-2 *Acoustics – Attenuation of sound during propagation outdoors.*

The following assumptions and calculation parameters were used in the noise model:

- The site and surrounding land was modelled assuming a ground absorption coefficient of 0.5
- Atmospheric absorption was based on an average temperature of 10°C and an average humidity of 70% which accounts for typical worst case propagation

- The algorithm also takes into account the presence of a well-developed moderate ground based temperature inversion, such as commonly occurs on clear, calm nights or 'downwind' conditions which are favourable to sound propagation
- Noise receivers were modelled at a height of 1.5 metres
- The noise source on the ROBE facility was modelled at a noise level and location that achieved a noise model calibration of within +/- 1 dB(A). Validation of the noise model is shown in Table 13 which compares the predicted and measured ROBE property boundary noise levels. Note that the source level was set to ensure that the predicted noise levels were greater than the measured noise levels.

5.2.3 Potential Impacts

With consideration to noise the following potential impacts have been identified:

- An additional 17TPH capacity flaker
- Replacement of 2 existing cooling fans
- Pump upgrades to internal impellors
- Widening of existing conveyor belt by approximately 10%
- Pipework and pipe screen widening to optimize canola oil passage in the system.

Assessment of existing ROBE facility noise impacts at surrounding sensitive receivers

Noise levels from the existing ROBE facility are shown in Table 14 and are predicted to comply with the DP&E CoA 24 and EPL 13097 Clause L4.1 noise limits. Note there are no significant LAmax or LA1 events therefore the LAmax is not required to be assessed.

Table 14 - Noise levels at surrounding sensitive receivers from existing operations, dB(A)

Receiver	Noise limit	Predicted noise level	Compliance with the noise limit
R1	35 $L_{Aeq(15min)}$ 45 L_{Amax} or $L_{A(1min)}$	23	**(-12)**
R2		25	**(-10)**
R3		29	**(-6)**
R4		24	**(-11)**
R5		26	**(-9)**
R6		25	**(-10)**
R7		28	**(-7)**
R8		23	**(-12)**
R9		21	**(-14)**

Assessment of potential operation noise impacts from the proposed modification

The proposed MoA will occur within an acoustically protected building. Irrespective, potential noise impacts with consideration to the modification are discussed below:

- The dominant noise source with the ROBE facility is the two existing flakers which are located within the Seed Processing Plant (SPP) building. There are currently two existing 15TPH capacity flakers which can operate simultaneously. An additional 17TPH capacity flaker is proposed however it would only operate simultaneously with one of the other existing flakers. The second existing flaker would be on standby during emergency or maintenance. As such only two flakers would operate at any one time. The capacity of the proposed flaker will only marginally increase. Therefore, the noise from operation of the flakers is unlikely to significantly change.
- A single more efficient fan is to be installed. The newer more efficient fan is likely to produce similar noise emissions
- Some of the pumps will be replaced or upgraded however the total number and power rating of the pumps will not significantly increase
- There will be minor alterations to the pipework and screens which will have minimal effect on noise emissions
- There will be no other additional equipment that would produce significant noise emissions above the existing equipment
- All of the equipment is located inside the SPP and Refinery buildings and the internal building noise levels are not expected to significantly increase.

The noise levels from the site are currently predicted to comply with the site noise limits by between 6 to 14 dB(A) and are a fraction of the allowable sound energy. The equipment modifications to the site should not significantly increase the site noise emissions. Therefore, the proposed modifications should be acceptable from an acoustic perspective.

5.2.4 Mitigation measures

It is recommended that compliance noise monitoring be carried out at the commencement of operations of the modified ROBE facility to confirm that the noise limits are not exceeded. In the unlikely event that noise limits are shown to be exceeded, then additional mitigation measures could be incorporated into the building design to reduce noise levels to below the noise limits.

5.3 Traffic and transport

GHD has prepared a detailed Traffic Assessment which has been included as Appendix B to this report. Below is a summary of the key findings.

5.3.1 Traffic requirements

Correspondence from DP&E stipulates the following requirements in relation to traffic:

A more detailed traffic impact assessment is required. This should include, at a minimum, a description of the surrounding road network, existing traffic generation, proposed construction traffic routes and impacts of the proposed modification on traffic volumes / movements (hourly and daily) during construction and operation.

5.3.2 Existing Approval and Environment

Existing Approval

The existing development consent for the site permits the ROBE plant site to generate up to 75 heavy vehicles trips to the site a day. Under the current production rate, the site has an average of 33 heavy vehicle trips per day, which is significantly less than the permitted 75 heavy vehicle trips.

Existing Environment - Overview

The ROBE site is located within industrial and agricultural developments zones, which form part of the broader Bomen Business Park. Section 1.3 of this report outlines type of land-use activities within the surrounded site environment.

This section outlines existing traffic, road and access conditions around ROBE including exiting road network performance, accessibility and public transport.

Site Access Route and Adjacent Road Network

The site has a total of three access points which are located at Trahairs Road. All vehicles travelling to and from the site connect to the rest of the adjacent road network via Byrnes Road.

Trahairs Road

Trahairs Road functions as local road, providing one traffic lane in each direction. In the vicinity of the site access, Trahairs Road is a sealed road and provides access to the ROBE site and other adjacent rural land uses. At its western end, Trahairs Road forms the minor approach of a priority controlled T-intersection with Byrnes Road.

Byrnes Road

Byrnes Road functions as a sub-arterial road and provides a connection between Wagga Wagga to Junee. To the southwest of the site, Byrnes Road has a speed limit of 100 km/hr and forms the major approaches of a give way controlled tee-intersection with Trahairs Road. This intersection provides a channelized right turn bay and a left turn deceleration lane into Byrnes Road.

As shown at Figure 1, Byrnes Road connects to the Sturt Highway (A 20) via Eunony Bridge Road and Oura Road. Byrnes Road also connects to the Olympic Highway (A 41) via Bomen Road, Shepherds Siding Road and Junee Harefield Road.

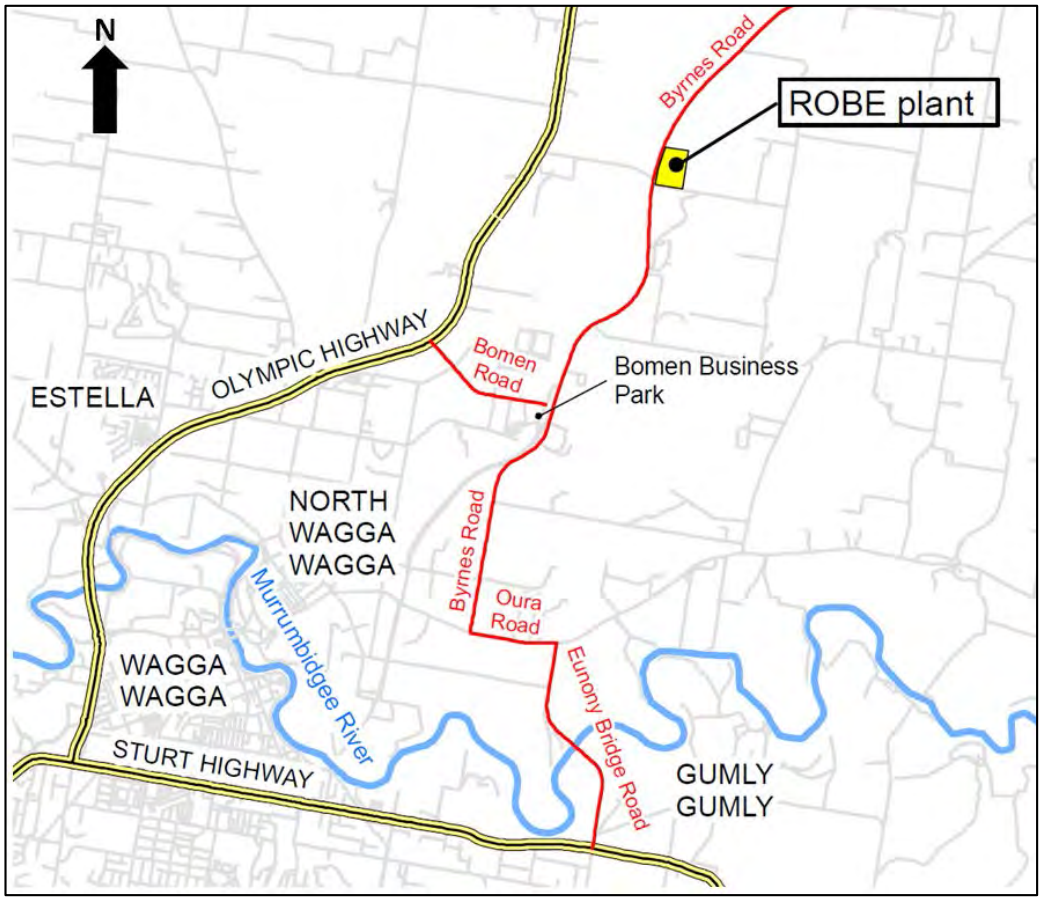
Sturt Highway and Olympic Highway

The Sturt Highway is major arterial road with regional significance, extending from South Australia to Victoria and to North South Wales (see Figure 3 below).

The Olympic Highway is major arterial road with regional significance. To the west of the site, the Olympic Highway runs parallel to Byrnes Road, providing a route between Cowra and Albury via Wagga Wagga.

Detailed analysis on existing annual average daily traffic (AADT) volumes and average daily traffic (ADT) volumes of the surrounding road network are provided in Appendix B to this report.

Figure 5 - Surrounding Road Network



5.3.3 Potential Impacts

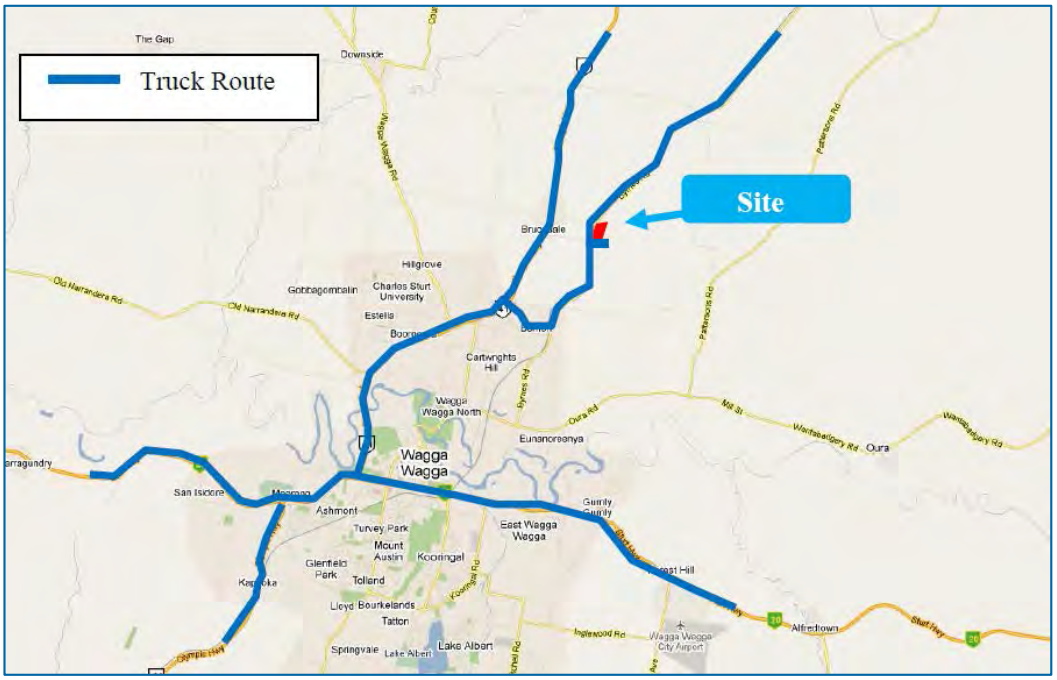
The proposed plant modification will result in

- Up to 56 additional vehicles per day during construction phase, over a period of 15 day
- Four additional heavy vehicles a day during operation phase.

This low level of traffic generation is not expected to impact the operational performance of the surrounding road network.

All trucks accessing the site during the construction and operation phases will do so using the regional truck routes shown in Figure 6.

Figure 6 - Heavy Vehicle Truck Routes



5.3.4 Conclusion

The key findings of the Traffic Impact Assessment include the following:

- Traffic generated from further modification of the plant will be within range of the permitted daily traffic movements for the consented development
- The additional truck movements will have negligible impacts to the performance of Trahairs Road/Byrnes Road intersection.

5.4 Greenhouse Gas

The site operations contribute to greenhouse emissions through a combination of electricity sourced through the grid and natural gas combusted onsite. A summary of the greenhouse gas emissions predicted to be emitted directly and indirectly by the project are shown in Table 15.

The total estimated annual greenhouse emissions for the proposed upgrade to the plant is estimated to amount to 33,214 t CO2 equivalent per year (t CO2 e/year). This is an increase of 5,536 t CO2 equivalents per year above the baseline.

Table 15 - Estimated annual Greenhouse Emissions

Greenhouse Gas Emission source	Quantity of Greenhouse Gas Emitted	
	Existing (t CO2 e/year)	Proposed (t CO2 e/year)
Natural gas consumption	11,486	13,783
Electricity use	16,192	19,431
Total GHG emissions	**27,678**	**33,214**
Total GHG emissions/tonne processed	**55.4**	**55.4**

Calculations are based on the factors supplied in the National Greenhouse Accounts Factors, Department of the Environment, December 2014.

5.4.1 Potential Impacts

The major greenhouse gas emissions from the project were associated with electricity use and natural gas consumption. The proposal is anticipated to increase natural gas and electricity consumption as a result of an overall expansion.

The proposed expansion will include an upgrade/modification of existing plant and equipment and associated piping and fittings. Gas consumption for the proposed solvent extraction plant was estimated to emit 13,783 t CO_2 equivalents per year, up from 11,486 t CO_2-e per year from the existing plant.

Electricity consumption for the proposed plant will increase with an associated annual increase to 19,431 t CO_2-e per year, up from 16,192 t CO_2-e per year from the existing plant.

Total scope 1, 2 and 3 emissions for the existing operations and proposed upgrade are shown in Table 16.

Table 16 - Estimated and proposed scope 1, 2, and 3 emissions

	Scope 1 Emissions (t CO_2 e/year)	Scope 2 Emissions (t CO_2 e/year)	Scope 3 Emissions (t CO_2 e/year)
Existing Operations	11,457	13,950	2,270
Proposed Operations	13,749	16,740	2,725

5.4.2 Mitigation measures

Although the proposed upgrade to the processing plant increases the overall tonnes of canola processed from 500 tonnes per day to 600 tonnes per day, their overall carbon footprint on a per tonne basis remains unchanged. ROBE will continue to investigate energy saving and efficiency opportunities on an ongoing basis.

6. Proposed changes to existing conditions

Through official correspondence regarding the proposed MoA, the DP&E has requested details of the proposed changes to the existing conditions of approval. The below relate specifically to the Notice of Modification (Project Approval 07_0146) dated 28th April 2011 and the supporting conditions from DP&E. GHD notes that the below list is not exhaustive and there may be other conditions to which DP&E may need to address separately.

6.1 Limits on Approval

Schedule 2 - Conditions 6 and 7

6. *The Proponent shall not process more than 165,000 tonnes per year of oilseed, and shall not produce more than 90,000 tonnes per year of vegetable protein meal and 66,000 tonnes per year of refined vegetable oil.*

To be replaced with:

The proponent shall not process more than 200,000 tonnes per year of oilseed, and shall not produce more than 116,000 tonnes per year of vegetable protein meal and 81,500 tonnes per year of refined vegetable oil.

Schedule 2 – Condition 14

14. *The Proponent shall ensure that all the plant and equipment used on the site is maintained and operated in an efficient manner, and in accordance with relevant Australian Standards.*

GHD consider that the proposed MoA is consistent Condition 14.

6.2 Greenhouse Gas

Schedule 3 – Condition 57

57. *The Proponent shall prepare and implement an Energy Savings Plan for the project to the satisfaction of the Director-General. This plan must be prepared in accordance with the requirements of the DWE and the 'Guidelines for Energy Savings Action Plans, DEUS 2005', and be submitted to the Director-General for approval prior to starting operations on site.*

GHD consider the relevant conditions do not need to be altered from the proposed modification.

6.3 Air Quality

Schedule 3 – Condition 33

33. *The proponent shall ensure that the emissions from discharge points serving the plant do not exceed the air quality impact assessment criteria outlined in the EPL for the project.*

GHD consider the relevant conditions do not need to be altered from the proposed modification.

6.4 EPL 13097

The proposed MoA may result in the review of the existing EPL between ROBE and NSW EPA. GHD understands that these conditions of approval will relate specifically to key environmental

monitoring and operational requirements, some of which have been addressed in the previous chapter.

7. Environmental Management

7.1 Overview

ROBE is committed to sound environmental management for all aspects of the operations. For example, based on compliance and environmental performance over the last 2 years, the EPA issued a variation to the EPL and reduced the required monitoring to only 3 monitoring points. Moreover, ROBE have implemented a number of environmental management and monitoring systems to guide construction and operation as a result of the proposed MoA. Below outlines some of the key environmental practices which will continue throughout the construction and operational phases of the MoA.

7.2 Mitigation measures

A number of mitigation measures have been identified to minimise potential impacts associated with the proposed expansion including:

- Air
  - If exceedances or higher odour concentrations are experienced, further monitoring must be undertaken by ROBE
  - In the unlikely event that further exceedances are experienced, investigation into additional measures will need to be undertaken into the design of the facility to ensure compliance with the NSW Odour Criteria.
- Noise
  - It is recommended that compliance noise monitoring be carried out at the commencement of operations of the modified ROBE facility to confirm that the noise limits are not exceeded. In the unlikely event that noise limits are shown to be exceeded, then additional mitigation measures could be incorporated into the building design to reduce noise levels to below the noise limits.
- Greenhouse Gas
  - ROBE will continue to investigate energy saving and efficiency opportunities on an ongoing basis.

7.3 Environmental Audit - EnviroAg

ROBE has recently engaged EnviroAg Australia Pty Ltd to undertake an Environmental Audit of existing and future operations of the IOPP facility. The following levels of compliance were noted:

- 98.5% compliance of Development Consent (66/67 conditions)
- 99% compliance of EPL (74/75 conditions)
- 100% statement of commitments (33/33).

This report addresses non-compliance and areas for improvement and acknowledges that in most cases, ROBE has already made positive adjustments to the areas for which the recommendations have been made.

7.4 Environmental Management Strategy – SKM

ROBE's Environmental Management Strategy (EMS) was prepared by SKM (2011). The EMS seeks to:

- Ensure that the statutory obligations and other requirements for the project are made known to all construction and operational staff (including contractors- GHD has been engaged to undertaken requirements for the 2015-2016 year)
- Identify appropriate management plans and procedures that address the statutory obligations and other requirements for the project
- Identify organisational responsibilities for environmental management actions
- Establish procedures for monitoring, assessing and continually improving environmental management performance.

This Strategy provides an overarching environmental framework for the IOPP, incorporating a range of issue specific environmental management sub plans. The sub plans were developed in consultation with the relevant government agencies and are implemented by ROBE's Environmental Officer.

8. Conclusion

The proposed modification seeks to augment some of the existing infrastructure on the IOPP site in order to increase and optimise the crushing and refining process. The proposal will result in limited changes to the majority of site operational processes and is considered consistent with the objectives of the EP&A Act.

The proposal would improve the efficiency of production in line with market demand. The ongoing viability of the operations would ensure employment is maintained together with associated indirect benefits to sustaining the local and regional economy.

The Impact Assessment has identified the following:

- Construction works are expected to occur for less than 3 weeks and are limited to replacement and installation of new equipment located within the building. Construction works should not produce significant noise impacts at surrounding sensitive receivers and construction noise mitigation measures have been recommended
- The noise levels from the site are currently predicted to comply with the site noise limits by between 6 to 14 dB(A). The equipment modifications to the site should not significantly increase the site noise emissions. Therefore, the proposed modifications should be acceptable from an acoustic perspective
- Traffic generated from further modification of the plant will be within range of the permitted daily traffic movements for the consented development. The additional truck movements will have negligible impacts to the performance of Trahairs Road/Byrnes Road Intersection
- ROBEs overall carbon footprint on a per tonne basis will remain unchanged
- Whilst a small (~8 %) increase in hexane emissions as a result of the combustion of VOCs is predicted, modelling has indicated that ground level concentrations of hexane comfortably comply with the NSW criterion at nearby sensitive receptors. That said, emissions monitoring will remain as part of the ongoing environmental management of the facility.

Potential environmental impacts associated with the proposal are not considered significant and can be appropriately managed through the adoption of the proposed mitigation measures and management procedures.

9. References

EnviroAg Pty Ltd, ROBE Independent Environment Audit, 31st October 2014

NSW Department of Planning, *Assessment Report – Riverina Oils and Bio Energy Integrated Oilseed Processing and Biodiesel Facility, Wagga Wagga – (07_0146 MOD 1)*, April 2011

NSW Environmental Protection Authority, *Environment Protection Licence – 13097*, November 2014

NSW Planning, *Notice of Modification – Project Approval 07_0146*, 28th April 2011

RawFire Fire Safety Engineering*, Fire Engineering Report*, 21st November 2011

SKM, *Final Hazard Analysis*, 1st August 2012

SKM, *Operational and Construction Traffic Management Plan*, 4th August 2011

10. Limitations

This report: has been prepared by GHD for Riverina Oils and BioEnergy and may only be used and relied on by Riverina Oils and BioEnergy for the purpose agreed between GHD and the Riverina Oils and BioEnergy as set out in Section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than Riverina Oils and BioEnergy arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (Section 10 - Limitations). GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Riverina Oils and BioEnergy and others who provided information to GHD (including Government authorities)], which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

Appendices

Appendix A – Design Drawings

ROBE MoA - Mod 07 0146 MOD 2

List of additional works and modification to be done to increase Preparation plant capacity from 500 TPD TO 600 TPD

2x Flaker running @ 1 time - 1 standby Flaker

Sl no	ITEN NO	ITEM DESCRIPTION	EXISTING	PROPOSED CHANGES	COMMENTS
1	704 - 3	Flaker	The Existing two flakes 704-1 and 2 was having capacity of 250 TPD each	Additional Falker 704-3 proposed to with a capacity of 400TPD	By running flaker one 250 and 400tpd increased capacity can be obtained
2	704F-3	Flaker Feed Hopper	There is no feed hopper	New feed hopper to be provided for the new flaker	
3	730/04-3	Flaker Discharge Hopper	No discharge hopper	New discharge hopper for new flaker	
4	TP 06	Flaker feed conveyor	The existing feed conveyor for flaker connected to two flakers	The length of the conveyor increased to feed the new flaker	
5	757F	Flaker Aspiration Ducts	Flaker venting duct connected for two flakers	Ducts modified to suit the vents for three flakers	
6	TP 07	Flaker discharge conveyor	The existing discharge conveyor for the flaker was connected to two flakers	The length of the conveyor increased to receive the flakes from the third flaker	
7	2701/05	Permanent magnet for cooker	The cooker outlet chute modified during the startup of the plant as the flow was not proper, hence the magnets provided were not suitable	New magnets will be supplied to match with the modified chute	This would help in catching any ferrous particles going to the press and prevents the worms damage
8	2725	Sterling Pre Press	Existing press having capaicty of 500TPD	Variable frequency drive to be provided for the main 350 kw motor	This frequency drive can increase the throughput to 600 TPD
9	2744	Vibro Screen	Vibrating Screen for the pressed oil primary filtration	New screening tank 2717 provided to increase the capacity and performance	This tank should help in proceesing the extra oil coming from the press due to increase in plant capacity
10	TP O9A	Fines recirculation conveyor	Not Available	New conveyor provided	Due to addtion of screening tank TP 10 location has changed due to which this conveyor is added
11	TP 10	Recirculation conveyor for foots and fines	Existing conveyor	Existing Conveyor relocated	Due to addition of screening tank, foots discharge conveyor position changed.
12	TP 08	Recirculation Conveyor	Existing Conveyor	Exiting conveyor Nozzle to be relocated	Existing nozzle to be blinded and new nozzle to be made
13	2736/13	Cake Cooler fan	Existing fan capacity not sufficient	New fan with higher capacity	Due to increase in capacity the air flow rate increased to get the same cooling effect
14	2757B	Cake cooler aspiration duct	Existing Duct size not sufficient	Duct size increased	Due to air flow change the duct size needs to be increased to adjust the capacity
15	2782B	Filtered Oil tank	Existing capacity is small	Tank modified to increase the capacity	
16	2782C	Heel Drain Tank	Existing Capacity is small	Tank modified to increase the capacity	
17	P 2782A/A2	Filter Feed Pump	Existing Capacity is small	Capacity to be increased	New impeller to increase the capacity
18	P 2782B	Filtered oil Pump	Existing Capacity is small	Capacity to be increased	New impeller to increase the capacity
19	P 2782C	Heel Drain tank pump	Existing Capacity is small	Capacity to be increased	New impeller to increase the capacity
20	2781B	Oil Cooler for SPP	Existing Capacity is small	Capacity to be increased	New PHE provided
21	81B	Oil Cooler for SEP	Existing Capacity is small	Capacity to be increased	Additional Plates to be given to match the increased capacity
22	Chutes	Connecting Chutes	Exisisting / New	For Existing or New connection	Connecting chutes whereever required
23	Piping	Interconnecting pipes	Existing / New	Pipes for modification	Piping needs to be altered whereever the tanks are modified

All these above activities to be carried out to increase the seed preparation capacity from 500TPD to 600TPD
By increasing the preparation section capacity the total oil extracted and produced will increase from 210 TPD to 252 TPD

IF IN DOUBT, ASK – DO NOT SCALE !

TP06

4 # Length of Flaker Feed conveyor (TP06) to be increased upto 704-3 - new additional Flaker!

2 704F3

1 704-3

3 730/04-3

Proposed additional Flaker with Feed hopper & discharge hopper.

757F 5 Flaker aspiration duct (757F) - Length to be increased to start all the three Flakers.

TP07 6 Flaker discharge Conveyor (TP07) - Length to be increased to receive flakes from 3rd Flaker

Preparation plant – Cracking, Preconditioning & Flaking units

REFER PID LEGEND – 00363900.006

REV	DATE	DESCRIPTION OF MODIFICATION	NBR MOD	OF	BY
005	31.08.2012	HIGH LEVEL SWITCH(LAH) ADDED TO ITEM 703, 704F-1, 704F-2 & AS MARKED 5			VAV

Desmet Ballestra Group	PROJECT ID NBR	200924	
	PROJECT DESCRIPT	ROBEA	
ITEM NBR DISPOSITION: 798	DOCUMENT TYPE: P&ID	SECD: PROC.E / PROJ.M / DOM	SRV: MPS / SPV / PRA
DOCUMENT DESCRIPTION: P&ID PREPARATION	SCALE: 1:1	FORMAT: A0	AUTHOR: CSV
PREPARATION – SHEET–2(3) CRACKING, PRECONDITIONING & FLAKING	DATE: 09.12.2009	DRAWING NUMBER: IN062032	REVISION: 005

IF IN DOUBT, ASK

CAD DRWG

IF IN DOUBT, ASK – DO NOT SCALE !

#Increase the duct size as existing duct size insuffic 14

#Increase the capacity of cake cooler fan, which is insufficient. 13

#To provide VFD for main motor drive ~350KW, will increase throughput to 600 TPD.

Pre-Pressing plant – Cooker and Cake Cooler units

REFER PID LEGEND – 00363900.006

REV	DATE	DESCRIPTION OF MODIFICATION	NBR OF MOD	BY
007	31.08.2012	G2725-X ADDED & AS MARKED 7		VAV

Desmet Ballestra Group

ITEM NBR DISPOSITION	2798	DOCUMENT TYPE P&ID	SECD PROC.E	SRV MPS	SCALE 1:1
DOCUMENT DESCRIPTION	P&ID PRE-PRESSING		PROJ.M DOM	SPV PRA	FORMAT A0
				AUTHOR	LKS

PROJECT ID NBR: 200924
PROJECT DESCRIPT: ROBEA

PRE-PRESSING – SHEET-1(2)
COOKER & CAKE COOLER

DATE: 10.12.2009
DRAWING NUMBER: IN062033
REVISION: 007

IF IN DOUBT, ASK DO NOT SCALE !

CAD DRWG. DO NOT MODIFY

A0(841 x 1189)

IF IN DOUBT, ASK – DO NOT SCALE !

2716A1 VIBRATOR-1 2716A1 SUPPLY

2716A2 VIBRATOR-2 2716A2 SUPPLY

LUBRICATOR-4 AFR UNIT-4

LUBRICATOR-1 AFR UNIT-1

LUBRICATOR-2 AFR UNIT-2

2757CK

2757CK

TP09

MTP09/A

MTP09/B

2736/44

2744

M2744

9

A new screening tank is proposed which will help to process extra oil coming from press.

MTP10

TP10

11 #position of Recirculation conveyor(due to addition of screening tank) will be changed.

2738-04

2782A

M2782A

2738-06

2782A2

2729

2782C

16

#Heel drain tank capacity to be increased.

2782B

15

#Filter oil tank capacity to be increased.

#Oil Cooler for SPP - capacity to be increased.

20

2781B

2799/81B

2716B1

2716B2

2799/16B1-16B2

2738-0T

2782X

2738-02

FILTERED OIL TO STORAGE

P2782A

P2782A2

17 #Filter feed pump capacity to be increased.

P2782C

19 #Heel drain tank pump capacity to be increased.

P2782B

18 #Filtered oil pump capacity to be increased.

REFER PID LEGEND – 00363900.006

REV	DATE	DESCRIPTION OF MODIFICATION	NBR OF MOD	BY
008	31.08.2012	HOLD REMOVED FROM CLEAN WATER UNIT(L0955) GOES TO G2725-X & AS MARKED B		VW

Desmet Ballestra Group

ITEM NBR DISPOSITION	2798	DOCUMENT TYPE P&ID	SECD PROC.E	SRV MPS	SCALE 1:1 / FORMAT A0
DOCUMENT DESCRIPTION	P&ID PRE-PRESSING		PROJ.M	SPV	
			DOM	PRA	AUTHOR VLC
PRE-PRESSING – SHEET-2(2) PRESS OIL FILTRATION			DATE 10.12.2009	DRAWING NUMBER IN062034	REVISION 008

PROJECT ID NBR 200924

PROJECT DESCRIPT ROBEA

Pre-Pressing plant – Press Oil Filtration unit

A0 (841 x 1189)

IF IN DOUBT, ASK DO NOT SCALE !

CAD DRWG. DO NOT MODIFY

IF IN DOUBT, ASK – DO NOT SCALE !

Preparation plant – Cleaning & Destoning units

NOTE :
ALL ITEMS WITH A NUMBER IN A FRAME ARE CUSTOMER'S SUPPLY

REFER PID LEGEND – 00363900.006

REV	DATE	DESCRIPTION OF MODIFICATION	NBR OF MOD	BY
007	31.08.2012	PRESSURE TRANSMITTERS PT-703/160-3, PT-717/180-3, PT-7160-3 ARE DELETED & AS MARKED 7		RMB

Desmet Ballestra Group

PROJECT ID NBR			200924		
PROJECT DESCRIPT			ROBEA		
ITEM NBR DISPOSITION	798	DOCUMENT TYPE P&ID	SECD PROC.E	SRV MPS	SCALE 1:1 / FORMAT A0
DOCUMENT DESCRIPTION	P&ID PREPARATION		PROJ.M DCN	SPV PRA	AUTHOR CSV
PREPARATION – SHEET–1(3) CLEANING & DESTONING			DATE 09.12.2009	DRAWING NUMBER IN062031	REVISION 007

IF IN DOUBT, ASK – CAD DRWG

REFINING PROCESS LINE BALANCING LIST

List of additional works and modification to be done to increase refinery capacity from 200TPD to 250 TPD at ROBEA , wagga wagga , Ausralia

Sl no	Item tag no	Item description	Description of work carried out	existing	proposed modification	Advantage
1	T501	Oil feed tank	Add set of sprayers	2" size, suitable fro 200 TPD	replaced by 2 1/2", suitable for 250 TPD	increase flow rate to achieve 250 tons capacity
2	PT501	Oil feed pump	Change the existing impeller of pump	existing impeller 209.5 mm dia	replaced by Impeller dia 216 mm ,	increase flow rate to achieve 250 tpd
3	T521A	Heat exchanger PHE	addition of plates to PHE	3.84 m2	increased to 4.73 m2 to meet additional heat load	to meet heat laod for 250 tpd
4	T521B	Heat exchanger PHE	addition of plates to PHE	2.24 m2	increased to 3.04 m2 to meet additional heat load	to meet heat laod for 250 tpd
5	FT-T504	Mass flow meter	Additional equipment installation	Not available	additional equipment	in hot water line , to maintain moisture in oil for silica treatment
6	VR-T504	Control valve	Additional equipment installation	Not available	additional equipment	Controllingthe additional of hot water
7	PT503AC	Oil feed pump	Change the existing impeller of pump	existing impeller 139 mm dia	replaced by Impeller dia 140 mm ,	increase flow rate to achieve 250 tpd
8	VR-PT503AC	Control valve	Additional equipment installation	Not available	additional equipment	Controlling flow rate
9	606S	Silica dryer	Additional equipment installation	Not available	additional equipment	to absorb soap , reduce load on bleaching filters and maintain oil quality for increase capacity 250tpd
10	LT606S	Level transmitter for silica dryer	Additional equipment installation	Not available	additional equipment	for necessary automation of the additional tanks in loop
11	LAH606S	High level switch for silica dryer	Additional equipment installation	Not available	additional equipment	for necessary automation of the additional tanks in loop
12	TT606S	Temperature transmitter for slica dryer	Additional equipment installation	Not available	additional equipment	for necessary automation of the additional tanks in loop
12	V606S-1/S	on/off valve for silica dryer	Additional equipment installation	Not available	additional equipment	for necessary automation of the additional tanks in loop
14	P606S	Silica dryer transfer pump	Additional equipment installation	Not available	additional equipment	for necessary interconnection in existing process loop
15	FS-P606S	Rotameter	Additional equipment installation	Not available	additional equipment	for necessary interconnection in existing process loop
15	VR-P606S	Control valve	Additional equipment installation	Not available	additional equipment	for necessary automation of the additional tanks in loop
16	VR635	Control valve	Additional equipment installation	Not available	additional equipment	for necessary automation of the additional tanks in loop
17	P622-2	Bleacher pump	Additional equipment installation	Not available	additional equipment	to minimise the production loss in filter changeover,
18	FS-P622-2	Metal type rotometer flowmeter	Additional equipment installation	Not available	additional equipment	flushing line of pump P622-2, required for pump P622-2
19	682A-1	Recovered oil tank	Additional equipment installation	Not available	additional equipment	to meet the increased capacity ,
20	LAH 682A-1	high level switch for recovered oil tank	Additional equipment installation	Not available	additional equipment	for necessary automation of the additional tanks in loop
21	LAL 682A-1	low level swithc for recovered oil tank	Additional equipment installation	Not available	additional equipment	for necessary automation of the additional tanks in loop
22	V682A-1	Safety vlave	Additional equipment installation	Not available	additional equipment	for necessary automation of the additional tanks in loop
23	P682B	Oil feed pump	Change the existing impeller of pump	existing impeller 177.5 mm dia	replaced by Impeller dia 178 mm ,	increase flow rate to achieve 250 tpd
24	VR-P682B	Control valve	remove existing and add new control valve	existing 40 NB	replaced by 50 NB	increase flow rate , achieve 250 tons capacity
25	616C3	Safety filter	Additional equipment installation	Not available	additional equipment	to meet 250 tpd capacity
26	P802	Dearator transfer pump	Change the existing impeller of pump	existing impeller 221 mm dia	replaced by Impeller dia 230 mm ,	increase flow rate to achieve 250 tpd
27	P822	Deodoriser oil pump	Change the existing impeller of pump	existing impeller 233 mm dia	replaced by Impeller dia 243 mm ,	increase flow rate to achieve 250 tpd
28	881B2	Deodoriser oil final cooler	addition of plates to PHE	19.32 m2	increased to 23 m2 to meet additional heat load	to meet heat laod for 250 tpd
29	P850/81B2	Final cooler tempered water pump	Change the existing impeller of pump	existing impeller 120.5 mm dia	replaced by Impeller dia 138 mm ,	increase flow rate to achieve 250 tpd
30	816B3	Polishing filter	Additional equipment installation	Not available	additional equipment	to meet 250 tpd capacity
31	PW501	Oil feed pump	Change the existing impeller of pump	existing impeller 220 mm dia	replaced by Impeller dia 248 mm ,	increase flow rate to achieve 250 tpd
32	W521A	Oil/oil heat exchanger PHE	addition of plates to PHE	8.25 m2	increased to 12.69 m2 to meet additional heat load	to meet heat load for 250 tpd
33	W521B	oil heater, PHE	addition of plates to PHE	2.88m2	increased to 4.39 m2 to meet additional heat load	to meet heat load for 250 tpd
34	W581A	Oil/Oil Heat exchanger PHE	addition of plates to PHE	29.9 m2	increased to 34.06 m2 to meet additional heat load	to meet heat load for 250 tpd
35	W581B	NEW phe, Oil/water heat exchanger	Additional new equipment	not available	additional equipment	to meet heat load for 250 tpd
36	PW503B-2	additional pump	Additional new equipment	not available	additional equipment	to meet heat load for 250 tpd
37	PSV-PW503B	safety valve for pump	additional	not available	additional equipment	for safety
38	PI PW503B	pressure gauge for pump discharge line	additional	not available	additional equipment	necessary instrumentation of additional pump
39	PSV W521C-S	safety valve	additional	not available	additional equipment	for safety
40	W521C-2	Oil heater - new	additional	not available	additional equipment	to meet heat load for 250 tpd
41	VR W521C-2	Control valve - new	additional	not available	additional equipment	necessary instrumentation of additional pump
42	TT W521C-2	Temperature transmitter	additional	not available	additional equipment	necessary instrumentation of additional pump
43	FT518NA	Flow meter	additional	not available	additional equipment	necessary instrumentation of additional pump
44	FT518	flowmeter	additional	not available	additional equipment	necessary instrumentation of additional pump
45	W521W	Oil heater	addition of plates to PHE	1.92 m2	increased to 2.37 m2 to meet additional heat load	to meet heat load for 250 tpd
46	PW518W1	Oil feed pump	Change the existing impeller of pump	existing impeller 198.5 mm dia	replaced by Impeller dia 205 mm ,	increase flow rate to achieve 250 tpd

8.33
10.41

All these above activities to be carried out to increase the existing refinery capacity from 200TPD to 250TPD

IF IN DOUBT, ASK – DO NOT SCALE !

T501 Oil feed Tank 1

#Modifying existing set of sprayers from 2"ϕ to 2.5"ϕ. Will increase flow rate from 200 TPD to 250 TPD.

#Addition of plates to Heat exchangers to meet additional heat load. 3

#Addition of plates to heat exchanger to meet additional heat load. 4

#Increasing capacity of Oil feed pump. 2

#Increasing the capacity of Oil feed pump 7

609A SUPPLY

609A

608/09A

630AC

630A

607AC

607A

641/35

662/35

635

T503AC

T562/03AC

T504

MT504

638-03

T521A

T521B

T599/21A

T599/21B

T534AC SUPPLY

T534AC

MT534AC

BUCKET

638-01

638-02

PT501

PT503AC

BLEACHING FILTER BAG

603A

603B

608/03A

636/03A

M608/03A

M636/09A

M630AC

M607AC

M630A

M607A

M635

REFER PID LEGEND – 00363900.006

REV	DATE	DESCRIPTION OF MODIFICATION	NBR OF MOD	BY
005	02.03.2012	BATTERY LIMIT ADDED TO CRUDE OIL FROM STORAGE LINE(L0451) TO T501 & AS MARKED S		SMK

NOTES :
1. FT T521B (STEAM) IS VARIABLE FLOWMETER WITH TOTALIZER.
2. TI-T504C TO BE LOCATED IN OPERATING FLOOR.

Desmet Ballestra Group			PROJECT IO NBR	200924	
			PROJECT DESCRIPT	ROBEA	
ITEM NBR DISPOSITION	T598-698	DOCUMENT TYPE P&ID	SECD PROC.E	SRV SVA	SCALE 1:1
DOCUMENT DESCRIPTION	P&ID PRETREATMENT BLEACHING		PROJ.M DOM	SPV PRA	AUTHOR CSV
BLEACHING – SHEET–1(3) FEED TANK & REACTOR			DATE 03.11.2009	DRAWING NUMBER IN061328	REVISION 005

IF IN DOUBT, ASK DO NOT SCALE ! 1 CAD DRWG. DO NOT MODIFY

AO (841 x 1189)

IF IN DOUBT, ASK – DO NOT SCALE !

646F
SEE NOTE-1

646A

646B

616A1
VIBRATOR-1

616A2
VIBRATOR-2

657CK1

657CK2

622/21

662/22-21

682A

682X

638-05
SEE NOTE-2

638-04

639

SECURITY SHOWER
CUSTOMER'S SUPPLY

P622

19-22-682A1 - Recovered oil tank additional with LAH, LAL, Safety Valve

NOTES :
1. PT 646F IS A GAUGE PRESSURE TRANSMITTER WITH A RANGE OF -1 to 0kg/cm2(g). 646F TO BE LOCATED AT OPERATING FLOOR.
2. THE FUNNEL 638-05 SHOULD BE ON THE OPERATING FLOOR IF A HEIGHT VISIBLE TO THE OPERATOR

REFER PID LEGEND – 00363900.006

REV	DATE	DESCRIPTION OF MODIFICATION	NBR OF MOD	BY
006	20.04.2012	NOTE ADDED AT PSV-682A OUTLET LINE(L0084) & AS MARKED 6		VAV

Desmet Ballestra Group		PROJECT ID NBR	200924
		PROJECT DESCRIPT	ROBEA
ITEM NBR DISPOSITION: T598–698	DOCUMENT TYPE: P&ID	SECD	SRV / SCALE: — / FORMAT: —
		PROD.E	SVA / 1:1 / A0
DOCUMENT DESCRIPTION: P&ID PRETREATMENT BLEACHING		PROJ.M	SPV / — / —
		DOM	PRA / AUTHOR / CSV
BLEACHING – SHEET–2(3) BLEACHER & HERMETIC LEAF FILTERS		DATE: 03.11.2009	DRAWING NUMBER: IN061329 / REVISION: 006

A0(841 x 1189)

IF IN DOUBT, ASK DO NOT SCALE !

CAD DRWG. DO NOT MODIFY

IF IN DOUBT, ASK – DO NOT SCALE !

641A

641A-E1

641A-E2

641A-C2

646C

647

699/47

638-07

629

682B

632B/532B

638-08

638-06

616C1

616C2

699/16C1-16C2

616C3 - Additional safety filter

25

23- Oil Feed pump

Increasing capacity

P682B

REFER PID LEGEND – 00363900.006

REV	DATE	DESCRIPTION OF MODIFICATION	NBR OF MOD	BY
006	02.03.2012	REVISED AS MARKED 5		SMK

NOTES :
1. PS-616C1-1 TYPE IS FLUSH DIAPHRAGM & CONNECTION IS DN25.

Desmet Ballestra Group			PROJECT ID NBR	200924	
			PROJECT DESCRIPT	ROBEA	
ITEM NBR DISPOSITION	T598-698	DOCUMENT TYPE P&ID	SECO PROC.E	SRV SVA	SCALE 1:1 / FORMAT A0
DOCUMENT DESCRIPTION	P&ID PRETREATMENT BLEACHING		PROJ.M DOM	SPV PRA	AUTHOR / CSV
BLEACHING – SHEET-3(3) SAFETY FILTERS & VACUUM EQPTS			DATE 03.11.2009	DRAWING NUMBER IN061330	REVISION 005

AO(841 x 1189) 8 7 6 5 4 3 2 1 — IF IN DOUBT, ASK DO NOT SCALE ! — CAD DRWG. DO NOT MODIFY

IF IN DOUBT, ASK – DO NOT SCALE !

821A

822A1

822A2

822B

822QS

860A1

860A2

860B

808

802

814

857C

837/21A

846F

837/80B-3

837/80B-2

837/80B-1

837/02-2

837/02-1

837/14-2

837/14-1

P850/81AG

881AG

899/81AG

P814AG

834A SUPPLY

868/34A

834A

838-01

P834A

P802

26 # Increasing capacity of Deaerator transfer pump.

REFER PID LEGEND – 003639000.005

REV	DATE	DESCRIPTION OF MODIFICATION	MOD OF MOD	BY
005	02.03.2012	R0741 DELETED IN LINE NO. L6559 NEAR PSV-6604A2 & AS MARKED 3		SAN

NOTES :
1. MAY TO BE LOCATED IN SPONSING FLOOR.
2. PI 811-1, 2 & 3 ARE DIAPHRAGM TYPE WITH CHEMICAL SEAL DIRECTLY MOUNTED WITH 40MB FLANGE.

Desmet Ballestra Group

ITEM MNR DISPOSITION	898QS	DOCUMENT TYPE: Paid	SECD	PROJECT ID NBR	200924
DOCUMENT DESCRIPTION	Paid DEODORIZING QUAUSTOCK		PROCLE / PROJ.M / DOM	PROJECT DESCRIPT	ROBEA
			SRV / SVA / SPV / PRA	SCALE: 1:1	FORMAT: A0
				AUTHOR	SMK
DEODORIZING – SHEET–1(4) DEODORIZER – FATTY ACID CIRCUITS			DATE: 20.10.2009	DRAWING NUMBER: IN061020	REVISION: 005

CAD DRWG, DO NOT MODIFY

A0 (841 x 1189)

A0 (841 x 1189)R

7	6	5	4	3	2	1

IF IN DOUBT, ASK ? CAD DRWG.

REFER PID LEGEND – 00363900.006

REV	DATE	DESCRIPTION OF MODIFICATION	NBR OF MOD	BY
C04	26.12.2010	68182 NOZZLE POSITIONS INTERCHANGED & AS MARKED 4		SWK

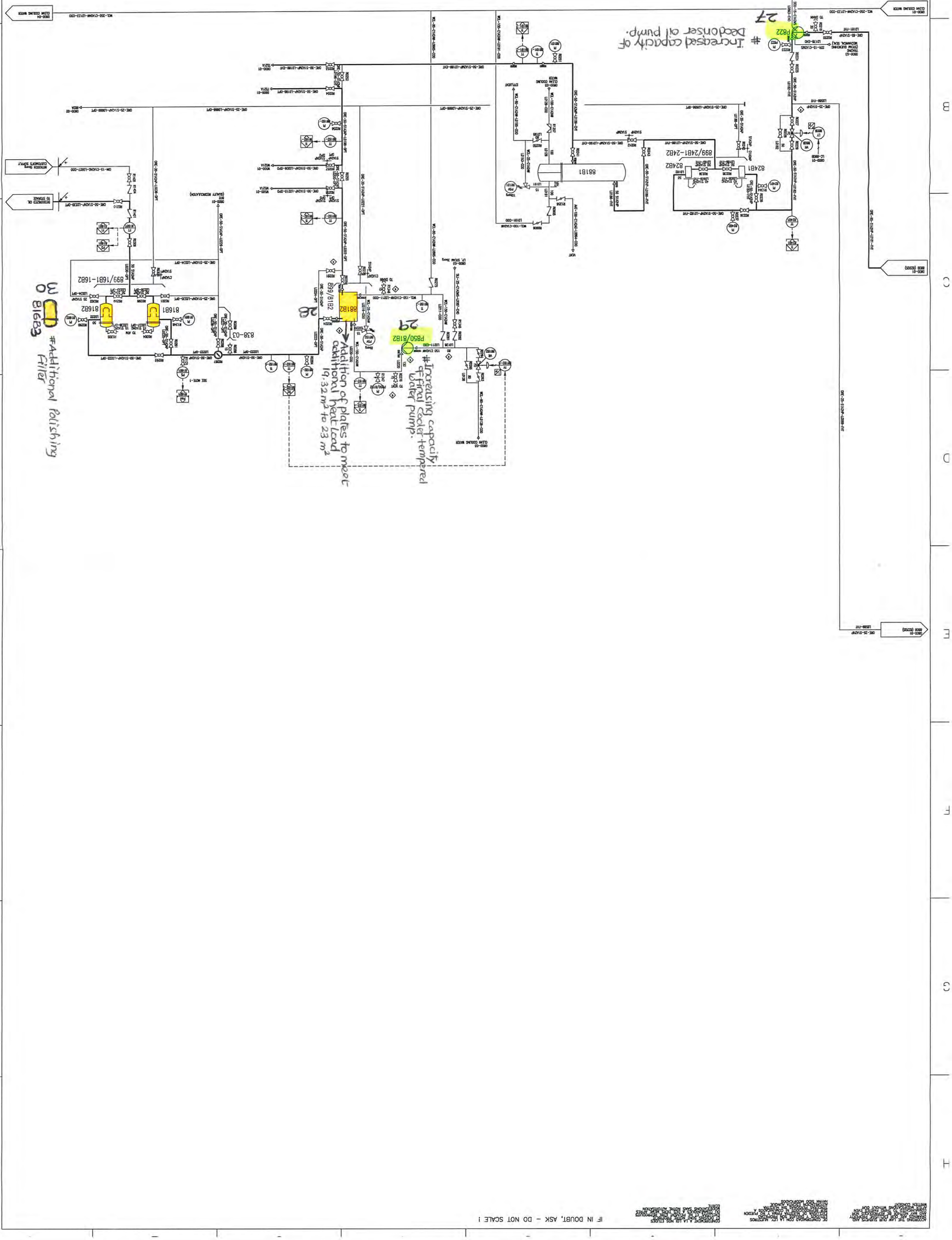
PROJECT ID NBR	200924	Desmet Ballestra Group	
PROJECT DESCRIPT	ROBEA		

ITEM NBR		DOCUMENT TYPE	SECO	SRV	SCALE
DESIGNATION	68BGS	PMID	PROCE	SYA	FORMAT
DOCUMENT			PROJ.M	SPV	1:1
DESCRIPTION	PMID DEODORIZING QUALISTOCK		DOM	PRA	AUTHOR
			DATE	DRAWING NUMBER	

DEODORIZING – SHEET-2(4)	20.10.2009	IN06102I	004
HEAT EXCHANGERS & POLISHING FILTERS			

REVISION	BY
A	

NOTES:
1. PS-81681 TEE IS FLUSH DRAINAGE & CONNECTION IS BXX.



IF IN DOUBT, ASK – DO NOT SCALE !

W521A

W521B

33
Oil Heater - Heat Exchanger

W599/21A-21B

W501
SEE NOTE-3

W524-1

W524-2

W599/24-1&2

W538-04
SEE NOTE-5

PW501

31
Oil Feed Pump
Increasing capacity

W503AC

MW503AC

MW504AC

W504AC

W538-05

W534AC1

W538-01

W538-02

PW534AC1

W568/34AC1

BUCKET-2

W539

W578NA1

MW578NA1

W578NA2

MW578NA2

W538-14

PW578NA1

MW504NA

W504NA

W534NA

W568/34NA1

W568/34NA2

PW534NA1

PW534NA2

W538-06

W538-07

W538-08

NOTE :
ALL ITEMS WITH A NUMBER IN A FRAME ARE CUSTOMER'S SUPPLY

NOTES :
1. PS-W534C TYPE IS FLUSH DIAPHRAM & CONNECTION IS DN25.
2. NO FLANGE JOINTS IN CITRIC ACID & CAUSTIC LINES ABOVE 1.4m (EXCEPT ANY NEAR THE DOSING POINTS).
3. MAN-HOLE OF W501 TO BE LOCATED IN CLOSED POSITION.
4. FT-W5218 TO BE MOUNTED IN VERTICALLY UPWARD POSITION.
5. OVERFLOW FUNNEL (W538-04) TO BE LOCATED AT 0M.

REFER PID LEGEND – 00363900.006

NOS	DATE	DESCRIPTION OF MODIFICATION	NBR OF MOD	BY
006	20.04.2012	SAMPLE VALVE RD424 SHIFTED AFTER THE VALVE RD417 AT PW578NA1 DISCHARGE LINE & AS MARKED 6		VAV
REV	DATE	DESCRIPTION OF MODIFICATION		

Desmet Ballestra Group			PROJECT ID NBR	200924	
			PROJECT DESCRIPT	ROBEA	
ITEM NBR DISPOSITION	W598	DOCUMENT TYPE P&ID	SECD PROC.E	SRV SVA	SCALE 1:1
DOCUMENT DESCRIPTION	P&ID DEGUMMING		PROJ.M	SPV	FORMAT A0
			DOM	PRA	AUTHOR UKS
DEGUMMING – SHEET–1(3)			DATE 03.11.2009	DRAWING NUMBER IN061015	REVISION 006

Oil Heat Exchanger

34

40 W512C-2 Additional Oil Heater.

36 PW503B-2 # additional pump

WESTFALIA TYPE : RSE90

REFER PID LEGEND – 00363900.006

NOTES :
1. R0363 SHOULD BE LOCKED IN OPEN POSITION.
2. PSH-PW0038 & PSH-PW0055 INLET & OUTLET TO BE PROVIDED WITH STEAM TRACING.

REV	DATE	DESCRIPTION OF MODIFICATION	NBR OF MOD	BY
007	06.08.2012	VALVE V-W518NA-9, V-W518NA-10 (LINE No. L0949) & NOTE-2 DELETED & AS MARKED ?		VAV

Desmet Ballestra Group		PROJECT ID NBR	200924	
		PROJECT DESCRIPT	ROBEA	
ITEM NBR DISPOSITION: W598	DOCUMENT TYPE: P&ID	SECO	SRV	SCALE: 1:1
		PROC.E	SVA	FORMAT: A0
DOCUMENT DESCRIPTION: P&ID DEGUMMING		PROJ.M	SPV	
		DDM	PRA	AUTHOR: UKS
DEGUMMING – SHEET-2(3)		DATE: 03.11.2009	DRAWING NUMBER: IN061016	REVISION: 007

Appendix B – Traffic Impact Assessment

ROBE MoA - Mod 07 0146 MOD 2

Riverina Oils and BioEnergy

Section 75W Modification

Traffic assessment

September 2015

Table of contents

1. Introduction 3
   1.1 Study Limitations 3
2. Existing Road Condition 4
   2.1 Overview 4
   2.2 Existing road network characteristics 4
   2.3 Site Access Route and Adjacent Road Network 4
   2.4 Existing Traffic Volume 6
   2.5 Existing Site Traffic Generation 6
   2.6 Walking and Cycling 7
   2.7 Public Transport 7
   2.8 Existing Crash Data Review 7
   2.9 Existing Trahairs Road and Byrnes Road Intersection Performance 7
3. Traffic Impact Assessment 9
   3.1 Construction Traffic Generation 9
   3.2 Operational Traffic Generation 10
   3.3 Traffic Impact Assessment - Construction and Operation 10
   3.4 Trahairs Road and Byrnes Road Intersection Performance 11
4. Conclusion 11

Table index

Table 1: Exiting ADT on the adjacent Wagga Wagga City Council roads 6
Table 2: Existing ROBE Plant Site Employment Trips 6
Table 3: Existing Heavy Vehicles Trips from the Site 7
Table 4: Level of Service (LoS) criteria for intersections 8
Table 5: Estimated “worse case" Peak hour traffic volume 9
Table 6: Operational Heavy Vehicle Trip Generation – Daily 10

Figure index

Figure 1: ROBE Site Location and Surrounding Road Network 5
Figure 2: Heavy Vehicles Access Route 11

1. Introduction

This Traffic Impact Assessment (TIA) has been prepared as part of Environment Assessment Report to support Riverina Oils & Bio Energy Pty Ltd (ROBE) Modification application for industrial activities at 177 Trahairs Road at the intersection of Trahairs and Byrnes Road. A summary of the proposed activities associated with this further Modification of Approval (MOA) application is provided in Section 1 of the Environmental Assessment report.

This TIA considers and assesses the following:

- Existing conditions – a review of existing road features, adjacent developments, traffic volumes and crash data
- Operational impact assessment – provides a review of the additional traffic generated as a result of the proposal and provides an assessment of the performance of the existing road network following the development of the site
- Construction traffic impact assessment - provides a review of the additional traffic generated during the proposed construction stage and provides an assessment of the performance of the existing road network during construction of the site.

1.1 Study Limitations

This report has been limited by the following assumptions:

- No traffic surveys were undertaken for this study. The assessment is based on existing tube counts traffic survey data provided by Road and Marine Service and Wagga Wagga City Council
- Expected construction traffic generation has been based on information provided by Riverina Oils & Bio Energy Pty Ltd
- Expected operation traffic generation provided by Riverina Oils & Bio Energy Pty Ltd.
- No crash data was available for this study. A detailed 5 years crash data report for the surrounding road network has been requested from Roads and Maritime and will be review as part of further studies.

2. Existing Road Condition

2.1 Overview

The ROBE Plant site is located within industrial and agricultural developments zones, which form part of the broader Bomen Business Park. Section 1 of the Environmental Assessment report outlines type of land-use activities within the surrounded site environment.

This section outlines existing traffic, road and access conditions around the ROBE Plant this including exiting road network performance, accessibility and public transport.

2.2 Existing road network characteristics

Roads are classified according to the functions that they perform. The main purpose of defining a road's functional class is to provide a basis for establishing the policies, which guide the management of the road according to their intended service or qualities. Functional road classification involves the relative balance of the mobility and access functions.

In terms of functional road classification, State roads are strategically important as they form the primary network used for the movement of people and goods between regions within Sydney, and throughout the State. State roads are the responsibility of the Roads and Maritime Services to fund, prioritise and carry out works. State roads generally include roads classified as Freeways, State Highways, and Main Roads under the 1993 Roads Act, and the regulation to manage the road system is stated in the Australian Road Rules (1999).

NSW Roads and Maritime Services define four levels in a typical functional road hierarchy, ranking from high mobility and low accessibility, to high accessibility and low mobility. These road classes are:

- Arterial Roads – controlled by RMS, typically no limit in flow and designed to carry vehicles long distance between regional centres
- Sub-Arterial Roads – can be managed by either council or RMS under a joint agreement. Typically their operating capacity ranges between 10,000 and 20,000 vehicles per day, and their aim is to carry through traffic between specific areas in a sub region, or provide connectivity from arterial road routes (regional links)
- Collector Roads – provide connectivity between local sites and the-arterial road network, and typically carry between 2,000 and 10,000 vehicles per day
- Local Roads – provide direct access to properties and the collector road system and typically carry between 500 and 4,000 vehicles per day.

2.3 Site Access Route and Adjacent Road Network

The site has a total of three access points which are located at Trahairs Road. A site map has been provided in Section 1 of the Environmental Assessment report. All vehicles travelling to and from the site connect to the rest of the adjacent road network via Byrnes Road.

Trahairs Road

Trahairs Road functions as local road, providing one traffic lane in each direction.

In the vicinity of the site access, Trahairs Road is a sealed road with a posted speed limit of 40 km/hr and provides access to the ROBE plant site and other adjacent rural lands. At its western end, Trahairs Road forms the minor approach of a priority controlled T-intersection with Byrnes Road.

Byrnes Road

Byrnes Road functions as a sub-arterial road and provides a connection between Wagga Wagga to Junee. To the southwest of the site, Byrnes Road has a speed limit of 100 km/hr and forms the major approaches of a give way controlled tee-intersection with Trahairs Road. This intersection provides a channelized right turn bay and a left turn deceleration lane from Byrnes Road into Byrnes Road.

As shown at Figure 1, Byrnes Road connects to the Sturt Highway (A 20) via Eunony Bridge Road and Oura Road. Byrnes Road also connects to the Olympic Highway (A 41) via Bomen Road, Shepherds Siding Road and Junee Harefield Road.

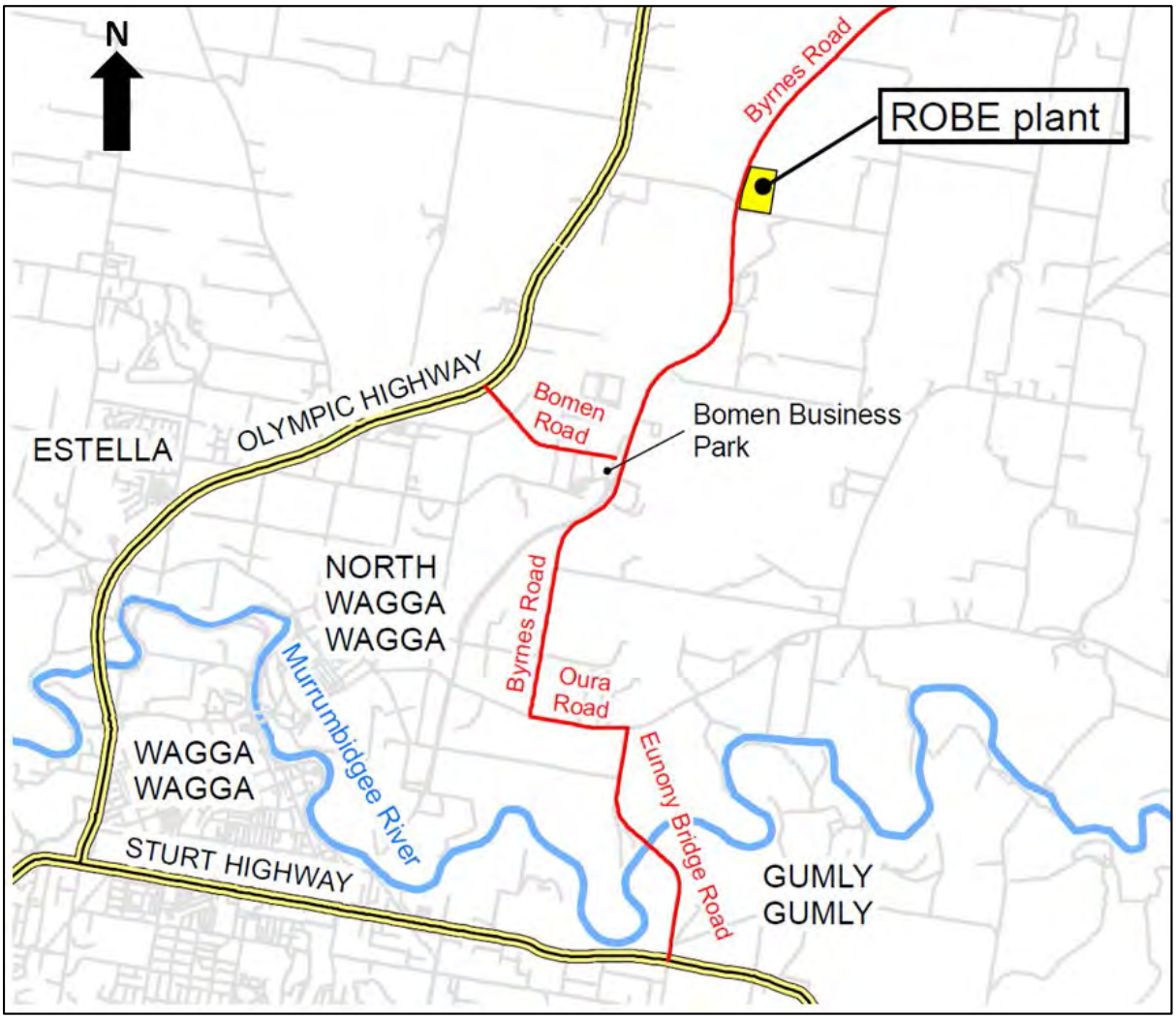
Sturt Highway and Olympic Highway

The Sturt Highway is major arterial road with regional significance, extending from South Australia to Victoria and to North South Wales.

The Olympic Highway is major arterial road with regional significance. To the west of the site, the Olympic Highway runs parallel to Byrnes Road, providing a route between Cowra and Albury via Wagga Wagga.

Detailed analysis on existing annual average daily traffic (AADT) volumes and average daily traffic (ADT) volumes of the surrounding road network are provided in Section 2.4.

Figure 1: ROBE Site Location and Surrounding Road Network



Source: Google Map

2.4 Existing Traffic Volume

Annual average daily traffic (AADT) and average daily traffic (ADT) are typically used as indication of traffic conditions surrounding road network and are published on annual basis by Roads and Maritime. The latest available AADT and ADT for the surrounding road network is summarised in **Table 1.**, which were obtained from Wagga Wagga City Council and Road and Marine Services.

Due to lack of permanent traffic counters along those sections of road in Wagga Wagga, some of the AADT and ADT for locations in the surrounding road network are more than five years old, which is generally, considered "outdated". However, there has been limited development growth in the vicinity of the study area, and it can be considered that traffic growth on local roads has been relatively small.

Table 1: Exiting ADT on the adjacent Wagga Wagga City Council roads

Road Name	Count Location	ADT/AADT	Count Year
Byrnes Road	Bavin Street	3,058	2005
Byrnes Road	North of Dampier Road	2,022	2001
Byrnes Road	North of Trahairs Road	2,152	2011
Ouara Road	Halest St – Brynes Road	4,140	2011
Ouara Road	North of Eunony Bridge Road	4,291	2011
Eunony Bridge Road		4,059	2015
Stuart Highway	Station ID 95547, Edward Street, Wagga Wagga	18,606	2010
Olympic Highway	Station ID 95542, Colin Knott Drive, Wagga Wagga	12,865	2010

Based on the existing traffic volumes shown in **Table 1.**, all roads within the study area are within the expected functional classification as outlined in Section 2.2.

2.5 Existing Site Traffic Generation

Existing Employment Trips

Under existing resource consents activities, ROBE has a total of 44 staff currently working during the weekdays and 15 staff working during weekends.

Table 2 summarises distribution of ROBE employment traffic generation, based on current shifts during a weekday and on weekends. Total employment trips presented on this table are based on worst case assumption scenario that all employees arrive and leave the site in a single occupant vehicle.

Table 2: Existing ROBE Plant Site Employment Trips

	Shift	Number of Staff	Trips /day
Weekday	Day	37	74
	Night	7	14
Weekend	Day	8	16
	Night	7	14

Existing Heavy Vehicles Trips

Currently the ROBE Plant site holds resource consent for 75 heavy vehicles movements per day. Table 3 summaries the average heavy vehicles movements recorded from each activity on the site between periods of 01st July 2013 to 29th June 2015, as provided by Riverina Oils & Bio Energy Pty Ltd.

Table 3: Existing Heavy Vehicles Trips from the Site

Activity Authorised	Truck Trips per day	Maximum Production Rates Tonnes/day
Seed Crushing	18	500
Oil Refining	8	200
Protein meal production	7	293.5
Total Truck Movements	**33**	

2.6 Walking and Cycling

The site is located within an isolated industrial site, within a rural/agricultural area. There are no footpaths or cycle lane provided along Byrnes Road or Trahairs Road. As such, there are few pedestrians and cyclists in the vicinity of the site.

2.7 Public Transport

There are no bus services serving the site, with no bus stops or bus services operating along Byrnes Road. As such, access to the site by public transport is not possible.

2.8 Existing Crash Data Review

No crash data was available for this study. A detailed 5 years crash data report for the surrounding road network has been requested from Roads and Maritime and will be review as part of further studies.

However, Riverina Oils & Bio Energy Pty Ltd advised that during the last five years, there have been no crashes recorded at the Trahairs Road/Byrnes Road intersection related to traffic accessing the site.

2.9 Existing Trahairs Road and Byrnes Road Intersection Performance

The performance of the existing road network is largely dependent on the operating performance of key intersections, which are critical capacity control points on the road network. SIDRA intersection modelling software was used to assess the proposed peak hour operating performance of the Trahairs Road/Byrnes Road intersection.

The criteria for evaluating the operational performance of intersections is provided by the Roads and Maritime Guide to Traffic Generating Developments 2002 and reproduced in Table 4. The criteria for evaluating the operational performance of intersections is based on a qualitative measure (i.e. Level of Service), which is applied to each band of average vehicle delay.

Table 4: Level of Service (LoS) criteria for intersections

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabouts	Give Way & Stop Signs
A	< 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control modes	At capacity, requires other control mode
F	> 70	Over Capacity Unstable operation	Over Capacity Unstable operation

Source: Roads and Maritime Guide to Traffic Generating Developments (2002)

Notes: .

1. The average delay for priority-controlled intersections is selected from the movement on the approach with the highest average delay
2. The level of service (LoS) for priority-controlled intersections is based on the highest average delay per vehicle for the most critical movement
3. The degree of saturation is defined as the ratio of the arrival flow (demand) to the capacity of each approach.

Existing Intersection Performance - Trahairs Road/Byrnes Road Intersection

No intersection traffic count data was available for this study for intersections in the vicinity of the site. The following assumptions were adopted to derive intersection turning movements in order to undertake a SIDRA intersection capacity assessment:

- The critical peak period for the Trahairs Road/Byrnes Road intersection is at the start and finish of the ROBE weekday shifts. As shown at Table 2, the weekday- day shift generate up to 74 employee trips a day, which is include 37 vehicles trips entering and leaving the site during AM and PM peak
- All employees arrive and depart the site within an hour of end or start of the shift. Based on this worst case scenario, a total of 37 employment trips passenger vehicles will be leaving the site during the end of the day shift
- Left and right turn movements into and out of Trahairs Road were assumed to be at equal split
- The 2011 ADT volumes at Byrnes Road, North of Trahairs Road, were used as the basis of calculated through movements at Byrnes Road. It was assumed that 10% of the daily traffic along Byrnes Road occurs during the peak hour
- In order to growth the 2011 estimated peak hour traffic volume to the 2015, a conservative growth rate of 20% was applied.

Table 5. summarises the traffic volumes used for SIDRA intersection capacity assessment of the Trahairs Road/Byrnes Road intersection.

Table 5: Estimated "worse case" Peak hour traffic volume

Intersection Approach	Shift	Total Number of Vehicles
Trahairs Road	Left	19
	Right	19
Byrnes Road - NB	Through	130
	Right	19
Byrnes Road - SB	Through	130
	Left	19
Estimate Total Peak Hour Traffic Volume		336

Based on the assumed traffic movements, the SIDRA intersection modelling indicates that LoS A is expected for all approaches.

3. Traffic Impact Assessment

As part of this proposal, ROBE is applying for a further Modification of Approval to:

- Increase the seed crushing capacity from 500 to 600 tonnes per day, which equates to an increase from 165,000 to 200,000 tonnes per annum
- Increase the refining capacity from 200 to 250 tonnes per day, which equates to an increase from 66,000 to 82,500 tonnes per annum
- Increase the vegetable protein meal production from 293.5 to 352 tonnes per day which equates to an increase from 90,000 to 116,000 tonnes per annum.

This section analyse traffic impact associate with the proposed modification to the plant during construction and operational stage.

3.1 Construction Traffic Generation

Construction activities are expected to occur over a maximum of 15 days, including:

- Ten days for construction projects
- Five days for monitoring/testing of the plant.

The following sections discuss the expected construction traffic generation associated with the proposal.

Construction Personnel Trips

During the modification phase of the plant, there will be 23 tradesmen vising the site for employment related matters.

As the site is located on rural industrial/agricultural area with limited public transport, it has been conservatively assumed that all construction workers would access the site within single occupant passenger vehicles (light vehicles).

This will result in an additional of 46 light vehicles a day trips, including arrivals and departures. Based on shift patterns, the construction personnel traffic would generate 30 day shift trips and 16 night shift trips.

Construction Heavy Vehicles Trips

The proposed plant modification will require a transportation of 5 containers, approximately 20 feet long. This will generate a maximum of 5 heavy vehicles through the construction period.

Delivering and removal of these containers is not expected to occur during the road network peak hours. As such, this traffic generation would have a negligible impact to the operation of the road network.

3.2 Operational Traffic Generation

Employment Trips Changes

ROBE does not propose to increase the number of staff working at the site due to the proposed further modification to the Plant. Therefore, employment traffic generated at the site will remain as existing following the proposed upgrade.

Heavy Vehicles Trips Changes

The existing development consent for the site permits the ROBE plant site to generate up to 75 heavy vehicles trips to the site a day. Under the current production rate, the site has an average of 33 heavy vehicle trips per day, which is significantly less than the permitted 75 heavy vehicle trips.

The proposal changes to the plant will results an average increase of four heavy vehicles a day. Table 6 provides a comparative summary of the daily number of heavy vehicles generated from the existing and the proposed plant production rates. As shown, the proposal would generate an average of four additional heavy vehicles per day. This small increase in traffic would have a negligible impact to the operation of the surrounding road network.

Table 6: Operational Heavy Vehicle Trip Generation – Daily

Activity Description	Existing Average Truck Trips per day	Proposed Average Truck Trips per day	Increase in Trucks Per Day
Seed Crushing	18	19	1
Oil Refining	8	9	1
Protein meal production	7	9	2
Total change in heavy vehicles			**4**

3.3 Traffic Impact Assessment - Construction and Operation

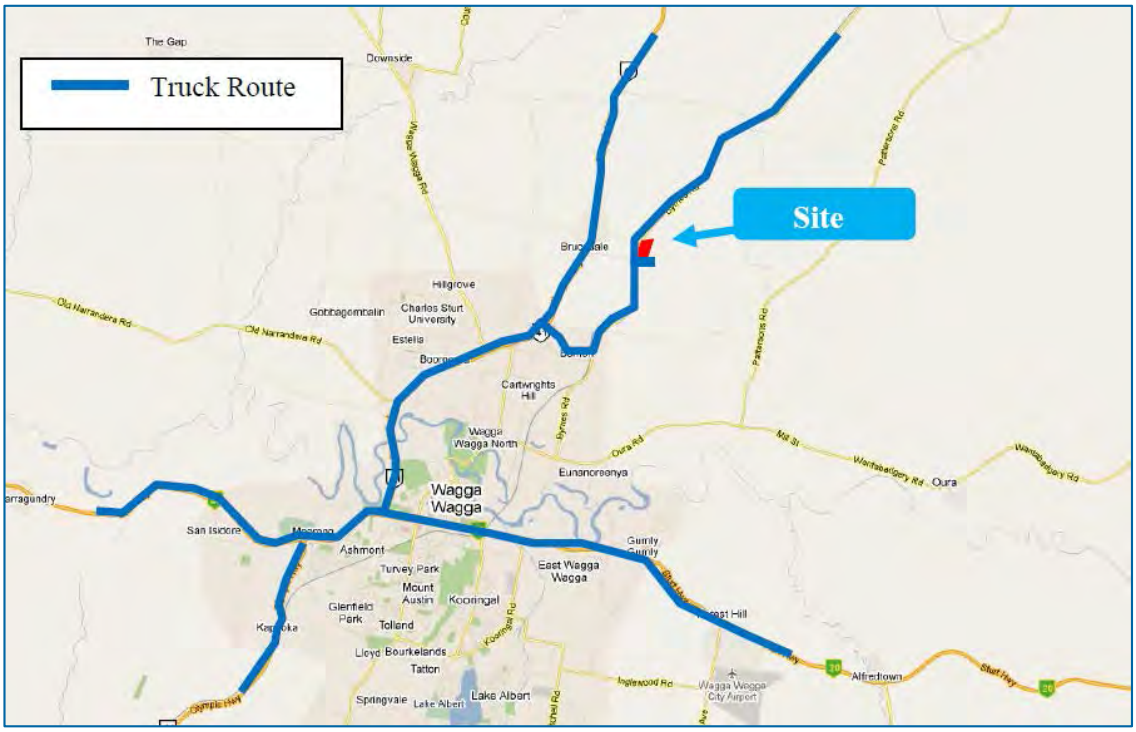
The proposed plant modification will result in

- Up to 56 additional vehicles per day during construction phase, over a period of 15 day
- Four additional heavy vehicles a day during operation phase.

This low level of traffic generation is not expected to impact the operational performance of surrounded road network.

All trucks accessing the site during constructions and operation phase will do so using the regional truck routes shown in Figure 2.

Figure 2: Heavy Vehicles Access Route



3.4 Trahairs Road and Byrnes Road Intersection Performance

Currently, Trahairs Road/Byrnes Road intersection operates at LOS A during peak periods. As such, the intersection has capacity to accommodate additional traffic during modification and operation stage of the plant. SIDRA intersection modelling of the proposed construction stage indicates that the intersection would continue to operate at LoS A.

4. Conclusion

The existing development consent for the site permits the ROBE plant site to generate up to 75 heavy vehicles trips to the site a day. Under the current production rate, the site has an average of 33 heavy vehicle trips per day, which is significantly less than the permitted 75 heavy vehicle trips.

During the constructions phase of proposed modification, Riverina Oils & Bio Energy Pty Ltd is expected to generate

- Up to 46 light vehicles trips per day (30 trips during the day and 16 during the night)
- A maximum of extra 10 trucks movements per day.

Riverina Oils & Bio Energy Pty Ltd is not intending to increase number of employees as result of increase plant production rate. As such, the changes in traffic generation following the development of the plant will purely be based on changes in truck volumes. The proposal is expected to generate an additional four heavy vehicles per day.

The key findings of the Traffic Impact Assessment include the following:

- Traffic generated from further modification of the plant will be within range of the permitted daily traffic movements for the consented development
- The additional truck movements will have negligible impacts to the performance of Trahairs Road/Byrnes Road Intersection

- The additional truck movements will access the site, via the current access arrangements.

GHD

Suite 3, Level 1, 161-169 Baylis Street
Wagga Wagga NSW 2650
T: 61 2 6923 7400 F: 61 2 6971 9565 E: wgamail@ghd.com.au

N:\AU\Wagga Wagga\Projects\23\15587\WP\Specialist Studies\Traffic\75209.docx

Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	C.Hechei	O. Peel	O. Peel*	K. Day	K. Day*	26/08/2015

www.ghd.com

Appendix C – Riverina Water County Council

ROBE MoA - Mod 07 0146 MOD 2

RIVERINA WATER COUNTY COUNCIL

INFORMATION & SPECIAL TERMS OF SUPPLY

Ref: PHC: 9/3/1
8th November 2011

Riverina Oils & BioEnergy
PO Box 498
IVANHOE VIC 3079

ATTENTION: Mr. Dern Pease

Dear Dern:

RE: SERVICE CONNECTION – 299 TRAHAIRS ROAD, BOMEN, WAGGA WAGGA

I refer to your letter dated 14 October 2011 regarding water supply to your proposed Integrated Oilseed Processing Plant at 299 Trahairs Road, Wagga Wagga.

The infrastructure costs (including Development Servicing Charges) are provided at the end of this letter. The design, installation and charges are based on the information supplied in your letter.

Riverina Water is able to make water supply available to your site as follows:-

1. Riverina Oils & BioEnergy (ROBE) is to pay for the equivalent cost of a 150mm water mains extension from the end of Riverina Water's existing water supply main in Byrnes Road to the ROBE water metering point in Trahairs Road, near the intersection of Byrnes Road.

2. Riverina Water may decide to install a water main larger than 150mm to cater for later growth. Any additional cost associated with the larger main will be borne by Riverina Water.

3. ROBE's payment for a 150mm main will ensure that it has access to a maximum flow rate of 11.6 l/s at the point of supply when the plant reaches its planned ultimate development. Access to the full flow rate is conditional upon ROBE paying Riverina Water any charges applicable to the change in development and or change in water demand.

4. Based on ROBE's information, Stage 1 of the development will have a **maximum water demand of 300kl per day** and that the demand for water will be spread evenly over 24 hours. This equates to a flow rate of 3.5 l/s.

$300\ m^3/d \times 30\ d/month = 9000\ m^3/d$

All correspondence to:
General Manager
91 Hammond Avenue, Post Office Box 456
Wagga Wagga NSW 2650
Phone: (02) 6922 0608 Fax: (02) 6921 2241
Email: admin@rwcc.com.au
ABN 52 084 883 210

5. The 2011/2012 Development Servicing Charge relating to 300kl/day demand is $216,000 based on E.T. (equivalent Tenement) value of 60.

6. Actual usage will be monitored after commissioning, and if found to be higher than estimated, an additional account for Development Servicing Charges will be issued.

7. Given that ROBE will be paying the cost of the 150mm water main and Development Servicing Charges for 60 E.T., Riverina Water will permit ROBE to take supply up to a rate of 9 l/s during Stage 1 of its development, provided that daily consumption does not exceed 300kl. ROBE is responsible for ensuring that water is not taken at rates higher than these permitted levels and, if necessary to ensure compliance, Riverina Water may install flow limiting devices at ROBE's cost.

8. It is understood that later development stages will see ROBE's demand for water increase to 1,000 kl/day, again spread evenly over 24hours. The maximum supply rate available from Riverina Water would then be 11.6 l/s, again subject to applicable charges relating to the changed development or increased water supply requirements.

9. ROBE has indicated that it may require more than 300kl per day when commissioning the plant or at times when the ROBE water treatment plant for recycled water is under maintenance. It is important to note that this offer and quotation for supply of water is based on a maximum daily demand of 300kl and that this maximum demand is not to be exceeded. Water quantities in excess of 300kl on any day will not be permitted unless some prior arrangement has been made with Riverina Water. Any additional water is not to be taken until Riverina Water has issued a written permit describing how and when such additional water may be used.

10. It is unlikely that the water main extended to ROBE's site will be able to meet the fire fighting demands for your development. You have indicated that ROBE will be providing their own fire water storage and pumping systems to meet any fire fighting requirements.

11. Due to the range of flows possible with the supply connection to ROBE, Riverina Water will install a water meter with data logging features to enable monitoring of demand patterns. In our telephone discussion, you indicated that you would like access to Riverina Water's water meter do enable interfacing with your process monitoring system.
I do not have a firm design for the meter installation at this stage; however I would envisage a mag-flow meter with internal data logging and provision for wired connection to your process monitoring system. The meter could be

battery powered or AC powered with battery backup. An AC powered meter would require you to provide suitable power supply to the metering site. We will need to obtain more detail from you regarding the type of interfaces available between the meter and your SCADA system. ROBE would be responsible for the cost of any cabling and interfacing of their SCADA to the Water Meter. Details regarding this interface should be discussed with our Operations Engineer, Jason Ip, as soon as possible so that the correct meter configuration can be ordered.

12. The Water Meter has been sized to ensure accuracy for billing and to also ensure that it does not cause significant pressure loss. For Stage 1, a 50mm Mag-flow meter is planned.

13. Plumbing at the meter will be such that the meter can be easily changed to an 80mm Mag-flow when the plant is expanded to its ultimate capacity.

14. You will be responsible for installation of the appropriate backflow prevention devices.

15. All plumbing on the site must be approved by Riverina Water County Council prior to commencement of any water plumbing. Your plumber can contact our office for the necessary plumbing permit / application form.

The cost of provision of water supply as detailed above is as follows:-

Development Servicing Charge	$216,000 (based on the above conditions and 60 ET)
150mm diameter water main extension incl. 100mm water service and 50mm mag-flow meter	$109,622
TOTAL	$325,622

Before paying for this water supply installation, it is extremely important that ROBE understand the conditions of supply – particularly **300kl maximum water consumption allowed on any one day, and 9 litres per second is the maximum water consumption rate allowed.**

All other conditions of supply are as per Riverina Water County Council's standard conditions of supply. These can be viewed in the Operational Plan on our web site www.rwcc.com.au .

Payment for the water mains extension and water service ($109,622) is required before scheduling of the water supply works can begin. Water supply to the site will not be turned on until The Development Servicing Charge has been paid.

Appendix D – DP&E Comments

ROBE MoA - Mod 07 0146 MOD 2

Review of Riverina Oils and BioEnergy Modification – 07_0146 MOD 2

- The report is referred to as a "Preliminary Environmental Assessment" in the title and is described as a "high level preliminary environmental assessment" in the Conclusion. The modification request requires a detailed environmental assessment, including all relevant technical reports that support the modification request. The document should be referred to as an "Environmental Assessment".
- The text of the report refers to an increase in refining capacity of 66,000 to 82,500 tonnes per annum while Table 2 refers to an increase to 81,500 tonnes per annum. Please confirm the proposed capacity increase and amend the report accordingly.
- Please provide an estimate of construction and operational jobs generated by the proposed modification.
- A more detailed traffic impact assessment is required. This should include, at a minimum, a description of the surrounding road network, existing traffic generation, proposed construction traffic routes and impacts of the proposed modification on traffic volumes / movements (hourly and daily) during construction and operation.
- A more detailed air quality impact assessment is required to quantify any impacts as a result of the increase production capacity. Explain existing emissions limits, relevant conditions, EPL licence requirements, and relevant air pollutants and confirm that existing emission limits will not be exceeded. EPA has requested that the EA includes an assurance that hexane emission limits will not be exceeded.
- Discuss and quantify impacts to greenhouse gas emissions (increase or reduction).
- Further quantification of impacts is required in relation to water for the existing and proposed production capacity, including water consumption (existing versus proposed) and process wastewater (quantification of volume increase and existing capacity rather than percentages).
- Provide evidence of consultation with Riverina Water Country Council regarding the supply of water for the proposed increase in demand.
- Quantification of existing versus proposed material balance (eg: as outlined in ROBE powerpoint presentation).
- Quantification of construction noise impacts in a noise impact assessment, with reference to the EPA's *Interim Construction Noise Guideline (DEC 2009).*
- Quantification of solid waste generation.
- Proposed impact on utilities consumption and how additional demand will be met.
- All plans should be provided at a minimum of A3 size to scale.
- An additional section should be included that details the proposed wording of any existing conditions of approval that need to be modified as a result of the proposal.
- Include compliance section to include details of current odour complaint.

Sally Munk
Senior Environmental Planner, Industry Assessments
29 July 2015

Appendix E – Air Quality Assessment

ROBE MoA - Mod 07 0146 MOD 2

Riverina Oils and BioEnergy

Section 75W Modification

Air Quality Assessment

September 2015

Table of contents

1. Introduction 3
   - 1.1 Purpose and scope 3
   - 1.2 Limitations 3
   - 1.3 Assumptions 4
2. Existing licence requirements 5
   - 2.1 In-stack concentration limits 5
   - 2.2 Monitoring conditions 5
   - 2.3 Off-site conditions 5
   - 2.4 Licence variations 6
3. Meteorology 7
   - 3.1 Annual and seasonal variation in wind 7
   - 3.2 Seasonal variation in Wind Pattern 8
   - 3.3 Pattern of Atmospheric Stability 9
   - 3.4 Annual Average Directional Pattern in Atmospheric Stability 10
   - 3.5 Seasonal Variation in Atmospheric Stability 11
4. Proposed Updates to plant 12
5. In-stack concentration limits 13
   - 5.1 Summary of existing in-stack concentrations 13
   - 5.2 Results of in-stack testing 13
   - 5.3 Prediction for proposed upgrade to meet in-stack Concentration Limits 14
6. Predicted ground level concentrations 15
   - 6.1 Model inputs 15
   - 6.2 Predicted impacts 16
   - 6.3 Assessment of hexane 18
7. Conclusion and recommendations 19
8. References 21

Table index

Table 1 Summary of EPL 13097 (February 2015) requirements - in-stack concentrations of pollutants 5

Table 2 ROBE AWS Seasonal wind rose distribution 9

Table 3 ROBE AWS Seasonal Stability Roses 11

Table 4 Proposed Increases in Production Rate 12

Table 5 In-stack concentrations for VOCs (measured as n-propane): limit of 40 mg/m^3 13

Table 6 In-stack concentrations of TSP: limit of 50 mg/m^3 13

Table 7 In-stack concentrations of H_2S: limit of 5 mg/m^3 13
Table 8 In-stack concentrations of NOx: limit of 350 mg/m^3 13
Table 9 Summary of compliance with in-stack concentration limits 14
Table 10 Modelled parameters for current emissions impact 15
Table 11 Summary of mass emission rates for dispersion modelling 15
Table 12 Sensitive receptor locations 16
Table 13 Maximum predicted impacts –hexane (criterion in NSW Approved methods = 3200 µg/m^3 (1 hour average) 16
Table 14 Maximum predicted impacts – TSP (NSW criterion = annual average of 90 µg/m^3) 17
Table 15 Maximum predicted impacts - odour 17

Figure index

Figure 1 ROBE AWS annual wind rose distribution 8
Figure 2 ROBE AWS Annual Stability Rose 10

1. Introduction

1.1 Purpose and scope

This report has been prepared as part of a review conducted by NSW Planning and Environment to provide

- A more detailed air quality impact assessment to quantify any impacts as a result of the increase in production capacity at the ROBE plant.
- Explain existing emissions limits, relevant conditions, EPL licence requirements and relevant air pollutants
- Confirm that existing emission limits will not be exceeded;
- Comment on the likelihood of increase to hexane emissions limits.

The air quality impact assessment of the planned expansion is presented in this report. It examines three areas to estimate the consequences of the expansion, namely:

- The likely increase in concentrations of in-stack pollutants;
- The likely increase in ground level concentrations of pollutants; and
- A specific focus on hexane emission limits.

The second point requires dispersion modelling and the inputs to that modelling, namely meteorology and emission rates are also examined.

1.2 Limitations

1.3 Assumptions

This assessment has been based on information provided to GHD by ROBE, including in-stack testing reports, previous work surrounding management, communications with EPA and NSW Planning and Environment, and supplied data around the Environmental Incident Register. GHD has not independently verified this information and has assumed that results are representative of site conditions at the time of testing.

2. Existing licence requirements

The Licence (EPL # 13097) was most recently updated in February 2015 and is structured into conditions under the following headings:

- Administrative – Section A
- Limits – Section L
- Operating- Section O
- Monitoring – Section M, and
- Reporting –Section R

2.1 In-stack concentration limits

The emissions to air from the ROBE plant are permitted at seven discharge points and the in-stack concentration limits for specified pollutants at each point are specified in section L2 of the EPL. They are repeated in Table 1 below.

Table 1 Summary of EPL 13097 (February 2015) requirements - in-stack concentrations of pollutants

EPA ID Number Discharge Point, DP	Type of monitoring	Location Description	In-stack concentration limit 100 percentile limit
2	Discharge to air	Combined vent servicing	TSP – 50 mg/m3 H2S – 5 mg/m3
3	Discharge to air	Solvent extraction plant scrubber	VOCs - 40 mg/m3 H2S – 5 mg/m3
4	Discharge to air	Boiler house stack	NOx – 350 mg/m3
7	Discharge to air	Combined vent	TSP – 50 mg/m3
13	Discharge to air	Earth conveying system	TSP – 50 mg/m3
14	Discharge to air	Filter blowing vapour scrubber	VOC – 40 mg/m3 H2S – 5 mg/m3
15	Discharge to air	High pressure steam generator	NOx - 350 mg/m3

2.2 Monitoring conditions

Condition M2 of the licence specifies that DPs 2, 3 and 14 require quarterly monitoring for those pollutants mentioned above in Table 1. In addition, continuous monitoring of Total Reduced Sulphides (TRS) is required at each of these three discharge points.

2.3 Off-site conditions

The following conditions that link to potential off-site impact are also noted in EPL 13097.

- Condition L5 states “The Licensee must not cause or permit the emission of offensive odour beyond the boundary of the premises”.
- Condition O3 states “The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises”.

- Condition M5 states that “The Licensee must keep a record of all complaints made to the licensee … in relation to pollution arising from any activity to which this licence applies.”

2.4 Licence variations

A Notice to Variation of Licence No 13097 was provided on 23 February 2015 to remove the requirement to monitor NOx from gas powered boilers (EPA ID point 4), particulates from the bag house and no longer required monitoring at sources 7, 13 and 15.

The update to the licence in February 2015 also removed the requirement to monitor the following sources:

- Point 4 – Boiler house stack for Boiler 1
- Point 7 – Combined vent stack TSP; previously measured at <2 mg/m3 on all dates except for January 2015, where it recorded a value of 9.7 mg/m3 (still at a level considered to have a minor impact).
- Point 13 – Earth conveying system
- Point 15 – High pressure stream generator.

3. Meteorology

Local wind climate will largely determine the pattern of off-site impacts of air pollutants from the ROBE facility. The characterisation of local wind patterns requires accurate site-representative hourly recordings of wind direction and speed over a period of at least a year.

Wind rose distributions for the ROBE facility were compiled based on data obtained from the automatic weather station (AWS) located on the ROBE site. This data has been used to create a 12 month data file for the period 01 October 2012 to 30 September 2013. The anemometer sensors for wind direction and speed were a wind vane and rotating cups respectively.

The effect of wind on dispersion patterns can be examined using the general wind climate and atmospheric stability class distributions. The features of particular interest in this assessment are: (i) the prevailing wind directions and (ii) the relative incidence of more stable light wind conditions.

3.1 Annual and seasonal variation in wind

The average wind rose for the entire data period is shown in Figure 1 and indicates that the predominant annual average wind directions are from the west-southwest comprising of 9.6 per cent of incident winds, with a comparable extent from the south-west (9.5 per cent) and to lesser extents from the north, northeast and east-southeast (8.8 per cent, 9.1 per cent and 9.4 per cent respectively). The annual average wind speed measured was 2.0 m/s. The observed wind speed distribution indicates that the largest proportion of high wind speeds (> 6 m/s) are from the southwest and the largest proportion of light winds (< 2 m/s) are from the east-southeast.

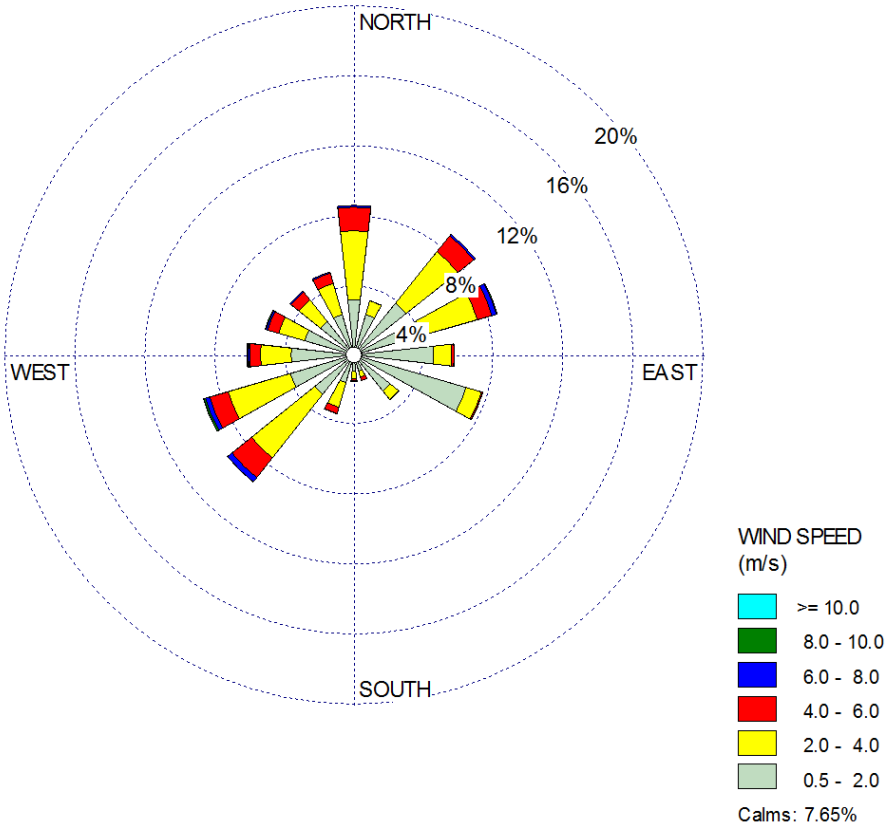


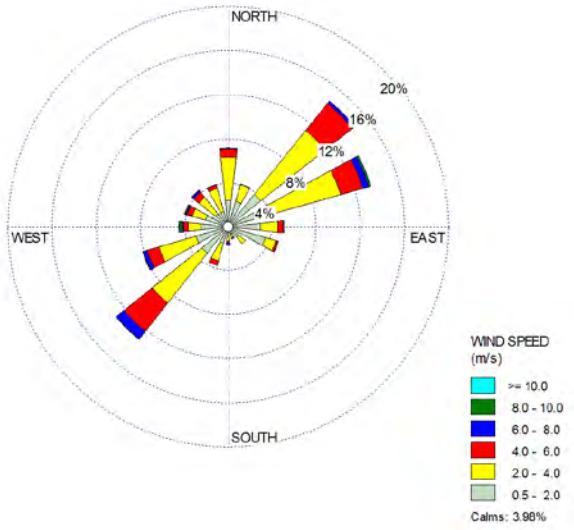
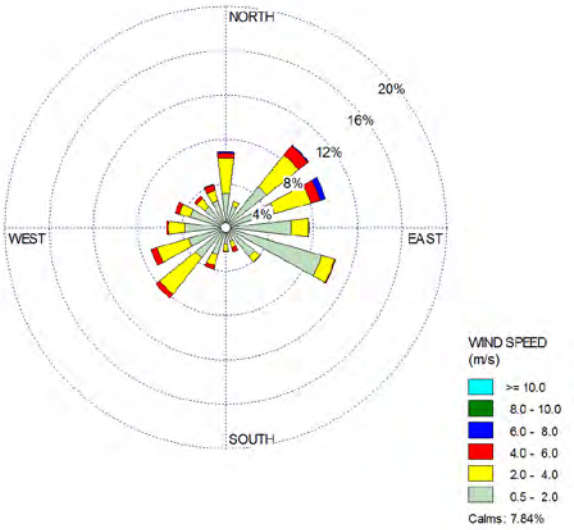
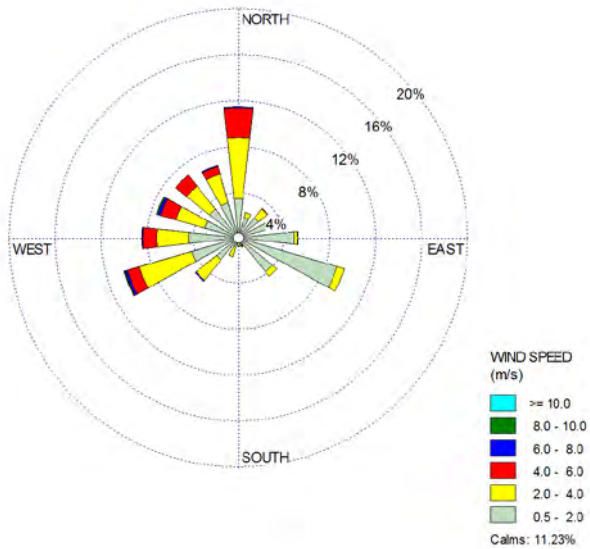
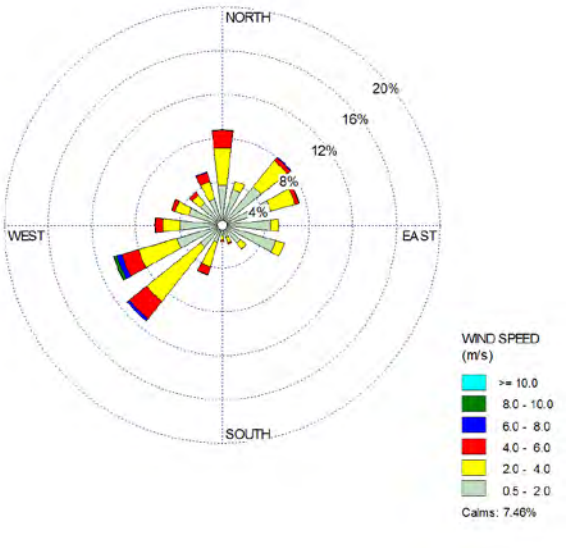
Figure 1 ROBE AWS annual wind rose distribution

3.2 Seasonal variation in Wind Pattern

The seasonal wind roses in Table 2 below show that:

- During winter, northerly winds are the most dominant due to pre-frontal northerlies followed by synoptic westerlies and cool air drainage flows from the east-southeast;
- During summer north-easterly winds are the most dominant followed by the southwest due to the synoptic sub-tropical ridge migrating to the south of this location during the warmest months of the year;
- Spring and autumn are transitional periods. During these months both summer and winter patterns are observed;
- The seasonal incidence of high winds (>6 m/s) is greatest in summer, and lowest in autumn;
- The incidence of light (<2 m/s) winds is greatest in autumn, followed by winter and least in summer;
- As with the annual wind rose, there is a lack of southerly winds in all seasons, and
- The direction and high proportion of light winds in autumn is predominantly from the east-southeast and east. These drainage flows are likely to be associated with high stability, and can be expected to define the directions of poorest dispersion.

Table 2 ROBE AWS Seasonal wind rose distribution

Summer (average speed = 2.56 m/s)	Autumn (average speed = 1.76 m/s)
	
Winter (average speed = 1.84 m/s)	Spring (average speed = 2.00 m/s)
	

3.3 Pattern of Atmospheric Stability

In the Pasquill/Gifford atmospheric stability scheme, stability is classified into six classes A through F. A, B and C stability classes represent strongly, moderately and slightly unstable atmospheres respectively. Under unstable conditions dispersion of emissions from near-ground sources is good due to convectively vertical turbulent mixing.

The stability category D denotes neutral atmospheric conditions (strong winds in moderate temperatures or lighter winds on overcast to partly cloudy days).

Categories E and F denote slightly and moderately stable atmospheres when dispersion is poorest, as vertical mixing of air is suppressed. Stable atmospheric conditions occur in the

absence of strong gradient winds, and mostly on nights with clear skies. They are often associated with ground-based radiation forced temperature inversions, sometimes with fog, mist or frost.

Neutral stability (D class) conditions occur most frequently and along with the prevailing wind direction can indicate the most common direction for potential impact. Under night-time E and F class conditions, emissions from ground based sources; result in a downwind plume that is detectable to a greater distance than during the day.

3.4 Annual Average Directional Pattern in Atmospheric Stability

Figure 2 shows the stability rose for the entire data period. Noting that a neutral atmosphere (D) is normally the dominant stability state of the atmosphere, D class conditions occur at 38.2% incidence while the A, B and C class contribute unstable atmospheres 32.1% of the time and the stable E and F conditions occur at a 29.7% incidence. Figure 2 shows that the majority of stable winds are from the east northeast, west south-west and south-west.

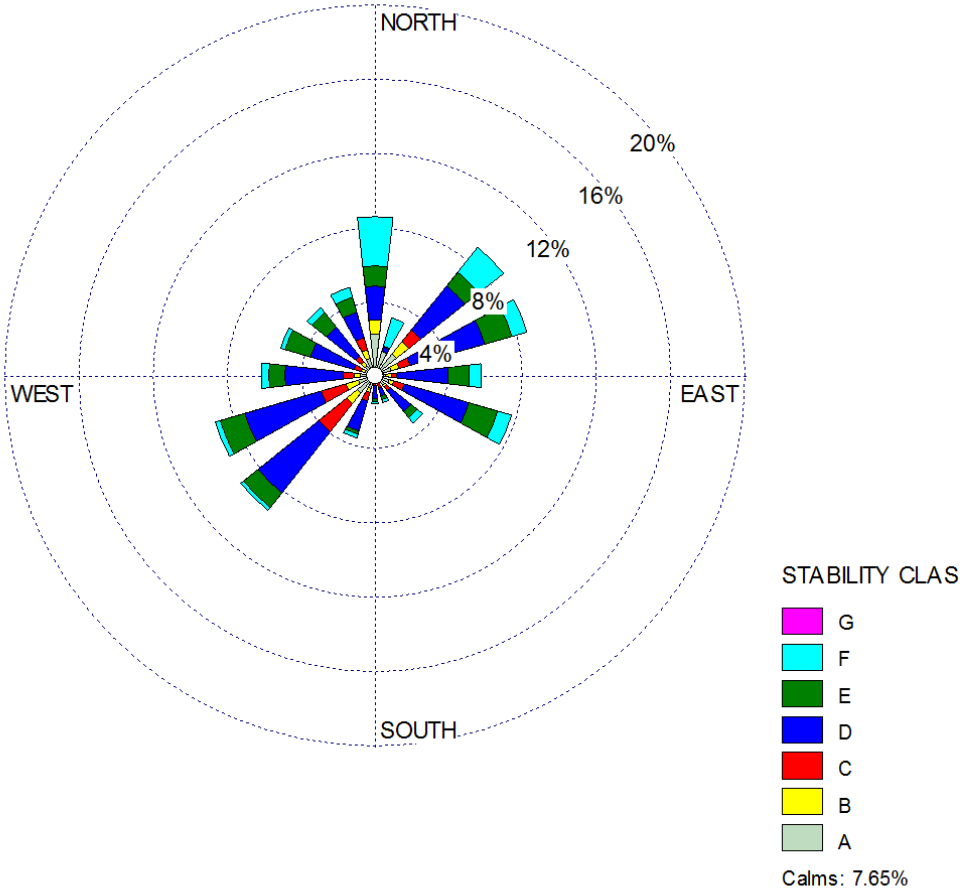


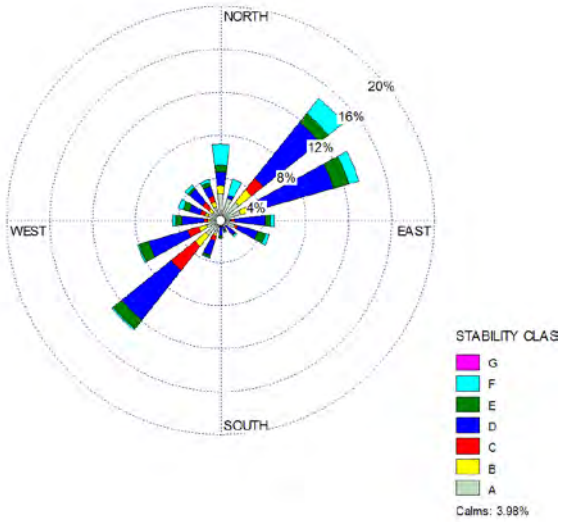
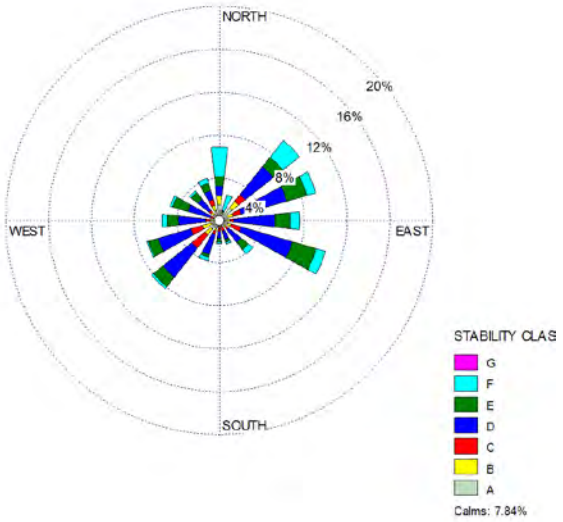
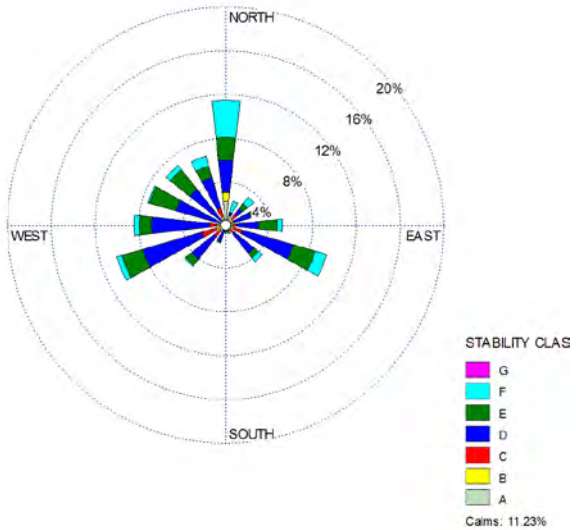
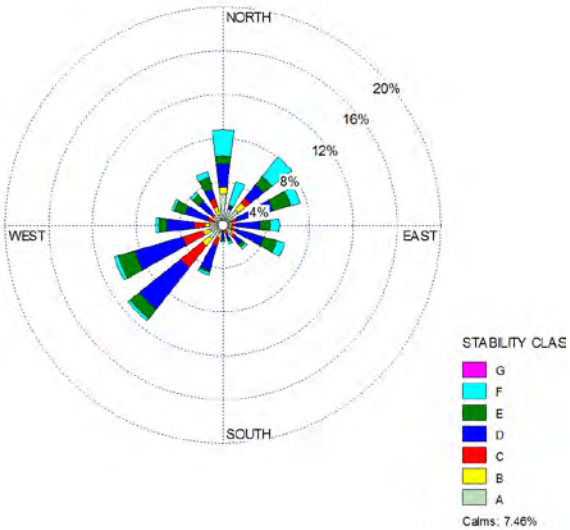
Figure 2 ROBE AWS Annual Stability Rose

3.5 Seasonal Variation in Atmospheric Stability

Table 3 shows the following seasonal variation trends in atmospheric stability:

- In summer, the peak occurrence of stable winds is from the east northeast;
- In winter, stable winds predominate from the west southwest and west;
- In autumn, stable winds predominate from the northeast, east northeast and east-southeast; and
- In spring, stable winds predominate from the south west and west southwest.

Table 3 ROBE AWS Seasonal Stability Roses

Summer	Autumn
	
Winter	**Spring**
	

4. Proposed Updates to plant

Increases in the operational capacity and production of the plant are likely to result in increases to both in-stack concentrations and flowrates of certain pollutants and to peak ground level concentrations of the pollutants.

Without detailed design drawings and discussion with the process designers it is not possible for GHD to determine the 'split' of the emission rate increase to the component increases in ; (i) concentration and (ii) flowrate. So, to be conservative, the increase has been assumed to be expressed entirely as an increase to in-stack concentration. In this manner, the check of the proposed upgrade against the in-stack licence limits will be conservative.

Note that in relation to off-site peak impact it is the emission rate at each stack that is critical. GHD has for each modelled pollutant assumed a 25% increase in predicted peak GLC, so that the impact of the upgrade has been calculated by increasing the peak pollutant levels on the grid array by 25%. Given that some sources will in fact give a 20% increase in emission rate, this assumption will be slightly conservative.

Recent in-stack testing allows for the accurate quantification of impacts for existing operations. To account for future operations, a linearly proportional increase to in-stack concentration of relevant pollutants has been assumed for the relevant operation at the stack discharge point. All other factors including temperature, velocity and physical stack characteristics have been assumed to remain unchanged. A summary of these predicted increases is given below in Table 4.

Table 4 Proposed Increases in Production Rate

Update	% increase	Likely Impacts
Increase seed crushing capacity from 500 to 600 tpd	20 %	Increase of odour in seed crushing plant (combined vent servicing - DP 2
Increase refining capacity from 200 to 250 tpd	25 %	Increase of odour in refinery (filter blowing vapour scrubber) – DP 14
Increase vegetable protein meal production from 293.5 to 352 tpd	20 %	Solvent Oil extraction plant and scrubber combined vent - DP 3)

5. In-stack concentration limits

5.1 Summary of existing in-stack concentrations

Quarterly testing has been conducted quarterly to assess the compliance with in-stack concentration limits at the three measured sources. The sources whose monitoring requirement was removed in the February 2015 update of the EPN all demonstrated comfortable compliance with in-stack concentrations. The three pollutants still requiring measurement, so as to not exceed in-stack concentration limits, are VOCs, TSP and H_2S.

5.2 Results of in-stack testing

The results of in-stack testing since October 2013 for each of these pollutants are summarised below, along with additional pollutant NO_x to demonstrate likely compliance with the proposed future operations.

Table 5 In-stack concentrations for VOCs (measured as n-propane): limit of 40 mg/m^3

In-stack concentration measured results – mg/m3						
Source	October 2013	February 2014	July 2014	October 2014	January 2015	April 2015
3	16	17	15	26	34	32
14	63	360	39*	170	37	27
* sampled in quadruplicate by ETC and duplicate samples sent to ETC and SGS Laboratories. A range of 30 to 39 mg/m3 was obtained by ETC (with the maximum value used)						

Table 6 In-stack concentrations of TSP: limit of 50 mg/m^3

	In-stack concentration measured results – mg/m3					
Source	October 2013	February 2014	July 2014	October 2014	January 2015	April 2015
2	17	12	9.5	5.9	21	13
7	< 2	< 2	< 2	< 1	9.7	-
13	11	3.9	4.8	12	23	-

Table 7 In-stack concentrations of H_2S: limit of 5 mg/m^3

	In-stack concentration measured results – mg/m3					
Source	October 2013	February 2014	July 2014	October 2014	January 2015	April 2015
2	<0.04	< 4	<3	<0.08	<0.2	<0.2
14	<0.04	< 3	< 3	< 0.09	< 0.2	< 0.2

Table 8 In-stack concentrations of NOx: limit of 350 mg/m^3

	In-stack concentration measured results– mg/m3					
Source	October 2013	February 2014	July 2014	October 2014	January 2015	April 2015
4	110	120	110	110	100	-
15	63	63	63	65	100	-

5.3 Prediction for proposed upgrade to meet in-stack Concentration Limits

As a result of an, approximate 25 % increase in operations across the plant, the measurements of all pollutants can be scaled up by this factor to predict future concentrations. For H2S and NOx, this still results in comfortable compliance. The maximum predicted concentrations of the pollutants scaled up based on this 25 % increase in throughput of the plant is summarised below in Table 9.

The following observations can be made using Table 9:

- In-stack concentration limits for NOx and H_2S are comfortably met at all sources, providing justification for the removal of the condition to monitor sources 4 and 15, where the maximum concentration was around 35 % percent of the criterion.
- In-stack concentration limits of H_2S were comfortably met at all sources, with all concentrations recorded below the limits of reporting.
- In-stack concentration limits for TSP are readily met at locations 2, 7 and 13, with the highest concentration occurring at 13 still less than 50 % of the criterion.
- Some measured concentrations of total VOCs (as n-propane) are well above the 40 mg/m^3 licence limit for point source DP 14. These exceedances have been investigated and audited in the past, and measures have been put in place to ensure accurate sampling. The July 2014 measurement of VOCs was conducted with quadruplicate values, and thus can be reliably used. However, the source of the earlier high exceedances cannot be determined with any certainty.

The two most recent values of VOC concentrations taken in 2015 may be the most accurate indication of expected levels of VOCs as a result of changes to practices. However, using these values still indicates that both sources DP 3 and DP 14 are close to exceeding the in-stack concentration limit, and an increase in VOCs produced from the proposed upgrade could result in non-compliance with this criterion.

Table 9 Summary of compliance with in-stack concentration limits

Pollutant	Sources	Maximum existing concentration (% of criterion)	Future predicted concentrations (% of criterion)
VOCs	3	85 %	**106**
	14 (all results)	> 100 %	**> 100**
	14 (2015 measurements)	92.5 %	116
TSP	2	42 %	52.5
	7	19.4 %	24.3
	13	46 %	57.5
H2S	2	< LoR	< LoR
	14	< LoR	< LoR
NOx	4	34.3 %	42.9
	15	28.9 %	35.7

As one of the limits of reporting for H_2S is at 80 % of the in-stack concentration criterion, these concentrations should continue to be monitored for future operations to ensure compliance is achieved.

6. Predicted ground level concentrations

In order to quantify the impacts of air emissions, AUSPLUME version 6 was used in accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (NSW Environment Protection Authority, 2005). With in-stack testing conducted quarterly, the assessment can be conducted as a Level 2 (refined dispersion modelling) assessment according to the NSW Approved Methods.

Three pollutants were identified for this assessment according to the EPL:

- Odour (condition L5);
- Dust as Total Suspended Particulates (TSP) (condition O3).
- VOCs as a result of past non-compliance to in-stack limits.

These sources (and the associated pollutants) were indicated to be closest to compliance limits in section 5 and as such have been the focus of dispersion modelling to predict ground level concentrations. The remaining pollutants NOx and H_2S, as a result of comfortable compliance with in-stack limits, can be reasonably predicted to meet ground level concentrations.

6.1 Model inputs

Model inputs for the dispersion modelling of pollutants identified are based on the most recent in-stack testing and consider DPs 2, 3 and 14.

The physical characteristics of each modelled stack are given in Table 10. The peak to mean ratio of 2.3:1 was applied to estimate the peak 1 second average concentrations of odour from the modelled 1 hour average for wake affected point sources. The lower end of the stack exit velocity range was used for the modelling to be conservative in the prediction of ground level concentrations.

Table 10 Modelled parameters for current emissions impact

Source	Combined Vent (DP2)	Combined Vent (DP7)	Solvent Plant Extraction scrubber (DP3)	Filter Blower Vapour Scrubber Vent (DP14)
Stack height	30	25	23.5	28
Diameter	1.05 metres	0.85 metres	1.05 metres	0.31 metres
Exit Temperature	48 degrees Celsius	30 degrees Celsius	48 degrees Celsius	28 degrees Celsius
Exit velocity	5.06 m/s	11 m/s	4.8 m/s	1.43 m/s

A summary of the mass emission rates is provided in Table 11 for the sources.

Table 11 Summary of mass emission rates for dispersion modelling

	Mass emission rates (maximum recorded)			
	Source 2	Source 3	Source 14	Source 7
VOCs (g/s)	-	0.110	0.004*	-
TSP (g/s)	0.077	-	0.004	0.051
Odour (OUV/min)	559,800	21,000,000 (all measurements) 3,126,000 (April 2015)	97,200	-
* using most recent in-stack testing numbers from 2015				

The following sensitive receptors were selected to represent nearby isolated rural residences for dispersion modelling concentrations.

Table 12 Sensitive receptor locations

Receptor ID	Easting (m)	Northing (m)
R1	537,248	6121,739
R2	537,625	6121,799
R3	538,090	6121,848
R4	537,968	6122,862
R5	537,760	6123,116
R6	538,140	6123,263
R7	538,268	6123,807
R8	540,329	6119,814
R9	540,594	6119,575

6.2 Predicted impacts

Dispersion modelling was conducted for the three main pollutants identified through in-stack testing; VOCs, TSP and odour.

6.2.1 VOCs and hexane

VOCs do not have a specific criterion in the NSW Approved Methods for the Modelling and Assessment of Air Pollutants. Hexane was identified as the significant VOC at the facility, based on results of in-stack testing conducted prior to 2015, for sources DP3 and DP14. Hexane has a ground-level concentration limit of 3200 µg/m^3 in the Approved Methods and as such, hexane emissions were modelled.

The NSW Approved Methods for the Sampling and Analysis of Air Pollutants (NSW Environment Protection Authority, 2007) prescribes the calculation of VOCs as n-propane equivalent on a mass basis when numerous species of VOCs are present (as is the case with DP14).

As evident from Table 13, the criterion for hexane is easily met at all sensitive receptors for both existing and proposed operations, with concentrations all less than 1 % of the criterion.

Table 13 Maximum predicted impacts –hexane (criterion in NSW Approved methods = 3200 µg/m^3 (1 hour average)

Receptor	Existing impacts – µg/m^3		Predicted future impacts – µg/m^3	
	2015 measurements	Maximum recorded measurements	2015 measurements	Maximum recorded measurements
Maximum on Receptor Grid	12.5	16.9	15.7	21.1
R1	0.7	0.9	0.9	1.2
R2	0.9	1.2	1.2	1.5
R3	1.4	1.8	1.7	2.3
R4	1.1	1.4	1.3	1.7
R5	0.9	1.1	1.1	1.3
R6	0.6	0.8	0.8	1.0
R7	0.4	0.6	0.5	0.7
R8	0.5	0.6	0.6	0.7
R9	0.4	0.5	0.5	0.6

6.2.2 TSP

The criterion of 90 µg/m^3 for TSP is readily met at all sites for current and predicted operations, as evident from Table 14.

Table 14 Maximum predicted impacts – TSP (NSW criterion = annual average of 90 µg/m^3)

Receptor	Existing impacts - µg/m^3 Annual average	Predicted future impacts µg/m^3 Annual average
Maximum GLC on Receptor Grid (beyond site boundary)	0.001	0.00125
R1	0.060	0.075
R2	0.075	0.093
R3	0.101	0.126
R4	0.080	0.099
R5	0.057	0.072
R6	0.031	0.038
R7	0.020	0.025
R8	0.032	0.040
R9	0.027	0.034

6.2.3 Odour

The impact assessment criterion for mixtures of odours pollutant for a nose-response-time average, 99th percentile for single rural residences is given in the NSW Approved Methods as 7.0 odour units. As evident from Table 15, when the April 2015 measurements are applied to existing operations and projected into the future, the odour criterion is met at all sensitive receptors, with the greatest impact occurring at R3 (4.1 OU predicted in future operations). However, using the maximum measured odour emission rates at DPs 2, 3 and 14 results in predicted peak (99.9%ile) odour concentrations above the criterion at 6 of the 9 sensitive receptors for existing operations and 8 of the 9 sensitive receptors for proposed operations.

GHD is aware of one complaint received by ROBE relating to odour in November 2013, over the period from November 2011 to June 2014 (ROBE Environmental Incident Register). The complaint was listed sourced to the soaps and gums from the evaporation pond, which ROBE subsequently removed. This is consistent with their odour management plan which details the complaints handling procedure. The single odour complaint received by ROBE suggests that the plant odour emissions as measured in the April 2015 survey are more likely to represent the actual emissions from the plant.

Table 15 Maximum predicted impacts - odour

Receptor	Existing impacts – OU Nose-response-time average (99th percentile)		Predicted future impacts (25 % increase in throughput) Nose-response-time average (99th percentile)	
	April 2015 measurements	Maximum recorded measurements	April 2015 measurements	Maximum recorded measurements
Maximum on grid array (outside site boundary)	15.0	92	18.8	115
R1	1.8	10.6	2.3	13.3
R2	2.2	13.2	2.8	16.5
R3	3.3	19.6	4.1	24.5

Receptor	Existing impacts – OU Nose-response-time average (99th percentile)		Predicted future impacts (25 % increase in throughput) Nose-response-time average (99th percentile)	
	April 2015 measurements	Maximum recorded measurements	April 2015 measurements	Maximum recorded measurements
R4	2.5	14.8	3.1	18.5
R5	2.1	12.5	2.6	15.6
R6	1.4	8.9	1.8	11.1
R7	1.0	6.1	1.3	7.6
R8	1.1	6.5	1.4	8.1
R9	0.9	5.5	1.1	6.9

6.3 Assessment of hexane

Hexane emission limits were not specifically set in the EPL, however total VOCs have a concentration limit of 40 mg/m^3 (100 percentile).

- Hexane emissions arise from its use as a solvent in the plant, including as vapours from the hexane tanks, either through leaks in the tanks or during filling operations which occurs a few times a year.

Furthermore, non-routine emissions of hexane occur when hexane is released from the separator extractor purge fans during plant shutdowns, when hot work is required to be done.

6.3.1 Hexane from oil refining process

ROBE has indicated to GHD that the proposed operations for the plant do not involve any additional deliveries nor an increase in volume of hexane used at the plant. Instead, plans have been given for the conveyor belt to be widened to increase the seed processing capacity, using the same amount of hexane

Hexane emissions have been identified within the plant through in-stack testing by ETC at DP3 and DP14 prior to 2015. Hexane has been demonstrated to make up the majority of measured VOCs from DP3, while it also represents a significant proportion of VOCs measured at DP14. The exact sources of these hexane emissions have not been identified and should be quantified and assessed as to the likely changes as a result of proposed plant operations.

On the conservative assumption that all VOCs from DP 14 are represented with hexane-equivalence, modelled ground level concentrations at the nearest sensitive receptors from the contribution of DP3 and DP14 are demonstrated to comfortably comply with the hexane criterion (refer to Table 13).

7. Conclusion and recommendations

ROBE has demonstrated improving practices to management of emissions through their plant. This has been evidenced by a reduction in licence conditions for monitoring requirements and ongoing communication with EPA to address concerns in relation to plant operations. The following conclusions can be made based on the information provided to GHD:

- In-stack concentration limits have been demonstrated to comfortably meet compliance limits for TSP, NO_x, and hydrogen sulphide H_2S for existing concentrations based on the quarterly testing conducted in recent years.
- In-stack concentration limits for VOCs at DP 14 have experienced some exceedances over the past few years, with spikes in concentrations identified by previous testing. The most recent testing conducted in 2015 (two rounds) has indicated compliance with the in-stack concentrations for VOCs, and if these conditions continue into the future then conditions will continue to be met for existing operations.
- The predicted increase in air quality emissions for the proposed upgrade was based on conservative assumption that the concentration of each pollutant would increase linearly with the increase in throughput (of around 25 %). Based on this assumption, increases in in-stack concentrations of TSP, NO_x and H_2S would still be predicted to comply. However, an increase in the concentration of VOCs would result in exceedances of the compliance limit.

In order to comply with the in-stack concentration limit of VOCs as specified in their EPL, ROBE must demonstrate that (a) concentrations of VOCs would not increase, through provision of evidence that in the upgrade, in-stack concentration would remain the same, and it would be an increase in flow-rate that would be the factor expected to increase, and that (b) management practices are in place to further reduce VOC emissions through identification of the sources of VOCs at source ID DP 14.

Furthermore, modelling has demonstrated:

- Low predicted ground level concentrations for TSP and VOCs for both existing and future proposed operations, easily meeting NSW EPA criteria for impacts at the nearest sensitive receptors;
- Compliance with NSW EPA odour criterion based on April 2015 odour emission rate measurements for existing and future proposed operations, at the nearest sensitive receptors. However, it should be noted that past measurements of odour emission rate have been higher and, under these conditions, the odour dispersion modelling would show an exceedance of the criterion at most of the nearby receptors.

In order to comply with the odour criterion for ground level concentration at the nearest sensitive receptors, ROBE should demonstrate that odour measurements from the most recent round of testing are representative of future conditions for both current operations and future proposed operations. A more accurate indication of odour sources and concentrations would be possible through an examination of the record of total reduced sulphides for DPs 2, 3 and 14, which are monitored on a continuous, on-going basis.

Finally, ROBE has indicated that hexane emissions as a result of the storage and delivery of the substance would not increase since no changes to deliveries or the quantity of hexane stored is planned. Whilst a small (~8 %) increase in hexane emissions as a result of the combustion of VOCs is predicted, modelling has indicated that ground level concentrations of hexane comfortably comply with the NSW criterion at nearby sensitive receptors. If plant operations,

process flow analysis and testing indicate that other sources of hexane may be present in the facility, these would also require quantification and assessment as to the likely changes as a result of proposed plant operations.

8. References

NSW Environment Protection Authority. (2005). *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*. Sydney: Department of Environment and Conservation NSW.

NSW Environment Protection Authority. (2007). *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*. Sydney: Department of Environment and Conservation NSW.

GHD

Suite 3, Level 1, 161-169 Baylis Street
Wagga Wagga NSW 2650
T: 61 2 6923 7400 F: 61 2 6971 9565 E: wgamail@ghd.com.au

\\ghdnet\ghd\AU\Wagga Wagga\Projects\23\15587\WP\Specialist Studies\Air\75208.docx

Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	B McKay	T Pollock	T Pollock*	K. Day	K. Day*	26/08/2015

www.ghd.com

Appendix F – Noise Impact Assessment

ROBE MoA - Mod 07 0146 MOD 2

Riverina Oil and BioEnergy

Section s75W Modification

Noise Assessment

September 2015

Table of contents

1. Introduction 2
2. Assessment of construction noise 3
   - 2.1 Noise requirements 3
   - 2.2 Construction noise impacts 3
   - 2.3 Recommended construction noise mitigation measures 3
3. Assessment of operational noise 5
   - 3.1 Noise requirements 5
   - 3.2 Existing environment 6
   - 3.3 ROBE facility existing noise emission levels 8
   - 3.4 Potential impacts 10
   - 3.5 Operational mitigation measures 11
4. Conclusion 12

Table index

Table 1 Surrounding sensitive receivers 6
Table 2 Site noise monitoring results, dB(A) 8
Table 3 Noise model validation 10
Table 4 Noise levels at surrounding sensitive receivers from existing operations, dB(A) 10

Figure index

Figure 1 Site boundary and surrounding sensitive receivers 7
Figure 2 Noise monitoring locations 9

1. Introduction

An assessment of the construction and operational noise impacts to support the Riverina Oils and BioEnergy (ROBE) Modification to Approval s75W of the original Project Approval (PA 07_0146) has been undertaken.

This report has been prepared as part of a review conducted by NSW Planning and Environment to provide

- A more detailed construction and operational noise impact assessment to quantify any impacts as a result of the increase in production capacity at the ROBE plant
- Explain existing noise limits, relevant conditions and EPL licence requirements
- Confirm that existing emission limits will not be exceeded
- Comment on the likelihood of increase to noise limits.

The noise impact assessment of the planned expansion is presented in this report. It examines three areas to estimate the consequences of the expansion, namely:

- The likely increase if any in of construction noise;
- The likely increase if any in operational noise

The above points require noise modelling and the inputs to that modelling, namely meteorology and existing noise results are also examined.

The modification includes an:

- Increase the seed crushing capacity from 500 to 600 tonnes per day, which equates to an increase from 165,000 to 200,000 tonnes per annum
- Increase the refining capacity from 200 to 250 tonnes per day, which equates to an increase from 66,000 to 82,500 tonnes per annum
- Increase the vegetable protein meal production from 293.5 to 352 tonnes per day which equates to an increase from 90,000 to 116,000 tonnes per annum.

The increase in capacity will require process optimization by augmentation or replacement of a range of equipment within the process including the flaker, hoppers, conveyors, screens, oil tanks, pumps and filters. The augmentation of the plant will be undertaken predominately within the existing layout of the plant and will not introduce any substantial environmental risks to the operation of the facility. The proposed modifications are not consistent with the exiting project approval or development described in the Environmental Assessment undertaken for the site. Therefore, a further modification under Section 75 W of the EP&A Act is required.

2. Assessment of construction noise

2.1 Noise requirements

Correspondence from the Department of Planning and Environment (DP&E) stipulates the following requirements in relation to Noise:

Quantification of construction noise impacts in a noise impact assessment, with reference to the EPA's 'Interim Construction Noise Guideline (DEC 2009)'.

Information provided by ROBE confirms that the construction period will be approximately 10-15 days.

The *Interim Construction Noise Guideline* (DEC 2009) has two assessment methods as follows:

- The quantitative assessment method is used for works that have the potential to affect sensitive receivers and land uses for more than three weeks.
- The qualitative assessment method is applicable for short term works that are likely to affect sensitive receivers and land uses for less than three weeks in total. The qualitative assessment does not require noise predictions or assessment against a noise criteria but rather provides appropriate mitigation measures to manage noise and complaints if noise impacts are expected.

Since the construction is to occur for less than 3 weeks the qualitative assessment method has been used.

2.2 Construction noise impacts

Construction works are expected to occur for less than 3 weeks and are limited to replacement and installation of new equipment located with the building. Construction works should not significantly impacts surrounding sensitive receivers. Construction noise mitigation measures have been recommended and are provided in Section 2.3.

2.3 Recommended construction noise mitigation measures

The following construction noise mitigation measures are recommended:

- Noise generating construction activities shall be undertaken in accordance with the *Interim Construction Noise Guideline* (DECC, 2009) and during the recommended standard hours for construction work:
  - 7 am – 6 pm Monday to Friday
  - 8 am – 1 pm Saturdays
  - No work on Sundays or Public Holidays.
- Construction work outside normal hours would only comprise:
  - Outage related works where system outages are unavailable during daylight hours (for example cut over works)
  - The delivery of oversized loads if requested by police or other authorities for safety reasons
  - Emergencies
  - Other non-construction activities that are not audible at the substation boundary, including testing and commissioning activities.

- All site workers should be sensitised to the potential for noise and vibration impacts on local residents and encouraged to take practical and reasonable measures to minimise the impact during the course of their activities. This should include:
  - Avoid the use of loud radios
  - Avoid shouting and slamming doors
  - Where practical, machines should be operated at low speed or power and switched off when not being used rather than left idling for prolonged periods
  - Keep truck drivers informed of designated vehicle routes, parking locations and delivery hours
  - Minimise reversing
  - Avoid dropping materials from height
  - Avoid metal to metal contact on material
  - All engine covers should be kept closed while equipment is operating.

3. Assessment of operational noise

3.1 Noise requirements

DP&E have not specified any additional requirements specific to operational noise however the site will need to comply with the existing approval noise limits. The DP&E CoA 24 and EPL 13097 Clause L4.1 specify the following noise limits for the existing ROBE facility are as follows:

Noise Limits (dB(A))

Day	*Evening*	*Night*	*Night*	*Location*
$L_{Aeq\ (15\ minute)}$	$L_{Aeq\ (15\ minute)}$	$L_{Aeq\ (15\ minute)}$	$L_{A1\ (1\ minute)}$ or $L_{A\ max}$	
35	*35*	*35*	*45*	*At any residence or other sensitive receiver*

Note: a) To determine compliance with the $L_{Aeq\ (15\ min)}$ noise level limits in the above table, noise from the project is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of a dwelling where the dwelling (rural situations) is more than 30 metres from the boundary. To determine compliance with the $L_{A1\ (1\ minute)}$ noise level limits in the above table, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the EPA may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).

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

b) The noise emission limits identified in the above table apply under meteorological conditions of:

- *Wind speeds of up to 3 m/s at 10 metres above ground level*
- *Temperature inversion conditions of up to 3˚C/100m, and wind speeds of up to 2m/s at 10 metres above the ground level.*

L4.2 For the purpose of the above condition:

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

3.2 Existing environment

The nearest residential receivers to the site have been identified in Table 1 and Figure 1.

Table 1 Surrounding sensitive receivers

Receiver	Easting	Northing	Distance to site boundary (km)
R1	537248	6121739	1.5
R2	537625	6121799	1.9
R3	538090	6121848	1.0
R4	537968	6122862	1.5
R5	537760	6123116	1.75
R6	538140	6123263	1.5
R7	538268	6123807	1.9
R8	540329	6119814	1.9
R9	540594	6119575	2.25

Figure 1 Site boundary and surrounding sensitive receivers

3.3 ROBE facility existing noise emission levels

Attended noise measurements were undertaken at the site boundary to determine the existing ROBE facility operational noise emissions. The measurements were undertaken

- During the night-time period
- At four locations on the site boundary
- On the 17 and 18 June 2015
- With the plant running under typical operational capacity
- Using a B&K 2250 Light Type 1 sound level meter (Serial number 2722377)

The sound level meter was calibrated before and after the measurement period using a SVAN SV-30 acoustic calibrator (Serial No.39467) and was found to be within the acceptable tolerance of ± 0.5 dB(A).

The noise monitoring locations on the property boundary are shown in Figure 2. Table 2 details the noise monitoring results at the four boundary locations (L1 to L4) for each 15-minute measurement (M1 and M2).

No tonal, low frequency or impulsive noise sources were observed during the attended monitoring period.

Table 2 Site noise monitoring results, dB(A)

	Location 1 (L1)		Location 2 (L2)		Location 3 (L3)		Location 4 (L4)	
	M1	M2	M1	M2	M1	M2	M1	M2
$L_{Aeq,15\ minute}$	59.3	45.2	54.9	57.1	49.8	50.0	50.2	45.4
Site contribution $L_{Aeq,15\ minute}$	**39.7**	**40.2**	**47.1**	**47.2**	**49.8**	**49.9**	**44.9**	**45.4**
Measurement commenced	21:56	22:11	22:34	22:49	23:15	23:30	23:58	00:13
Measurement ceased	22:11	22:26	22:49	23:04	23:30	23:45	00:13	00:28
Weather observations (at ground level)	Temp: 11 °C Wind: 0 m/s Rain: Light mist		Temp: 11 °C Wind: 0 m/s Rain: NIL		Temp: 11 °C Wind: 0 m/s Rain: NIL		Temp: 11 °C Wind: 0 m/s Rain: NIL	
Noise emission observations L_{Ap}	**Site hum: 39 - 44** Road traffic: 45 - 79		**Site hum: 45 - 48** Road traffic: 48 - 77 Birds: 49 - 59		**Site hum: 48 - 52** Car door: 52 – 55		**Site hum: 43 - 48** Road traffic: 48 - 52 Rail traffic: 48 -	

Figure 2 Noise monitoring locations

This noise measurement results on the property boundary have been used to calibrate the noise model which has been used to predict the noise emissions from the existing ROBE facility at the identified surrounding sensitive receivers (R1 to R9). Noise modelling was undertaken using CadnaA v4.4 which calculates environmental noise propagation according to *ISO 9613-2 Acoustics – Attenuation of sound during propagation outdoors.*

The following assumptions and calculation parameters were used in the noise model:

- The site and surrounding land was modelled assuming a ground absorption coefficient of 0.5
- Atmospheric absorption was based on an average temperature of 10 °C and an average humidity of 70 per cent which accounts for typical worst case propagation
- The algorithm also takes into account the presence of a well-developed moderate ground based temperature inversion, such as commonly occurs on clear, calm nights or 'downwind' conditions which are favourable to sound propagation
- Noise receivers were modelled at a height of 1.5 metres
- The noise source on the ROBE facility was modelled at a noise level and location that achieved a noise model calibration of within +/- 1 dB(A). Validation of the noise model is shown in Table 3 which compares the predicted and measured ROBE property boundary noise levels. Note that the source level was set to ensure that the predicted noise levels were greater than the measured noise levels.

Table 3 Noise model validation

Monitoring location	Modelled, dB(A)	Measured, dB(A)	Difference
L1	41.0	40.0	+1.0
L2	47.7	47.2	+0.5
L3	50.9	49.9	+1.0
L4	45.1	45.2	0.0

3.4 Potential impacts

With consideration to noise the following potential impacts have been identified:

- An additional 17TPH capacity flaker
- Replacement of 2 existing cooling fans
- Pump upgrades to internal impellors
- Widening of existing conveyor belt by approximately 10%
- Pipework and pipe screen widening to optimize canola oil passage in the system.

3.4.1 Assessment of existing ROBE facility noise impacts at surrounding sensitive receivers

Noise levels from the existing ROBE facility are shown in Table 4 and are predicted to comply with the DP&E CoA 24 and EPL 13097 Clause L4.1 noise limits. Note there are no significant LAmax or LA1 events therefore the LAmax is not required to be assessed.

Table 4 Noise levels at surrounding sensitive receivers from existing operations, dB(A)

Receiver	Noise limit	Predicted noise level	Compliance with the noise limit
R1	35 $L_{Aeq(15min)}$ 45 L_{Amax} or $L_{A(1min)}$	23	**(-12)**
R2		25	**(-10)**
R3		29	**(-6)**
R4		24	**(-11)**
R5		26	**(-9)**
R6		25	**(-10)**
R7		28	**(-7)**
R8		23	**(-12)**
R9		21	**(-14)**

3.4.2 Assessment of potential operation noise impacts from the proposed modification

Potential noise impacts with consideration to the modification are discussed below:

- The dominant noise source with the ROBE facility is the 2 existing flakers which are located within the Seed Processing Plant (SPP) building. There are currently 2 existing 15TPH capacity flakers which can operate simultaneously. An additional 17TPH capacity flaker is proposed however it would only operate simultaneously with 1 of the other existing flakers. The second existing flaker would be on standby during emergency or maintenance. As such only 2 flakers would operate at any one time. The capacity of the proposed flaker will only marginally increase. Therefore, the noise from operation of the flakers is unlikely to significantly change.
- A single more efficient fan is to be installed. The newer more efficient fan is likely to produce similar noise emissions
- The conveyor belt would be increased in width; however the conveyor motor and chassis would remain unchanged. The modifications should not change the noise emissions from conveyor
- Some of the pumps will be replaced or upgraded however the total number and power rating of the pumps will not significantly increase
- There will be minor alterations to the pipework and screens which will have minimal effect on noise emissions
- There will be no other additional equipment that would produce significant noise emissions above the existing equipment
- All of the equipment is located inside the SEP and Refinery buildings and the internal building noise levels are not expected to significantly increase.

The noise levels from the site are currently predicted to comply with the site noise limits by between 6 to 14 dB(A) and are a fraction of the allowable sound energy. The equipment modifications to the site should not significantly increase the site noise emissions. Therefore, the proposed modifications should be acceptable from an acoustic perspective.

3.5 Operational mitigation measures

It is recommended that compliance noise monitoring be carried out at the commencement of operations of the modified ROBE facility to confirm that the noise limits are not exceeded. In the unlikely event that noise limits are shown to be exceeded, then additional mitigation measures could be incorporated into the building design to reduce noise levels to below the noise limits.

4. Conclusion

An assessment of the construction and operational noise impacts to support the ROBE Modification to Approval s75W of the original Project Approval (PA 07_0146) has been undertaken.

Construction works are expected to occur for less than 3 weeks and are limited to replacement and installation of new equipment located with the building. Construction works should not produce significant noise impacts at surrounding sensitive receivers and construction noise mitigation measures have been recommended.

The noise levels from the site are currently predicted to comply with the site noise limits by between 6 to 14 dB(A). The equipment modifications to the site should not significantly increase the site noise emissions. Therefore, the proposed modifications should be acceptable from an acoustic perspective.

GHD

Suite 3, Level 1, 161-169 Baylis Street
Wagga Wagga NSW 2650
T: 61 2 6923 7400 F: 61 2 6971 9565 E: wgamail@ghd.com.au

G:\23\15587\WP\75207.docx

Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
A	D. Galt	E. Milton	E Milton*	K. Day	K. Day*	26/08/2015
0	D. Galt	E. Milton	E Milton*	K. Day	K. Day*	04/08/2015

www.ghd.com

GHD

Suite 3, Level 1, 161-169 Baylis Street
Wagga Wagga NSW 2650
T: 61 2 6923 7400 F: 61 2 6971 9565 E: wgamail@ghd.com.au

\\ghdnet\ghd\AU\Wagga Wagga\Projects\23\15587\WP\75185 (Repaired).docx

Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
A	P. Russell	K. Day	K. Day*	K. Day	K. Day*	26/08/2015
0	p. Russell	K. Day	K. Day*	K. Day	K. Day*	04/09/2015

www.ghd.com