

## **ASSESSMENT REPORT**

**Shoalhaven Starches Ethanol Expansion Project  
Section 75W Modifications (MP 06\_0228)**

**MOD 11 – DDG Dryers and Cooling Towers  
MOD 12 – Beverage Grade Ethanol**



**August 2017**

Cover photo: Aerial Photograph of Shoalhaven Starches Factory, Bomaderry  
Source: [www.manildra.com.au](http://www.manildra.com.au)

© Crown copyright 2017  
Published August 2017  
NSW Department of Planning and Environment  
[www.planning.nsw.gov.au](http://www.planning.nsw.gov.au)

Disclaimer:  
While every reasonable effort has been made to ensure that this document is correct at the time of publication, the State of New South Wales, its agents and employees, disclaim any and all liability to any person in respect of anything or the consequences of anything done or omitted to be done in reliance upon the whole or any part of this document

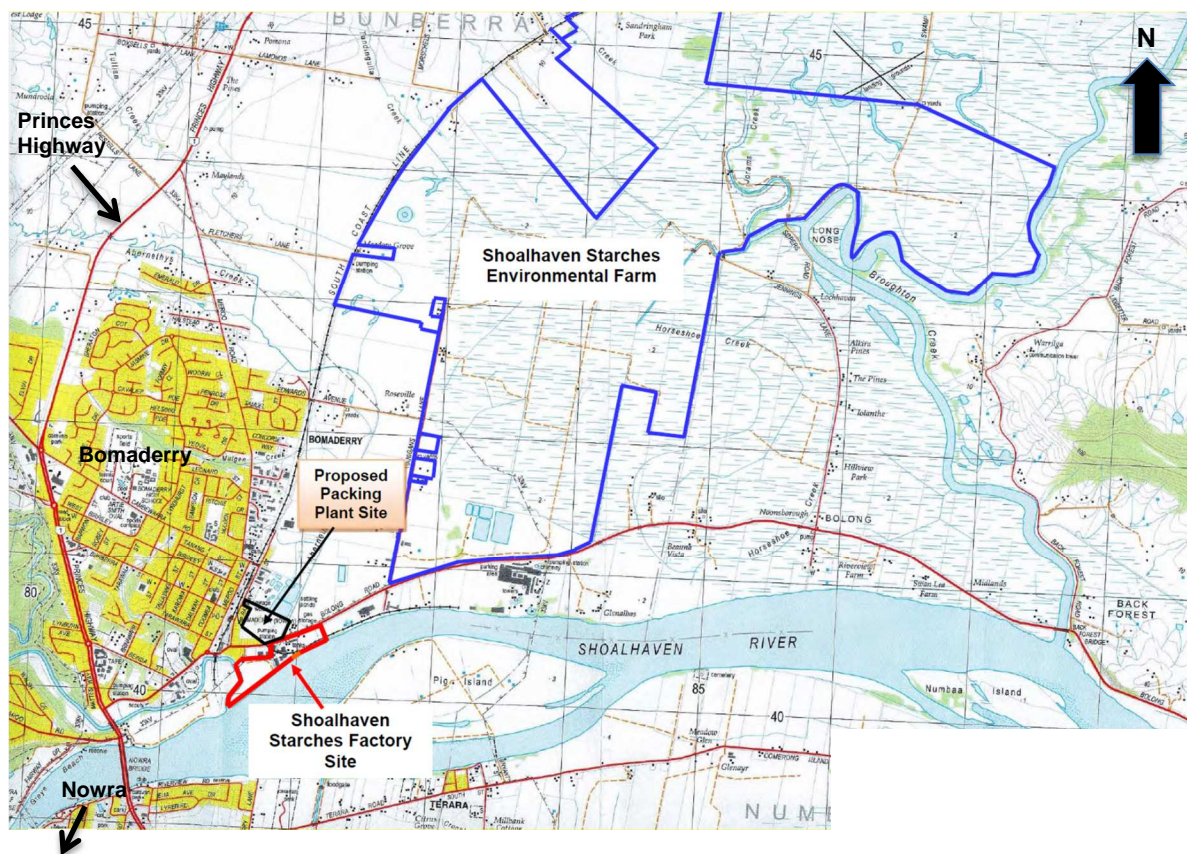
## 1. INTRODUCTION

This report assesses two modification requests by Shoalhaven Starches Pty Ltd (the Proponent) to modify its factory in Bomaderry on the NSW South Coast. The requests have been lodged under Section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The requests seek approval to relocate approved infrastructure within the factory site and increase the production of beverage-grade ethanol.

## 2. BACKGROUND

Shoalhaven Starches has operated a factory at Bomaderry in the Shoalhaven local government area since 1979 (see **Figure 1**). The factory receives wheat grain from mills in western NSW which is processed to produce food, beverage, paper and fuel products. These include flour, gluten, glucose, starch and ethanol (for beverage, industrial and fuel products). The factory is a 24/7 operation and has around 300 employees.

Wastewater generated from processing activities is treated and irrigated on a nearby 'environmental farm' owned by the Proponent. The environmental farm covers over 1,000 hectares (ha) of rural land on the northern bank of the Shoalhaven River and contains a wastewater treatment plant, storage ponds and extensive irrigation system for discharging treated wastewater from the factory (see **Figure 1**).



**Figure 1** - Shoalhaven Starches Factory, Packing Plant Site and Environmental Farm, Bomaderry

In 2009, the then Minister for Planning approved a major expansion to fuel-grade ethanol production at the factory. The approval required the Proponent to implement significant odour controls, including a wastewater treatment plant. The odour controls were implemented in 2011-12 and have been successful in substantially reducing odour complaints from the nearby residential areas.

Since 2009, the demand for fuel-grade ethanol has not increased as anticipated, so the Proponent has sought to modify components of the approved project to adapt production and diversify its outputs. The Proponent seeks to optimise production of flour, gluten, starch and beverage-grade ethanol products, as opposed to fuel-grade ethanol, in order to remain economically competitive.

## **2.1 Site Description**

The factory and environmental farm are located on the eastern fringe of Bomaderry and 2 kilometres (km) to the north-east of the township of Nowra. The factory is surrounded by other industrial uses, including a metal fabrication factory, meat packaging works and industrial and agricultural suppliers. The nearest residences are located in Bomaderry, 300 metres (m) to the west of the approved packing plant and over 400 m north-west of the factory. There are a few rural residential properties near the environmental farm on Bolong Road and Jennings Lane.

Shoalhaven City Council's sewage treatment works is located 180 m to the north of the factory and Bomaderry railway station is located 500 m to the north-west of the factory. Shoalhaven Starches has a private rail spur line, which extends from the railway station across Railway Street and Bolong Road into the factory site, extending for approximately 750 m along the northern bank of the Shoalhaven River.

## **2.2 History of Planning Approvals & Modifications**

Prior to 2009, the Proponent operated its factory and environmental farm under multiple, separate planning approvals issued by Shoalhaven City Council (Council) and the Minister for Planning.

### ***Shoalhaven Starches Ethanol Expansion Project (06\_0228)***

In January 2009, the then Minister for Planning approved the Shoalhaven Starches Ethanol Expansion Project (SSEEP) under the now repealed provisions of Part 3A of the EP&A Act. The SSEEP approval consolidated all previous planning approvals for the site with the aim of simplifying regulation and compliance.

The SSEEP is shown on **Figure 2** and involved:

- staged increases of ethanol production from 126 megalitres a year (ML/yr) to 300 ML/yr following successful implementation of a range of odour controls;
- implementation of mandatory odour controls including a wastewater treatment plant and biofilter; and
- installation of additional infrastructure at the dried distillers grain (DDG), ethanol and starch plants, a new packing plant, rail siding and product and wastewater pipelines.

By June 2012, the Proponent had installed the mandatory odour controls and the Department approved the increase in ethanol production to the maximum volume permitted being 300 ML/yr, subject to conditions, including quarterly odour monitoring and annual odour audits. Demand for ethanol in fuels has not increased as predicted, with ethanol production levels at the factory in the order of 219 ML/yr in 2015.

Given the reduced market demand for ethanol, the Proponent now proposes to divert more liquid starch into dried starch, and is progressively installing infrastructure that will allow optimisation of flour products and increased production of beverage grade ethanol for alcohol products. The Proponent has lodged two modification requests to amend the size and location of approved infrastructure and increase production of beverage grade ethanol, as opposed to fuel grade ethanol.

### **Modifications to 06\_0228**

Since 2009, there have been ten modifications approved to the SSEEP by the Planning Assessment Commission. The most recent modifications reflect the changed focus to increased flour, starch and gluten production. **Table 1** summarises these modifications.

**Table 1: Modifications to the Shoalhaven Starches Ethanol Expansion Project (06\_0228)**

<b>MOD No.</b>	<b>Date Approved</b>	<b>Description</b>
1	30 Sept 2011	<ul style="list-style-type: none"><li>remove the requirement for the dried distillers grain (DDG) pelletising plant from the list of mandatory odour controls; and</li><li>implement alternate odour controls including a new loading chute with dust extractor and extension of the load-out shed to fully enclose truck loading.</li></ul>
2	14 Sept 2012	<ul style="list-style-type: none"><li>install additional infrastructure to improve operational and energy efficiency, including two additional fermenter tanks, an evaporator, beer column, heat exchangers, substation and compressors.</li></ul>
3	9 Oct 2012	<ul style="list-style-type: none"><li>relocate an approved staff car park of 60 spaces to the former Dairy Farmers site;</li><li>include the former Dairy Farmers site at 220 Bolong Road in the project approval, following acquisition by the Proponent.</li></ul>
4	24 Mar 2014	<ul style="list-style-type: none"><li>relocate the approved DDG pelletising plant within the factory site, increase its footprint and approved height, from 21 m to 28 m.</li></ul>
5	16 Sept 2015	<ul style="list-style-type: none"><li>modify the design, footprint and odour controls on the DDG pelletising plant including a 49 m high air discharge stack; and</li><li>construct eight storage silos up to 26 m high.</li></ul>
6	25 Nov 2015	<ul style="list-style-type: none"><li>demolish a disused industrial building "Moorehouse" purchased by the Proponent; and</li><li>construct a temporary car park on the northern side of Bolong Road adjacent to the Shoalhaven Water pumping station.</li></ul>
7	18 Jan 2016	<ul style="list-style-type: none"><li>relocate the approved Starch Dryer No. 5 within the factory site to the former "Moorehouse" site and increase the overall footprint; and</li><li>construct a substation, pipes and pipe gantry to supply the starch dryer.</li></ul>
8	1 Mar 2016	<ul style="list-style-type: none"><li>extend the existing flour mill to increase flour production from 265,000 to 400,000 tonnes per annum (tpa) and offset imports of flour to the factory from mills in western NSW.</li></ul>
9	8 Mar 2017	<ul style="list-style-type: none"><li>increase the size of the approved packing plant to increase the type and volume of packaged dried products;</li><li>construct a container storage and truck loading area with noise barriers;</li><li>extend and duplicate the approved rail spur line;</li><li>install product pipes under Bolong Road, a small bag packer at the DDG pellet plant and a new stormwater detention tank.</li></ul>
10	18 April 2017	<ul style="list-style-type: none"><li>Construct a new flour mill B and increase flour production on site from 400,000 to 842,400 tpa;</li><li>Relocate seven storage silos, store six of the silos on the former Paper Mill site and relocate one silo adjacent to the DDGs plant to store mill feed;</li><li>Construct a mill feed structure with bucket elevator and dust collectors to transfer husk material into DDGs dryers.</li></ul>

### **Council Issued Consents**

Separate to the SSEEP approval, the Proponent sought and obtained development consents from Council for works associated with the factory. This has included:

- construction and operation of an interim packing plant at the factory (RA 11/1002);
- demolition of the dimethyl ether plant (DA 13/1713); and
- construction of two additional grain silos for buffer storage (DA 14/2161).

Council also granted approval to the Proponent for road and site access upgrades, consistent with the SSEEP approval. These included:

- upgrades to site access points on Bolong Road, including the Dairy Farmers site access (DA 10/1843); and
- widening the access point to the interim packing plant (DA 11/1855).

Two other Council issued consents apply to land adjacent to the factory and owned by the Proponent. These include the Algae Demonstration Facility and the Meat Processing Plant, both located at the former Dairy Farmers site.





### 3. PROPOSED MODIFICATIONS

The Proponent lodged the following modification (MOD) requests under Section 75W of the EP&A Act:

- MOD 11 – DDGs Dryers and Cooling Towers, lodged on 1 November 2016; and
- MOD 12 – Beverage Grade Ethanol, lodged on 23 November 2016.

As the modification requests were lodged at a similar time, the Department has evaluated the impacts of both modifications under this assessment report to provide a complete view of the proposed changes. The modification requests are summarised in **Table 2**, shown on **Figures 3 to 5** and described in full in the Environmental Assessments (EAs) accompanying each modification (**Appendix C**). **Plates 1 to 6** show existing similar infrastructure on the site.

The modifications involve relocating approved infrastructure within the factory site and modifying the design, size and footprint of the approved, but not constructed, infrastructure. The modifications also involve increasing beverage-grade ethanol for alcohol products, with a corresponding reduction in fuel-grade ethanol production.

**Table 2: Proposed Modifications**

Modification	Description
<b>Mod 11 – DDGs Dryers, Cooling Towers, Maintenance Building and Biofilters</b>	
DDGs dryers ( <b>Figure 3</b> )	<ul style="list-style-type: none"> <li>• reduce the number of approved dryers from six to four and relocate close to the existing DDG pellet plant, shown in <b>Plate 1</b>;</li> <li>• increase the height of the approved DDGs dryer building by 2 m (total 22 m);</li> <li>• increase the height of the approved DDGs stack by 5 m (total 30 m); and</li> <li>• relocate the motor control centre (MCC) room.</li> </ul>
Cooling towers ( <b>Figure 3</b> )	<ul style="list-style-type: none"> <li>• relocate approved cooling towers within the site.</li> </ul>
Forklift maintenance building	<ul style="list-style-type: none"> <li>• construct a forklift maintenance building with a footprint of 756 square metres (m<sup>2</sup>) and height of 10 m.</li> </ul>
Biofilters	<ul style="list-style-type: none"> <li>• install two new biofilters to treat air emissions from the DDGs dryers.</li> </ul>
Container storage	<ul style="list-style-type: none"> <li>• construct a hardstand for container preparation and storage (existing container storage area is shown in <b>Plate 2</b>).</li> </ul>
Coal and woodchip stockpile ( <b>Plate 3</b> )	<ul style="list-style-type: none"> <li>• regularise the storage of coal and woodchips in stockpiles on the factory site;</li> <li>• regularise and expand the storage of coal and woodchips in stockpiles on the environmental farm, covering 4 hectares (see <b>Plates 3, 4 and 5</b>).</li> </ul>
Construction	<ul style="list-style-type: none"> <li>• 6 months and 20 construction staff.</li> </ul>
<b>Mod 12 – Beverage Grade Ethanol</b>	
Ethanol distillery ( <b>Figure 4</b> )	Construct new ethanol distillery equipment east of the existing distillery (see <b>Plate 6</b> ) including: <ul style="list-style-type: none"> <li>• four new rectifier columns 46 m high;</li> <li>• four new re-boiler columns 23.5 m high;</li> <li>• three ethanol storage tanks within bunds (19 m and 24 m high); and</li> <li>• pipes and gantries to connect new infrastructure and tanks.</li> </ul>
Ancillary infrastructure	<ul style="list-style-type: none"> <li>• install eight cooling towers 7.5 m high;</li> <li>• construct a substation;</li> <li>• construct emergency ISO container storage area; and</li> <li>• demolish existing fire pump station and install an approved pump station on the northern side of Bolong Road.</li> </ul>
Relocation of approved infrastructure	<ul style="list-style-type: none"> <li>• relocate approved rectifier column and side stripper column; and</li> <li>• relocate evaporator unit.</li> </ul>
Rail siding ( <b>Figure 5</b> )	<ul style="list-style-type: none"> <li>• extend two existing rail sidings on the northern bank of the Shoalhaven River to enable train maintenance by 105 m and 170 m;</li> <li>• remove existing tanks and fill a wastewater pond at the Dairy Farmers site.</li> </ul>
Car parking	<ul style="list-style-type: none"> <li>• provide an 58 space carpark on the northern side of Bolong Road adjacent to BOC gas.</li> </ul>
Production	<ul style="list-style-type: none"> <li>• increase production of beverage grade ethanol to 110 ML/yr (total ethanol production at the factory would not exceed the approved 300 ML/yr).</li> <li>• no increase in the volume of wastewater generated.</li> </ul>
Construction	<ul style="list-style-type: none"> <li>• 18 months and 37 construction staff.</li> </ul>





**Plate 1** – Existing DDG Loadout Shed (foreground) and DDG Pellet Plant & Stack (background)



**Plate 2** – Existing Container Storage Area (east of DDG Plant)

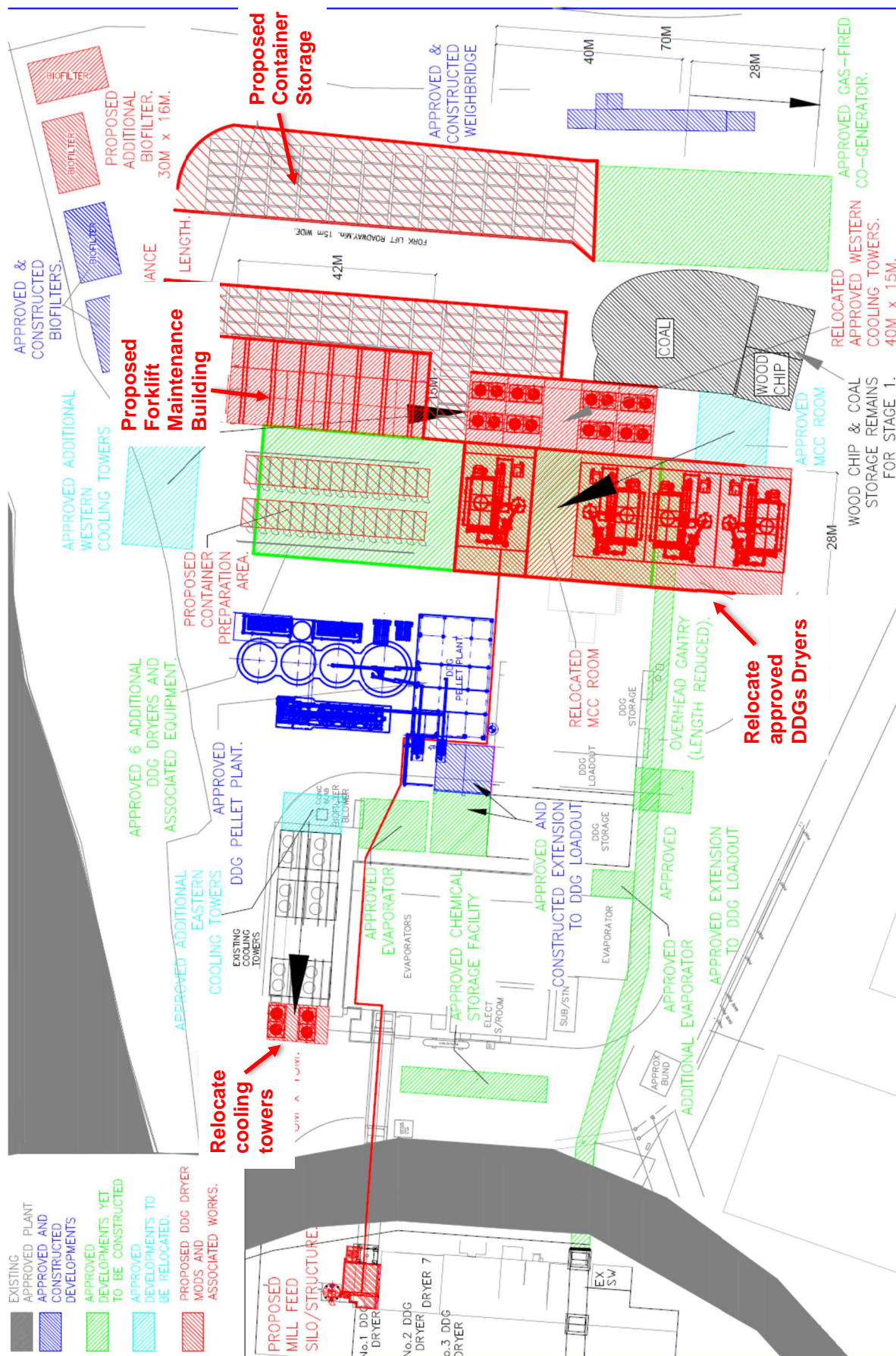


**Plate 3** – Regularise and Expand Existing Coal and Woodchip Storage on Environmental Farm (MOD 11)



**Plate 4** – Existing Coal Stockpile on Environmental Farm (viewed from Bolong Road)





**Figure 3 – Proposed Modifications to DDGs Dryers, Cooling Towers, Container Storage and Forklift Maintenance Building (MOD 11). Modifications shown in red**



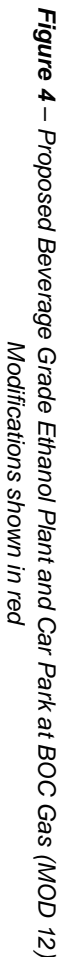


**Plate 5** – Existing Woodchip Stockpile on Environmental Farm (viewed from Hanigans Lane)



**Plate 6** – Existing Ethanol Distillery







#### **4. STATUTORY CONTEXT**

##### Approval Authority

The Minister for Planning was the approval authority for the original project application, and is consequently the approval authority for the modification requests.

However, as the Proponent made reportable political donations, the requests will be determined by the Planning Assessment Commission (the Commission) in accordance with the Minister's Instrument of Delegation, dated 14 September 2011.

##### Section 75W

In accordance with Clause 12 of Schedule 6A of the EP&A Act, Section 75W of that Act as in force immediately before its repeal on 1 October 2011 and as modified by Schedule 6A, continues to apply to transitional Part 3A projects.

Under Section 75W of the EP&A Act, the Minister is obliged to be satisfied that what is proposed is a modification of the original proposal, rather than being a new project in its own right.

The Department notes:

- the primary function and purpose of the approved project would not change due to the modifications;
- the modifications involve alterations to approved infrastructure to adapt production within the existing limits;
- the modifications are of a scale that warrants the use of Section 75W of the EP&A Act; and
- any potential environmental impacts would be minimal and appropriately managed through the existing or modified conditions of approval.

Consequently, the Department considered the requests should be assessed and determined under Section 75W of the EP&A Act rather than requiring a new development application.

#### **5. CONSULTATION & SUBMISSIONS**

Under Section 75W of the EP&A Act, the Department is not required to notify or exhibit the application. However, following a review of each request, the Department considered the applications should be publicly exhibited, to provide nearby landholders the opportunity to comment on the modifications. The Department:

- made the modification requests publicly available:
  - on the Department's website;
  - at the Department's Information Centre (Bridge Street, Sydney);
  - at the Department's Regional Office (Crown Street, Wollongong); and
  - at Shoalhaven City Council (Bridge Street, Nowra).
- notified nearby landowners about the exhibition periods by letter;
- notified relevant State government authorities and Shoalhaven City Council by letter; and
- advertised the exhibitions in the Nowra South Coast Register and the Shoalhaven and Nowra News.

The requests were exhibited for the following periods:

- Mod 11: from 14 November 2016 to 14 December 2016; and
- Mod 12: from 16 December 2016 to 31 January 2017.

**Table 3** provides a summary of the submissions received on each modification with further discussion of the issues provided below. No submissions were received from the general

public and no objections were received. **Appendix D** contains a web link to the Government agency submissions.

**Table 3: Summary of Submissions**

MOD No.	No. of Submissions	Objections	Submitters
11	4	None	<ul style="list-style-type: none"> <li>• Shoalhaven City Council</li> <li>• Roads and Maritime Services</li> <li>• Environment Protection Authority</li> <li>• Department of Primary Industries</li> </ul>
12	5	None	<ul style="list-style-type: none"> <li>• Shoalhaven City Council</li> <li>• Roads and Maritime Services</li> <li>• Environment Protection Authority</li> <li>• Department of Primary Industries</li> <li>• Fire and Rescue NSW</li> </ul>

### **Shoalhaven City Council (Council)**

Council did not object to the modifications but requested further information on a number of matters common to each modification. These included flooding, traffic and parking. Council agreed with the conclusions of the air quality, noise and contamination assessments and recommended they be referred to the EPA for comment. The specific issues raised by Council are summarised below.

#### **Flooding**

Council requested:

- an updated flood emergency and evacuation plan, to demonstrate safe evacuation is possible for the modified site;
- an engineer's report to demonstrate all new buildings and structures can withstand the forces of flood water, debris and buoyancy forces for specific flood events;
- floor levels of buildings and structures are built above the flood planning level;
- alternative measures to manage the potential flood level increase resulting from the coal and woodchip stockpiles at Hanigans Lane;
- specific measures to manage the coal and woodchip stockpiles during flood events, including maintaining access and measures to ensure materials do not become floating debris; and
- specific controls for the proposed car park at the BOC gas site, as it is in a high hazard flood storage zone.

#### **Traffic and Parking**

Council raised the following concerns in relation to traffic and parking:

- the traffic impact assessment should utilise existing traffic volumes on Bolong Road, rather than reduced volumes predicted by RMS following completion of the Princes Highway upgrade works;
- need for an overall car parking plan for the site to demonstrate the adequacy of on site parking, the number of spaces provided and compliance with Australian Standards;
- access to the proposed car park at the BOC site on the northern side of Bolong Road and its interaction with the distillery access on the southern side of Bolong Road. Council requested the provision of a four-leg roundabout to resolve concerns regarding illegal U-turn movements. Council also requested vehicle swept paths to demonstrate turning movements can be undertaken safely. Section 6.3 of this report addresses this issue;
- maintenance of access to the existing fire pump house; and
- provision of a sealed road shoulder for cyclists on Bolong Road.

Council has previously raised a number of outstanding road and traffic matters during consideration of earlier modifications, which relate to the SSEEPP approval. The



Department's Compliance Unit has been working directly with Council and the Proponent to resolve these matters. The priority matters identified by Council include:

- provision of sealed and line marked car parking on the factory site and at the temporary car park on the northern side of Bolong Road;
- removal of illegal gates on the southern side of Bolong Road opposite the BOC gas site, which have been used for access, despite it not being a designated access point;
- provision of a sealed shoulder, at Council specified widths, to provide sufficient space for right-turning trucks out of the factory;
- complete line marking on Bolong Road and Railway Street for the full length of the project;
- upgrade the access to the Dairy Farmers site to Council's satisfaction;
- specific controls to prevent U-turns at the distillery access; and
- setting further back the automated gates on Hanigans Lane to the environmental farm to provide sufficient space for trucks to pull off the lane whilst waiting for the gates to open (the Proponent provided evidence to the Department's compliance unit in October 2016, demonstrating this item had been completed).

Some of these matters have been completed (removal of illegal gates opposite BOC gas and setback of the automated gates on Hanigans Lane). The other matters are addressed in Section 6.3 of this report. Council did not object to the intent of the draft conditions and provided detailed comments. The Department included some of the detail in the draft notice of modification.

### **Environment Protection Authority (EPA)**

The EPA did not object to the modifications but raised several deficiencies with the odour modelling. The EPA advised the odour modelling:

- is not consistent with the EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*, as it did not adopt peak odour emission rates, instead using average emission rates, which does not represent worst-case;
- does not account for the maximum approved ethanol production volume of 300 ML/year;
- includes errors in the odour emission rates for starch dryers;
- does not directly compare odour emissions from the 2009 model (base case) with predicted emissions for the modifications; and
- does not propose or evaluate additional odour controls as foreshadowed and included in the 2009 SSEEP approval (Stage 2 and 3 Additional Odour Controls).

The EPA did not comment on any other aspects of the modifications, such as noise or waste.

Following submission of the revised odour modelling, the EPA requested further sensitivity analysis to address variability in the odour emissions data. The Proponent provided the additional analysis and the EPA advised it was satisfied with the conclusions of the modelling. The EPA recommended conditions for odour mitigation and verification.

### **Roads and Maritime Services (RMS)**

RMS advised that Bolong Road is a regional classified road and Council is best placed to comment on any safety or capacity issues on Bolong Road regarding the modifications. RMS advised it would issue its concurrence under Section 138 of the *Roads Act 1993*, if Council is satisfied with proposed access arrangements or works to Bolong Road to support the modifications. RMS also raised specific issues including:

- car parking provision on site, both existing and proposed, demonstration there are adequate spaces and they comply with access requirements and minimum widths to ensure no parking on Bolong Road;
- provision of formal pedestrian access on the northern side of Bolong Road to access proposed parking areas; and

- requirements to complete the upgrade works to the Dairy Farmers site access.

### **Fire and Rescue NSW (FRNSW)**

FRNSW provided specific matters to be included in a Fire Safety Study (FSS) for the modifications. A FSS is required following determination and prior to construction. The matters relate to the minimum fire protection system and site resource capabilities that should be provided to enable FRNSW to safely and effectively resolve fire incidents. FRNSW requested:

- an update of the site-wide FSS to include the modifications;
- the FSS include:
  - control measures for low likelihood fire scenarios;
  - meteorological (wind) analysis to determine conditions for worst-case fire or release event; and
  - all fire protection measures and procedures.

### **Department of Primary Industries (DPI)**

The DPI reviewed the modifications and advised it had no comments.

The Proponent consulted with the **Department of Defence (DoD)** and included their response in the EA for Mod 12. The DoD advised it had no concerns with the modification in relation to the operational airspace of HMAS Albatross. DoD requested the Proponent provide as-constructed details to AirServices Australia for tall structures included in the modification, for inclusion in its database. DoD also provided specific details for lighting, should it be used on the structures.

The Department did not receive a response from Transport for NSW, Office of Environment and Heritage or the Office of the National Rail Safety Regulator.

### **Proponent's Response to Submissions (RTS)**

The Proponent provided the following additional information to respond to the issues raised in submissions. The information is collectively referred to as the RTS:

- response to questions on the PHA, prepared by Pinnacle Risk Management dated 21 February 2017 and 24 March 2017;
- Access and Parking Assessment, April 2017 prepared by ARC Traffic and Transport;
- Revised Odour and Air Quality Assessment, May 2017 and Response to EPA's email dated 20 July 2017, prepared by GHD; and
- response to the Department's questions, prepared by Cowman Stoddart dated 22 May 2017.

The RTS was provided to relevant agencies to consider and provide final submissions. Both Council and EPA provided recommended conditions for the modifications.

## **6. CONSIDERATION**

The Department has assessed the merits of the proposed modifications and has reviewed the following as part of its assessment:

- EA and Director-General's assessment report for the SSEE;
- existing conditions of approval (as modified);
- the EAs for the modifications (Appendix C);
- submissions from government authorities (Appendix D);
- the Proponent's response to issues raised in submissions (Appendix E);
- relevant environmental planning instruments, policies and guidelines; and
- requirements of the EP&A Act, including the objects of the Act.

The Department considers the key issues for the two modifications are hazards, odour, traffic and parking and noise. The Department's assessment of other issues, including visual amenity and building height, flooding, riverbank stability, contamination and acid sulphate soils is provided in **Table 5**.

### **6.1 Hazards and Risks**

Modifications to factory processes and equipment has the potential to increase hazards and risks at the facility. Hazards from new plant and equipment, and the risk of propagation to existing plant and equipment were assessed in Preliminary Hazard Analyses (PHA), undertaken by Pinnacle Risk Management (Pinnacle).

The PHA's identified and assessed the following potential hazardous events for MOD 11 and MOD 12:

- dust explosions and smouldering fires from the DDG dryers;
- bund and pool fires through loss of containment of ethanol;
- catastrophic failure of equipment causing fires and vapour explosions;
- tank top fires in ethanol storage tanks; and
- leaks and spills from tanks and tanker loading.

#### MOD 11 – DDG dryers, cooling towers and biofilters

The Department reviewed the PHA and considered the modifications to the DDG dryers and plant are unlikely to result in off-site risk. The PHA recommended appropriate safety measures including installation of explosion vents.

The proposed container storage area would include a mix of empty and full containers, likely to contain dry combustible solids, stored in an open area. The Department agrees with the conclusions of the PHA that explosion is not likely, as there is no confinement in the event of a release from the containers. Smouldering fires is the most credible risk, however it is unlikely to result in off-site risk.

The PHA proposed adequate safeguarding and mitigation measures. The Department recommends these measures are fully implemented to ensure the risks remain on site.

The Department's assessment concludes the proposed MOD 11 satisfies the risk criteria and does not significantly increase the cumulative risk from the facility. The Department recommends updating the existing conditions to include MOD 11, requiring pre-construction and pre-commissioning hazard studies undertaken to the satisfaction of the Secretary.

#### MOD 12 – Beverage grade ethanol

MOD 12 involves construction of new rectifier and re-boiler columns and three additional ethanol storage tanks. Ethanol is a flammable liquid which can be released from the equipment and piping in the event of failure and if ignited can result in pool, jet or flash fires. The PHA considered the potential fire impacts from the release of ethanol.

The Department questioned some of the assumptions used in the analysis and requested further consideration of automated controls to minimise the risks from catastrophic failure on the pressurised column in the proposed ethanol distillery. Pinnacle provided appropriate justifications for the assumptions and provided further analysis of catastrophic column failure including modelling the plume from a release of ethanol from the column. The modelling concluded the plume would not reach ground level, thereby lowering the risk of the event. Pinnacle also confirmed the column would be fitted with a mechanical relief valve for safety. The Department reviewed the additional information and considered the off-site risk to be below the risk criteria and acceptable.

In April 2017, the Proponent submitted a change to the proposed modification layout for MOD 12. The change involved altering the number and size of the proposed ethanol storage

tanks to provide greater operational flexibility. The Department reviewed the proposed changes in consultation with Pinnacle. The Department concluded the risk results and conclusions of the original PHA are the same, if not improved, for the revised tank arrangement, as the tanks would be slightly smaller. The Department considered that additional risk analysis is not necessary for the altered tank arrangement, however these changes should be reflected in the Final Hazard Analysis (FHA) prepared prior to construction. The Department also recommends the proposed tank arrangement and bunding complies with the *Australian Standard AS 1940: 2004 The Storage and Handling of Flammable and Combustible Liquids* (AS 1940).

The Department's assessment concludes the risks posed by MOD 12 satisfy the risk criteria and do not significantly increase the cumulative risks from the facility. Given the importance of the mechanical safety device (relief valve) to prevent catastrophic release from the rectification column, the Department recommends the Proponent provide additional details for the relief valve, such as type and sizing, in the FHA, to be approved by the Secretary prior to commencement of construction.

### **Conclusion and Recommendations**

The Department recommends conditions to ensure hazards and risks from the modified DDG plant and new ethanol distillery are appropriately managed, including a requirement to update the Site-Wide Fire Safety Study, Emergency Plan and Safety Management System to include the modifications. The Department also requires the Proponent submit for the Secretary's approval, a Hazard and Operability Study and Final Hazard Analysis prior to construction of the DDG dryers and beverage grade ethanol distillery. The FHA for the ethanol distillery must include details of the safety device to be fitted on the rectification column and shall demonstrate that the safety device is appropriately sized for the worst-case scenario. The modifications must also be included in subsequent hazard audits of the facility. With these measures in place, the Department's assessment concludes the hazards and risks of the modifications would be appropriately managed.

## **6.2 Odour**

The primary objective for the Shoalhaven Starches facility is to ensure odour impacts from the approved ethanol expansion project do not increase with subsequent modifications to the factory. The existing conditions of approval require implementation of further odour controls if there is any measured increase in odour impacts. With this objective in mind, the odour assessment modelled emissions from the proposed modifications for comparison with modelled emissions for the original ethanol expansion project (2009 base case) and the most recent independent odour audit (2016).

As noted in Section 5, the EPA identified several inadequacies in the odour assessment presented in the EA for MODs 11 and 12. The Proponent commissioned GHD to revise the odour assessment and consider MODs 11 and 12 cumulatively. The revised odour assessment was submitted in May 2017. Following a review of the revised odour assessment, the EPA requested further sensitivity analysis in the modelling to address variability in the odour emissions data. GHD addressed the EPA's specific comments and the EPA advised it was satisfied with the revised odour assessment.

Odour from the factory is primarily from volatile organic compounds (VOCs). The four key odour contributors, in order, are:

- environmental farm – effluent treatment and storage ponds;
- DDG plant – including pellet plant exhaust stacks and biofilters;
- Starch plant – gluten and starch dryers; and
- Ethanol plant – yeast propagators and retention tank.

GHD identified the key components of the modifications likely to generate odour:

- one DDG dryer ducted to the existing biofilters;



- three DDG dryers ducted to two new biofilters;
- relocation of the approved cooling towers; and
- a washing column at the new beverage grade ethanol distillery.

The odour assessment modelled emissions from the key components for comparison with existing and approved operations. As odour impacts from the modifications were predicted to exceed existing levels, mitigation measures were modelled to show the resulting odour reduction. **Table 4** summarises predicted emissions at four key residential receptor locations. **Figure 6** shows the predicted odour contours of existing operations compared with the modification with mitigation installed.

**Table 4: Predicted Peak Odour Impact (Odour Units)**

Location	Criterion	Existing Operations	MODs 11 and 12 no mitigation	MODs 11 and 12 with mitigation
R1 Bomaderry	6	5	5	3
R2 North Nowra	3	3	3	2
R3 Nowra	5	<b>6</b>	<b>6</b>	4
R4 Terara	5	<b>6</b>	<b>6</b>	4

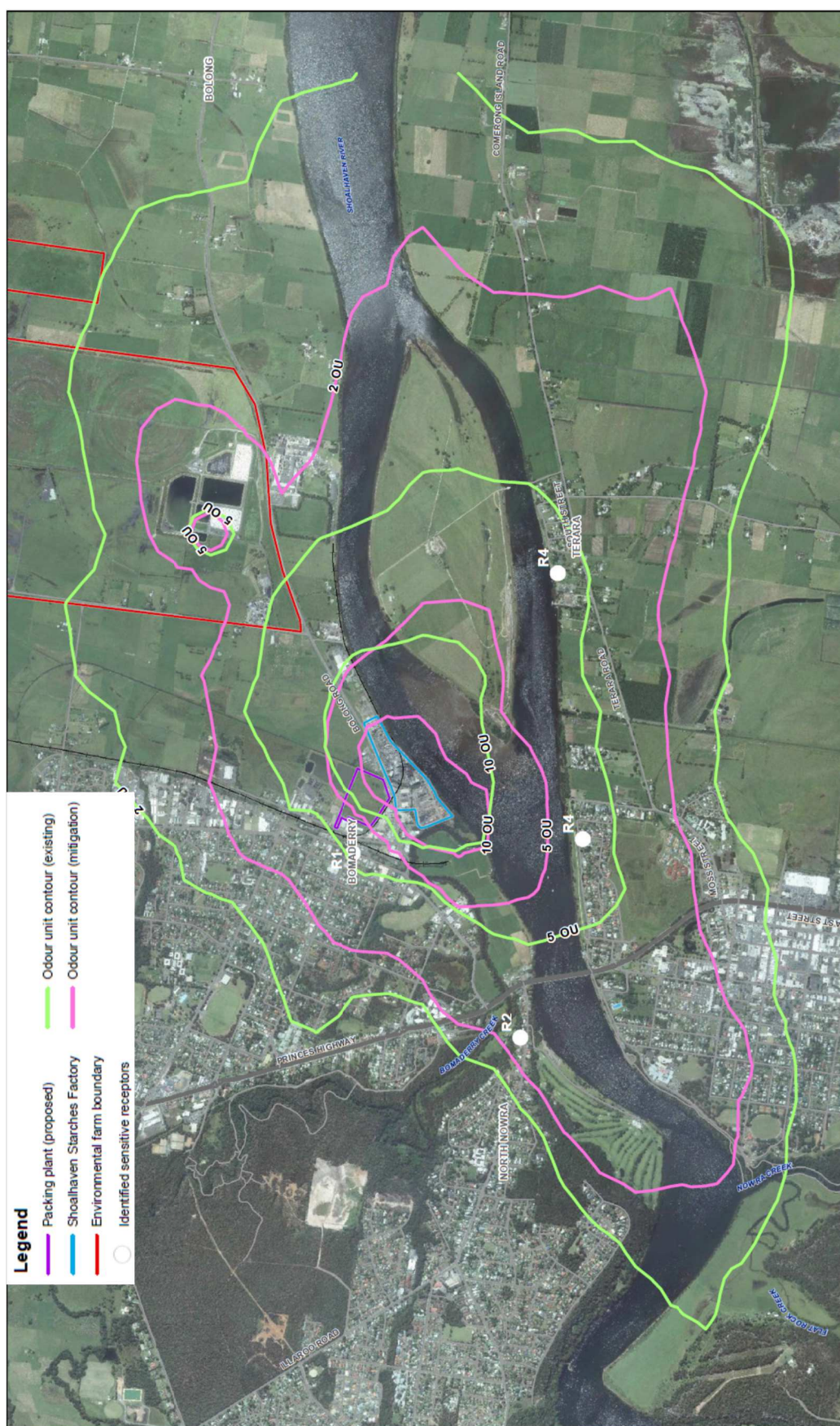
\* **bold** type indicates exceedance of EPA criterion

GHD identified the existing gluten dryers 3 and 4 contribute a large percentage to total odour emission rates. The dryers have horizontal vents with air discharged at low velocities. This reduces odour dispersion resulting in elevated ground level odour impacts under certain weather conditions. GHD proposed realigning the ducts towards vertical, which would enable emissions to be dispersed up into the atmosphere. Discharge velocities would also be increased to enable greater dispersion. These mitigation controls were estimated to reduce odour impacts at the nearest receptors by two odour units, which would then comply with the EPA criterion.

The EPA reviewed the odour assessment and questioned some aspects of the modelling, including the peak odour emission rates used and the variability in odour emissions from the key sources. GHD provided further clarification, including additional sensitivity analysis. GHD also noted the modelling had included a high degree of conservatism. The EPA was satisfied with the clarifications and noted the odour assessment predicted the modifications would comply with the 2009 approved base case, with mitigation. The mitigation involves re-orienting the discharge vents and velocities on gluten dryers 3 and 4. The EPA recommended the conditions include a requirement to implement these mitigation works and validate the effectiveness of the controls.

### **Conclusion and Recommendations**

The Department agrees with the conclusions of the odour assessment and the recommendation of the EPA to implement and validate the odour mitigation controls on the gluten dryers. The Department recommends the odour controls be implemented prior to operation of any part of MODs 11 and 12. With these controls in place, the Department concludes the modified project would reduce odour emissions from the overall factory. The Department also recommends an odour validation report be provided to demonstrate the effectiveness of the mitigation controls. The report is to be provided as part of the annual independent odour audit, required under the existing approval conditions. The Department's assessment concludes the modification would not increase odour impacts from the factory.





### 6.3 Traffic, Access and Parking

#### **Background**

The Shoalhaven Starches factory is located in an industrial area of Bomaderry centred on Bolong Road and Railway Street. As the largest industrial premise in the area, the Proponent generates many of the heavy vehicle movements in this locality, as well as light vehicle movements from staff trips. Over the past 20 years the Shoalhaven Starches factory has grown, with the most significant expansion works undertaken since the 2009 SSEE approval.

For many years, Council has raised questions about the management of traffic generated by the Proponent including the safety and capacity of Bolong Road, Railway Street, the site access points and on site parking. Requirements to upgrade Bolong Road were included in development consents dating back to 1997. In 2011, the Proponent upgraded Bolong Road and four site access points, including the former Dairy Farmers access (acquired by Shoalhaven Starches). The upgrade works included turning lanes, line marking, installation of a central median fence and pedestrian refuge and moving the 100 kilometres per hour zone further east away from the site access points (see **Plate 7** and **Plate 8**).



**Plate 7** – Bolong Road Looking East, Shoalhaven Starches Factory on Right

With the approval of various modifications since 2009, there have been changes to on site parking configurations and re-distribution of traffic between the site access points. With each modification, Council has raised concerns about outstanding matters relating to the upgrade of Bolong Road and the Dairy Farmers access. Council has never accepted the completed works as satisfactory and has not taken ownership of the road, as the relevant roads authority. Bolong Road is a regional classified road managed by Council.

Since 2012, the Department has attempted to mediate the issue, meeting with Council and the Proponent to ascertain the exact nature of the non-complying aspects of the road upgrade works. This process has proved un-productive and the issues have still not been resolved.



**Plate 8** – Bolong Road Looking West at Dairy Farmers Site Access

In February 2017, the Department's compliance unit met with Council and the Proponent to finally resolve the issue. This resulted in the preparation of a single list of outstanding items. Council advised it would accept care and maintenance of the road following satisfactory completion of these items. This process has coincided with the assessment of MOD 12, which proposes further changes to access and parking.

The Department is seeking to resolve the outstanding matters simultaneously with its assessment of MOD 12, to ensure the outstanding items are rectified and Council accepts responsibility for on-going care and maintenance of Bolong Road. It is untenable for all parties to have these matters outstanding and leave the Proponent responsible for part of a regional classified road.

### **Outstanding Matters**

#### **Bolong Road Upgrade Works**

Since the works were completed in 2011, Council has not accepted care and maintenance of the road due to the following outstanding matters:

- inadequate shoulder widths;
- inadequate safety measures for cyclists, including shoulder widths, signs and crossing widths; and
- no raised reflective pavement markers installed.

Council has also raised concerns about motorists making illegal U-turns on Bolong Road at the distillery access. Shoalhaven Starches installed bollards at the access point (see **Plate 9**) and a no U-turn sign, which has prevented trucks from making U-turns, however Council noted light vehicles still have enough space to U-turn. The Proponent proposes to address this concern as part of works for MOD 12 (discussed below).





**Plate 9** – Yellow Bollards at Distillery Access to Prevent Truck U-turns on Bolong Road

#### Dairy Farmers Access Upgrade Works

In 2011, Shoalhaven Starches upgraded the Dairy Farmers access to enable trucks to turn within the site and re-enter Bolong Road (see **Plate 10**). Council's outstanding matters in relation to these works include:

- inadequate shoulder widths;
- inadequate safety measures for cyclists, including shoulder widths and signs; and
- no raised reflective pavement markers installed.



**Plate 10** – Dairy Farmers Access

In 2012, MOD 3 was approved which included a 60 space car park on the Dairy Farmers site. The increased use warranted an upgrade of the access to provide dedicated turning lanes on Bolong Road for vehicles accessing the car park. The Proponent proposed to rectify the outstanding matters at the Dairy Farmers access when completing the MOD 3 works. However, due to changes at the factory, the Proponent did not proceed with the car

park, nor the upgrade works for the turning lanes and outstanding works. Compounding this matter are several other Council approved developments on the Dairy Farmers site, including a meat processing plant and algae demonstration facility, which have intensified the use of the site and exacerbated the need to resolve the outstanding upgrade works. The car parking matters are addressed through the changes proposed as part of MOD 12, discussed below.

#### Car Parking

The 2009 SSEEPP approval included specific conditions for the provision of car parking on the Shoalhaven Starches site. The intent of the condition was to address illegal parking on the verge of Bolong Road, which Council had identified as a regular occurrence. The conditions prescribed the number of spaces to be provided on site and compliance with Australian Standards (AS 2890).

The Department understands that car parking on the verge of Bolong Road has not occurred since the upgrade works were completed on Bolong Road in 2011. Independent environmental audits conducted since 2010 have not identified any problem with on road parking, nor has Council raised the issue since 2008. The Department regularly reviews aerial photography of the site and has not seen cars parked on the road verge of Bolong Road near the factory for over 6 years.

Whilst the intent of the condition to stop cars parking along Bolong Road has been achieved, the Proponent has not strictly complied with the project approval condition which requires provision of a certain number of spaces and paving and line marking of spaces in accordance with Australian Standards. The Proponent advised that car parking is an ever-changing feature of the site, as old parking areas are used to build new plant and equipment, necessitating new parking areas or intensification of existing parking areas at the factory. In 2015, the Department approved a temporary car park (MOD 6) on the northern side of Bolong Road to accommodate on site parking changes and provide adequate space for construction vehicles. This temporary car park also offset the loss of 60 spaces not constructed at the Dairy Farmers site as part of MOD 3. Most of the on site parking is on unpaved road base.

Despite the fluid nature of parking provision on the site, Council has maintained its position that all on site car parks should be paved and line marked to Australian Standards. Council states two key reasons for this requirement. Firstly, unless spaces are line marked, maximum capacity is not achieved as cars are parked at different angles and wider apart. Secondly, unsealed surfaces result in dirt being tracked onto Bolong Road.

The Proponent commissioned ARC Traffic and Transport to undertake a review of access and parking across the site in the context of Council's outstanding issues and the implications of changes associated with MOD 12 (see **Appendix E**). In relation to parking ARC concluded:

- the transfer of loose material from the car parks to Bolong Road is minimal;
- the car parks are used only by staff in light vehicles;
- many parking spaces are un-used when there is no construction on site;
- parking spaces can be delineated using paint or plastic disc markers, without the need for paving; and
- the driveway to the temporary car park on the northern side of Bolong Road should be sealed to improve the access.

As noted in the ARC report, it is not uncommon for car parks to be unpaved and not line marked, as is the case for an overflow car park at Council's offices in Nowra.

As the parking needs on site are regularly changing and there is considerable extra cost associated with paving, the Department considers it unnecessary to require the Proponent to



pave the on site car parks. The car park on the northern side of Bolong Road is temporary and would be removed following completion of key construction projects on the site, however, given the frequent use of this car park, the Department agrees with the recommendation of ARC, to provide a sealed driveway to the car park from Bolong Road.

The Department also considers it appropriate to include a condition requiring Shoalhaven Starches to clean dirt off Bolong Road near the factory, if a build-up occurs. The Department also recommends the Proponent delineate parking spaces using plastic disc markers or paint to achieve maximum parking capacity.

#### **Changes Proposed for MOD 11 and MOD 12**

MODs 11 and 12 are not expected to significantly increase light or heavy vehicle movements to the site during operation as production volumes would not increase.

ARC prepared traffic assessments for the modifications. These assessments are superseded by the ARC Access & Parking Assessment, April 2017, which was prepared to address the outstanding issues. The key components of the modifications include:

- a new 58 space car park at the BOC site on the northern side of Bolong Road;
- constructing the 60 space car park on the Dairy Farmers site, as described in MOD 3, with some changes to accommodate MOD 12 infrastructure; and
- upgrade the Dairy Farmers access as described in MOD 3, including dedicated turning lanes for vehicles accessing the car park (specifically an auxiliary left (AUL) lane and a channelized right (CHR) lane on Bolong Road).

Other recommendations identified by ARC, which will be undertaken as part of the MOD 12 works include:

- increase the temporary car park on the northern side of Bolong Road from 60 to 100 spaces and extend the timeframe for removing the car park until the end of the construction period for MOD 12;
- seal at least 12 metres of the driveway from Bolong Road to the temporary car park;
- extend the central barrier fence along Bolong Road in front of the distillery access. This would prevent right-turns from Bolong Road into the distillery and prevent illegal U-turns at this location;
- construct an internal access road to connect the Dairy Farmers car park with the services area and ethanol distillery; and
- minor re-design works at the western car park to ensure access is maintained for the Bomaderry Country Store.

#### **Conclusion and Recommendations**

As discussed above, the Department considers it imperative the outstanding matters are promptly resolved and Council takes care and maintenance responsibility for this section of Bolong Road.

The Department recommends modifying all the road and parking conditions in the project approval. The modified conditions include a timeframe for submitting detailed design plans to Council for the outstanding works on Bolong Road, Dairy Farmers access and the proposed changes to car parking, including the BOC car park and temporary car park. The conditions also include a timeframe for Council's approval of the plans, completion of the upgrade works (prior to operation of MOD 12 or no later than 31 March 2018) and Council's acceptance of the works-as-executed plans (no later than 31 May 2018). Council did not object to the intent of these conditions and provided detailed comments relating to the design of the works.

Given these matters have been outstanding for six years, the Department has also included a condition requiring the appointment of an independent traffic expert to certify the works, in the event of a dispute between Council and the Proponent over the completed works. The

recommended condition requires the completed works to be signed off by 30 June 2018, with the Secretary's determination final and binding on both parties. Council did not object to the recommended conditions.

With these conditions in place, the Department is confident the outstanding traffic matters will be resolved in a timely manner.

#### 6.4 Noise

The modifications involve relocation of approved plant and construction of additional equipment that may increase overall noise emissions from the site. Harwood Acoustics prepared noise impact assessments (NIAs) for the modifications, considering sound power levels of new and relocated equipment to predict noise levels at the nearest residential receivers.

The nearest receivers to the factory include the residences on Meroo and Coomea Streets Bomaderry, located over 400 m to the north-west. Other receivers include the residences in Terara on the southern side of the Shoalhaven River, 1.3 km from the site and in North Nowra, 750 m to the south. These locations are shown on **Figure 7** and are consistent with the receivers listed in the project approval and the EPL.



**Figure 7 – Residential Receiver Locations**

The NIAs compared predicted noise levels with the existing noise limits in the Environment Protection Licence (EPL) for the premises, the project approval and Shoalhaven Starches' approved Noise Management Plan. Any new plant or equipment at the factory must meet a design noise goal of 10 dB(A) less than the noise limits, to ensure cumulative noise from the factory does not exceed the noise limits at receivers.

#### MOD 11

The NIA for MOD 11 identified the following key noise sources:

- operation of the DDG dryers;

- operation of the cooling towers; and
- truck and front end loader movements at the coal and woodchip stockpiles on the environmental farm.

The NIA noted noise from forklifts moving containers around and front end loaders and trucks moving coal and woodchips from the stockpiles in the DDG area, are existing noise sources with no significant increases expected due to the modification.

The NIA evaluated noise from operation in two stages:

- the first stage involves operation of one DDG dryer and two cooling towers; and
- the second stage involves an additional three DDG dryers, six cooling towers and relocation of the coal and woodchip stockpiles to the environmental farm.

The NIA predicted noise from the first stage would comply with the noise goals, and therefore the noise limits at all receiver locations, however noise from the second stage would exceed the noise goal by up to 6dB(A) in Bomaderry and 4dB(A) in North Nowra. Noise levels of 36dB(A) were predicted in Bomaderry, compared with the design noise goal of 30dB(A) and noise limit of 40dB(A). This is likely to result in exceedances of the noise limits at residences.

The EPA did not raise any concerns about the predicted exceedance and noted that a design solution can generally be implemented to control noise.

The NIA recommends noise controls such as low noise plant and localised acoustic treatment. The Department requested further information from the Proponent on the specific noise controls that could be implemented to ensure compliance. The Proponent's noise consultant advised the design process would include selection of cooling tower models with a maximum sound power level of 81 dB(A) and/or erection of sound barrier screens to the north east and south east of the towers. Sound barriers would need to extend 1 m above the top of each cooling tower fan. The Proponent would undertake further noise verification of the detailed design to ensure the noise limits can be achieved. The Proponent also noted the second stage of DDG dryer and cooling tower construction is likely to be several years away, by which time different fan models and casings may be available, which would influence noise outputs.

The Department reviewed the Proponent's last annual report (2016) which showed two minor noise non-compliances of 1-2 dB(A). The report also showed there had been two noise complaints over the preceding 12 month period. The Proponent identified a gluten dryer required a new silencer, which the Proponent confirmed was installed in February 2017.

As noise levels from the factory are generally compliant with the noise limits, the Department recommends new plant and equipment be subject to noise verification during the design process to ensure the factory remains compliant. The Department recommends the Proponent prepare a design noise verification report, prior to construction of the first and second stages of the DDG dryers and cooling towers. The report must demonstrate the effectiveness of noise controls to ensure the noise limits will be achieved for the first and second stages of operation of the DDG dryers and cooling towers. The Department also recommends a condition requiring noise validation monitoring 12 months after operation of the first and second stages. With these measures in place, the Department concludes the modifications would be designed to comply with the noise limits.

### MOD 12

The NIA for MOD 12 identified the following key noise sources:

- operation of evaporators;
- operation of the cooling towers;
- operation of pumps, motors and valves; and

- intermittent operation of forklifts at the new ISO container storage yard.

The NIA noted the extension of the rail sidings would not introduce a new noise source, as maintenance of locomotives currently occurs in the same location. The extension of the rail sidings is proposed immediately next to the existing sidings adjacent to the Dairy Farmers site.

The NIA predicted noise from the additional items of plant and equipment would comply with the design noise goals and would not exceed the noise limits at each residential receptor. The NIA included sound power level goals for the cooling towers, evaporators and distillery equipment to achieve the noise limits. It also identified the potential need for silencers, specially selected flow valves or acoustic screening and enclosures following selection of the equipment.

The Department is satisfied with the conclusions of the NIA and recommends the Proponent prepare a design noise verification report, prior to construction of noise generating equipment associated with MOD 12. The report must demonstrate the selected equipment can meet the noise goals, or specify the noise controls required to meet the noise goals. The Department also recommends a condition requiring noise validation monitoring 12 months after operation of MOD 12.

### Construction Noise

The NIA assessed construction noise for both MOD 11 and 12 noting most construction works would comply with the EPA's *Interim Construction Noise Guideline*. Minor noise exceedances may occur during piling activities, which typically take less than two weeks. The Proponent undertakes construction activities in accordance with a noise management plan, which includes procedures for notifying residents of upcoming noisy works and complaints handling and response procedures. The existing conditions limit piling activities to Monday to Friday between 9am and 5pm and other works are limited to standard construction hours.

### Conclusion and Recommendations

The Department's assessment has identified the potential for new plant and equipment associated with MOD 11 to exceed the design noise goals and lead to exceedances of the noise limits at residences in Bomaderry and North Nowra.

The Department has recommended conditions requiring a design noise verification report prior to construction of the equipment, with the effectiveness of noise controls quantified before construction can commence. The Department also recommends noise validation monitoring 12 months after operation of the modifications to demonstrate the new plant and equipment is meeting the noise goals and limits at receivers. These conditions require the Proponent to demonstrate the modification equipment can achieve the noise limits at residences, prior to construction and operation. With these conditions in place, the Department is satisfied the modification would not increase noise from the overall factory beyond the noise limits.

## **6.5 Other Issues**

The Department's assessment of other issues is provided in **Table 5**.

**Table 5: Assessment of Other Issues**

Issue	Assessment	Recommendation
Visual amenity	<p><u>Visual Amenity</u></p> <ul style="list-style-type: none"> <li>• The modifications include additional tall structures, including: <ul style="list-style-type: none"> <li>- DDG dryer stack at 30 m;</li> <li>- beverage grade ethanol plant columns at 46 m;</li> <li>- re-boiler columns at 23.5 m;</li> <li>- ethanol storage tanks ranging from 19 to 23 m;</li> <li>- relocated evaporator at 23 m; and</li> </ul> </li> </ul>	<p>As part of MOD 11, require the Proponent to:</p> <ul style="list-style-type: none"> <li>• update the landscape and vegetation management plan</li> </ul>

Issue	Assessment	Recommendation
	<ul style="list-style-type: none"> <li>– coal and woodchip stockpiles on the environmental farm (see <b>Plates 4 and 5</b>).</li> <li>• The EAs included visual assessments, considering the visibility of the structures from key vantage points including passing motorists on Bolong Road, rural residences on Hanigans Lane and the residential areas in Bomaderry, North Nowra and Terara.</li> <li>• The visual assessments noted the proposed structures are consistent in size to existing structures at the factory, including the wet end dryer at 43 m, boiler house stack at 53 m and flour uploader at 34.5 m.</li> <li>• The assessment noted the structures would be most prominent for passing motorists on Bolong Road, and from the residential area of North Nowra, 750 m from the factory. It also noted the presence of intervening vegetation which partially screens views.</li> <li>• The coal and woodchip stockpiles are already in place on the environmental farm, and are visible for motorists on Bolong Road and from rural residential properties on Hanigans Lane.</li> <li>• Views of the factory and the environmental farm are partially screened by existing and planted vegetation and the EA recommended additional landscaping to minimise visual impacts.</li> <li>• The Proponent has committed to use non-reflective building materials like other structures on the site.</li> <li>• Council did not raise any concerns regarding visual amenity.</li> <li>• The Department notes the factory is in an industrial area adjacent to the former Dairy Farmers factory, former Shoalhaven Paper Mill and Cleary Bros Concrete. The proposed structures would blend with the industrial character of the site and immediate area.</li> <li>• The Department's assessment concludes the visual impacts of the modifications would be minimal.</li> <li>• The Department recommends the Proponent update its existing landscape and vegetation management plan to include additional landscaping between the DDG area and the riverbank, and around the stockpiles on the environmental farm.</li> <li>• The original project approval also includes conditions for the control of lighting and use of non-reflective building materials which apply to the modifications.</li> </ul>	<p>with landscaping around the DDG area and stockpiles, prior to construction of the modifications and implement the landscaping to the satisfaction of the Secretary.</p> <p>Existing conditions of approval require the Proponent to:</p> <ul style="list-style-type: none"> <li>• control lighting and use non-reflective building materials.</li> </ul>
Building height	<ul style="list-style-type: none"> <li>• HMAS Albatross (airbase) is located 10 km south-west of the factory.</li> <li>• The Proponent provided information to the Department of Defence regarding the height of the structures in the DDG area and the ethanol distillery.</li> <li>• The Department of Defence considered the potential impacts to the safety of aircraft operations from HMAS Albatross, advised it had no concerns and requested the Proponent provide as-constructed details to Airservices Australia following completion of construction for inclusion in its database.</li> <li>• The existing conditions require the Proponent to provide as-constructed details to Airservices Australia for any structure above 30 m.</li> </ul>	<p>Manage via existing conditions requiring the Proponent to:</p> <ul style="list-style-type: none"> <li>• provide as-constructed details to Airservices Australia following completion of construction of structures above 30 m.</li> </ul>
Flooding	<ul style="list-style-type: none"> <li>• The factory is located on the northern bank of the Shoalhaven River and the proposed modifications are in high hazard floodway and storage areas.</li> <li>• WMA Water (WMA) assessed the implications of the modifications on flood levels, flows and velocities, referring to its previous studies including the Shoalhaven Floodplain Risk Management Study and Plan 2008 and the Shoalhaven River Flood Study 2013.</li> <li>• <u>MOD 11</u></li> <li>• WMA assessed four scenarios for comparison with existing conditions on the floodplain in 2016 and 1990 (to consider cumulative impacts of all development on the floodplain since 1990). The four scenarios included: <ul style="list-style-type: none"> <li>– A – relocating approved equipment that is not yet built (DDG dryers, cooling towers and MCC room);</li> <li>– B1 – Scenario A + new equipment (2 biofilters, forklift maintenance building and container storage/preparation</li> </ul> </li> </ul>	<p>As part of MOD 11, require the Proponent to:</p> <ul style="list-style-type: none"> <li>• update the flood mitigation and management plan to include the modifications and describe procedures to ensure plant and stockpiles do not become floating debris; and</li> <li>• provide a structural engineer's report to certify new plant and equipment has</li> </ul>

Issue	Assessment	Recommendation
	<p>area);</p> <ul style="list-style-type: none"> <li>- B2 – Scenario B1 + part of the container storage area temporarily used for coal and woodchip storage; and</li> <li>- C – Scenario B1 + coal and woodchip storage near Haningans Lane (final scenario).</li> </ul> <ul style="list-style-type: none"> <li>• The assessment concluded Scenarios A, B1 and B2 produce no significant incremental increase in flood levels.</li> <li>• Scenario C would have minimal impact near the factory, but would increase the flood level by over 0.1 m immediately south of the coal and woodchip stockpiles during the 1% Annual Exceedance Probability (AEP) flood event. However, this land forms part of Shoalhaven Starches environmental farm and does not contain any buildings or structures. The modification would have minimal impact during smaller, more frequent events, such as a 5% AEP, as floodwater would not overtop the Shoalhaven River bank.</li> <li>• WMA concluded there would be no increase in frequency or duration of inundation due to MOD 11, however there would be an increase in the area or extent of inundation. There would also be an increase in peak flow velocity around the wet weather storage ponds and the coal and woodchip stockpiles of up to 2 metres per second. WMA's assessment concluded the works would not increase risks to life or safety of persons during a flood event and noted the incremental increase in flood level is relatively minor.</li> <li>• WMA noted the need for a structural engineer's report to demonstrate the structures can withstand flood waters.</li> <li>• Council reiterated the need for the structural report and requested clarification on the controls to ensure the coal and woodchips do not become floating debris during a flood event. Council also requested the floor of the forklift maintenance building, motor control centre room and DDG dryers are raised above the flood planning level (FPL).</li> <li>• The Proponent advised the motor control centre room would be raised above the FPL or protected up to the FPL. The forklift maintenance building and DDG dryers would be below the FPL, but would be constructed with flood compatible materials and built to withstand flood events.</li> </ul> <p><u>MOD 12</u></p> <ul style="list-style-type: none"> <li>• WMA considered the flood impacts of additional equipment for the beverage grade ethanol plant and ethanol storage tanks. The assessment noted there would be a slight increase in peak flood levels immediately upstream of the equipment within the factory site and a reduction in peak flood levels downstream.</li> <li>• WMA concluded no further assessment was required as there would be no increase in flood levels on land not owned by the Proponent.</li> </ul> <p><u>Conclusion</u></p> <ul style="list-style-type: none"> <li>• The Department reviewed the flood assessments and Council's submissions and concluded the modifications would have a minor impact on flooding.</li> <li>• The Department agrees with the recommendations of Council and has included conditions requiring a structural report to confirm the structures have been built to withstand floodwaters. The existing conditions require the Proponent to update its flood mitigation and management plan for each modification. The Department has included an additional requirement to specify the controls to ensure plant and stockpiles do not become floating debris.</li> </ul>	<p>been constructed from flood compatible materials and to withstand flooding.</p>
Riverbank stability	<ul style="list-style-type: none"> <li>• Coffey prepared a geotechnical assessment to assess potential impacts of the modifications on riverbank stability.</li> <li>• The modifications include: <ul style="list-style-type: none"> <li>- biofilters – 25 m north of Shoalhaven River bank;</li> <li>- cooling towers – 20 m west of Abernathy's Creek bank;</li> <li>- container storage area – 18 m east of Bomaderry Creek bank; and</li> <li>- rail siding extensions – 25 m north of Shoalhaven River bank.</li> </ul> </li> </ul>	<p>As part of MOD 12, require the Proponent to:</p> <ul style="list-style-type: none"> <li>• appoint a geotechnical engineer to survey the Shoalhaven River bank near</li> </ul>



Issue	Assessment	Recommendation
	<ul style="list-style-type: none"> <li>• The proposed beverage grade ethanol plant (MOD 12) is setback some distance from river banks and unlikely to impact on bank stability.</li> <li>• Coffey undertook a site inspection, noting areas of erosion and slumping of the creek banks, vegetation cover and soil profiles (based on previously borehole sampling of the site). The assessment did not cover the proposed rail sidings as they were added to the modification after the Coffey assessment.</li> <li>• Coffey concluded the biofilters, cooling towers and container storage area would not affect bank stability due to low foundation loads within the upper soils only, setback of the structures and subsurface conditions. Coffey noted the stacked containers would have a uniform load distribution and any heavy loads associated with the cooling towers would need to be piled to bedrock.</li> <li>• The Department concludes the modification is unlikely to affect bank stability but notes the proposed rail line extension adjacent to the Shoalhaven River bank was not assessed.</li> <li>• The existing conditions require the Proponent to monitor the stability of the Shoalhaven River bank near the site and undertake maintenance and repairs if a problem is identified.</li> <li>• The Department recommends an additional condition requiring the Proponent to appoint a geotechnical engineer to evaluate the rail line extension works and implement any required controls, prior to construction of the rail line extension.</li> </ul>	<p>the rail line extension and implement controls prior to construction.</p> <p>Existing conditions of approval require the Proponent to monitor riverbank stability.</p>
Contamination and acid sulphate soils	<ul style="list-style-type: none"> <li>• The factory site has been used for industrial purposes since the 1970's. Coffey has undertaken several contamination assessments of the site, including in 2007, 2014 and 2015.</li> <li>• The modification would utilise space adjacent to existing structures for new industrial plant. Most of the area is covered with asphalt or gravel and has previously been filled. The coal and woodchip stockpiles on the environmental farm are located directly on the ground surface.</li> <li>• Coffey undertook a phase 1 contamination assessment including a site inspection, review of historical studies, contaminated land records and acid sulphate soil maps to identify areas of environmental concern and contaminants of potential concern.</li> <li>• The assessments identified some localised contamination on the site, including: <ul style="list-style-type: none"> <li>- petroleum hydrocarbons adjacent the railway line to the south of the proposed ISO container storage area;</li> <li>- asbestos containing material (ACM) in soils in the location of the proposed cooling towers, evaporator and ISO container storage area and near the proposed railway siding on the former Dairy Farmers site;</li> <li>- elevated concentrations of zinc, anthracene and phosphorous in wastewater ponds on the former Dairy Farmers site.</li> </ul> </li> <li>• Coffey noted acid sulphate soils (ASS) are present at depths greater than 3 m on the site and depths greater than 2 m on the BOC gas car park site. The existing conditions require the Proponent to implement an acid sulphate soil management plan to deal with any material encountered during construction works.</li> <li>• Coffey concluded there would be a low likelihood of unacceptable risks to site workers from the identified contamination and proposed a number of management measures including an asbestos removal plan, disposal of wastewater from the treatment ponds, and further inspection around the diesel storage tank and the ground surface of the former Dairy Farmers site to determine the presence of ACM.</li> <li>• The EPA and Council did not comment on contamination.</li> <li>• The Department notes the modification would not require substantial earthworks, but may disturb isolated pockets of contaminated material during pile driving and minor levelling works. The Proponent has committed to implementing the recommendations provided by Coffey and the Department concludes these measures would be adequate for managing the</li> </ul>	<p>As part of MOD 12, require the Proponent to:</p> <ul style="list-style-type: none"> <li>• conduct further investigations to determine the presence of ACM across the site;</li> <li>• prepare a remedial action plan and implement the recommendations of the plan (such as removing or capping ACM within soils on the site) by September 2017;</li> <li>• update and implement the protocol for managing unexpected finds and address the isolated hydrocarbon contamination near the railway lines; and</li> <li>• test water in ponds and dispose of to a licensed facility if contaminants exceed relevant trigger levels, prior to construction of the modifications.</li> </ul>

Issue	Assessment	Recommendation
Coal and woodchip stockpiles	<p>isolated areas of contamination.</p> <ul style="list-style-type: none"> <li>The Department has included the recommendations as modified conditions and recommends updating the existing conditions addressing contamination.</li> <li>In 2016, the Department identified large stockpiles of coal and woodchips on the environmental farm.</li> <li>Following a compliance investigation, the Department identified the Proponent did not have approval for the stockpiles. The Department's compliance unit issued a penalty notice and ordered the Proponent to cease transport of material from the stockpiles to the factory, until a traffic safety report was completed for the transport route.</li> <li>The traffic safety report was completed by the Proponent and the Department confirmed in October 2016 that measures were installed to address the recommendations of the traffic study.</li> <li>In November 2016, the Proponent lodged MOD 11 which formally requests approval for the coal and woodchip stockpiles.</li> <li>In its submission, Council recommended the Proponent implement specific measures to ensure the stockpiles do not become floating debris during flood events.</li> <li>The EPA did not raise any concerns about the stockpiles.</li> <li>The Department notes the stockpiles on the environmental farm are the primary storage location for the factory, with material transferred from the farm to smaller stockpiles on the factory site. The coal is used in several of the boilers at the factory and the woodchips are used in one boiler (in accordance with an EPA resource recovery exemption approval).</li> <li>The Department notes the use of the environmental farm for the storage of coal and woodchips is necessary, as there is inadequate space at the factory. The stockpiles are located 250 m from the nearest farm dwelling and are within a broader storage area on the Proponent's environmental farm.</li> <li>There is some screening vegetation along the southern and western sides of the storage area. The Proponent's wastewater storage ponds are located to the east and north.</li> <li>The potential for dust generation is minimal as the coal and woodchips are large sized particles with minimal fine components that could become airborne.</li> <li>There is some potential for runoff from the coal stockpile to contain contaminants. The Department notes the woodchips are virgin material (as required by the EPA approval) and unlikely to contain contaminants. However, the Proponent's Environment Protection Licence (EPL) requires all runoff from the farm to be contained on the farm.</li> <li>The Department recommends the Proponent provide evidence to the satisfaction of the Secretary, confirming the stormwater controls that have been implemented to manage runoff from the stockpiles to ensure compliance with the EPL and to address the matters raised by Council.</li> <li>With these measures in place the Department considers the stockpiles would be adequately managed.</li> </ul>	<p>As part of MOD 11, require the Proponent to:</p> <ul style="list-style-type: none"> <li>evidence to the satisfaction of the Secretary confirming the stormwater controls that have been implemented to manage runoff from the stockpiles; and</li> <li>implement specific measures to ensure the stockpiles do not become floating debris during flood events (as noted in the Flooding section above).</li> </ul>

## 7. CONCLUSION

The Department has assessed the proposed modifications in accordance with the requirements of Clause 8B of the *Environmental Planning and Assessment Regulations 2000* and concludes the modifications would:

- result in minimal environmental impacts beyond the approved facility;
- enable the Proponent to alter production to reflect changing markets with a reduced emphasis on fuel grade ethanol production and increased focus on starch, gluten and beverage products;
- resolve outstanding road upgrade and parking issues;

- ensure the key amenity impacts of odour and noise are maintained below existing limits; and
- maintain the hazards and risks of the facility below relevant limits.

Following on from its assessment of the proposed modifications to the development, the Department considers that the modification requests are approvable, subject to any modifying conditions of approval outlined in **Appendices A** and **B**. This assessment report is hereby presented to the Planning Assessment Commission for determination.

## **APPENDIX A – INSTRUMENT OF MODIFICATION - MOD 11**

## **APPENDIX B – INSTRUMENT OF MODIFICATION - MOD 12**



## **APPENDIX C – ENVIRONMENTAL ASSESSMENTS**

For MOD 11 see separate file at:

[http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=8046](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8046)

For MOD 12 see separate file at:

[http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=8104](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8104)

## **APPENDIX D – SUBMISSIONS**

For MOD 11 see separate files at:

[http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=8046](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8046)

For MOD 12 see separate files at:

[http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=8104](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8104)

## **APPENDIX E – RESPONSE TO SUBMISSIONS**

For MOD 11 see separate files at:

[http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=8046](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8046)

For MOD 12 see separate files at:

[http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=8104](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8104)