

## ASSESSMENT REPORT

### Shoalhaven Starches Ethanol Expansion Project Section 75W Modification (MP 06\_0228)

#### MOD 13 – Conversion of Boilers



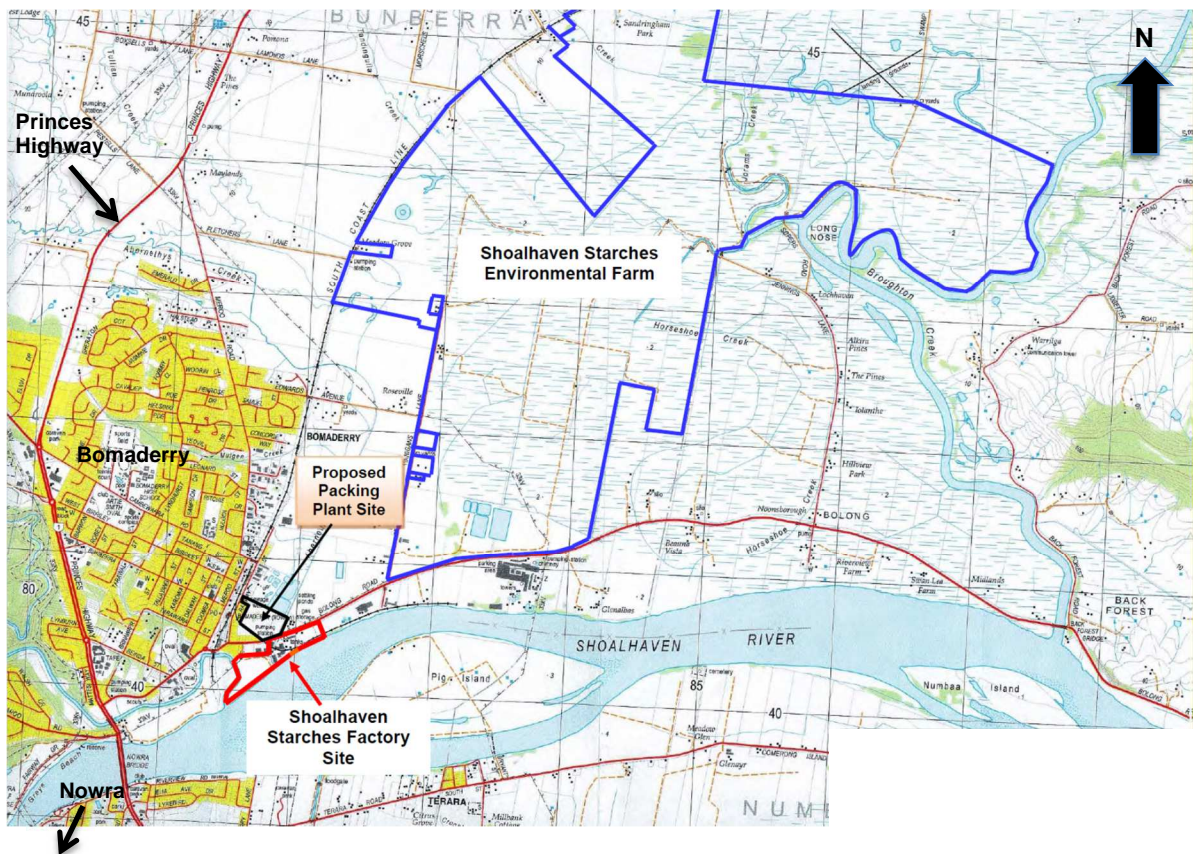
*Shoalhaven Starches Factory*

#### 1. BACKGROUND

This report assesses a modification request by Shoalhaven Starches Pty Ltd (the Proponent) to modify its factory in Bomaderry on the NSW South Coast.

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.

The factory includes several boilers which generate steam to power components of the production process. The factory is a large energy user with various forms of supply including electricity, natural gas, biogas, coal and woodchip. Energy use represents the largest cost of production at the factory. The boilers are fired by a mixture of coal, natural gas, biogas and woodchip. With recent increases in gas prices, the Proponent has sought to modify three of its existing boilers (2, 4 and 6) to optimise steam output using coal instead of natural gas. The conversion is estimated to reduce the Proponent's annual energy costs by approximately \$9 million.

### 1.1 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 500 m north-west of the factory.

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.

## 1.2 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 Part 3A of the *Environmental Planning and Assessment Act 1979* (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
- 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 is diverting 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.

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

The Minister for Planning has approved twelve modifications to the SSEEP approval since 2009. The most recent modifications reflect the changed focus to increased flour, starch, gluten and beverage grade ethanol production. **Table 1** summarises these modifications.

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

MOD No.	Date Approved	Description
1	30 Sept 2011	<u><i>Remove DDG Pellet Plant</i></u> <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</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	<u><i>Fermenter and Distillery</i></u> <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	<u><i>Relocate Car Park</i></u> <ul style="list-style-type: none"><li>• relocate approved 60 space staff car park 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	<u><i>Relocate DDG Pellet Plant</i></u> <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	<u><i>DDG Pellet Plant Stack</i></u> <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</li><li>• construct eight storage silos up to 26 m high.</li></ul>
6	25 Nov 2015	<u><i>Demolition</i></u> <ul style="list-style-type: none"><li>• demolish a disused industrial building "Moorehouse" purchased by the</li></ul>

MOD No.	Date Approved	Description
		Proponent <ul style="list-style-type: none"> <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	<u>Starch Dryer No. 5</u> <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</li> <li>construct a substation, pipes and pipe gantry to supply the starch dryer.</li> </ul>
8	1 Mar 2016	<u>Extend Existing Flour Mill</u> <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	<u>Packing Plant Relocation</u> <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	<u>Flour Mill B</u> <ul style="list-style-type: none"> <li>construct a new flour mill B and increase flour production on site from 400,000 842,400 tpa. Relocate storage silos and construct a mill feed structure.</li> </ul>
11	1 Sept 2017	<u>Dryers, Cooling Towers, Maintenance Building and Biofilters</u> <ul style="list-style-type: none"> <li>reduce the number of approved dryers and relocate approved footprint, relocate cooling towers, construct a forklift maintenance building, install two biofilters, construct hardstand for container storage, store coal and woodchips on the factory site and environmental farm.</li> </ul>
12	1 Sept 2017	<u>Beverage Grade Ethanol</u> <ul style="list-style-type: none"> <li>increase production of beverage grade ethanol and reduce production of fuel grade ethanol</li> <li>install ethanol distillery infrastructure including rectification columns, cooling towers, a substation, storage tanks and pipes</li> <li>extend two rail sidings and provide additional car parking.</li> </ul>

### **Council Issued Consents**

Separate to the SSEE 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)
- construction of two additional grain silos for buffer storage (DA 14/2161).

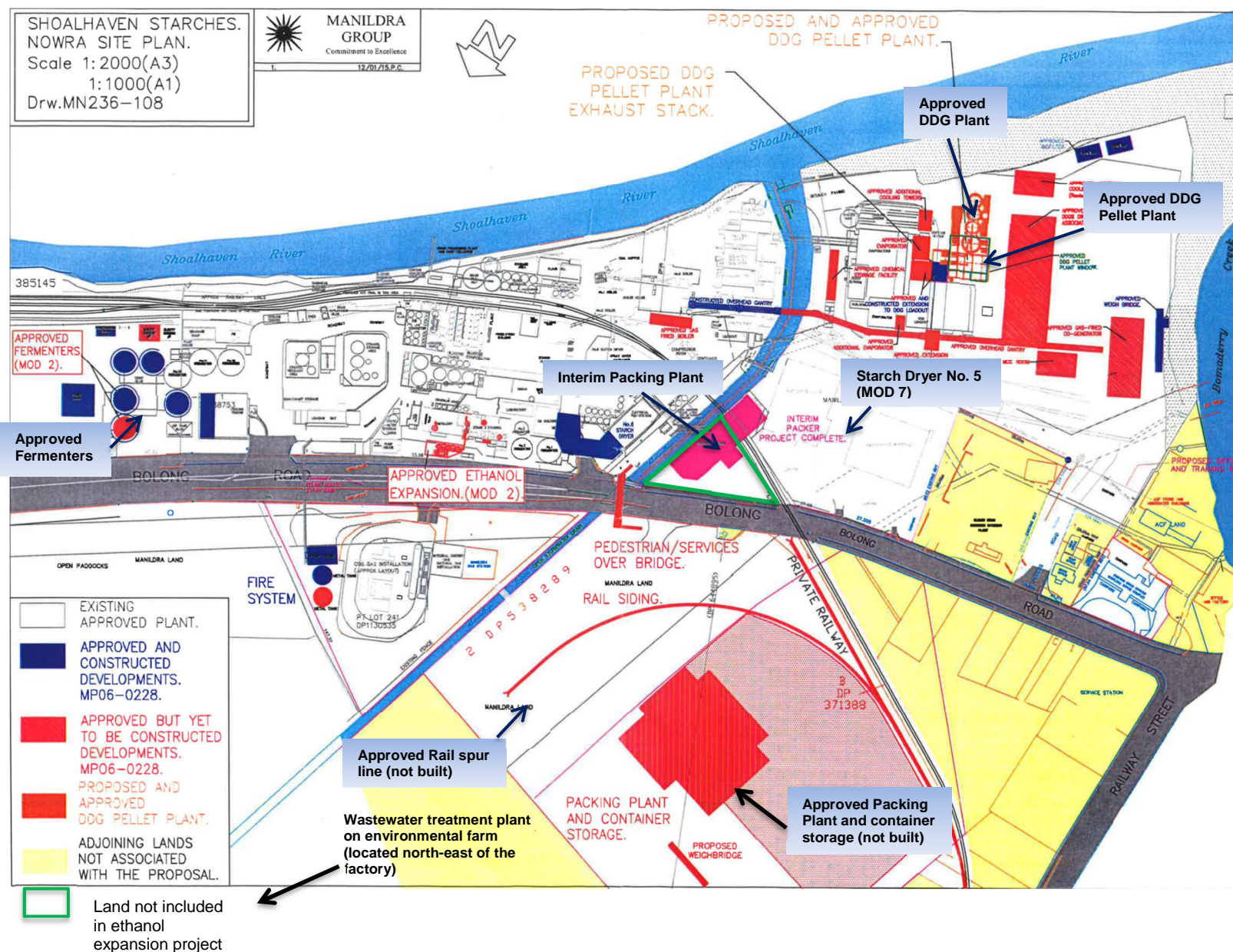
Council also granted approval to the Proponent for road and site access upgrades, consistent with the SSEE approval. These included:

- upgrades to site access points on Bolong Road, including the Dairy Farmers site access (DA 10/1843)
- 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.



Figure 2 - Shoalhaven Starches Approved Ethanol Expansion Project (06\_0228)



## 2. PROPOSED MODIFICATION

In June 2017, the Proponent lodged a modification request under Section 75W of the EP&A Act to convert three boilers (2, 4 and 6) to increase steam production using coal. The Proponent subsequently requested a few additions to the modification request to regularise structures that have been built on a different footprint compared to the approved plans. All components of the modification are described below.

### 2.1 Conversion of Boilers

The Shoalhaven Starches factory uses a large amount of energy to produce starch, gluten, glucose and ethanol products. The Proponent uses a number of energy sources including electricity, natural gas, biogas, coal and woodchips. There are seven boilers at the factory which produce steam for production processes. Four of these boilers use natural gas, one uses woodchips and two use coal.

Given recent increases in gas prices, the Proponent proposes to modify three boilers on the site to reduce its reliance on natural gas and increase the production of steam using coal fired boilers. The modifications are estimated to substantially reduce the Proponent's annual energy costs, by around \$9 million. This would in turn reduce its overall production costs and improve competitiveness.

The Proponent currently uses coal fired boilers on the site (boilers 5 and 6) and initially installed boilers 2 and 4 to operate as coal fired boilers. Boilers 2 and 4 operated using coal until around 2012, when boiler 2 was converted to use woodchips and boiler 4 was converted to use natural gas. The Proponent proposes to refurbish the coal firing equipment on boilers 2 and 4 and install baghouses and raise stack heights on each boiler to treat air emissions from coal combustion. Boiler 6 is already coal fired but requires a new baghouse to enable an increase in steam production. Coal would be transported to the boilers from the existing stockpile on the environmental farm. There would be no increase in the amount of coal stored in the stockpile, but there would be a minor increase in truck trips between the environmental farm and the factory to transfer coal to the modified boilers. The fly ash generated from coal combustion would be collected from the boilers and transported to the environmental farm to maintain farm access roads.

The modification is summarised in **Table 2**, shown on **Figures 3** and **4** and described in full in the Environmental Assessment (EA) in **Appendix B**.

**Table 2: Proposed Modification**

Modification	Description
Boiler No. 2	<ul style="list-style-type: none"><li>convert from woodchips to coal fired</li><li>construct a new baghouse 14.7 m high</li><li>replace existing emissions stack of 22.42 m with a new stack 40 m high.</li></ul>
Boiler No. 4	<ul style="list-style-type: none"><li>convert from gas to coal fired</li><li>construct a new baghouse on top of the boiler building, increasing the height by 8.4 m to a total height of 35 m</li><li>repair and extend existing emissions stack and increase the height by 10 m to a total height of 40 m.</li></ul>
Boiler No. 6	<ul style="list-style-type: none"><li>retain as a coal fired boiler</li><li>construct a new baghouse 18.2 m high to increase steam production.</li></ul>
Construction	<ul style="list-style-type: none"><li>12 weeks and 20 construction staff.</li></ul>

### 2.2 Minor Alterations and Additions

The Department's compliance team requested the Proponent undertake an independent compliance audit of the entire factory and environmental farm. In April 2017, the Proponent provided the Department with its Independent Compliance Audit report, prepared by GHD. The audit identified several structures on the site that were not consistent with or covered by the SSEEP approval or other development consents. Many of the non-compliances related to approved items being constructed on a different footprint or in a different location to the

approved plans. In response to the audit findings, the Proponent proposed to apply for a modification for these structures. The Department's compliance team agreed with this recommendation and on 17 August 2017, the Proponent lodged a request to regularise the structures as part of this modification. **Table 3** provides details of the modifications. **Figure 5** shows the approved versus constructed locations. Detailed figures of each structure are contained within the Independent Compliance Audit report prepared by GHD.

**Table 3: Alterations and Additions**

Structure	Modification	Reference
<i>Approved structure built in a different location or on a different footprint</i>		
Fermenter	<ul style="list-style-type: none"> <li>fermenter tank number 15 built 23 m from approved location</li> <li>fermenter gantry built 4 m from approved location</li> <li>fermenter bund wall not included in MOD 2 concept design.</li> </ul>	MOD 2
Flour Mill	<ul style="list-style-type: none"> <li>footprint of flour mill 80 m<sup>2</sup> larger than approved, to accommodate flour tempering bins.</li> </ul>	07_0021 (consolidated into 06_0228)
Product Dryer 6	<ul style="list-style-type: none"> <li>constructed on a different footprint to approved location.</li> </ul>	06_0228
Starch Dryer 5	<ul style="list-style-type: none"> <li>constructed on the same footprint but layout within the footprint differs from approved layout. Dryer building is larger and the gantry and pipework locations differ as they connect to the interim packing plant, instead of the larger packing plant approved on the northern side of Bolong Road (not yet constructed).</li> </ul>	MOD 7
Biofilters	<ul style="list-style-type: none"> <li>a bioscrubber was approved near the DDG plant. Following detailed design, two biofilters were considered more suitable and were constructed south-west of the approved location to accommodate the structures side by side.</li> </ul>	06_0228
Weighbridge	<ul style="list-style-type: none"> <li>constructed 85 m south-west of approved location. Location changed to improve internal traffic flows and safety.</li> </ul>	06_0228
<i>Unapproved structures</i>		
Shipping containers and demountable buildings	<ul style="list-style-type: none"> <li>shipping containers and demountable buildings in the services area at the factory used for construction purposes</li> <li>demountable building south of fermenters.</li> </ul>	N/A
Woodchip shelter	<ul style="list-style-type: none"> <li>following approval from the EPA to use woodchips in boiler 2, the Proponent constructed a shelter near the coal stockpile at the factory, to keep the woodchips dry.</li> </ul>	N/A
<i>Exempt and Complying Development</i>		
Storage shed and shipping containers on the environmental farm	<ul style="list-style-type: none"> <li>storage shed and shipping containers on environmental farm do not meet requirements for exempt and complying development as there is more than 1 container per lot and the storage shed is too close to a lot boundary.</li> </ul>	N/A
Tyres on environmental farm	<ul style="list-style-type: none"> <li>approximately 5000 tyres used to hold down covers over silage (cattle feed) on the environmental farm. Used in accordance with the EPA's Recovered Tyres Exemption 2014 and the Department of Primary Industry's Guideline 'Successful Silage'.</li> </ul>	N/A

### 2.3 Design Changes to Beverage Grade Ethanol Distillery (MOD 12)

On 1 September 2017, the Planning Assessment Commission (the Commission) approved Modification 12 to increase beverage grade ethanol production at the factory. The modification involves construction of new distillery infrastructure adjacent to the existing fermenters.

The Proponent has commenced detailed design of the distillery infrastructure and has identified a more efficient design that requires an altered footprint. There is no change to the distillery outputs or production volumes. **Figure 6** shows the proposed modified footprint compared with the approved location. The Proponent has requested the new design and altered footprint be included in this modification.

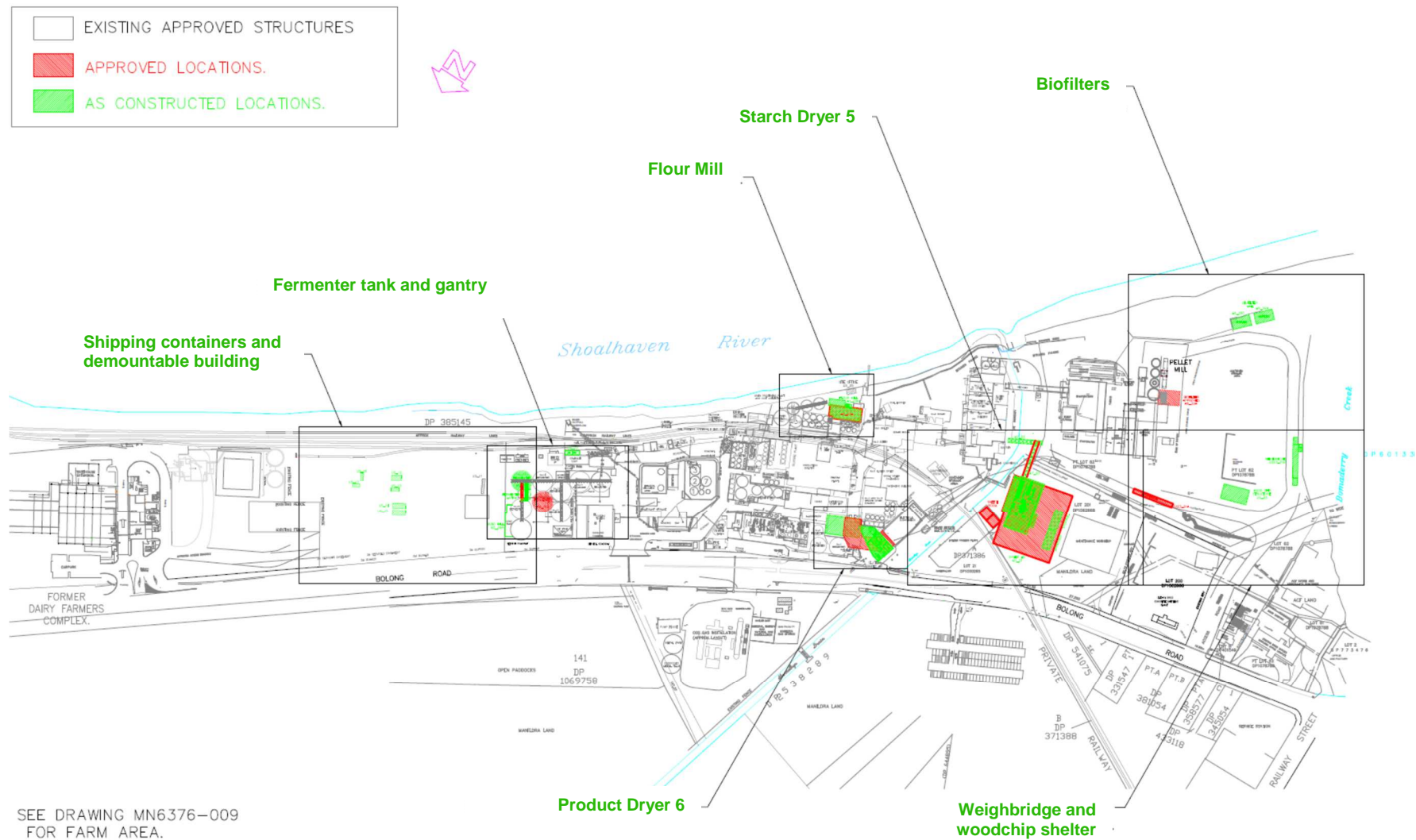


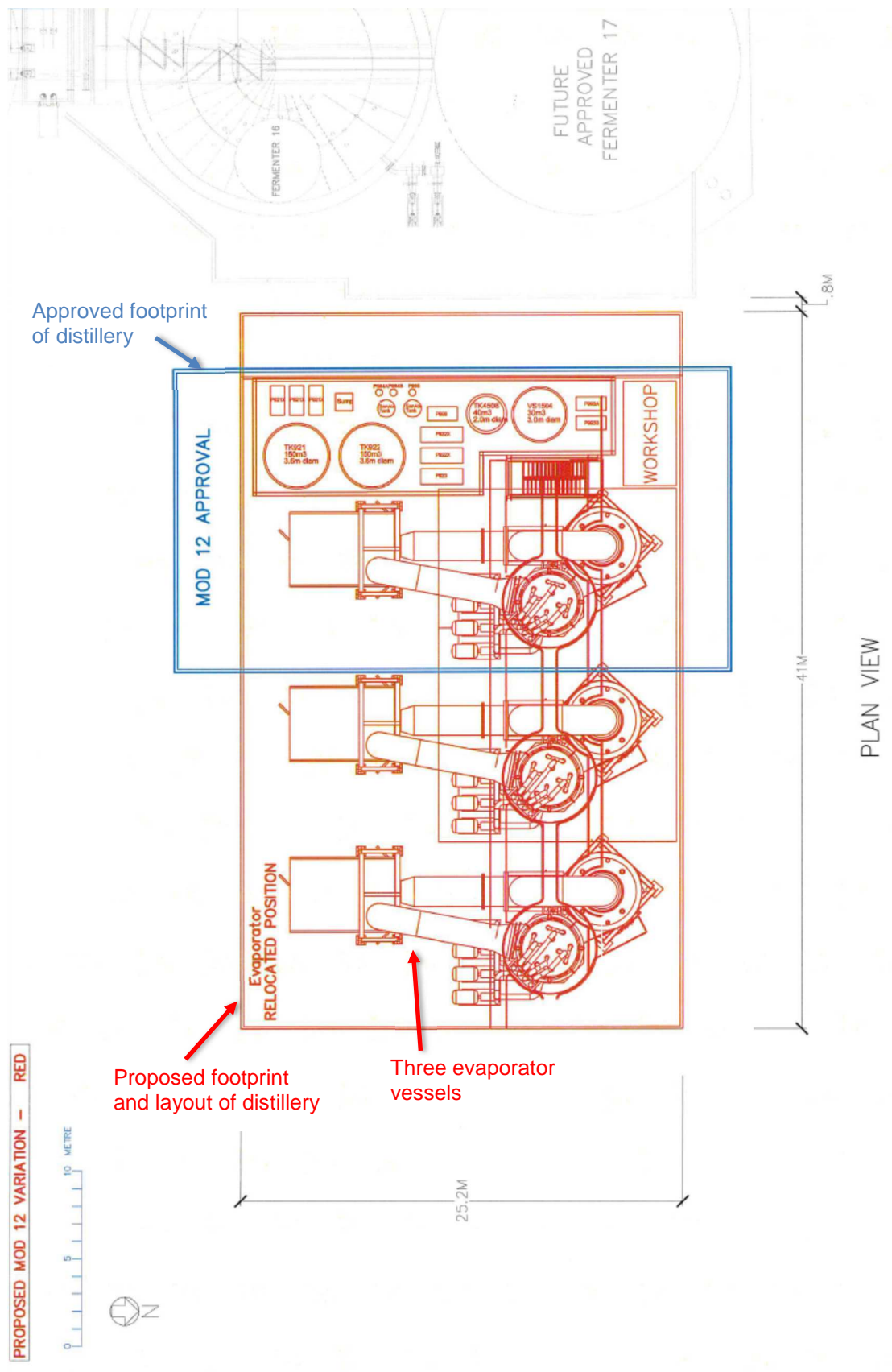






Figure 5 – Regularise Existing Structures





**Figure 6 – Beverage Grade Ethanol Distillery Footprint**



### 3. 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 request.

However, as the Proponent made reportable political donations, therefore the request will be determined by 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 modification
- the modification involves alterations to existing infrastructure to reduce energy costs
- the modification is of a scale that warrants the use of Section 75W of the EP&A Act
- any potential environmental impacts would be minimal and appropriately managed through the existing or modified conditions of approval.

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

### 4. CONSULTATION & SUBMISSIONS

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

- made the modification request publicly available from 11 September to 25 September 2017:
  - on the Department's website and at NSW Service Centres
  - at Shoalhaven City Council offices in Bridge Street, Nowra
- notified nearby landowners about the exhibition period by letter
- notified relevant State government agencies and Shoalhaven City Council by letter
- advertised the exhibition in the Nowra South Coast Register and the Shoalhaven and Nowra News.

A total of five submissions were received from Government agencies. No submissions were received from the general public and no objections were received. **Appendix C** contains a web link to the submissions and a summary of the issues raised is provided below.

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

Council did not object to the modification subject to consideration of the following matters:

- works to the temporary car park on the northern side of Bolong Road (required as part of MOD 12) be completed prior to construction of the boiler modifications
- the Proponent submit a Construction Traffic Management Plan to Council for approval prior to construction (as specified in the Proponent's Traffic Impact Assessment report)
- the modification is referred to NSW Fire & Rescue for comments on hazards

- the Proponent comply with the requirements of Shoalhaven Water.

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

The EPA did not object to the modification but raised several deficiencies with the air quality assessment. The initial modelling was not undertaken in accordance with the EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*. EPA identified several issues including justification for the use of the AEROMOD model, the absence of cumulative assessment, inadequate emissions inventory and several technical inaccuracies. The Proponent revised the modelling and in October 2017 met with the EPA and the Department to address the issues raised. Following further comments from the EPA, refinement of the modelling and provision of specifications from the manufacturers of the baghouses, EPA advised it was satisfied with the air quality assessment. The EPA provided recommended conditions for the modification including requirements for quarterly monitoring of air emissions from the boiler stacks.

### **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 modification. RMS advised it would issue its concurrence under Section 138 of the *Roads Act 1993*, if Council is satisfied with any proposed works to Bolong Road to support the modification.

The **Office of Environment and Heritage (OEI)** and **Department of Primary Industries (DPI)** advised they had no comments on the modification.

The Department did not receive a response from NSW Fire and Rescue.

The Proponent consulted with the **Department of Defence (DoD)** during preparation of the EA for the modification. The DoD advised it had no concerns with the modification in relation to the operational airspace of the HMAS Albatross, located 10 km south-west of the factory. 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. These requirements are included in the existing project approval for the SSEEP. The Proponent did not consult again with DoD in relation to regularisation of approved structures as there was no height increase of any of the structures.

### **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:

- MOD 13 Air Quality Assessment, Updated Cumulative Air Quality Assessment, prepared by GHD, dated 13 October 2017
- Boiler emission test reports
- Baghouse filter emissions data.

## **5. CONSIDERATION**

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

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

The Department considers the key issues for the modification are air quality and hazards. **Table 4** provides the Department's assessment of other issues, including traffic, noise, visual amenity, building height, contamination, acid sulfate soils and flooding.

## 5.1 Air Quality

The modification involves converting boilers from using natural gas and woodchips to coal. Emissions from the combustion of coal differ to gas and woodchips, requiring the installation of baghouses to treat emissions prior to discharge via stacks. The modification also involves increasing the height of the existing stacks to aid the dispersion of air discharges.

The EA included an AQIA prepared by Stephenson Environmental Management Australia (SEMA). The EPA identified several inadequacies with the AQIA noting it was not prepared in accordance with the EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*. The Department and the EPA met with the Proponent to discuss the specific technical issues with the modelling. The Proponent commissioned GHD to prepare a revised AQIA to address the issues raised. The EPA requested further refinements to the GHD model, details of boiler emissions testing and performance data from the manufacturers of the baghouse filters. The Proponent provided the additional information and the EPA advised it was satisfied with the revised AQIA.

The revised AQIA considered all existing and proposed air emission sources to assess the cumulative emissions from the factory for comparison with relevant limits. The assessment considered odour, particulate matter and products of combustion, such as carbon monoxide, sulfur dioxide, oxides of nitrogen, heavy metals and volatile organic compounds. The cumulative assessment used conservative background particulate levels, measurements from the existing factory and assumed emission rates for the boilers running on coal.

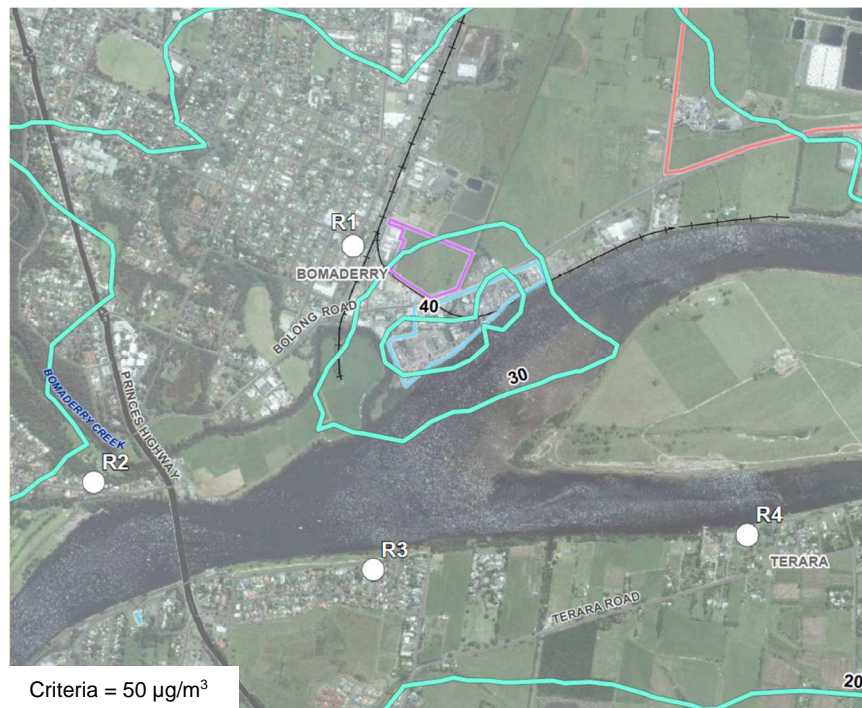
The AQIA compared cumulative emissions from all factory sources with the EPA's impact assessment criteria and concluded:

- particulate matter concentrations would comply with the 24-hour average criteria of 50  $\mu\text{g}/\text{m}^3$  for  $\text{PM}_{10}$  and 25  $\mu\text{g}/\text{m}^3$  for  $\text{PM}_{2.5}$  at the nearest residential receivers. **Figure 7** shows the maximum predicted cumulative ground level  $\text{PM}_{10}$  concentrations relative to the nearest receivers (R1 to R4)
- worst case sulfur dioxide, oxides of nitrogen and carbon monoxide concentrations would comply with the 1-hour average criteria at the nearest residential receivers
- hydrogen fluoride concentrations would comply with the 24 hour criteria at the nearest residential receivers
- volatile organic compounds and polycyclic aromatic hydrocarbons would be well below relevant criteria at the nearest receivers
- heavy metal concentrations would be below the relevant criteria at the nearest receivers.

The EPA was satisfied with the predictions of the modelling and recommended a range of conditions to manage emissions from the converted boilers. The EPA recommended emission limits and quarterly monitoring for a range of pollutants including particulates, sulfur dioxide, oxides of nitrogen, volatile organic compounds and heavy metals. The EPA recommended a post commissioning verification report including the results of monitoring and a requirement to implement further mitigation measures if the limits are exceeded.

The Department agrees with the conclusions of the AQIA and the recommendations of the EPA. The Department notes the cumulative emissions from the factory, operating with the converted boilers, would not exceed the EPA's impact assessment criteria for all assessed pollutants. The recommended conditions include a requirement for the Proponent to implement additional mitigation measures to minimise emissions if the limits are exceeded. With these controls in place, the Department concludes the air and odour emissions from the modified project would be appropriately managed to meet relevant limits.





**Figure 7** – Maximum Predicted Cumulative Ground Level PM<sub>10</sub> Concentrations

The proposal to regularise structures built on altered footprints was not considered in the revised AQIA. The Department notes these structures relate to the SSEEP project approval and approved modifications MOD 2 – Fermenters and MOD 7 – Starch Dryer No. 5. The Department notes the air quality impacts of these structures were already assessed in the relevant applications and the altered footprints would be unlikely to change the overall air emissions from the factory. The Department concludes the existing conditions (and the modifications proposed for the boilers) are appropriate for managing the air emissions from the modified factory.

## 5.2 Hazards and Risks

Modifications to factory processes and equipment has the potential to increase hazards and risks at the facility. Pinnacle Risk Management (Pinnacle) prepared a Preliminary Hazard Analysis (PHA) to assess the potential hazardous events and corresponding risks associated with the modification.

The PHA identified and assessed the following potential hazardous events for the conversion of boiler numbers 2, 4 and 6:

- release of fly ash (waste left after combustion of coal)
- fire in a baghouse
- coal dust explosion
- coal stockpile fire
- fugitive coal dust emissions
- fire propagation back through the coal feed system.

The PHA considered the causes and consequences of the above hazardous events and identified existing safeguards for the prevention, detection and mitigation of these events. The PHA assessed the risks to both the public and operational personnel for comparison with the Department's risk criteria for land use safety planning. The PHA noted the distance from the boiler house and coal handling equipment to the nearest site boundary (Bolong Road) is 120 m.

The PHA concluded the risks from modifications to boilers 2, 4 and 6 would comply with the Department's risk criteria for fatality risk, injury risk, toxic exposure and propagation (i.e. domino effect) due to fire and explosion. The PHA concluded societal risk, area cumulative risk and environmental risk would be acceptable. The primary reason for the low risk levels is that significant levels of impact would be contained on site. The PHA recommended all existing coal handling equipment that would be refurbished for the converted boilers should be functionally tested prior to reuse. This includes the safety instrumented controls and mechanical protective systems.

The Department reviewed the PHA and requested clarification from the Proponent regarding the physical changes proposed to the boilers. Following review of the PHA and additional information, the Department considered the analysis appropriate and the hazard identification comprehensive. The Department agrees with the conclusions of the PHA that potential fires and explosion events are unlikely to result in off site impact and the proposed modification satisfies the relevant risk criteria. The Department also notes the modification does not significantly increase the cumulative risk from the facility.

The Department considers the PHA lists adequate safeguarding and mitigation measures and agrees with the recommendation to test existing coal handling equipment prior to reuse. The Department has included this recommendation as a modified condition as well as a requirement to update the existing hazard related studies and plans in the approval to include the modification. This includes the Site-Wide Fire Safety Study, Emergency Plan and Safety Management System. The Department also requires the Proponent to submit for the Secretary's approval, a Final Hazard Analysis prior to construction of the boiler conversions. 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 modification would be appropriately managed.

The Department's hazards team considered the structures built on altered footprints and noted these structures were considered in the environmental assessments and relevant post-approval hazard studies for the SSEEPP and subsequent modifications. The Department considered:

- the altered fermenter location (MOD 2)
- larger footprint of the flour mill
- altered footprint of gluten dryer 6
- altered layout of starch dryer 5 (MOD 7)
- different location for the biofilters
- different location for the weighbridge

The Department concludes the hazards and risks would not change due to the altered footprints of these structures. The Department notes the weighbridge has been built in the location for a gas-fired cogeneration plant, approved as part of the SSEEPP but not yet constructed. The Department has recommended a condition requiring the Proponent to apply to modify the SSEEPP approval, should it seek to construct the cogeneration plant. The modification would need to propose an alternate location for the cogeneration plant and assess the potential impacts on the adjacent weighbridge. The Department considers the existing conditions to manage hazards and risks adequately cover the altered structures.

### 5.3 Other Issues

**Table 4** provides the Department's assessment of other issues.

**Table 5:** Assessment of Other Issues

Issue	Assessment	Recommendation
Traffic	<ul style="list-style-type: none"> <li>• The EA included a traffic and car parking assessment (TCPA) prepared by ARC Traffic &amp; Transport.</li> <li>• The TCPA noted the following key points: <ul style="list-style-type: none"> <li>- the modification would not increase production levels or</li> </ul> </li> </ul>	<p>Require the Proponent to:</p> <ul style="list-style-type: none"> <li>• submit a Construction Traffic</li> </ul>

Issue	Assessment	Recommendation
	<ul style="list-style-type: none"> <li>operational staff numbers               <ul style="list-style-type: none"> <li>– there would be an increase in coal truck trips supplying the boilers and an increase in trucks taking fly ash waste from the boilers</li> <li>– truck trips delivering woodchips would be removed.</li> </ul> </li> <li>• Trucks accessing the boilers would use the western access point, with most trucks traveling to and from the west. Fly ash trucks would travel east to the environmental farm via Hanigans Lane where fly ash is used for farm road maintenance.</li> <li>• The modification would result in:               <ul style="list-style-type: none"> <li>– an additional 12 coal truck trips per day</li> <li>– an additional 4 fly ash truck trips per day</li> <li>– removal of 6 woodchip truck trips per day.</li> </ul> </li> <li>• The TCPA considered existing traffic numbers, future traffic growth and the additional trips. The TCPA analysed intersection performance and concluded the additional truck trips would have little or no impact on the local road network or key intersections.</li> <li>• The modification would require 20 construction staff over a period of 12 weeks. This would generate an estimated 9 additional light vehicle trips during peak hour. Construction vehicles would use the temporary car park on the northern side of Bolong Road.</li> <li>• The TCPA concluded construction traffic would have little or no impact on local roads, intersections or the temporary car park.</li> <li>• Council, as the relevant roads authority, raised no objection to the modification and recommended two conditions:               <ul style="list-style-type: none"> <li>– works to the temporary car park (required as part of MOD 12) be completed prior to construction of the boiler modification. The works include increasing car park capacity, providing a concrete driveway and markers to delineate spaces</li> <li>– the Proponent submits a Construction Traffic Management to Council for approval.</li> </ul> </li> <li>• The Department agrees with the conclusions of the TCPA and considers the additional 10 truck trips per day from the modification would have negligible impacts on the local road network, key intersections and on-site car parking.</li> <li>• The Department notes the structures the Proponent is seeking to regularise were previously assessed as part of the traffic assessments for the SSEEP approval and MODs 2 and 7.</li> <li>• The Department does not agree with Council's request to complete the works to the temporary car park prior to construction of the boiler modification. These works are directly linked to the larger construction works required for MOD 12. The boiler modification would generate only minimal construction traffic and does not warrant upgrading the car park. The works to the temporary car park form part of a broader package of road works with specific delivery dates specified in the project approval.</li> <li>• The Department has included Council's request for a Construction Traffic Management Plan.</li> </ul>	<p>Management Plan for Council's approval, prior to construction.</p>
Noise	<ul style="list-style-type: none"> <li>• The modification has the potential to increase noise from the factory with the addition of new plant on the boilers.</li> <li>• The factory is in an industrial area of Bomaderry with the nearest residential receivers located on Meroo and Coomea Streets, over 400 m to the north-west.</li> <li>• The project approval and Environment Protection Licence include noise limits at residential receivers and require new plant to 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 limits at receivers.</li> <li>• The main noise sources associated with the boiler conversion includes fans to provide air flow to the furnaces, baghouse pneumatic cleaning pulses and conveyor motors.</li> <li>• The EA included a noise impact assessment (NIA) which predicted noise levels from the new equipment, using manufacturer's sound power level data, and compared these to the design noise goals.</li> <li>• The NIA predicted noise from the new equipment would comply with the noise goals, and therefore the noise limits at all receiver</li> </ul>	<p>Manage via existing conditions requiring the Proponent to:</p> <ul style="list-style-type: none"> <li>• submit a design noise verification report for the Secretary's approval prior to construction</li> <li>• conduct noise validation monitoring 12 months after operation of the modified boilers.</li> </ul>



Issue	Assessment	Recommendation
	<p>locations, provided the sound power levels are consistent with those provided by the manufacturer.</p> <ul style="list-style-type: none"> <li>• The NIA noted if fan selections change or additional plant is required then specific noise mitigation measures may be required.</li> <li>• The EPA did not comment on the noise aspects of the modification.</li> <li>• The Department's assessment concludes the additional plant required for the boiler conversion is unlikely to increase noise levels at residential receivers, provided the sound power levels for the equipment are consistent with those used in the NIA.</li> <li>• The Department notes the existing conditions require the Proponent to submit a design noise verification report prior to construction of modifications and conduct noise validation monitoring, 12 months after operation of modifications.</li> <li>• The Department is satisfied the existing conditions provide for adequate management of noise from the modified factory. The Department also notes the structures the Proponent is seeking to regularise were previously assessed as part of noise studies for the SSEEPP project approval and MODs 2 and 7.</li> </ul>	
Visual amenity	<ul style="list-style-type: none"> <li>• The modification includes new tall structures (baghouses and stack extensions), including: <ul style="list-style-type: none"> <li>– boiler no. 2 – new baghouse 14.7 m high and replace existing 22 m stack with 40 m stack</li> <li>– boiler no. 4 – new baghouse on top of boiler building increasing height by 8.4 m to a total height of 35 m</li> <li>– boiler No. 6 – new baghouse 18.2 m high.</li> </ul> </li> <li>• Other components of the modification, including the alterations to approved structures on site and the changes to the MOD 12 layout would not result in any substantial visual changes on the site.</li> <li>• The EA included a visual assessment, considering the visibility of the new structures (baghouses and stack extensions) from the key vantage points on Bolong Road, Princes Highway and the residential areas in Bomaderry, North Nowra and Terara.</li> <li>• The visual assessment noted the proposed structures are consistent in scale and height to existing structures, including the boiler house at 27 m, boiler stack at 53 m and flour mill at 34 m.</li> <li>• The assessment noted the structures would be partially screened from passing motorists on Bolong Road by intervening tall structures. The stacks would be visible from the urban area of Bomaderry as it is elevated above the site. Views from North Nowra and Terara are more distant and the factory is partially screened by vegetation, however the stacks would be visible above the vegetation.</li> <li>• The EA concluded the modification would not have significant adverse visual impacts given the scale and character is consistent with existing structures at the factory.</li> <li>• The Proponent has committed to use non-reflective building materials and cladding colours like other structures on the site.</li> <li>• Council did not raise any concerns regarding visual amenity.</li> <li>• The Department concludes the proposed structures would blend with the existing industrial character of the site and adjacent industrial areas of Bomaderry and would have minimal visual impact.</li> <li>• The original project approval includes conditions for the control of lighting and use of non-reflective building materials which applies to the modification.</li> </ul>	<p>Manage via existing conditions requiring 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 (DoD) regarding the height of the baghouses and stacks.</li> <li>• The DoD considered the potential impacts to the safety of aircraft operations at HMAS Albatross, advised it had no concerns and requested the Proponent provide as-constructed details to Airservices Australia following completion of construction, for</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</li> </ul>

Issue	Assessment	Recommendation
	<p>inclusion in its database.</p> <ul style="list-style-type: none"> <li>The existing conditions require the Proponent to provide as-constructed details to Airservices Australia for any structure above 30 m.</li> <li>The structures the Proponent is seeking to regularise were built on different footprints to the approved locations but are consistent with the approved heights. No further consultation with DoD was undertaken in relation to these structures. DoD previously commented on MOD 7 and the existing approval requires the details of all tall structures to be reported to DoD.</li> </ul>	<p>structures above 30 m.</p>
Contamination and acid sulfate soils	<ul style="list-style-type: none"> <li>The factory has been used for industrial purposes since the 1970s with the boiler house constructed in 1977.</li> <li>Coffey has undertaken several contamination assessments of the site, with the most recent for Flour Mill B in 2016, which is located immediately adjacent the boiler house and proposed modification.</li> <li>The modification would involve minor ground disturbance to construct foundations for the fans and exhaust stacks. Other works would take place on or within the boiler house building and would not require ground disturbance.</li> <li>Coffey considered the potential for the modification to disturb contaminated soils and acid sulfate soils (ASS).</li> <li>The assessment noted the area surrounding the boiler house is mostly paved hardstand in moderate to good condition with an adjacent chemical storage bund also in good condition.</li> <li>Coffey concluded the potential for widespread contamination on site is low, with the paved area likely to have limited subsurface contamination.</li> <li>Coffey recommended precautions during subsurface excavations, particularly close to the chemical storage bund, with procedures for handling any unexpected finds. Coffey also noted that an ASS management plan would be required if excavations are to exceed 3 m in depth, as ASS may be encountered at this depth.</li> <li>The EPA and Council did not comment on contamination or ASS.</li> <li>The Department considers the minor excavation works would have limited potential to encounter contaminated soils or ASS. The Department concludes the excavation works can be appropriately managed by modifying the existing conditions to require an unexpected finds protocol for the modification. The existing conditions already require an ASS management plan for modifications.</li> </ul>	<p>Require the Proponent to:</p> <ul style="list-style-type: none"> <li>update and implement a protocol for managing unexpected finds.</li> </ul> <p>Manage via existing conditions requiring the Proponent to:</p> <ul style="list-style-type: none"> <li>submit an ASS management plan for the modification, if required.</li> </ul>
Flooding	<ul style="list-style-type: none"> <li>The boiler house and proposed modification are located within an area described as high hazard and floodway, inundated in the 1 in 100 year flood event.</li> <li>The EA included a flood compliance report (FCR) prepared by WMA Water. The report considered the modification in the context of previous flood studies of the site and evaluated the modification against Council's Development Control Plan (DCP) 2014, for development on flood prone land.</li> <li>The FCR noted the modification involves largely sealed structures with many components located above the probable maximum flood level. The works are located within an area of extensive development that already significantly impedes flood flows. The area of proposed works is considered too small to be evaluated in terms of the loss of floodplain storage and restriction of flows.</li> <li>WMA Water noted the works are consistent with the requirements of Council's DCP in relation to safety and escape routes.</li> <li>The Department agrees with the Proponent's assessment and concludes the modification would have minimal effect on flooding. The existing conditions are adequate for certifying that the structures would be built to withstand flooding.</li> <li>The Department notes the flooding assessment did not consider the structures built on altered footprints (as it pre-dated the Proponent's request to include this in the modification). However, the Department notes these aspects were previously assessed as part of the SSEEP approval and MODs 2 and 7. Whilst the location of the structures was altered, the scale of the structures is generally consistent with the approval and would be unlikely to</li> </ul>	<p>Manage via existing conditions requiring the Proponent to:</p> <ul style="list-style-type: none"> <li>provide a structural engineer's certificate, prior to and following construction, to certify the structures are built to withstand flooding.</li> </ul> <p>Require the Proponent to:</p> <ul style="list-style-type: none"> <li>remove shipping containers and demountable buildings from the factory site following completion of construction of MOD 13.</li> </ul>

Issue	Assessment	Recommendation
	<p>significantly change the flooding impacts at the factory.</p> <ul style="list-style-type: none"> <li>The Department notes the shipping containers used for construction purposes are temporary structures and whilst not assessed in the FCR, they would be unlikely to change the flooding impacts at the factory or off site.</li> <li>However, the Department has recommended the Proponent remove the shipping containers and demountable buildings from the factory site following the completion of construction works associated with MOD 13.</li> </ul>	
Alterations and additions to structures	<ul style="list-style-type: none"> <li>An independent compliance audit of the factory identified several structures that were approved but built on a different footprint within the factory. The audit also identified smaller structures, some temporary, that were not covered by the project approval. <u>Approved structure built on different footprint or location</u></li> <li>The Department reviewed the compliance audit report and notes the Proponent has obtained construction or building certificates for the permanent structures as required by the SSEEP project approval. The Department has recommended updating the existing condition to require construction / building certificates for alterations or additions to existing structures, as well as new structures.</li> <li>The Department notes these structures (fermenter tank, flour mill, product dryer 6, starch dryer 5, biofilters and weighbridge) were previously assessed as part of the SSEEP approval and subsequent modifications. The Department considers the altered footprints and locations would be unlikely to change the approved impacts of the project and the existing conditions adequately cover these structures. <u>Unapproved structures</u></li> <li>The Department notes the shipping containers and demountable buildings on the factory site are used for construction purposes, meaning they are consistent with the State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (E&amp;C Codes).</li> <li>The woodchip shelter is a permanent structure and is not consistent with the E&amp;C Codes. The Department notes the structure is an awning and does not have enclosed sides, therefore potential impacts on flooding would be negligible.</li> <li>Shipping containers and a storage shed constructed on the environmental farm are also not consistent with the E&amp;C Codes as there are more than 1 shipping container per lot and the storage shed is located too close to a lot boundary (although the adjacent lot is owned by the Proponent).</li> <li>The Department has considered the shipping containers and storage shed on the environmental farm and notes they are consistent with farm uses. The shed is located 85 m from the nearest rural residential property and the shipping containers are 700 m from the nearest residential property. The Department concludes these structures would have negligible environmental impacts.</li> <li>The audit also identified the use of tyres on the environmental farm to hold down covers over silage (stock feed). The Proponent uses and stores approximately 5,000 tyres for this purpose, with the amount in use varying depending on silage production. The Department consulted with the EPA, confirming the use of the tyres is consistent with the EPA's Recovered Tyres Exemption 2014 and the Department of Primary Industry's Guideline 'Successful Silage'. No additional conditions are required for this use.</li> <li>The Department's assessment concludes the altered and unapproved structures would not change the environmental impacts of the approved factory and farm operations. The Department recommends amending the condition requiring construction / building certificates for any alterations or additions to structures.</li> </ul>	Update the existing condition for compliance with the Building Code of Australia to require compliance for alterations and additions to existing structures.

## 6. CONCLUSION

The Department has assessed the proposed modification in accordance with the relevant requirements of the EP&A Act. The Department concludes the modification would:

- result in minimal environmental impacts beyond the approved facility
- ensure the air quality impacts are maintained below existing limits
- maintain the hazards and risks of the facility below relevant limits
- regularise altered structures on the site.

The Department and the EPA extensively reviewed the air quality assessment for converting the boilers from natural gas to coal. This process verified that the modification would comply with the limits for relevant air quality pollutants. The Department has recommended a range of conditions to ensure the air emissions from the boilers are verified post operation and additional mitigation measures are implemented if the boilers are not meeting the emission limits. The Department has also reviewed the Independent Compliance Audit, 2017 which identified several unapproved alterations to structures on the site. The Department considered the potential impacts of these alterations and concluded there would be minimal environmental impacts due to the altered footprints and layouts.

Following on from this assessment of the proposed modification, the Department considers the modification application is approvable, subject to any modifying conditions of consent outlined in **Appendix A**. This assessment report is hereby presented to the Commission for determination.

Prepared by:  
Deana Burn  
Specialist Planner, Industry Assessments

Endorsed by:



Chris Ritchie 20/12/17  
**Director**  
**Industry Assessments**

Endorsed by:



Anthea Sargeant 9/1/2018  
**Executive Director**  
**Key Sites & Industry Assessments**



## **APPENDIX A – INSTRUMENT OF MODIFICATION**

## **APPENDIX B – ENVIRONMENTAL ASSESSMENT**

See separate files at:

[http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=8561](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8561)

## **APPENDIX C – SUBMISSIONS**

See separate files at:

[http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=8561](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8561)

## **APPENDIX D – RESPONSE TO SUBMISSIONS**

See separate file at:

[http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=8561](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8561)