# STATEMENT OF ENVIRONMENTAL EFFECTS

**APPLICATION TO MODIFY PROJECT APPROVAL MP06_0228**
**SHOALHAVEN STARCHES EXPANSION PROJECT**

**MODIFICATION APPLICATION No. 21 (Mod 21)**
**(MADE PURSUANT TO S. 4.55(1A) OF THE ENVIRONMENTAL PLANNING & ASSESSMENT ACT)**

**PROPOSED MODIFICATION TO APPROVED PACKING PLANT AND OTHER WORKS**

**Shoalhaven Starches**
**Bolong Road, Bomaderry**

**Prepared for**

**SHOALHAVEN STARCHES PTY LTD**

**August 2021**

COWMAN STODDART PTY LTD

# Statement of Environment Effects

| | |
|---|---|
| Project | Application to Modify Project Approval MP06_0228, Shoalhaven Starches Expansion Project (Modification Application No. 21 (Mod 21))<br>Proposed Modification to Approved Packing Plant and Other Works. |
| Address | Bolong Road, Bomaderry |
| Our ref: | 21/16 |
| Prepared by | Stephen Richardson |
| Draft | 16 July 2021 |
| Final | 11 August 2021 |



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# EXECUTIVE SUMMARY

Shoalhaven Starches is a member of the Manildra Group of companies. The Manildra Group is a wholly Australian owned business and the largest processor of wheat in Australia. It manufactures a wide range of wheat based products for food and industrial markets both locally and internationally.

The Shoalhaven Starches factory located on Bolong Road, Bomaderry produces a range of products for the food, beverage, confectionary, paper and motor transport industries including starch, gluten, glucose and ethanol.

Project Approval MP06_0228 was granted by the Minister for Planning on the 28th January 2009 for the Shoalhaven Starches Expansion Project. This approval also encapsulated previous approvals for the site into one overall approval for the site (at that time).

The Shoalhaven Starches Expansion Project sought to increase ethanol production at the Bomaderry plant in a staged manner from 126 million litres per year to 300 million litres per year. To accomplish the increase in ethanol production, this project required a series of plant upgrades and increase in throughput of raw materials, principally flour and grain.

Following the Minister's determination Shoalhaven Starches have been implementing and commissioning works in accordance with this Project Approval.

Under Project Approval MP 06_0228 Shoalhaven Starches obtained approval to establish a new Packing Plant, container loading area and a rail spur line on the northern side of Bolong Road. These works also required the provision of an overhead bridge structure to allow product to be transferred and safe pedestrian movement across Bolong Road.

In 2019 the the Independent Planning Commission approved Mod 16 which included the construction of a Specialty Product Facility and additional Gluten Dryer. The Specialty Products Building would enable the production of an increased range of specialised products as an extension to Shoalhaven Starches existing product line. The specialty products will comprise a range of modified gluten products for the food industry; and modified starches for both paper manufacturing as well as food production.

Shoalhaven Starches have now identified that as a result of the increase in range of different specialised products that will now be able to be produced as a result of Mod 16; amendments will be required to the approved Packing Plant on the northern side of Bolong Road to accommodate the different packaging requirements for this increased range of specialised products.

In addition, this Modification Application will include other works not directly related to the modifications to the Packing Plant including:

- The installation of a waste water buffer tank adjacent to the existing waste water tank located within the vicinity of the water treatment plant and waste water storage ponds located on the Environmental Farm;
- The installation of an Ethanol Nitrogen Generator and storage vessels within the Shoalhaven Starches factory site; and
- The installation of an Indirect Cooking plant within the Shoalhaven Starches factory site
- The installation of an additional two fermentation tanks within the eastern part of the site.

The Shoalhaven Starches Expansion Project was a 'transitional Part 3A Project" for the purposes of Schedule 6A of the Environmental Planning & Assessment Act. As of the 1st March 2018 the transitional arrangements for former Part 3A projects have been discontinued. The discontinuation of the transitional arrangements for Part 3A projects and concept plans means that modifications are assessed through the State Significant Development (SSD) pathway. As such this Modification Application is made pursuant to Section 4.55(1A) of the Environmental Planning & Assessment Act 1979.

The preparation of this SEE has been undertaken following consultation with the DPIE, the EPA, The Natural Resource Access Regulator (NRAR), Fire & Rescue NSW, The Australian Department of Defence, and Shoalhaven City Council.

The SEE is supported by the following expert assessments:

- An Air Quality Impact Assessment prepared by GHD (**Annexure 3**). GHD conclude that:
    - Odour dispersion modelling was undertaken by GHD for the quarter with maximum odour emissions (Quarter 2) and for the most recent quarter (Quarter 3).
        - Modelling of the Quarter 2 predicted a marginal increase in odour impacts resulting in an exceedance at residential receptors R2 and R3. This exceedance was primarily attributed to high quarterly odour sampling results.
        - Modelling of the most recent quarter 3 however predicted compliance of the odour criteria at all residential receptors.
    - Dispersion modelling of particulates, combustion products, PAH, VOCs and metals was undertaken for base and mitigation scenarios.
        - For both base and mitigation scenarios, minor exceedances of the cumulative 24 hour $PM_{10}$ and $PM_{2.5}$ criteria were predicted by GHD at commercial receptor C1. These exceedances were primarily attributed by GHD to high background concentrations that occurred on the days where exceedances were predicted.

  - For the base scenario, nitrogen dioxide concentrations were predicted by GHD to exceed the criteria at commercial/industrial sensitive receptor C1 for two hours of the modelled year (0.02% of the time) and C2 for one hour of the modelled year C2 (0.05% of the time) for the base scenario. There were no predicted exceedances of the nitrogen dioxide criteria in the mitigation scenario where the use of coal boiler 8 was replaced with the use of gas boiler 7 and gas boiler 8.
- GHD recommend that an investigation of opportunities be undertaken to use gas fired boilers instead of coal. In this regard GHD identify Shoalhaven Starches will be incorporating the conversion of coal fired boilers to gas as part of the future proposal to construct a gas fired co-generation plant as part of the future Modification 23.
- Compliance was predicted by GHD for all other air quality species for both scenarios.

- A Noise Assessment by Harwood Acoustics (**Annexure 4**):
  - Harwood Acoustics make a range of recommendations to reduce the level of noise emission from the items of plant and equipment associated with this modification to achieve the noise design goals derived from Environment Protection Licence 883 noise limits at each receptor location.
  - Harwood Acoustics advise the level of noise emission from the construction phase of the project will be within the noisemanagement levels set by the NSW EPA's *Interim Construction Noise Guideline*.
  - Harwood Acoustics however recommend that construction noise mitigation measures are included in the Construction Safety& Environmental Management Plan prepared by Shoalhaven Starches.
- A Flood Compliance Report prepared by WMAwater (**Annexure 5**) identifies that a comparison of peak flood levels between the approved and Modification Proposal for the 1% AEP event indicate that the maximum increase in 1% AEP flood level outside the Shoalhaven Starches plant is up to 0.05m at the rail crossing of Bolong Road with increases in flood level generally limited to within the Shoalhaven Starches plant.
- A Preliminary Hazard Analysis (PHA) undertaken by Pinnacle Risk Management (**Annexure 6**) that assess the risks associated with the proposed modifications and provides a comparison against relevant risk criteria. The PHA demonstrates the Modification Proposal will comply with all risk criteria. The PHA also concludes that societal risk, area cumulative risk and environmental risk will be acceptable. Based on the analysis the PHA, makes no further recommendations in relation to this Modification Proposal.
- A Geotechnical and Riverbank Stability Assessment by GHD (**Annexure 7**) demonstrates the development of the third rail siding on the northern side of Bolong Road will not

adversely affect the stability of the western bank of Abernethy's Creek. Similarly in regard to the pipe bridge extending from the Packing Plant to the creek and the pipe gantry extending over Abernethy's Creek south of Bolong Road should not affect the stability of the creek either, provided the structures are supported on piles extending to rock.

The Modification Application will not involve changes to the size, scale or intensity of the existing Shoalhaven Starches operations. The modification proposal will not result in any increases in overall production rates from the site, nor will it involve any significant changes in level of impacts arising from the approved development.

The SEE concludes that the proposed modifications will have minimal environmental impacts; and the development to which Project Approval MP06_0228 as modified by the Modification Application relates, will be substantially the same development as the development for which this consent was originally granted and before that consent as originally granted was modified.

# 1.0 INTRODUCTION

Project Approval MP06_0228 was granted by the Minister for Planning on the 28th January 2009 for the Shoalhaven Starches Expansion Project. This approval also encapsulated previous approvals for the site into one overall approval for the site (at that time).

The Shoalhaven Starches Expansion Project sought to increase ethanol production at the Bomaderry plant in a staged manner from 126 million litres per year to 300 million litres per year. To accomplish the increase in ethanol production, this project required a series of plant upgrades and increase in throughput of raw materials, principally flour and grain.

Following the Minister's determination, Shoalhaven Starches have been implementing and commissioning works in accordance with this approval.

Under Project Approval MP 06_0228 Shoalhaven Starches obtained approval to establish a new Packing Plant, container loading area and a rail spur line on the northern side of Bolong Road. These works also required the provision of an overhead bridge structure to allow product to be transferred and safe pedestrian movement across Bolong Road. Site works have commenced in relation to approved Packing Plant site.

In 2019 the the Independent Planning Commission approved Mod 16 which included the construction of a Specialty Product Facility and additional Gluten Dryer. The Specialty Products Building will enable the production of an increased range of specialised products as an extension to Shoalhaven Starches existing product line. The specialty products will comprise a range of modified gluten products for the food industry; and modified starches for both paper manufacturing as well as food production.

Shoalhaven Starches have now identified that as a result of the increase in range of different specialised products that will now be able to be produced as a result of Mod 16; amendments will be required to the approved Packing Plant on the northern side of Bolong Road to accommodate the different packaging requirements for this increased range of specialised products.

In addition, this Modification Application will include other works not directly related to the modifications to the Packing Plant:

- The installation of a waste water buffer tank adjacent to the existing waste water tank located within the vicinity of the water treatment plant and waste water storage ponds located on the Environmental Farm;
- The installation of an Ethanol Nitrogen Generator and storage vessels within the Shoalhaven Starches factory site; and

- The installation of an Indirect Cooking plant within the Shoalhaven Starches factory site
- The installation of an additional two fermentation tanks within the eastern part of the site.

The Modification Application will not involve changes to the size, scale or intensity of the existing Shoalhaven Starches operations. The modification proposal will not result in any increases in production rates from the site, nor will it involve any changes in level of impacts arising from the approved development.

The Modification Application is made pursuant to Section 4.55(1A) of the Environmental Planning & Assessment Act. This SEE has been prepared in support of the Modification Application.

The SEE has been prepared following consultation with the:

- Department Planning, Industry & Environment (DPIE);
- Environmental Protection Authority (EPA);
- Natural Resource Access Regulator (NRAR);
- Fire & Rescue NSW;
- Australian Department of Defence;
- Shoalhaven City Council (SCC).

Responses from the above government agencies that have been received at the time of preparing this SEE are included as **Annexure 1** to this SEE.

The Modification Application is supported by plans included in **Annexure 2**, and the following expert assessment reports:

- Air Quality Assessment prepared by GHD Pty Ltd (**Annexure 3**);
- An Environmental Noise Impact assessment prepared by Harwood Acoustics (**Annexure 4**);
- A Flood Compliance Report prepared by WMAwater (**Annexure 5**);
- A Preliminary Hazard Analysis prepared by Pinnacle Risk Management (**Annexure 6**);
- A Geotechnical & Riverbank Stability Assessment prepared by GHD (**Annexure 7**).

It is considered that the components associated with this Modification Application will not have any significant adverse environmental impacts; and as a result of this Modification Application the development to which Project Approval MP06_0228 as modified relates will be substantially the same development as the development for which this consent was originally granted and before that consent as originally granted was modified.

# 2.0 SITE AND SURROUNDS

## 2.1 LOCAL AND REGIONAL CONTEXT

The Shoalhaven Starches factory complex is situated upon various allotments of land along Bolong Road, Bomaderry, within the Shoalhaven local government area. The factory site is located on the southern side of Bolong Road on the northern bank of the Shoalhaven River with some operations located on the northern side of Bolong Road. The Shoalhaven Starches site (excluding the former Dairy Farmers and former Paper Mill sites) has an area of approximately 12.5 hectares.

The works associated with this modification proposal involve the following parcels of land:

- Lot 16 DP 1121337;
- Lot 2 DP 538289;
- Lots A & B DP 371388;
- Lot 1 DP 838753;
- Lot B DP 334511;
- Lot 2 DP 548659;
- Lot 21 DP 1000265;
- Lot 1 DP 842231;
- Lot 143 DP 1069758;
- Lot 241 DP 1130535;
- Lot 2 DP 538289;
- Lot B DP 371388.

**Figure 1** is a site locality plan.

The majority of lots associated with these modifications are zoned IN1 (General Industrial) zone, with the exception of Lot 1 DP 842231 which is zoned RU1 under the provisions of SLEP 2014.

The town of Bomaderry is located 0.5 km (approx.) to the west of the factory site, and the Nowra urban area is situated 2.0 km to the south west of the site. The “Riverview Road” area of the Nowra Township is situated approximately 1000 metres immediately opposite the factory site across the Shoalhaven River.

The village of Terara is situated approximately 1.5 kilometres to the south east of the site, across the Shoalhaven River. Burraga (Pig) Island is situated between the factory site and the village of Terara and is currently used for dairy cattle grazing.

There are a number of industrial land uses which have developed on the strip of land between Bolong Road and the Shoalhaven River. Industrial activities have included a metal fabrication factory, the Shoalhaven Starches site and the former Dairy Farmers factory and Shoalhaven Paper Mill (both now owned by the Manildra Group of Companies). The industrial area is serviced by a privately owned spur railway line that runs from just north of the Nowra-Bomaderry station to the Shoalhaven Starches Site.

The state railway terminates at Bomaderry with a separate, privately owned spur line to the factory site. Shoalhaven City Council sewerage treatment works is situated between the railway line and the factory.

The Company also carries out irrigation activities on the Company's Environmental Farm located over 1000 hectares on the northern side of Bolong Road. This area is cleared grazing land and also contains a wastewater treatment plan, wet weather storage ponds and spray irrigation lines. The wet weather storage ponds on the farm form part of the irrigation management system for the factory. The Environmental Farm stretches over a broad area of the northern floodplain of the Shoalhaven River stretching from Bolong Road in the south towards Jaspers Brush in the north. Apart from the Environmental Farm this broad area is mainly used for grazing (dairy cattle).

The factory site has direct road frontage to Bolong Road to the north. The Shoalhaven River flows along the southern boundary of the factory site.

**Figures 2** is an aerial photograph of the locality and the site, respectively. **Figures 3** and **4** provides an aerial photograph of the location of the works associated with this Modification Application.

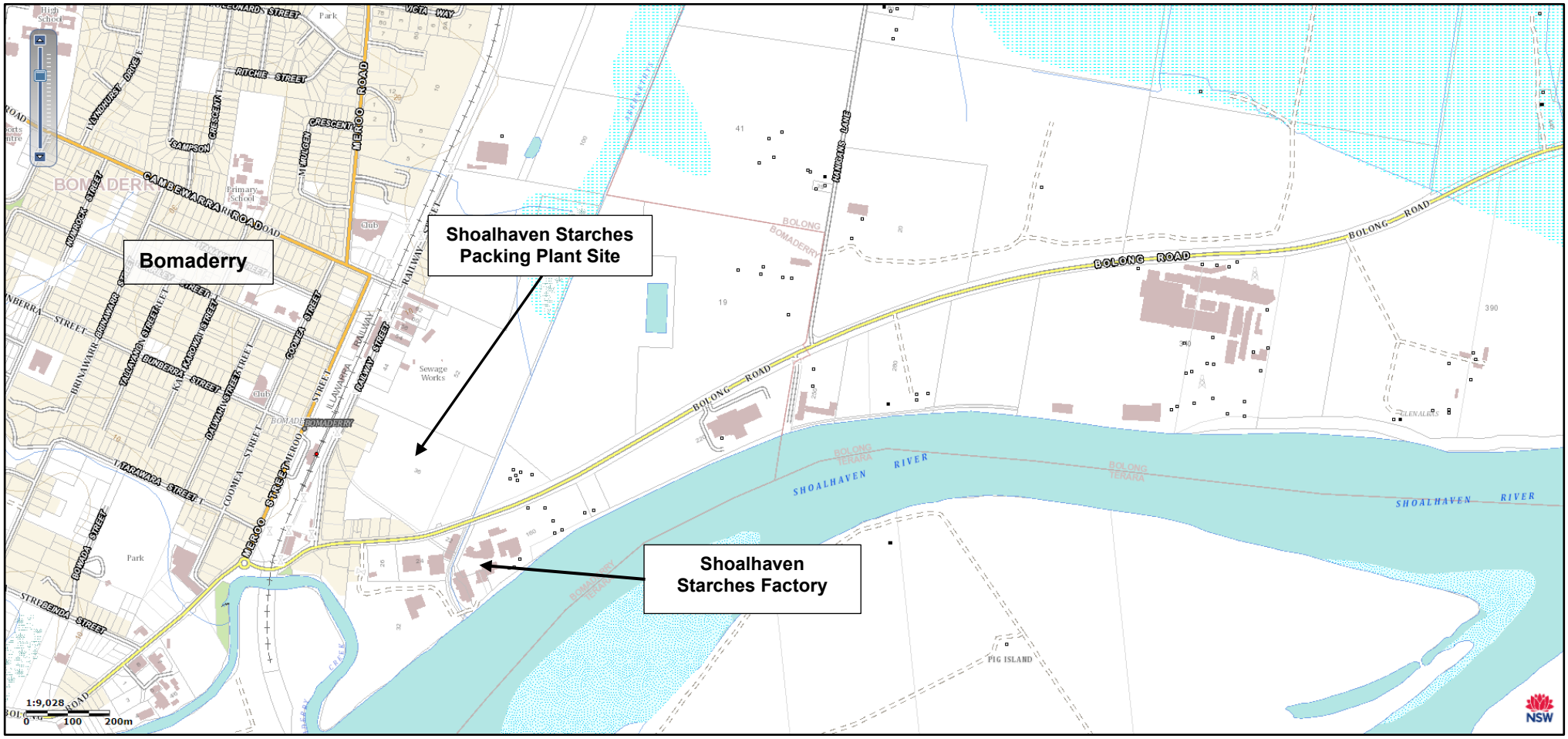


**Figure 1: Site Locality Plan.**

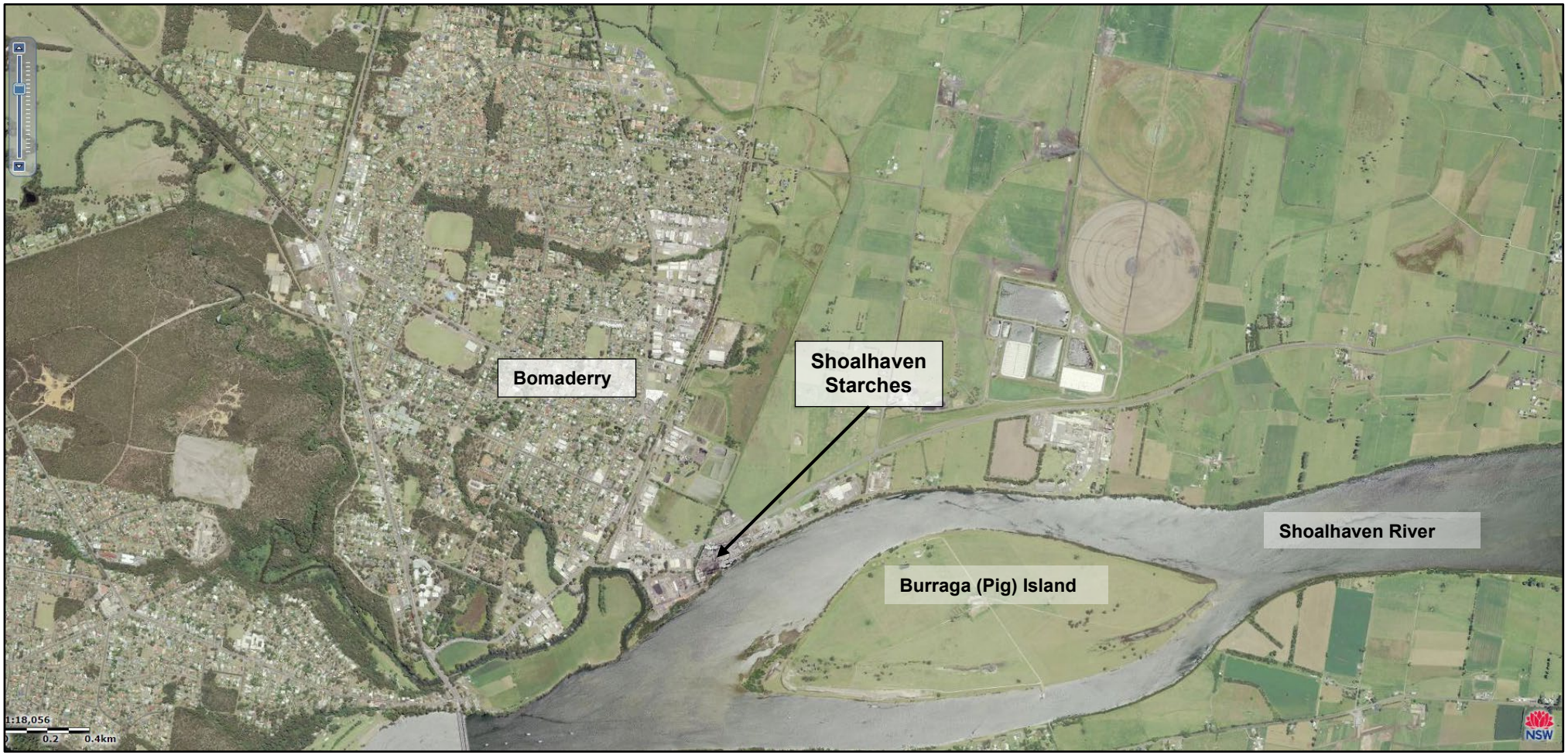


**Figure 2: Aerial photograph of locality.**


**Figure 3: Aerial photograph of Shoalhaven Starches factory site including approved Packing Plant site.**


**Figure 4: Aerial view of location of Wet Weather Storage Ponds and location of proposed additional Buffer Tank.**

# 3.0 BACKGROUND

## 3.1 PRODUCTION PROCESSES

The production process at the Shoalhaven Starches plant have evolved over a number of decades. Originally the plant was primarily concerned with the production of starch and gluten from flour. However, the Company has pursued a number of technological innovations particularly with respect to reducing the environmental impacts of the Company's operations. As a result, Shoalhaven Starches has been moving towards a "closed" system of production. Essentially this entails the efficient use of end products to ensure wastage is reduced to a minimum.

The first step in the production process is the delivery of flour and grain, by rail, from the Company's flour mills at Manildra, Gunnedah and Narrandera. The trainloads are brought into the plant via the switching yard at Bomaderry.

The Company received approval from the Minister for Planning for the erection of flour mills on site to enable the milling of part of the Company's flour requirements to be processed directly on the site. The remainder of the Company's flour requirements continue to be sourced from the Company's off-site flour mills.

Flour is transferred via storage to the "wet end" of the plant where fresh water is added. The subsequent mixing and separation process produces starch and gluten. The gluten is dried to enable it to be packaged and distributed as a high protein food additive for human consumption. This product is then taken from the site after packaging for both local and export markets.

The starch that is separated from the flour is either dried or remains in liquid form. The dried and liquid starch is sold to the paper and food industries. The starch is used for food, cardboard, paper and other industrial purposes. Liquid starch is used in the ethanol production process.

Starch is also used in the production of syrups on the site. The syrups plant products include glucose and brewer's syrup. These are used for foods, chocolates, confectionery, beer, soft drinks and fruit juice. The syrups plant products can also be used in the ethanol process.

The by-products from the starch, gluten and syrup production processes are combined to feed the fermentation and distillation stage of ethanol production. The outputs are fuel, industrial and beverage grade ethanol. Industrial grade ethanol is used in producing pharmaceuticals, printer's ink and methylated spirits.

Ethanol production results in some liquid and solid by-products, which are processed through the stillage recovery process plant (which was approved as part of PRP No. 7 in 2005). The solids in the stillage are recovered as Dried Distillers Grains Syrup (DDGS), dried and sold as a high protein cattle feed with the remaining water used for irrigation.

The wastewater resulting from the ethanol production is treated in the wastewater treatment plant located on the northern side of Bolong Road and is re-used in the Starch Plant and the surplus is irrigated onto Shoalhaven Starches Environmental Farm to the north of Bolong Road. This farmland is used for fodder crops, pasture and cattle grazing.

Boilers are used to produce steam which is used for a multitude of purposes throughout the factory site wherever product is dried, evaporated or heated.

## 3.2 RECENT DEVELOPMENT AND APPROVAL HISTORY

### 3.2.1 Project Approval MP 06_0228

On the 28th January 2009, the then Minister for Planning, issued Project Approval MP 06_0228 for the Shoalhaven Starches Expansion Project.

The primary objective of the Shoalhaven Starches Expansion Project was to increase the Company's ethanol production capacity to meet the expected increase in demand for ethanol primarily, arising from the then NSW Government's mandate to increase ethanol content by volume in petrol in NSW from 2% to 6% from October 2011, by upgrading the existing ethanol plant.

The approval, subject to certain conditions, enabled Shoalhaven Starches to increase ethanol production in a staged manner at its Bomaderry Plant from 126 million litres per year to 300 million litres per year.

To accomplish the increase in ethanol production, the Project Approval enabled Shoalhaven Starches to upgrade plant and increase throughput of raw materials, principally comprising flour and grain.

Under Project Approval MP 06_0228 Shoalhaven Starches obtained approval to establish a new Packing Plant, container loading area and a rail spur line on the northern side of Bolong Road. These works also required the provision of an overhead bridge structure to allow product to be transferred and safe pedestrian movement across Bolong Road.

In 2019 the the Independent Planning Commission approved Mod 16 which included the construction of a Specialty Product Facility and additional Gluten Dryer. The Specialty Products Building would enable the production of an increased range of specialised products as an extension to Shoalhaven Starches existing product line. The specialty

products will comprise a range of modified gluten products for the food industry; and modified starches for both paper manufacturing as well as food production.

Shoalhaven Starches have now identified that as a result of the increase in range of different specialised products that will now be able to be produced as a result of Mod 16; amendments will be required to the approved Packing Plant on the northern side of Bolong Road to accommodate the different packaging requirements for this increased range of specialised products.

The Project Approval also enabled the biological treatment of waste waters from the factory site and the re-use of over half the treated wastewater within the factory processes, with the remainder irrigated onto the Company's Environmental Farm. In addition, this Modification Application will include other works not directly related to the modifications to the Packing Plant, including an additional raw waste water tank within proximity of the existing raw waste water tank adjacent to the oxidation pond within the Environmental farm.

The Project Approval also consolidated all previous approvals into the one approval so that there would be essentially one approval for the site.

### 3.2.2 Approval History following MP 06_0228

***DA 10/1843 – Upgrade Vehicle Entrance (Former Dairy Farmers Factory Site)***

Project Approval MP 06_0228 required vehicle access points to the Bomaderry site to be upgraded to the satisfaction of Council and the RMS. The subsequent upgrading works included the construction of a concrete median along the centre of Bolong Road to the east of Abernethy's drain in such a manner that prevented vehicles travelling east along Bolong Road turning right into the central vehicle access point to the Shoalhaven Starches site and prevented vehicles turning right out from this access point and travelling east along Bolong Road.

These works also prevented vehicles turning right out from the BOC Carbon Dioxide Plant located opposite the Shoalhaven Starches site. Shoalhaven Starches therefore sought approval from Shoalhaven City Council to upgrade the former Dairy Farmers site vehicular access and relocate the access to enable vehicles to enter Access Point 2 from the east. These works would also allow vehicles wishing to travel west from BOC Carbon Dioxide Plant to leave this site to first travel east; by allowing vehicles to travel to the former Dairy Farmers Factory Complex and using the upgraded access to turn around before travelling west along Bolong Road.

***RA 11/1002 Interim Packing Plant***

Following Project Approval MP 06_0228 Shoalhaven Starches also obtained a separate development approval to use an existing factory building located at 22 Bolong Road (Lot 21 DP 100265) as an Interim Packing Plant from Shoalhaven City Council (RA 11/1002 dated 26th October 2011). This Interim Packing Plant operates in conjunction with the Company's existing Packing Plant which is located within the existing factory site.

***DA 11/1855 – Widening of Driveway***

A further development application (DA 11/1855) was submitted to Shoalhaven City Council on the 4th August 2011 seeking approval to widen the driveways serving 22 Bolong Road Bomaderry (ie. the site of the Interim Packing Plant) to accommodate semi-trailers. This development application was approved by Shoalhaven City Council on the 24th August 2011.

***DA 13/1713 – Demolition of Dimethyl Ether Plant***

On the 5th July 2013 Shoalhaven Starches submitted a development application to Shoalhaven City Council seeking the demolition of a Dimethyl Ether Plant on the site. This development application was approved by Shoalhaven City Council on the 15th July 2013.

***DA 14/2161 – Additional Two (2) Grain Silos***

On the 19th September 2014 Shoalhaven Starches submitted a development application to Shoalhaven City Council seeking development consent to erect two additional grain silos on the factory site within the vicinity of the existing Flour Mill, to provide security of raw material storage and supply when there are closures of the Illawarra rail line serving the Shoalhaven Starches site. Shoalhaven City Council approved this development application on the 27th April 2017.

***DA 16/1827 – Demolition of Existing Air Compressor Shed***

On the 7th July 2016 Shoalhaven Starches submitted a development application to Shoalhaven City Council seeking the demolition of an existing air compressor shed on the site. This development application was approved by Shoalhaven City Council on the 29th July 2016.

***Other Approvals***

There have been other approvals that have been issued by Shoalhaven City Council that are associated with the Shoalhaven Starches operations, but which do not directly relate to the operations of Shoalhaven Starches including:

- DA 11/1936 – Algae Demonstration Plant for evaluation of algae production and processing for alternative fuel and $CO_2$ sequestration. Proponent - Algae Tec Pty Ltd at 220 Bolong Road (former Dairy Farmers factory site).
- DA 14/1327 – Alterations to existing building (former Dairy Farmers Factory Building) and re-use as a meat processing plant. Proponent – Candal Investments Pty Ltd at 220 Bolong Road (former Dairy Farmers factory site).
- DA 15/1892 – Installation of Liquid Oxygen Vessel (6,000L). Proponent – Argyle Prestige Meats Ltd at 220 Bolong Road (former Dairy Farmers factory site).

***Recent Modification Applications***

Project Approval MP 06_0228 has also been the subject of the following modifications applications (**Table 1**).

**Table 1**

**Summary of Modification Applications**

| *Modification* | *Summary of Modifications* | *Approval Date* |
|---|---|---|
| Modification 1 | • Removed the requirement for dried distillers grain (DDG) pelletising plant from the list of mandatory odour controls<br>• Implement alternate odour controls including a new loading chute with dust extractor and extension of the load-out shed to fully enclose truck loading. | 30/9/2011 |
| Modification 2 | • Install additional infrastructure to improve operational and energy efficiency, including two additional fermenter tanks, an evaporator, beer column, heat exchangers, substation and compressors | 14/9/2012 |
| Modification 3 | • Relocate approved 60 space staff car park to the former Dairy Farmers site and include the site in the project approval, following acquisition by the Applicant. | 9/10/2012 |
| Modification 4 | • Relocate the approved DDG pelletising plant within the factory site, increases its footprint and approved height, from 21 m to 28 m. | 24/3/2014 |
| Modification 5 | • Modify the design, footprint and odour controls on the DDG pelletising plant including a 49 m air discharge stack and eight storage silos. | 16/9/2015 |
| Modification 6 | • Demolish a disused industrial building “Moorehouse” purchased by the Applicant<br>• Construct a temporary car park on the northern side of Bolong Road. | 25/11/2015 |
| Modification 7 | • Relocate the approved Starch Dryer No. 5 to the former “Moorehouse” site, increase the footprint and construct a substation, pipework and pipe gantry. | 18/1/2016 |

**Table 1 (continued)**

| *Modification* | *Summary of Modifications* | *Approval Date* |
|---|---|---|
| Modification 8 | • 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. | 1/3/2016 |
| Modification 9 | • increase the size of the approved packing plant to increase the type and volume of packaged dried products<br>• construct a container storage and truck loading area with noise barriers<br>• extend and duplicate the approved rail spur line<br>• install product pipes under Bolong Road, a small bag packer at the DDG pellet plant and a new stormwater detention tank. | 8/3/2017 |
| Modification 10 | • construct a new flour mill B and increase flour production on site from 400,000 tpa to 842,400 tpa. Relocate storage silos and construct a mill feed structure. | 18/4/2017 |
| Modification 11 | • Reducing the number of approved DDGS Dryers from six to four.<br>• A minor modification to the footprint of the four DDG dryers.<br>• Relocation of the cooling towers in the DDG Plant.<br>• A Mill Feed Silo and structure to feed DDG dryers.<br>• Expanded use of the existing coal and woodchip storage area within the SS Environmental farm.<br>• The addition of two biofilters to cope with the increased number of DDG Dryers.<br>• A forklift maintenance building adjacent to the relocated DDG dryers, along with a container preparation area adjacent to the relocated DDG Dryers. | 1/9/2017 |
| Modification 12 | Modifications to the existing Ethanol Distillery Plant to increase the proportion of 'beverage" grade ethanol that is able to be produced on the site. This modification will enable increased flexibility in terms of the range of types of ethanol produced at the site (ie. between fuel, industrial and beverage grade ethanol) to meet market demands; and modify the type and location of the Water Balance Recovery Evaporator that has been previously approved under Mod. 2 adjacent to the Ethanol Plant. | 1/9/2017 |
| Modification 13 | • Modification of boilers 2 and 4, with the conversion of boiler 4 from gas fired to coal fired.<br>• Installation of an additional baghouse on boiler 6. | 18/1/2018 |
| Modification 14 | Modifications to the former paper mill site. | 27/4/2018 |
| Modification 15 | Construction of the Supagas CO2 plant at the former Dairy Farmer factory site. | 7/8/2018 |
| Modification 16 | • Installation of a third flour mill C within the existing flour mill B building.<br>• Undertaking modifications to flour mills A and B.<br>• The construction of a new industrial building adjoining the Starch Dryer No. 5 building containing:<br>– The new product dryer;<br>– Plant and equipment associated with the processing of specialised speciality products. | 18/6/2019 |

**Table 1 (continued)**

| *Modification* | *Summary of Modifications* | *Approval Date* |
|---|---|---|
| | • Addition to Starch Dryer No 5 building to house a bag house for this dryer<br>– Conversion of two existing gluten dryers (1 and 2) to starch dryers.<br>– Additional sifter for the interim packing plant.<br>– Construction of a coal-fired co-generation plant to the south of the existing boiler house complex. The co-generation plant will house a new boiler (No. 8).<br>– Construction of lime silos: The lime injection system will consist of two storage silos and associated equipment for injecting powdered lime into each of the coal fired boilers.<br>– Relocation of the existing boiler no. 7 to the northern side of the overall boiler house complex.<br>– Construction of an indoor electrical substation on the northern side of Bolong Road.<br>– Construction of an additional rail intake pit for the unloading of rail wagons.<br>– Extension of the existing electrical substation located within the main factory area.<br>• An additional coal fired co-generation plant was also approved under Mod 16. This coal fired co-generation plant was to be sited immediately to the south of the existing Boiler House complex situated to the east of Abernethy's Creek. This coal fired co-generation plant would generate a total of 15 MW of power for the site. It is proposed that this coal fired co-generation plant will be in part replaced by the proposed gas fired co-generation plant as part of this Modification Application. | |
| Modification 17 | • Relocation of Baghouse for Starch Dryer No. 5.<br>• Installation of Service Lift adjacent to Starch Dryer No. 5.<br>• Elevating Service Conduit extending from factory site on southern side of Bolong Road to approved packing plant on northern side of Bolong Road above ground.<br>• Use of woodchips as fuel source in Boilers 2 and 4.<br>• Modification to condition 14J(e) – Amendment to design specification for silencers to exhaust fans for Flour Mill B.<br>• The increase in the building footprint of Product Dryer Building (PDB).<br>• The increase in the building footprint of the Specialty Products Building (SPB) which adjoins the PDB building.<br>• The provision of additional bulk chemical storage to the south of the PDB and SPB buildings.<br>• Demolition of part of the existing Maintenance Office and Stores to facilitate the extension of the PDB and SPB buildings to the west.<br>• Repurposing the remaining part of the Maintenance building to provide staff amenities and Plant Operation Control Rooms.<br>• To facilitate internal truck movements associated with the amendments to the SPB, existing car parking (48 spaces) | 23/10/2020 |

**Table 1 (continued)**

| *Modification* | *Summary of Modifications* | *Approval Date* |
|---|---|---|
| | currently located to the north and west of the Maintenance building will be relocated to an existing approved car parking located on the north side of Bolong Road.<br>• Extend the sifter room situated on top of the interim packing plant.<br>• Install a Product Dryer (No. 9) within the footprint of the SPB as approved under Mod 16. | |
| Modification 18 | • Relocation of Approved Gas Fired Boiler and other Associated Works to Facilitate Production of 'Hand Sanitiser' Alcohol in response to COVID 19 Crisis. | 4/9/2020 |
| Modification 19 | • Expansion of the ethanol distillery plant including new distillery columns, three ethanol storage tanks and cooling towers to facilitate the production of 100 mega litres (ML) of beverage grade ethanol within the approved limits and additional site infrastructure. | 8/3/2021 |

# 4.0 CONSULTATION

Prior to the preparation of this SEE consultation has been undertaken with:

- Department of Planning, Industry and Environment;
- Environmental Protection Authority;
- Natural Resource Access Regulator (NRAR);
- NSW Fire & Rescue;
- Shoalhaven City Council (SCC);
- Australian Department of Defence.

An initial meeting was held between staff from DPIE, Shoalhaven Starches and Cowman Stoddart on the 11th February 2021. Following that meeting DPIE confirmed that the Modification Application could be considered pursuant to Section 4.55(1A) of the Environmental Planning & Assessment Act and subsequently confirmed the requirements for the preparation of this SEE.

Written consultation was undertaken separately with the EPA, NRAR, NSW Fire & Rescue, SCC and the Australian Department of Defence. At the time of preparing this SEE responses have been received from the NRAR, NSW Fire & Rescue and SCC and these responses are included in **Annexure 1** to this SEE. The following is a summary of the responses made by government agencies to this proposal at the time of preparing this report.

***NRAR***

In an email dated 9th March 2021 the NRAR provided the following response to this Modification Proposal (with our responses to each of the matters they raise):

> *Thanks for getting in contact with NRAR in relation to the request for requirements for the Preparation of Statements of Environmental Effects for Proposed Mods 21, 22 and 23, Shoalhaven Starches Expansion Project (MP06_0228). NRAR do not have any comments on the proposal at this stage other than the following general requirements we request proponents to consider in their major project submissions (where relevant):*
>
> - *Identification and impact assessment of all works/activities that may intercept, extract, use, divert or receive water.*

Response

No works associated with this Mod will intercept, extract, use, divert or receive water from local watercourses or groundwaters.

> - *The identification of all water take for the project. Include details of water sources that water will be taken from where water entitlements need to be acquired to account for the water take.*

Response

Prior to the Shoalhaven Starches Expansion Project Approval Shoalhaven Starches daily average water usage consisted of 9,900 kilolitres which comprised:

- 7500 KL from the municipal drinking water supply; and
- 2400 KL from a raw water supply provided by Shoalhaven City Council via a pipeline from the former Australian Paper Mill.

The Shoalhaven Starches Expansion Project Approval necessitated an increase in water usage, both potable water for the processing of flour and non-potable for steam generation, cooking and other uses. Following the installation of the Waste Water Treatment Plant on the Environmental Farms associated with the Project Approval, and the subsequent availability of treated water for reuse, the current daily water supply for the Shoalhaven Starches operations is approximately:

- 4000 KL of potable quality water (obtained from Shoalhaven City Council).
- 3700 KL of raw water (obtained via the raw water supply provided by Shoalhaven Water via the pipeline from the former Australian Paper Mill site).
- 6000 KL of treated water for re-use (obtained from the Waste Water Treatment Plant on the company's Environmental Farm).

The current Mod will not alter the requirements for water supply to the site as outlined above.

- *Details of Water Access Licences (WALs) held to account for any take of water, or demonstration that WALs can be obtained prior to take of water occurring.*

Response

The Shoalhaven Starches operations do not have any Water Access Licences. This Mod proposal does not require the need for a WAL.

- *Assessment of the project's compliance with any exemptions or exclusions to requiring approvals or licenses under the Water Management Act 2000.*

Response

As a State Significant Development, under Section 4.41(1)(g) of the Environmental Planning & Assessment Act, a water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under section 91 of the *Water Management Act 2000* are not required.

- *Identification and impact assessment of all works located on waterfront land including consideration of the NRAR Guidelines for Controlled Activities on Waterfront Land (2018).*

Response

The proposal includes; the erection of an additional gantry structure across Abernethy's Creek; the provision of a third rail spur line also within proximity of Abernethy's Creek; and the slight relocation of a pipe bridge on the packing plant site which will extend from a location (as approved) within proximity of Abernethy's Creek. These works will all be situated within 40 metres of Abernethy's Creek and therefore on "waterfront land" for the purposes of the Water Management Act.

For the purposes of the *NRAR Guidelines for Controlled Activities on Waterfront Land (2018)* Abernethy's Creek, at the location of the proposed works, would be considered a 3rd order watercourse which stipulates a vegetated corridor zone of 30 metres each side of this watercourse.

Under the terms of the Project Approval there is a ring road which extends from Bolong Road around the northern side of the approved Packing Plant to Railway Street to the east of the Packing Plant site. This ring road is set back 18 metres from the western banks of Abernethy's Creek. Under the Project Approval the area between the ring road and the Abernethy's Creek is to be landscaped to provide a riparian corridor. The proposed modifications to the Packing Plant associated with this Modification Application are all proposed outside this vegetation riparian corridor consistent with the overall Project Approval.

There is no vegetated riparian corridor situated along Abernethy's Creek to the south of Bolong Road. This part of the creek flows through a heavily developed part of the Shoalhaven Starches factory site. There are already a series of gantries that cross Abernethy's Creek along this southern extent of the creek. In this regard it should be noted that there is a Landscape and Vegetation Management Plan approved under the Project Approval for rehabilitation landscaping along the banks of Abernethy's Creek.

The Geotechnical Assessment undertaken by GHD (**Annexure 7**) concludes that these works should not impact the stability of the creek banks provided the structures are supported on piles extending to rock.

- *A detailed and consolidated site water balance.*

Response

The water supply requirements for the site are detailed above.

- *Assessment of project against relevant policy and guidelines, e.g. Water Sharing Plans, Floodplain Management Plans, NSW Aquifer Interference Policy, NSW Floodplain Harvesting Policy, Guidelines for Controlled Activities on Waterfront Land (2018).*

Response

- The SEE is supported by a Flood Compliance Report prepared by WMAwater (**Annexure 5**).
- Issues pertaining to the development of waterfront land and the NRAR Guidelines for Controlled Activities on Waterfront Land (2018) are discussed above.
- The proposal does not raise issues in terms of aquifer interference or floodplain harvesting therefore these guidelines will have no relevance to this proposal.

***NSW Fire & Rescue***

In an email dated 16th March 2021 the NSW Fire & Rescue provided the following response to this Modification Proposal:

> *Thank you for your email regarding the proposed modifications to the Shoalhaven Starches site.*
>
> *Fire and Rescue NSW (FRNSW) have no specific requirements to be addressed within the forthcoming Statement of Environmental Effects that are being prepared in support of the Modification Applications (the Applications).*
>
> *FRNSW will review the Applications once exhibited by the Department of Planning, Industry and Environment (the Department), and may provide comment at this time if deemed necessary.*
>
> *Should the Department approve the Applications, FRNSW may request that a Condition be included in the relevant Instruments of Consent that would require the existing Fire Safety Study for the site to be updated and approved prior to the issuing of the relevant Construction Certificates. FRNSW considers that this may be required in order to address any potential increase in risk posed by the proposed modifications.*
>
> *I trust that this satisfies your requirements at this time, please do not hesitate to contact me should you have any further queries.*

Response

This response does not raise any further matters that require to be addressed.

***Shoalhaven City Council (SCC)***

In an email dated 27th April 2021 SCC supplied the following comments in relation to this Modification Proposal:

> *Development Engineering comments/requirements:*
>
> *1. Changes to the carpark are proposed and the revised plans are considered suitable. The following condition of consent is recommended.*
>
> *Car parking design standards*
>
> *Prior to the issue of a construction certificate, certified engineering design plans and specifications must be prepared by a professional engineer, (as*

*defined in the national construction code) or surveyor and approved by the certifier.*

*All car parking and access design for the must comply with the following:*

*A) Constructed in accordance with the following:*

- *As 2890*
- *With a flexible pavement, surfaced with 30mm of ac10 asphaltic concrete or two coat bitumen seal using 14mm and 7mm aggregate, or,*
- *With a concrete pavement designed and constructed for a minimum traffic loading of 1 x 106 esa, or,*
- *With an asphaltic concrete (ac) flexible pavement designed and constructed for a minimum traffic loading of 1 x 106 esa. Where asphaltic concrete surfaced pavements are likely to be subject to bogie-axle vehicles turning tightly, the asphaltic concrete is to include a rubber base to improve durability and manufacturer's product details.*

*B) Bordered in accordance with council's standard drawings by:*

- *Concrete kerbing, except where surface runoff is concentrated, in which case concrete integral kerb and gutter must be constructed.*

Response

Noted Council raise no issue with revised car park layout.

*Floodplain engineering comments/requirements:*

2. *A hydraulic impact assessment is required to ensure that the proposed development will not adversely increase flood hazard and damage to other properties or adversely affect flood behaviour for a 5% aep up to the PMF scenario. Besides, flood related development controls (chapter G9, Shoalhaven Development Control Plan 2014) need to be assessed appropriately.*

Response

The SEE is supported by a flood assessment prepared by WMAwater (**Annexure 5**). Flooding is further discussed in Section 7.2.6 of this SEE.

# 5.0 PROPOSED MODIFICATION TO PROJECT APPROVAL MP06_0228

## 5.1 SUMMARY OF MODIFICATION PROPOSAL

**Table 2** below provides a summary of the proposed works associated with this Modification Application.

**Table 2**

**Summary of Proposed Works under Mod 21**

| ***Factory Component*** | ***Proposed Works associated with Modification Application No. 21 (Mod 21)*** |
|---|---|
| *Modifications to Packing Plant* | |
| Packing Plant Building | • Install an additional sixteen (16) product storage silos to the seven (7) approved product storage silos. The approved 7 silos will also be relocated to accommodate the 16 new silos.<br>• Installation of an additional eight (8) packer feed bins in conjunction with the original 12 approved packer feed bins. In addition, the height of all packer feed bins will align with the original two highest bins approved under Mod 9.<br>• To accommodate the installation of the additional equipment and re-siting of equipment, the footprint of the Packing Plant is to be reconfigured from that which was approved.<br>• The change to the configuration of the Packing Plant building will necessitate a change on the layout of the car park associated with the Packing Plant building. |
| Packing Plant Site | • A third rail siding is proposed to enable storage of additional rail wagons and wagons to be taken offline for maintenance.<br>• Increase the height of the gantry containing the product transfer lines to provide additional clearance for the container reach stacker.<br>• Provide a train tunnel where noise mitigation walls surrounding the container storage area terminate at the rail line to provide additional noise attenuation.<br>• Provide a loader maintenance and cleaning area within the container storage area. |
| *Other Modification Works* | |
| Environmental Farm | • Install additional raw waste water tank within proximity of existing raw waste water tank. |

**Table 2 (continued)**

| *Factory Component* | *Proposed Works associated with Modification Application No. 21 (Mod 21)* |
|---|---|
| Factory Site | • Install a Nitrogen Generator and Storage Tanks.<br>• Establish an additional Indirect Cooking Facility.<br>• Installation of an additional two (2) Fermentation Tanks.<br>• The installation of the additional fermenter Tanks will require the relocation of the ISO Container Storage area and 50 approved car parking spaces. |

## 5.2 MODIFICATIONS TO APPROVED PACKING PLANT

Project Approval MP 06_0228 included approval to establish a new Packing Plant, container loading area and a rail spur line on the northern side of Bolong Road. These works also required the provision of an overhead bridge structure to allow product to be transferred and safe pedestrian movement across Bolong Road.

In 2017 the Independent Planning Commission approved Mod 9 which among other matters enabled amendments to the footprint and size of the approved Packing Plant as a result of the need to accommodate the then increase in dried starch production following the redirection of liquid starch from the ethanol production process.

In 2019 the Independent Planning Commission approved Mod 16 which included the construction of a Specialty Product Facility and additional Gluten Dryer. The Specialty Products Building would enable the production of an increased range of specialised products as an extension to Shoalhaven Starches existing product line. The specialty products will comprise a range of modified gluten products for the food industry; and modified starches for both paper manufacturing as well as food production.

Shoalhaven Starches have now identified that as a result of the increase in range of products that will be able to be produced arising from the works associated with Mod 16, amendments will be required to the approved Packing Plant on the northern side of Bolong Road to accommodate these different products.

- The approved Packing Plant made provision for 7 silos to store product awaiting packaging. To accommodate the increased variety of gluten and starch products that will now be able to be produced from the Specialty Product Building following Mod 16 increased flexibility will be required for the storage of the range of gluten and starch products that now will be able to be produced within the new Packing Plant.

It is therefore proposed to construct sixteen (16) smaller silos in addition to the original 7 approved silos. These silos will be sited to the south east of the approved Packing Plant and will be housed within a covered structure that will have a height above ground level of 34.75 metres. The proposed 16 silos will each have a square footprint with dimensions of 5 metres by 5 metres, height of 30 metres and volume of 300 tonnes.

The 7 approved silos will be relocated to accommodate the 16 additional silos. All silos will be housed within the one covered structure.

- Additional packer feed bins will also need to be installed within the Packing Plant building to accommodate the need for improved flexibility to enable a greater range of gluten and starch products to be packed.

  The approved packing Plant included 12 packer feed bins. Ten of the approved bins comprise a height of 20 metres and were housed entirely within the APPROVED Packing Plant building; while two approved packer feed bins comprised a height of 34 metres and encroached above the Packing Plant building.

  The approved 12 packer feed bins supply four separate packing lines for the standard starch and gluten products including:

  - Gluten – 2 bins each to feed the bulk-bag packing line and 25 kg bag packing lines respectively;
  - Starch and Gluten – 4 holding (buffer) bins and 2 packer feed bins for 2 x 25 kg bag packing lines;
  - Starch – 2 bins to feed the starch bulk-bag packing line.

  It is proposed to install an additional eight (8) packer feed bins within the Packing Plant building to enable the specialty gluten and starch products to be packed. The specialty products are stored in separate packer feed bins and packed in separate packing lines to the standard gluten and starch products to prevent cross-contamination and reduce wastage (removing the need for flushing out lines and silos). Additional packing bins and lines also improve flexibility and reduce product changeovers.

  In addition to providing additional packer feed bins, it is also proposed that **all** packer feed bins (both approved and proposed) will be fitted with a holding bin that will be situated above the packer feed bin to enable the installation of a sifter to satisfy struct customer product quality requirements. All packing lines will have a holding bin to ensure even flow through the sifter, then followed by a packer feed bin to ensure even flow to the packer to ensure longer runs and less wastage. As a result all packer feed

bins will comprise a height that will be consistent to the two approved packer bin bins that rose to a height of just over 34 metres under the current Project Approval.

Under the Project Approval the packer feed bins were able to be housed within the approved Packing Plant building. The packer feed bins are required to be housed within a building to satisfy increasingly stringent food safety and quality requirements (ie. reducing the potential for contamination from dust, birds, water ingress and condensation). Housing the bins within the building also reduces noise levels as noise generating equipment associated with the bins (such as motors and fans) are able to be housed inside the building. As a result of the need to install the holding bins / sifters above the packer feed bins however the portion of the Packing Plant building within which the packer feed bins will be housed will need to be be increased in height to 34.3 metres above ground level. It should be noted that this height is consistent with the height of two of the original approved packer feed bins.

- Additional product transfer lines and services will also need to extend from the Specialty Product Buildings approved under Mod 16 and extend across Bolong Road to the Packing Plant via the approved underground services crossing. It is also proposed to slightly relocate the transfer lines and gantry to accommodate the amended product silos. In addition, it is also proposed to increase the height of this gantry to 18.4 metres above ground level.
- To accommodate the change in equipment used within the Packing Plant, such as the additional packer feed bins, the overall footprint of the Packing plant building will also need to be slightly reconfigured from that which was originally approved.
- The change in the footprint of the Packing Plant building will also necessitate a change in the layout of the approved car parking spaces associated with the Packing Plant building.

In addition to the above modifications, it is also proposed to carry out the following modifications to the approved Packing Plant site:

- To enable storage of additional rail wagons and enable wagons to be taken off line for maintenance purposes a third rail siding is proposed.
- It is also proposed to increase the height of the gantry containing the product transfer lines to the product silos to provide additional clearance above the container reach stacker. The current approved gantry has a height above ground level of 14.5 metres AHD. It is proposed to lift the gantry to a minimum height above ground level of 15 metres, with the top of the gantry having a height of 23.4 metres AHD (a height above ground level of 18.4 metres).

- To provide additional noise attenuation it is also proposed to provide a train tunnel where the noise mitigation walls surrounding the container storage area terminate at the rail line.
- It is also proposed to provide a loader maintenance and cleaning area within the container storage area.

To enable a comparison between the approved and the Modification proposal **Figures 5** and **6** below provide a site plan, plan and elevations of the approved Packing Plant building.

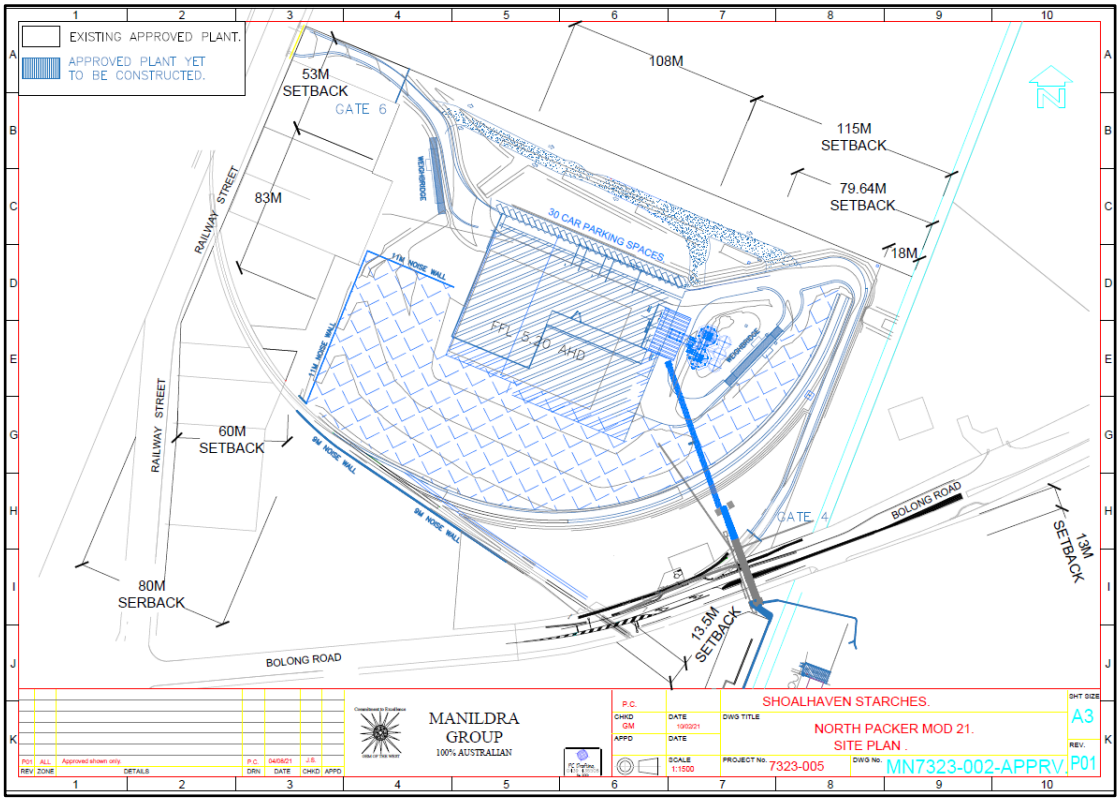


**Figure 5: Approved Site Plan for Packing Plant.**

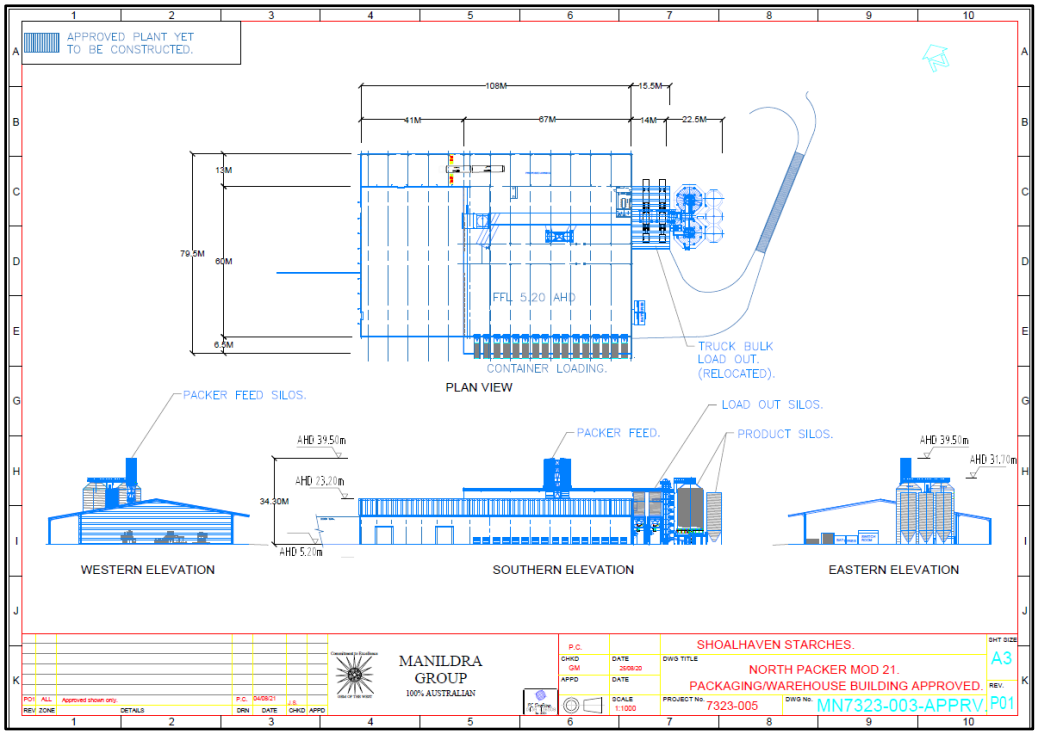


**Figure 6: Plan and elevation details of approved Packing Plant building.**

**Figures 7** and **8** below is a site plan, plan and elevations detailing the works associated with the Modification Application as they relate to the Packing Plant site.

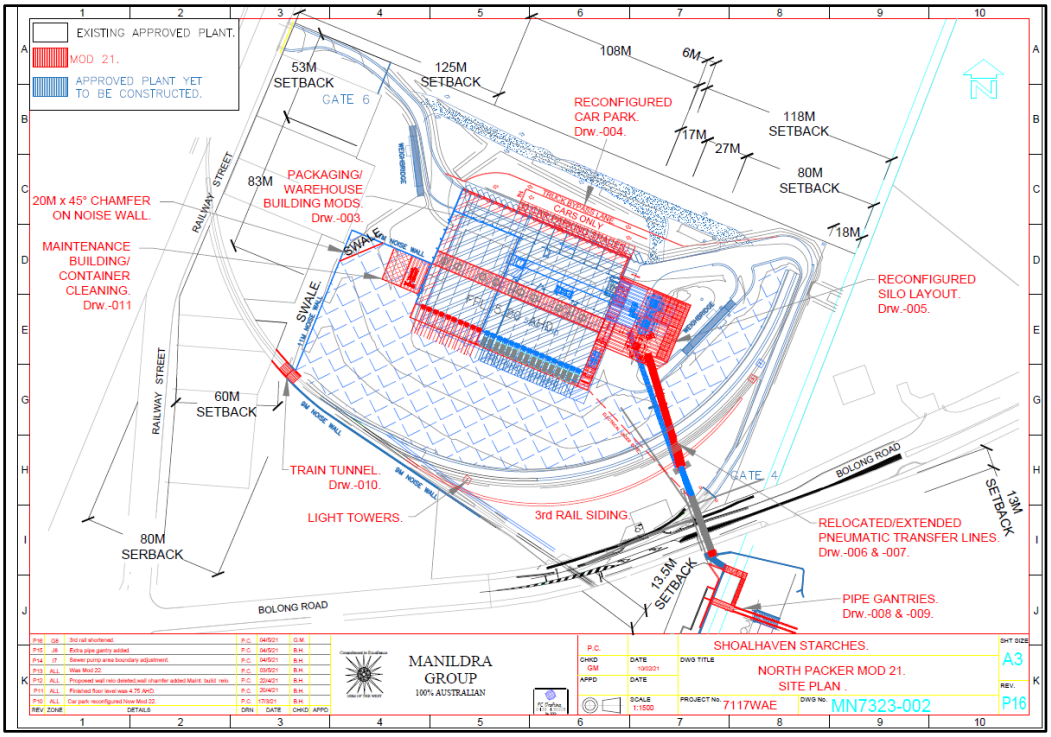


**Figure 7: Site Plan – Packing Plant modifications.**

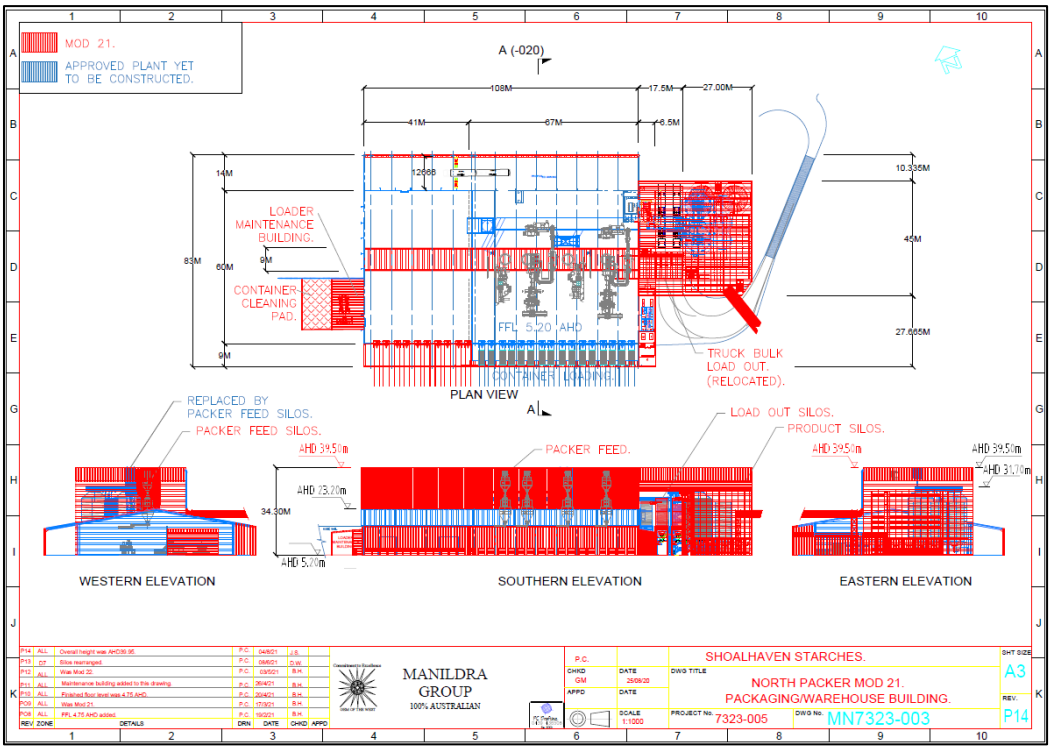


**Figure 8: Plan and elevations of modifications proposed to Packing Plant.**

## 5.3 OTHER MODIFICATIONS

In addition to the modifications associated with the approved Packing Plant, it is also proposed to undertake the following modifications to the Approved Project.

- It is proposed to install an additional raw waste water tank within proximity of the existing raw waste water tank adjacent to the oxidisation pond within the Environmental Farm and located to the north of Bolong Road (and opposite the former Paper Mill site). It is proposed that this tank will provide additional storage and act as a buffer in the case that the existing tank is required to be taken off line. This tank will have an effective volume of 3000 KL with dimensions of approximately 20 metres diameter and 12 metres height above ground level. **Figure 9** below is a plan detailing the location of the proposed additional raw waste water tank.

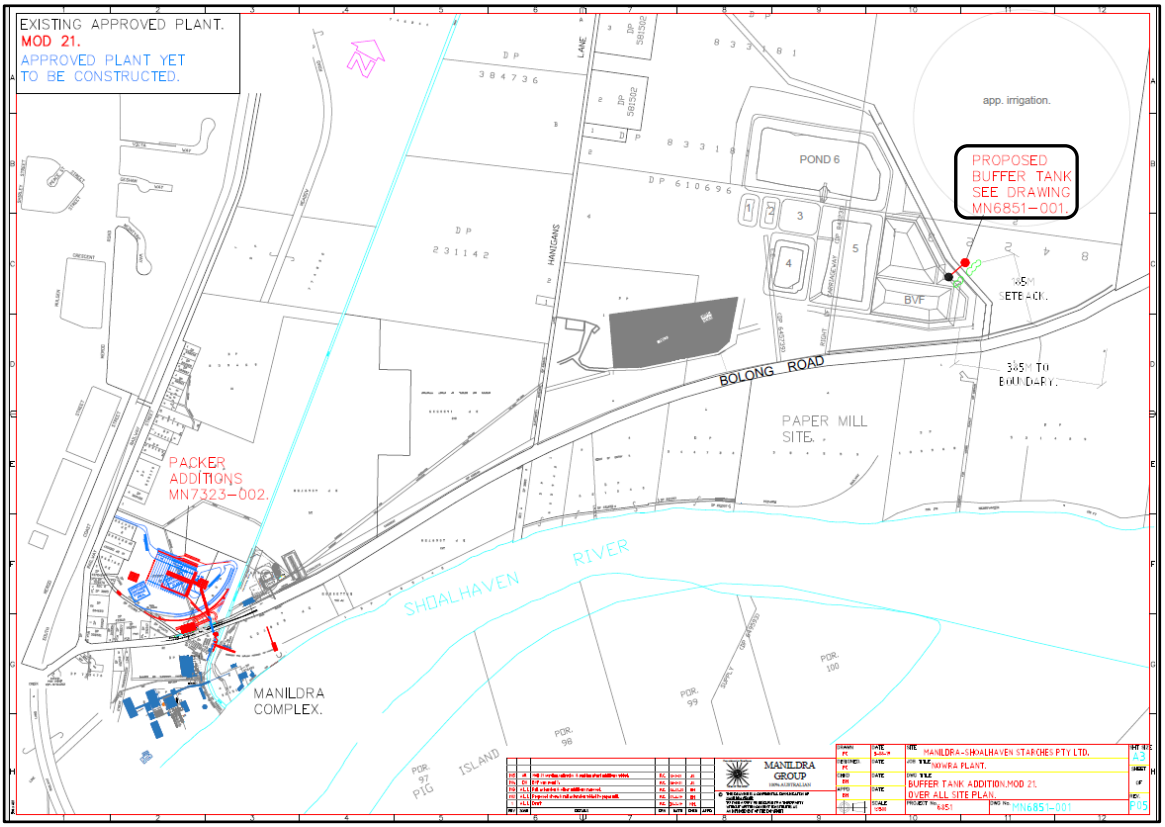


**Figure 9: Location of the proposed additional raw waste water tank.**

- It is also proposed to install a Nitrogen Generator and Storage Tanks that will supply Nitrogen to the existing and proposed ethanol storage tanks to eliminate in-tank fire risk. This facility will be located between the existing ethanol loading bay and the Bolong Road frontage of the site. This facility will comprise a Nitrogen Generator housed within a container type building. Four storage vessels comprising compressed air and mixing tanks will be sited between the Nitrogen Generator and Bolong Road. The nitrogen that is produced will be stored in six vessels with a height above ground level of 10 metres adjacent and to the west of the Nitrogen Generator. **Figure 10** below is a plan detailing the location of the proposed Nitrogen Generator and storage tanks.

- In order to produce ethanol, starch is essentially heated to convert it (with enzymes) into sugars which are then fermented to produce ethanol. This starch heating process is undertaken in an Indirect Cooking Facility. Shoalhaven Starches have identified that there is inadequate capacity in their current Indirect Cooking process to accommodate both the existing ethanol production as well as that associated with the movement from lower to higher grade ethanol production under Mods 18 and 19. To provide increased indirect cooking capacity it is proposed to establish an additional

Indirect Cooking Facility to be located adjacent to the existing Glucose Plant, to the north of the internal railway and to the south of the Ethanol Distillery.

The additional Indirect Cooking Facility will comprise series of vessels housed within a structure that will have a footprint of 184.5 $m^2$ (20.5 m x 9 m) and height of 16.6 metres above ground level. The structure will include a range of processing vessels situated over three floors; and a single product feed tank.

**Figure 10** below is a plan detailing the location of the proposed Nitrogen Generator and Storage Tanks and Indirect Cooking Facility.

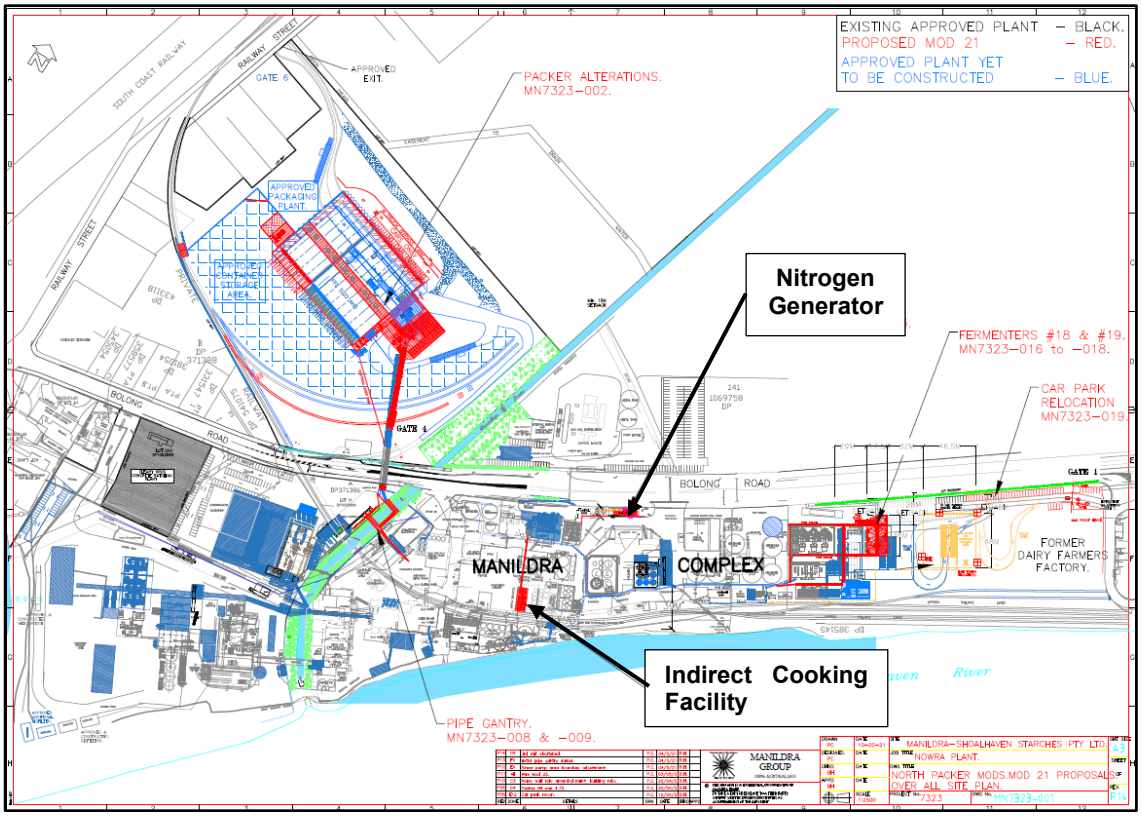


**Figure 10: Location of proposed Nitrogen Generator and Storage Tanks, and Indirect Cooking Facility.**

It is also proposed to install an additional two Fermenters (No. 18 and 19) to the east of the existing Evaporators and approved cooling towers to the east of the site. The proposed additional Fermenters will operate identically to the existing Fermenters at the site.

Byproducts from the starch, gluten and syrup production processes at the site are combined within the Fermenters on the site to feed fermentation and subsequently the distillation stage of ethanol production process.

Shoalhaven Starches however have been experiencing difficulties with foaming in their existing Fermenters and as a consequence, have been required to operate the existing Fermenters at approximately half capacity to prevent the foaming overflowing.

As a result, the fermentation capacity at the site has been significantly reduced with the consequential impact on the site's ethanol production.

Shoalhaven Starches have identified the need for two more Fermenters (Nos 18 and 19) in order to provide sufficient volume to accommodate this foaming difficulty. The proposed additional Fermenters will have similar dimensions as the other existing Fermenters on the site including an overall height above ground level of 27.5 metres (including associated pipework).

The siting of these additional Fermenters will also require the following changes to the footprint of the approved development in this part of the site:

- The relocation of the approved ISO Container Storage area further to the east; and
- The relocation of 50 approved car parking spaces also further to the east along the Bolong Road frontage of this site.

**Figure 11** below is a plan detailing the location of the proposed additional Fermenters.

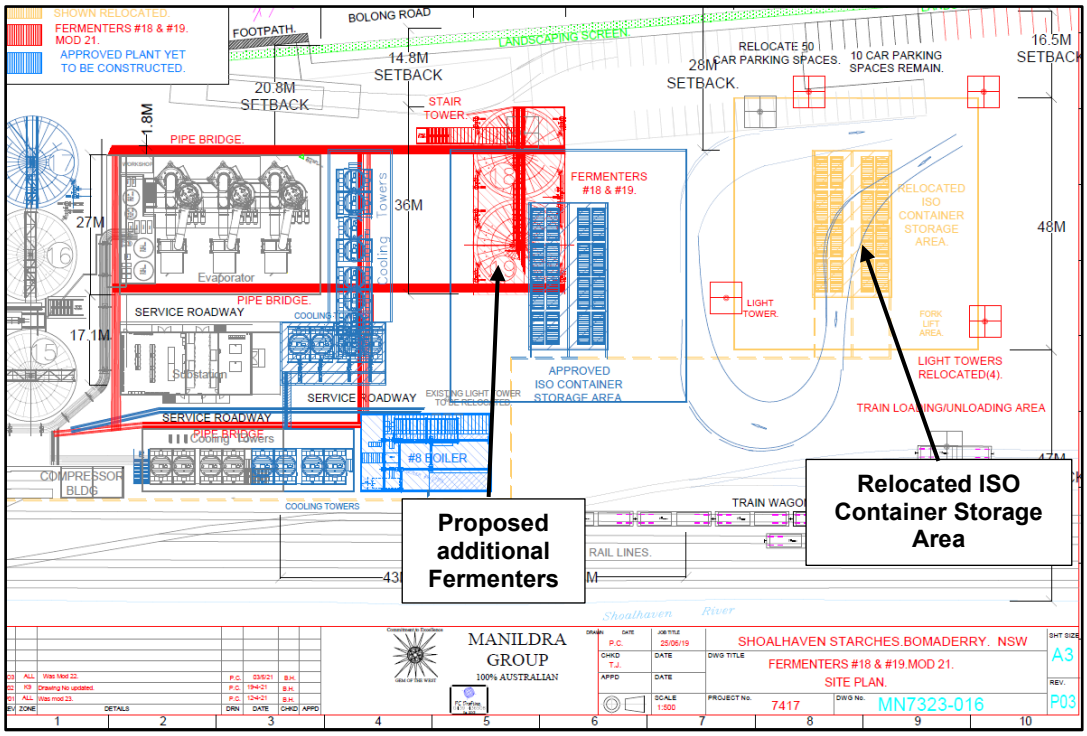


**Figure 11: Location of Additional Fermenters No. 18 and 19.**

**Annexure 2** includes the complete drawing set and plans for the modifications associated with this Modification Application.

# 6.0 SECTION 4.55(1A) OF THE EP&A ACT

This application is made pursuant to Section 4.55(1A) of the Environmental Planning & Assessment (EP&A) Act.

Section 4.55(1A) of the EP&A Act reads:

> *4.55 Modification of consents—generally*
>
> *(1A) **Modifications involving minimal environmental impact** A consent authority may, on application being made by the applicant or any other person entitled to act on a consent granted by the consent authority and subject to and in accordance with the regulations, modify the consent if—*
>
> *(a) it is satisfied that the proposed modification is of minimal environmental impact, and*
>
> *(b) it is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which the consent was originally granted and before that consent as originally granted was modified (if at all), and*
>
> *(c) it has notified the application in accordance with—*
>
> *(i) the regulations, if the regulations so require, or*
>
> *(ii) a development control plan, if the consent authority is a council that has made a development control plan that requires the notification or advertising of applications for modification of a development consent, and*
>
> *(d) it has considered any submissions made concerning the proposed modification within any period prescribed by the regulations or provided by the development control plan, as the case may be.*
>
> *Subsections (1), (2) and (5) do not apply to such a modification.*

Fundamentally an application made pursuant to Section 4.55(1A) must demonstrate that the development to which the consent as modified relates will have minimal environmental impact; and is substantially the same development as the development for which consent was originally granted and before that consent as originally granted was modified.

Such an assessment would typically need to appreciate both the qualitative and quantitative aspects of the development being compared in its proper context as described by Bignold J at paragraphs 54 to 56 in *Moto Projects (No.2) Pty Ltd v North Sydney C [1999] NSWLEC 280*. This judgment includes the following comments:

> *54. The relevant satisfaction required by **s 96(2)(a)** to be found to exist in order that the modification power be available involves an ultimate finding of fact based upon the primary facts found. I must be satisfied that the modified development is substantially the same as the originally approved development.*

> *55. The requisite factual finding obviously requires a comparison between the development, as currently approved, and the development as proposed to be modified. The result of the comparison must be a finding that the modified development is "essentially or materially" the same as the (currently) approved development.*
>
> *56. The comparative task does not merely involve a comparison of the physical features or components of the development as currently approved and modified where that comparative exercise is undertaken in some type of sterile vacuum. Rather, the comparison involves an appreciation, qualitative, as well as quantitative, of the developments being compared in their proper contexts (including the circumstances in which the development consent was granted).*

The *Modifying an Approved Project* draft guidelines produced as part of the *Draft Environmental Impact Assessment Guidance Serie*s by the NSW Department of Planning and Environment in June 2017, provides some guidance when assessing modifications of State Significant development:

> *For SSD, a proponent must demonstrate that the change, if carried out, would result in a development that would be substantially the same development as the original development. In order to draw this conclusion, a proponent must have regard to the following considerations, which have been established through decisions of the NSWLEC:*
>
> - *''Substantially'' means ''essentially or materially'' or ''having the same essence.''*
> - *A development can still be substantially the same even if the development as modified involves land that was not the subject of the original consent (provided that the consent authority is satisfied that the proposal is substantially the same).*
> - *If the development as modified, involves an ''additional and distinct land use'', it is not substantially the same development.*
> - *Notwithstanding the above, development as modified would not necessarily be substantially the same solely because it was for precisely the same use as that for which consent was originally granted.*
> - *To determine whether something is ''substantially the same'' requires a comparative task between the whole development as originally approved and the development as proposed to be modified. In order for the proposal to be ''substantially the same'', the comparative task must:*
>   - *result in a finding that the modified development is ''essentially or materially'' the same*
>   - *appreciate the qualitative and quantitative differences in their proper context*
>   - *in addition to the physical difference, consider the environmental impacts of proposed Modification Applications to approved developments.*

> ***''Substantially'' means ''essentially or materially'' or ''having the same essence.''***

Comments

It is considered the modification proposal is substantially the same as that approved and is development that could be considered "*materially the same as that previously approved".* Furthermore, it is considered that the modifications proposed are of the same '*essence'* as the approved development given that:

- the proposal maintains the current land use approved at the site and does not seek to alter the over-riding character of development;
- the proposed built form is substantially the same as that already approved, in that development is to consist of industrial buildings, plant and equipment located within the general confines of the overall approved Shoalhaven Starches Factory site;
- The proposed modifications do not represent an expansion of the of Shoalhaven Starches' footprint and the majority of the modifications will be located within the areas of the site that already contain approved development.
- The proposed buildings maintain the same form as that approved with due consideration given in the Modification Application to relevant issues pertaining to air quality, noise and flood impacts; and
- The proposal does not seek to increase overall production from the site, nor will it involve the generation of any additional significant environmental impacts.

> ***A development can still be substantially the same even if the development as modified involves land that was not the subject of the original consent (provided that the consent authority is satisfied that the proposal is substantially the same).***

Comment

The proposal does not involve land that was not the subject of the approval which was in place at the time that the Shoalhaven Starches Expansion Project site transitioned from the Transitional Part 3A provisions to being assessed as State Significant Development

> ***If the development as modified, involves an ''additional and distinct land use'', it is not substantially the same development.***

Comment

The proposal does not involve an *''additional and distinct land use'.* None of the proposed modifications represent an additional distinct land use. Whilst this modification proposal involves a number of individual components these modifications all relate to existing approved development.

> ***Notwithstanding the above, development as modified would not necessarily be substantially the same solely because it was for precisely the same use as that for which consent was originally granted.***

Comment

The modification proposal does not seek to change the nature of the approved use of the site, it will remain as originally approved. Rather the modification proposal arises from the need to accommodate an increased variety of products that will be able to be produced as a result of works approved under Mod 16.

> ***To determine whether something is ''substantially the same'' requires a comparative task between the whole development as originally approved and the development as proposed to be modified. In order for the proposal to be ''substantially the same'', the comparative task must:***
>
> - ***result in a finding that the modified development is ''essentially or materially'' the same***
> - ***appreciate the qualitative and quantitative differences in their proper context***
> - ***in addition to the physical difference, consider the environmental impacts of proposed Modification Applications to approved developments.***

Comment

Quantitatively, the proposal does not represent any increases in production in the terms of processing of flour and starch / gluten or overall ethanol production.

The qualitative elements of the proposal demonstrate that the environmental and amenity impacts of the modification proposal are limited and justifies this proposal being considered as a modification.

This proposal will not expand the overall footprint of the approved Shoalhaven Starches factory. All of the proposed modifications are located within parts of the site that have existing or approved development. The proposed development will have a limited additional visual impact. The bulk, character and scale of the structures associated with this modification application will not be dissimilar to that of other industrial type development associated with the existing factory site. Furthermore, the proposed works will be sited within proximity of similar structures of a similar nature. The works will be sited in the midst of the existing factory complex and will be viewed within this context.

The SEE is supported by expert assessments:

- An Air Quality Assessment prepared by GHD which recommends an investigation of opportunities be undertaken to use gas fired boilers instead of coal. In this regard Shoalhaven Starches will be incorporating the conversion of coal fired boilers to gas as part

of the future proposal to construct a gas fired co-generation plant as part of the future Modification 23.

- An Environmental Noise Impact Assessment by Harwood Acoustics that includes recommendations that will reduce the level of noise emission from the items of plant and equipment associated with this modification to within the noise design goals derived from Environment Protection Licence 883 noise limits at each receptor location.
- A Flood Compliance Report by WMAwater concludes that a comparison of peak flood levels between the approved and proposed works for the 1% AEP event indicate that the maximum increase in 1% AEP flood level outside the Shoalhaven Starches plant is up to 0.05 m at the rail crossing of Bolong Road with increases in flood level generally limited to within the Shoalhaven Starches plant.
- A Preliminary Hazard Analysis (PHA) prepared by Pinnacle Risk Management demonstrates the Modification Proposal will comply with all risk criteria; and will be acceptable in terms of societal, area cumulative and environmental risks.
- A Riverbank Stability Assessment prepared by GHD demonstrates the development of the third rail siding on the northern side of Bolong Road will not adversely affect the stability of the western bank of Abernethy's Creek. Similarly, the pipe bridge extending from the Packing Plant to the creek and the pipe gantry extending over Abernathy's Creek south of Bolong Road should not affect the stability of the creek provided the structures are supported on piles extending to rock.

The above expert assessments demonstrate that the Modification Proposal will have minimal environmental impact.

The works associated with this modification application do not represent an additional and or distinct land use as all proposed modifications facilitate and improve the existing approved production processes.

The proposal will not comprise any qualitative or quantitative changes in overall production from the site. The proposal essentially seeks to ensure that the site will be able to generate sufficient electrical power to accommodate the demand of the approved (as modified) development.

The modified proposal represents a scale of development that will be commensurate with the bulk, scale and character of the approved development.

As is evident from the expert consultant assessments that support the Modification Application the Modified proposal will have minimal environmental impacts when compared to the approved development.

It is our view that the proposed modification will have minimal environmental impacts and the modified development is substantially the same as approved Project. As such the modification proposal is considered consistent with provisions of Section 4.55(1A) of the Act in this instance.

Given the above circumstances it is our view that the modification proposal; will have minimal environmental impact when compared to the original approved development; and the development as modified by this modification application will be substantially the same development as the development for which consent was originally granted having regard to both the qualitative and quantitative elements of that development.

# 7.0 SECTION 4.15(1)(A) – ENVIRONMENTAL PLANNING PROVISIONS

In determining an application made pursuant to Section 4.55 of the EP&A Act the consent authority must take into consideration such of the matters referred to in Section 4.15(1) as are of relevance to the development the subject of the application.

## 7.1 ENVIRONMENTAL PLANNING INSTRUMENTS

### 7.1.1 State Environmental Planning Policies

**Table 3** details State Environmental Planning Policies (SEPP) that apply to the land and whether they are applicable to the proposal.

**Table 3**

**State Environmental Planning Policies that Apply to the Subject Site**

| *State Environmental Planning Policy* | *Applicable Yes/No* |
|---|---|
| State Environmental Planning Policy (Affordable Rental Housing) 2009 (pub. 2009-07-31) | No |
| State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004 (pub. 2004-06-25) | No |
| State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (pub. 2008-12-12) | No |
| State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 (pub. 2004-03-31) | No |
| State Environmental Planning Policy (Infrastructure) 2007 (pub. 2007-12-21) | Yes |
| State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (pub. 2007-02-16) | No |
| State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007 (pub. 2007-09-28) | No |
| State Environmental Planning Policy No 1 - Development Standards (pub. 1980-10-17) | No |
| State Environmental Planning Policy No 21 - Caravan Parks (pub. 1992-04-24) | No |
| State Environmental Planning Policy No 30 - Intensive Agriculture (pub. 1989-12-08) | No |
| State Environmental Planning Policy No 33 - Hazardous and Offensive Development (pub. 1992-03-13) | Yes |
| State Environmental Planning Policy No 36 - Manufactured Home Estates (pub. 1993-07-16) | No |
| State Environmental Planning Policy No 50 - Canal Estate Development (pub. 1997-11-10) | No |
| State Environmental Planning Policy No 55 - Remediation of Land (pub. 1998-08-28) | No |

**Table 3 (continued)**

| ***State Environmental Planning Policy*** | ***Applicable Yes/No*** |
|---|---|
| State Environmental Planning Policy No 62 - Sustainable Aquaculture (pub. 2000-08-25) | No |
| State Environmental Planning Policy No 64 - Advertising and Signage (pub. 2001-03-16) | No |
| State Environmental Planning Policy No 65 - Design Quality of Residential Apartment Development (pub. 2002-07-26) | No |
| State Environmental Planning Policy No 70 - Affordable Housing (Revised Schemes) (pub. 2002-05-01) | No |
| State Environmental Planning Policy (Primary Production and Rural Development) 2019 | No |
| State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017: Subject Land (pub. 2017-08-25) | No |
| State Environmental Planning Policy (Coastal Management) 2018 | Yes |

### *SEPP – Infrastructure*

This SEPP aims to facilitate the effective delivery of infrastructure across the state and that appropriate agencies are made aware of and are given an opportunity to make representations in respect of certain development, including traffic generating developments. Division 17 relates to Road and Traffic infrastructure while Schedule 3 of the SEPP outlines traffic generating development which requires referral to Roads and Maritime Services (RMS). The proposal does not trigger the criteria in this Schedule that would warrant the development application being referred to the RMS, and therefore the provisions of this SEPP would not apply to this proposal.

Schedule 3 includes the following criteria that may have relevance to this proposal:

| ***Development purpose*** | ***Column 1: Size or capacity – site with access to any road*** | ***Column 2 Size or capacity—site with access to classified road or to road that connects to classified road (if access within 90m of connection, measured along alignment of connecting road)*** |
|---|---|---|
| Car parks | 200 or more car parking spaces | 50 or more car parking spaces |
| Industry | 20,000m$^2$ in site area or (if the site area is less than the gross floor area) gross floor area | 5,000 m$^2$ in site area or (if the site area is less than the gross floor area) gross floor area |
| Any other purpose | 200 or more motor vehicles per hour | 50 or more motor vehicles per hour |

The modification proposal does not specifically trigger the above criteria. The proposal does involve the relocation of 50 approved parking spaces. However, these spaces are

already approved, and they are being relocated within the same part of the site to that which they were originally approved. There will be no change to the vehicle access points to Bolong Road associated with this change in parking configuration. Under these circumstances it is our view the RMS is not required to be notified of this Modification Proposal.

***SEPP No.33 – Hazardous and Offensive Development***

The objectives of SEPP No. 33 are set out in clause 2 of the SEPP and include:

*(a) to amend the definitions of hazardous and offensive industries where used in environmental planning instruments, and*

*(b) to render ineffective a provision of any environmental planning instrument that prohibits development for the purpose of a storage facility on the ground that the facility is hazardous or offensive if it is not a hazardous or offensive storage establishment as defined in this Policy, and*

*(c) to require development consent for hazardous or offensive development proposed to be carried out in the Western Division, and*

*(d) to ensure that in determining whether a development is a hazardous or offensive industry, any measures proposed to be employed to reduce the impact of the development are taken into account, and*

*(e) to ensure that in considering any application to carry out potentially hazardous or offensive development, the consent authority has sufficient information to assess whether the development is hazardous or offensive and to impose conditions to reduce or minimise any adverse impact, and*

*(f) to require the advertising of applications to carry out any such development.*

The Modification Proposal is supported by a Preliminary Hazard Analysis prepared by Pinnacle Risk Management Pty Ltd ("Pinnacle Risk") in accordance with the provisions of this SEPP (**Annexure 6**). Pinnacle Risk have undertaken a review of the works associated with this current Modification Proposal and assessed and compared the proposed works against relevant risk criteria.

***SEPP (Coastal Management) 2018***

*This SEPP seeks* to promote an integrated and co-ordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the *Coastal Management Act 2016* by:

*a) managing development in the coastal zone and protecting the environmental assets of the coast, and*

*b) establishing a framework for land use planning to guide decision-making in the coastal zone, and*

*c) mapping the 4 coastal management areas which comprise the NSW coastal zone, in accordance with the definitions in the Coastal Management Act 2016.*

This Policy applies to land within the coastal zone. Section 5 of the *Coastal Management Act 2016* provides that the ***coastal zone*** means the area of land comprised of the following coastal management areas:

a) the coastal wetlands and littoral rainforests area,

b) the coastal vulnerability area,

c) the coastal environment area,

d) the coastal use area.

Part 2 of the Coastal Management SEPP stipulates the Development Controls for Coastal Management Areas. Division 1 outlines the controls to be applied to development in the Coastal Wetlands and Littoral Rainforests Area.

***Coastal Wetlands and Littoral Rainforests Area.***

Mapping supporting the SEPP outlines the subject land is not mapped as containing coastal wetlands or littoral rainforest.

***Coastal Environment Area***

Division 3 of the SEPP stipulates the controls to be applied to development in the Coastal Environment Area.

The subject land is mapped under the NSW Coastal Management SEPP Mapping as being located within the Coastal Environment Area as seen below in **Figure 12**.


**Figure 12: NSW Coastal Management SEPP: Coastal Environment Area Map.**

Clause 13 of the SEPP specifies matters that must be considered in determining development applications on land within the Coastal Environment Area. Clause 13 reads:

> *1) Development consent must not be granted to development on land that is within the coastal environment area unless the consent authority has considered whether the proposed development is likely to cause an adverse impact on the following:*
>
> *a) the integrity and resilience of the biophysical, hydrological (surface and groundwater) and ecological environment,*
>
> *b) coastal environmental values and natural coastal processes,*
>
> *c) the water quality of the marine estate (within the meaning of the Marine Estate Management Act 2014), in particular, the cumulative impacts of the proposed development on any of the sensitive coastal lakes identified in Schedule 1,*
>
> *d) marine vegetation, native vegetation and fauna and their habitats, undeveloped headlands and rock platforms,*
>
> *e) existing public open space and safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability,*
>
> *f) Aboriginal cultural heritage, practices and places,*
>
> *g) the use of the surf zone.*
>
> *2) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that:*
>
> *a) the development is designed, sited and will be managed to avoid an adverse impact referred to in subclause (1), or*
>
> *b) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or*
>
> *c) if that impact cannot be minimised—the development will be managed to mitigate that impact.*

Comment:

- The proposal is not near a headland or rock platform and as such does not impact on public access to these areas.
- The proposal will not adversely impact the visual amenity and scenic qualities of the coast.
- The proposal involves works within an existing approved industrial site that is under development and is unlikely to impact on items of Aboriginal cultural heritage.
- The proposal involves works within an existing developing industrial site and will not impact upon the integrity or resilience of the biophysical or ecological environment.
- The proposal will incorporate erosion and sediment control measures to minimise impact on the water quality of the adjoining watercourses.

- The proposal will not involve any significant adverse impact on marine or native vegetation.
- The proposed development is not located within close proximity to the surf zone and will not impact on coastal environmental values or natural coastal processes.

***Coastal Use Area***

Division 4 of the SEPP specifies the controls to be applied to development in the Coastal Use Area. The modification proposal involves works that are partly situated within the Coastal Use zone as seen below in **Figure 13**. As such the provisions which apply to this mapping are relevant to the proposed development.

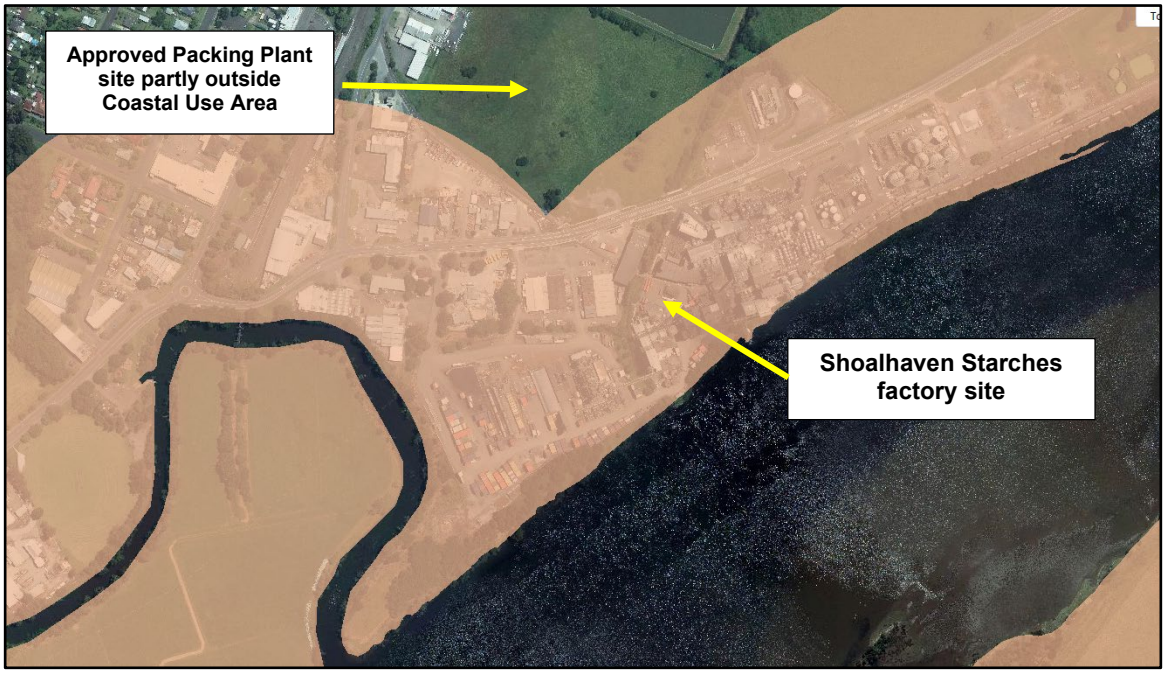


**Figure 13: NSW Coastal Management SEPP: Coastal Use Area Map.**

Clause 14 of the SEPP specifies matters that must be considered in determining development applications on land within the Coastal Use Area. Clause 14 reads:

> *(1) Development consent must not be granted to development on land that is within the coastal use area unless the consent authority:*
>
> *(a) has considered whether the proposed development is likely to cause an adverse impact on the following:*
>
> *(i) existing, safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability,*
>
> *(ii) overshadowing, wind funneling and the loss of views from public places to foreshores,*
>
> *(iii) the visual amenity and scenic qualities of the coast, including coastal headlands,*

*(iv) Aboriginal cultural heritage, practices and places,*

*(v) cultural and built environment heritage, and*

*(b) is satisfied that:*

*(i) the development is designed, sited and will be managed to avoid an adverse impact referred to in paragraph (a), or*

*(ii) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or*

*(iii) if that impact cannot be minimised—the development will be managed to mitigate that impact, and*

*c) has taken into account the surrounding coastal and built environment, and the bulk, scale and size of the proposed development.*

Comment:

- The proposal will not impact on existing safe access to the foreshore. The proposal is not near a beach, headland or rock platform and as such does not impact on public access to these areas.
- The works associated with this modification proposal will not cause overshadowing of the foreshore area or wind funnelling. The development will not block views from public places. The proposal will not adversely impact on the visual amenity and scenic qualities of the coast.
- As detailed above, the proposal will not adversely impact on Aboriginal cultural heritage and places.
- The works associated with this modification proposal are of a bulk, scale and size that are consistent with existing industrial development on the site and will not create an adverse visual impact in this locality.

Under these circumstances the proposal is considered to be consistent with the objectives

### 7.1.2 Local Environmental Plan

***Shoalhaven Local Environmental Plan 2014***

The parcels of land associated with this modification application are either zoned IN1 General Industrial or RU2 Primary production under the provisions of the Shoalhaven LEP 2014 (refer **Figures 14** and **15**).

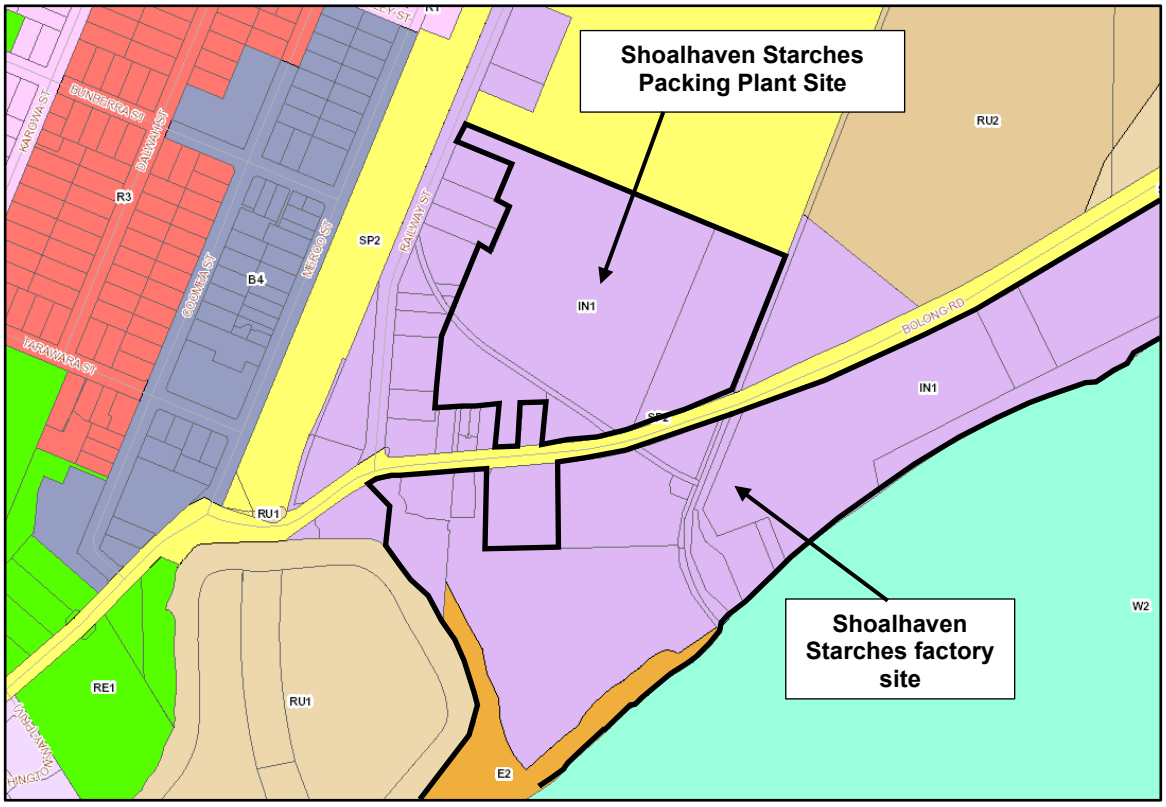


**Figure 14: Extract of zoning map under the SLEP 2014**
**(Shoalhaven Starches Factory & Approved Packing Plant sites)**

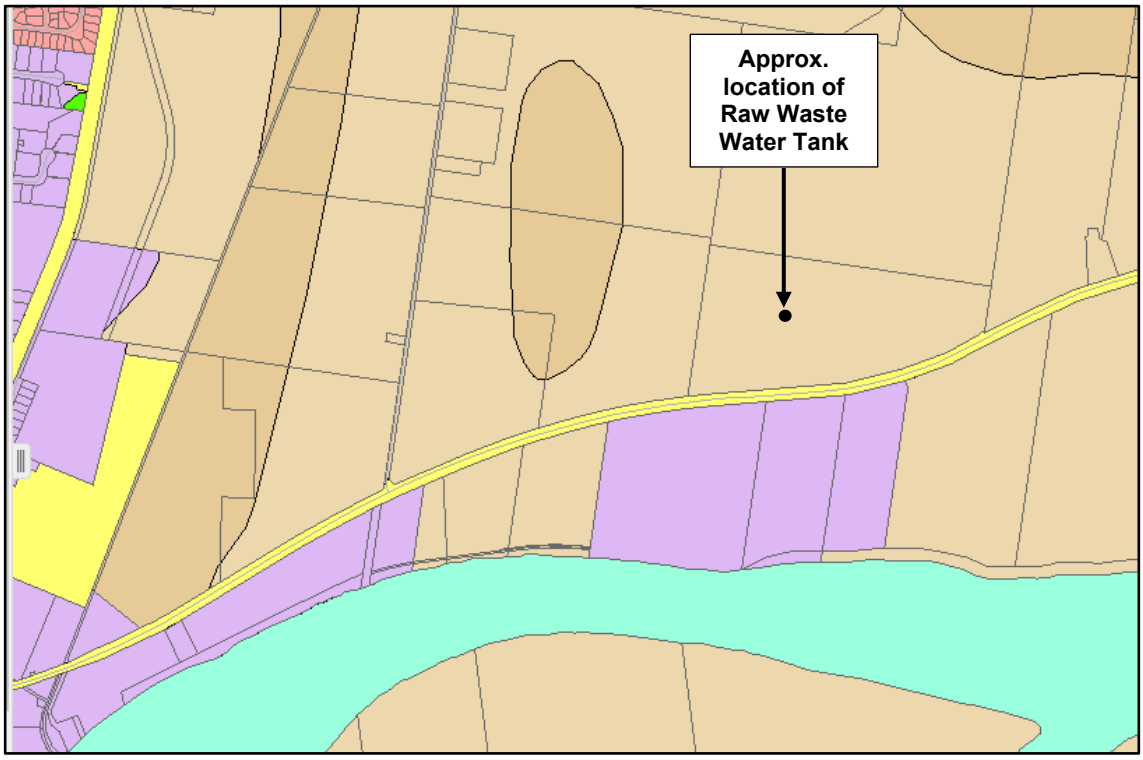


**Figure 15: Extract of zoning map under the SLEP 2014**
**(Location of Raw Waste Water Tank - Shoalhaven Starches Environmental Farm)**

### *IN1 General Industry Zone*

The objectives of the IN1 zone are:

- *To provide a wide range of industrial and warehouse land uses.*
- *To encourage employment opportunities.*
- *To minimise any adverse effect of industry on other land uses.*
- *To support and protect industrial land for industrial uses.*
- *To allow a diversity of activities that do not significantly conflict with the operation of existing or proposed development.*
- *To enable other land uses that provide facilities or services to meet the day to day needs of workers in the area.*

It is our view that the proposal is consistent with these objectives as the proposal involves modifications to an existing industrial facility.

"*General industries*" and "Rural industries" are permissible within the IN1 zone subject to consent (**Table 4**). The proposal involves modifications to an existing industrial development and is therefore permissible with consent.

**Table 4**
**Land Use Permissibility – IN1 Zone (Shoalhaven LEP 2014)**

| | |
|---|---|
| **Permitted without consent** | Nil. |
| **Permitted with consent** | Bulky goods premises; Depots; Freight transport facilities; **General industries**; Industrial training facilities; Kiosks; Light industries; Markets; Neighbourhood shops; Roads; Take away food and drink premises; Timber yards; Warehouse or distribution centres Any other development not specified in item 2 or 4. |
| **Prohibited** | Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Child care centres; Correctional centres; Crematoria; Eco-tourist facilities; Educational establishments; Environmental facilities; Exhibition villages; Extractive industries; Farm buildings; Forestry; Function centres; Health services facilities; Highway service centres; Home-based childcare; Home businesses; Home occupations; Home occupations (sex services); Information and education facilities; Marinas; Mooring pens; Moorings; Office premises; Open cut mining; Places of public worship; Registered clubs; Residential accommodation; Respite day care centres; Restricted premises; Retail premises; Sex services premises; Tourist and visitor accommodation; Water recreation structures; Wharf or boating facilities. |

***RU1 Primary Production Zone***

The objectives of the RU1 zone are:

- *To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.*
- *To encourage diversity in primary industry enterprises and systems appropriate for the area.*
- *To minimise the fragmentation and alienation of resource lands.*
- *To minimise conflict between land uses within this zone and land uses within adjoining zones.*
- *To conserve and maintain productive prime crop and pasture land.*
- *To conserve and maintain the economic potential of the land within this zone for extractive industries.*

It is our view that the proposal is consistent with these objectives as the proposal involves modifications to an existing approved rural industrial operation.

"Rural industries" are defined for the purposes of the SLEP 2014 as meaning:

> ***rural industry*** *means the handling, treating, production, processing, storage or packing of animal or plant agricultural products for commercial purposes, and includes any of the following—*
>
> *(a) agricultural produce industries,*
>
> *(b) livestock processing industries,*
>
> *(c) composting facilities and works (including the production of mushroom substrate),*
>
> *(d) sawmill or log processing works,*
>
> *(e) stock and sale yards,*
>
> *(f) the regular servicing or repairing of plant or equipment used for the purposes of a rural enterprise.*
>
> ***Note—***
>
> *Rural industries are not a type of* ***industry****—see the definition of that term in this Dictionary.*

The Shoalhaven Starches overall operations process wheat, other grains and flour to produce a range of products. Such an activity is consistent with the definition of an 'agricultural produce industry" which is defined under the SLEP 2014 as meaning:

> ***agricultural produce industry*** *means a building or place used for the handling, treating, processing or packing, for commercial purposes, of produce from agriculture (including dairy products, seeds, fruit, vegetables or other plant material), and includes wineries, flour mills, cotton seed oil plants, cotton gins, feed mills, cheese and butter factories, and juicing or canning plants, but does not include a livestock processing industry.*

***Note—***

*Agricultural produce industries are a type of* ***rural industry****—see the definition of that term in this Dictionary.*

As outlined in the 'note' in the above definition Agricultural produce industries are a type of rural industry. The proposed raw waste water tank associated with this Modification Application will form part of the Shoalhaven Starches waste water treatment operations that have been approved and take place on the Shoalhaven Starches Environmental Farm located on the northern side of Bolong Road. Such a use is inherently ancillary to the use of the site as a rural industry and therefore permissible with consent within the RU1 zone (refer **Table 5**).

**Table 5**
**Land Use Permissibility – RU1 Zone (Shoalhaven LEP 2014)**

| | |
|---|---|
| **Permitted without consent** | Extensive agriculture; Forestry; Home occupations |
| **Permitted with consent** | Agriculture; Air transport facilities; Airstrips; Animal boarding or training establishments; Aquaculture; Artisan food and drink industries; Boat building and repair facilities; Boat sheds; Building identification signs; Business identification signs; Camping grounds; Cellar door premises; Cemeteries; Charter and tourism boating facilities; Community facilities; Crematoria; Depots; Dual occupancies (attached); Dwelling houses; Eco-tourist facilities; Educational establishments; Environmental facilities; Environmental protection works; Extractive industries; Farm buildings; Flood mitigation works; Food and drink premises; Group homes; Helipads; Home-based child care; Home businesses; Home industries; Information and education facilities; Intensive livestock agriculture; Intensive plant agriculture; Marinas; Markets; Mooring pens; Moorings; Offensive industries; Open cut mining; Places of public worship; Plant nurseries; Recreation areas; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Roads; Roadside stalls; **Rural industries**; Rural workers' dwellings; Tourist and visitor accommodation; Veterinary hospitals; Water recreation structures; Water supply systems |
| **Prohibited** | Hotel or motel accommodation; Pubs; Serviced apartments; Any other development not specified in item 2 or 3 |

***Special Provisions***

The SLEP 2014 also has a number of specific provisions that apply to the land. The implications that these provisions have in relation to this proposal are discussed in **Table 6** below:

## Table 6
## Shoalhaven Local Environment Plan Provisions

| *SLEP 2014 Clause* | *Provisions* | *Comments* |
|---|---|---|
| *Clause4.3*<br>*Height of Buildings* | *(1) The objectives of this clause are as follows:*<br>*(a) to ensure that buildings are compatible with the height, bulk and scale of the existing and desired future character of a locality,*<br>*(b) to minimise visual impact, disruption of views, loss of privacy and loss of solar access to existing development,*<br>*(c) to ensure that the height of buildings on or in the vicinity of a heritage item or within a heritage conservation area respect heritage significance.*<br>*(2) The height of a building on any land is not to exceed the maximum height shown for the land on the Height of Buildings Map.*<br>*(2A) If the Height of Buildings Map does not show a maximum height for any land, the height of a building on the land is not to exceed 11 metres.* | There is no identified maximum height for the subject land. Clause 4.3(2A) however imposes a maximum building height of 11 m where no specific height limit is designated on the maps that support the LEP.<br>The proposal will involve the erection of a range of structures that will have heights that will exceed 11 metres in height ranging from 12 metres height for the proposed buffer tank to 34.75 metres for the proposed packer feed silos to be installed within the approved packing plant.<br>Under these circumstances this SEE is supported by a Written Request made pursuant to Clause 4.6 (**Annexure 8**) justifying non-compliance with this maximum building height limit. |
| *Clause 4.6*<br>*Exceptions to development standards* | *(1) The objectives of this clause are as follows:*<br>*(a) to provide an appropriate degree of flexibility in applying certain development standards to particular development,*<br>*(b) to achieve better outcomes for and from development by allowing flexibility in particular circumstances.*<br>*(2) Development consent may, subject to this clause, be granted for development even though the development would contravene a development standard imposed by this or any other environmental planning instrument. However, this clause does not apply to a development standard that is expressly excluded from the operation of this clause.*<br>*(3) Development consent must not be granted for development that contravenes a development standard unless the consent authority has considered a written request from the applicant that seeks to justify the contravention of the development standard by demonstrating:*<br>*(a) that compliance with the development standard is unreasonable or unnecessary in the circumstances of the case, and* | The proposal will involve the erection of a range of structures that will have heights that will exceed 11 metres in height ranging from 12 metres height for the proposed buffer tank to 34.75 metres for the proposed packer feed silos to be installed within the approved packing plant.<br>The proposed works will be erected within the broader approved Shoalhaven Starches factory site.<br>As the proposed works will be built within the existing industrial complex it is not expected that the new development will have an undue effect due to its height.<br>This Modification Application is supported by a Clause 4.6 Written Request justifying a departure to Clause 4.3(2A) under the specific circumstances of this case. |

**Table 6 (continued)**

| *SLEP 2014 Clause* | *Provisions* | *Comments* |
|---|---|---|
| *4.6 continued* | *(b) that there are sufficient environmental planning grounds to justify contravening the development standard.*<br>*(4) Development consent must not be granted for development that contravenes a development standard unless:*<br>*(a) the consent authority is satisfied that:*<br>*(i) the applicant's written request has adequately addressed the matters required to be demonstrated by subclause (3), and*<br>*(ii) the proposed development will be in the public interest because it is consistent with the objectives of the particular standard and the objectives for development within the zone in which the development is proposed to be carried out, and*<br>*(b) the concurrence of the Director-General has been obtained.*<br>*(5) In deciding whether to grant concurrence, the Director-General must consider:*<br>*(a) whether contravention of the development standard raises any matter of significance for State or regional environmental planning, and*<br>*(b) the public benefit of maintaining the development standard, and*<br>*(c) any other matters required to be taken into consideration by the Director- General before granting concurrence.*<br>*(6) Development consent must not be granted under this clause for a subdivision of land in Zone RU1 Primary Production, Zone RU2 Rural Landscape, Zone RU3 Forestry, Zone RU4 Primary Production Small Lots, Zone RU6 Transition, Zone R5 Large Lot Residential, Zone E2 Environmental Conservation, Zone E3 Environmental Management or Zone E4 Environmental Living if:*<br>*(a) the subdivision will result in 2 or more lots of less than the minimum area specified for such lots by a development standard, or* | |

**Table 6 (continued)**

| *SLEP 2014 Clause* | *Provisions* | *Comments* |
|---|---|---|
| *4.6 continued* | *(b) the subdivision will result in at least one lot that is less than 90% of the minimum area specified for such a lot by a development standard.*<br>*Note. When this Plan was made it did not include all of these zones.*<br>*(7) After determining a development application made pursuant to this clause, the consent authority must keep a record of its assessment of the factors required to be addressed in the applicant's written request referred to in subclause (3).* | |
| *Clause 5.10 Heritage Conservation* | *(1) The objectives of this clause are:*<br>*(a) to conserve the environmental heritage of Shoalhaven; and*<br>*(b) to conserve the heritage significance of heritage items and heritage conservation areas including associated fabric, settings and views; and*<br>*(c) to conserve archaeological sites; and*<br>*(d) to conserve Aboriginal objects and Aboriginal places of heritage significance.*<br>*(2) Development consent is required for any of the following:*<br>*(a) demolishing or moving any of the following or altering the exterior of any of the following (including, in the case of a building, making changes to its detail, fabric, finish or appearance):*<br>*(i) a heritage item,*<br>*(ii) an Aboriginal object*<br>*(iii) a building, work, relic or tree within a heritage conservation area,*<br>*(b) altering a heritage item that is a building by making structural changes to its interior or by making changes to anything inside the item that is specified in Schedule 5 in relation to the item,* | There are no heritage items within the subject land, and the subject site is not located within a heritage conservation area.<br>The site is an approved industrial site that is currently being developed for its approved purpose. It is not expected that the proposal will disturb any Aboriginal objects or relics. |

**Table 6 (continued)**

<table>
<tr><th>SLEP 2014 Clause</th><th>Provisions</th><th>Comments</th></tr>
<tr><td>5.10 continued</td><td>
(c) disturbing or excavating an archaeological site while knowing, or having reasonable cause to suspect, that the disturbance or excavation will or is likely to result in a relic being,<br>
discovered, exposed, moved damaged or destroyed,<br>
(d) disturbing or excavating an Aboriginal place of heritage significance,<br>
(e) erecting a building on land:<br>
(i) on which a heritage item is located or that is within a heritage conservation area;<br>
(ii) on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance,<br>
(f) subdividing land:<br>
(i) on which a heritage item is located or that is within a heritage conservation area, or<br>
(ii) on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance.
</td><td></td></tr>
<tr><td>Clause 7.1<br>Acid sulfate soils</td><td>
(1) The objective of this clause is to ensure that development does not disturb, expose or drain acid sulfate soils and cause environmental damage.<br>
(2) Development consent is required for the carrying out of works described in the Table to this subclause on land shown on the Acid Sulfate Soils Map as being of the class specified for those works, except as provided by this clause.
<table>
<tr><th>Class of Land</th><th>Works</th></tr>
<tr><td>1</td><td>Any works.</td></tr>
<tr><td>2</td><td>Works below the natural ground surface.<br>Works by which the watertable is likely to be lowered.</td></tr>
</table>
</td><td>An Acid Sulphate Soils Management Plan in accordance with Condition 21 of the original Project Approval has been formulated for the site. This plan will need to be updated to reflect this modification proposal; however, it is not considered necessary, that further assessment is required to be undertaken in relation to this Modification Application in terms of ASS.<br><br>.</td></tr>
</table>

**Table 6 (continued)**

| SLEP 2014 Clause | Provisions | Comments |
|---|---|---|
| *7.1 continued* | | |

| | |
|---|---|
| *3* | *Works more than 1 metre below the natural ground surface.*<br>*Works by which the watertable is likely to be lowered more than 1 metre below the natural ground surface.* |
| *4* | *Works more than 2 metres below the natural ground surface.*<br>*Works by which the watertable is likely to be lowered more than 2 metres below the natural ground surface.* |
| *5* | *Works within 500 metres of adjacent Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum by which the watertable is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2, 3 or 4 land.* |

*(3) Development consent must not be granted under this clause for the carrying out of works unless an acid sulfate soils management plan has been prepared for the proposed works in accordance with the Acid Sulfate Soils Manual and has been provided to the consent authority.*

*(4) Despite subclause (2), development consent is not required under this clause for the carrying out of works if:*

*(a) a preliminary assessment of the proposed works prepared in accordance with the Acid Sulfate Soils Manual indicates that an acid sulfate soils management plan is not required for the works, and*

*(b) the preliminary assessment has been provided to the consent authority and the consent authority has confirmed the assessment by notice in writing to the person proposing to carry out the works.*

*(5) Despite subclause (2), development consent is not required under this clause for the carrying out of any of the following works by a public authority (including ancillary work such as excavation, construction of access ways or the supply of power):*

*(a) emergency work, being the repair of the works of the public authority required to be carried out urgently because the works have been damaged, have ceased to function or pose a risk to the environment or to public health and safety,*

**Table 6 (continued)**

| *SLEP 2014 Clause* | *Provisions* | *Comments* |
|---|---|---|
| *7.1 continued* | *(b) routine management work, being the periodic inspection, cleaning, repair or replacement of the works of the public authority (other than work that involves the disturbance of more than 1 tonne of soil).*<br>*(c) minor work, being work that costs less than $20,000 (other than drainage work).*<br>*(6) Despite subclause (2), development consent is not required under this clause to carry out any works if:*<br>*(a) the works involve the disturbance of less than 1 tonne of soil, and*<br>*(b) the works are not likely to lower the watertable.* | |
| *Clause 7.3*<br>*Flood Planning* | *(1) The objectives of this clause are as follows:*<br>*(a) to minimise the flood risk to life and property associated with the use of land,*<br>*(b) to allow development on land that is compatible with the land's flood hazard, taking into account projected changes as a result of climate change,*<br>*(c) to avoid significant adverse impacts on flood behaviour and the environment.*<br>*(2) This clause applies to land at or below the flood planning level.*<br>*(3) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that the development:*<br>*(a) is compatible with the flood hazard of the land, and*<br>*(b) will not significantly adversely affect flood behaviour resulting in detrimental increases in the potential flood affectation of other development or properties, and*<br>*(c) incorporates appropriate measures to manage risk to life from flood, and*<br>*(d) will not significantly adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of riverbanks or watercourses, and* | The application is supported by a Flood Compliance Report prepared by WMAwater (**Annexure 5**) which concludes that a comparison of peak flood levels between the approved and proposed works for the 1% AEP event indicate that the maximum increase in 1% AEP flood level outside the Shoalhaven Starches plant is up to 0.05 m at the rail crossing of Bolong Road with increases in flood level generally limited to within the Shoalhaven Starches plant.<br>This issue is further addressed in Section 7.2.6 of this SEE. |

**Table 6 (continued)**

| *SLEP 2014 Clause* | *Provisions* | *Comments* |
|---|---|---|
| *7.3 continued* | *(e) is not likely to result in unsustainable social and economic costs to the community as a consequence of flooding, and*<br>*(f) will not affect the safe occupation or evacuation of the land.*<br>*(4) A word or expression used in this clause has the same meaning as it has in the Floodplain Development Manual (ISBN 0 7347 5476 0) published by the NSW Government in April 2005, unless it is otherwise defined in this Plan.*<br>*(5) (Repealed)* | |
| *Clause 7.4*<br>*Coastal Risk Planning* | *(1) The objectives of this clause are as follows:*<br>*(a) to avoid significant adverse impacts from coastal hazards,*<br>*(b) to ensure uses of land identified as coastal risk are compatible with the risks presented by coastal hazards,*<br>*(c) to enable the evacuation of land identified as coastal risk in an emergency,*<br>*(d) to avoid development that increases the severity of coastal hazards.*<br>*(2) This clause applies to the land identified as "Coastal Risk Planning Area" on the Coastal Risk Planning Map.*<br>*(3) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that the development:*<br>*(a) will avoid, minimise or mitigate exposure to coastal processes, and*<br>*(b) is not likely to cause detrimental increases in coastal risks to other development or properties, and*<br>*(c) is not likely to alter coastal processes and the impacts of coastal hazards to the detriment of the environment, and*<br>*(d) incorporates appropriate measures to manage risk to life from coastal risks, and* | The *Coastal Risk Planning Map* that accompanies the SLEP 2014 does not identify the subject land as a "*Coastal Risk Planning Area"*.<br>The provisions of this clause therefore do not apply to the subject site. |

**Table 6 (continued)**

| *SLEP 2014 Clause* | *Provisions* | *Comments* |
|---|---|---|
| *7.4 continued* | *(e) is likely to avoid or minimise adverse effects from the impact of coastal processes and the exposure to coastal hazards, and*<br>*(f) provides for the relocation, modification or removal of the development to adapt to the impact of coastal processes and coastal hazards, and*<br>*(g) has regard to the impacts of sea level rise.*<br>*(4) A word or expression used in this clause has the same meaning as it has in the NSW Coastal Planning Guideline: Adapting to Sea Level Rise (ISBN 978-1-74263-035-9) published by the NSW Government in August 2010, unless it is otherwise defined in this clause.*<br>*(5) In this clause:*<br>***coastal hazard** has the same meaning as in the Coastal Protection Act 1979.* | |
| *Clause 7.5*<br>*Terrestrial Biodiversity* | *(1) The objective of this clause is to maintain terrestrial biodiversity, by:*<br>*(a) protecting native flora and fauna,*<br>*(b) protecting the ecological processes necessary for their continued existence, and*<br>*(c) encouraging the recovery of native flora and fauna, and their habitats.*<br>*(2) This clause applies to land:*<br>*(a) identified as "Biodiversity—habitat corridor" or "Biodiversity—significant vegetation" on the Terrestrial Biodiversity Map, and*<br>*(b) situated within 40m of the bank (measured horizontally from the top of the bank) of a natural waterbody.*<br>*(3) Before determining a development application for development on land to which this clause applies, the consent authority must consider:*<br>*(a) whether the development is likely to have:*<br>*(i) any adverse impact on the condition, ecological value and significance of the fauna and flora on the land, and* | The Terrestrial Biodiversity Map that accompanies the SLEP 2014 does not identify the subject land as including areas of Biodiversity - habitat corridor and/or Biodiversity - significant vegetation.<br>Given the developed industrial nature of the site the proposal is unlikely to have any adverse impacts on the ecological value of the land. |

**Table 6 (continued)**

| *SLEP 2014 Clause* | *Provisions* | *Comments* |
|---|---|---|
| *7.5 continued* | *(ii) any adverse impact on the importance of the vegetation on the land to the habitat and survival of native fauna, and*<br>*(iii) any potential to fragment, disturb or diminish the biodiversity structure, function and composition of the land, and*<br>*(iv) any adverse impact on the habitat elements providing connectivity on the land, and*<br>*(b) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.*<br>*(4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that:*<br>*(a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or*<br>*(b) if that impact cannot be reasonably avoided by adopting feasible alternatives—the development is designed, sited and will be managed to minimise that impact, or*<br>*(c) if that impact cannot be minimised—the development will be managed to mitigate that impact.*<br>*(5) For the purpose of this clause:*<br>***bank** means the limit of the bed of a natural waterbody.*<br>***bed,** of a natural waterbody, means the whole of the soil of the channel in which the waterbody flows, including the portion that is alternatively covered and left bear with an increase or diminution in the supply of water and that is adequate to contain the waterbody at its average or mean stage without reference to extraordinary freshets in the time of flood or to extreme droughts.* | |

**Table 6 (continued)**

| *SLEP 2014 Clause* | *Provisions* | *Comments* |
|---|---|---|
| *Clause 7.6*<br>*Riparian land and watercourses* | *(1) The objective of this clause is to protect and maintain the following:*<br>*(a) water quality within watercourses,*<br>*(b) the stability of the bed and banks of watercourses,*<br>*(c) aquatic and riparian habitats,*<br>*(d) ecological processes within watercourses and riparian areas.*<br>*(2) This clause applies to all of the following:*<br>*(a) land identified as "Riparian Land" on the Riparian Lands and Watercourses Map,*<br>*(b) land identified as "Watercourse Category 1", "Watercourse Category 2" or "Watercourse Category 3" on that map,*<br>*(c) all land that is within 50 metres of the top of the bank of each watercourse on land identified as "Watercourse Category 1", "Watercourse Category 2" or "Watercourse Category 3" on that map.*<br>*(3) Before determining a development application for development on land to which this clause applies, the consent authority must consider:*<br>*(a) whether or not the development is likely to have any adverse impact on the following:*<br>*(i) the water quality and flows within the watercourse,*<br>*(ii) aquatic and riparian species, habitats and ecosystems of the watercourse,*<br>*(iii) the stability of the bed and banks of the watercourse,*<br>*(iv) the free passage of fish and other aquatic organisms within or along the watercourse,*<br>*(v) any future rehabilitation of the watercourse and its riparian areas, and*<br>*(b) whether or not the development is likely to increase water extraction from the watercourse, and*<br>*(c) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.* | The *Riparian Lands and Watercourses Map* that accompanies the SLEP 2014 identifies a category 2 watercourse Abernethy's Creek flowing to the east of the Packing Plant site. The proposed works associated with this Modification Application include the installation of gantries, and the construction of an additional 3rd rail siding within proximity of this watercourse.<br>An assessment has been undertaken by GHD in relation to bank stability (**Annexure 7**) that demonstrates the development of the third rail siding on the northern side of Bolong Road will not adversely affect the stability of the western bank of Abernethy's Creek. Similarly in regard to the pipe bridge extending from the Packing Plant to the creek and the pipe gantry extending over Abernathy's Creek south of Bolong Road should not affect the stability of the creek either, provided the structures are supported on piles extending to rock. |

**Table 6 (continued)**

| *SLEP 2014 Clause* | *Provisions* | *Comments* |
|---|---|---|
| *7.6 continued* | *(4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that:*<br>*(a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or*<br>*(b) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or*<br>*(c) if that impact cannot be minimised—the development will be managed to mitigate that impact*<br>*(5) For the purpose of this clause:*<br>***bank** means the limit of the bed of a watercourse.*<br>***bed**, of a watercourse, means the whole of the soil of the channel in which the watercourse flows, including the portion that is alternatively covered and left bear with an increase or diminution in the supply of water and that is adequate to contain the watercourse at its average or mean stage without reference to extraordinary freshets in the time of flood or to extreme droughts.* | |
| *Clause 7.7*<br>*Landslide risk and other land degradation* | *(1) The objective of this clause is to maintain soil resources and the diversity and stability of landscapes, including protecting land:*<br>*(a) comprising steep slopes, and*<br>*(b) susceptible to other forms of land degradation.*<br>*(2) This clause applies to the following land:*<br>*(a) land with a slope in excess of 20% (1:5), as measured from the contours of a 1:25,000 topographical map, and*<br>*(b) land identified as "Sensitive Area" on the Natural Resource Sensitivity—Land Map.*<br>*(3) Before determining a development application for development on land to which this clause applies, the consent authority must consider any potential adverse impact, either from, or as a result of, the development in relation to:*<br>*(a) the geotechnical stability of the site, and*<br>*(b) the probability of increased erosion or other land degradation processes.* | The proposed works involve land that is identified as sensitive land under the SLEP 2014 mapping. In this regard the land upon which the approved packing plant, container storage and rail sidings are affected by these provisions.<br>Coffey Environments ("Coffey's") undertook a "*Geotechnical Investigation and Assessment*" as part of the EA that supported Mod 9 which dealt with modifications to the approved Packing Plant site in 2016. This report assessed the geotechnical conditions within the packing plant site generally and provided advice on bearing capacity of the soils and rock encountered and suitable footing systems for the proposed structures. The proposed modifications to the packing plant under this Mod will need to consider the recommendations arising from this original report. |

**Table 6 (continued)**

| *SLEP 2014 Clause* | *Provisions* | *Comments* |
|---|---|---|
| | *(4) Before granting consent to development on land to which this clause applies, the consent authority must be satisfied that:*<br>*(a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or*<br>*(b) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or*<br>*(c) if that impact cannot be minimised – the development will be managed to mitigate that impact.*<br>*(5) In this clause, topographical map means the most current edition of a topographical map, produced by Land and Property Information division of the Department of Finance and Services, that identifies the Council's local government area and boundary.* | The Coffey's report for Mod 9 also considered the potential effects of the development on the stability of the Abernethy's Creek bank. This assessment in part addressed the stability of the section of Abernethy's Creek where it was close to the proposed access road and rail line alignments within the Packing Plant site. This report made a range of recommendations in terms of these works and their proximity to this watercourse.<br>This modification proposal will involve works within proximity of Abernethy's Creek including the additional rail siding, the change to the alignment of the pipe bridge and works associated with the new pipe gantry. Given these circumstances this SEE is supported by a further geotechnical assessment undertaken by GHD that addresses the potential impacts that such works could have on the stability of the banks of Abernethy's Creek and any recommendations to mitigate such impacts (**Annexure 7**). This report demonstrates the development of the third rail siding on the northern side of Bolong Road will not adversely affect the stability of the western bank of Abernethy's Creek. The pipe bridge extending from the Packing Plant to the creek and the pipe gantry extending over Abernethy's Creek south of Bolong Road should also not affect the stability of the creek either, provided the structures are supported on piles extending to rock.<br>This issue is further discussed in Section 7.2.7 of this SEE. |

**Table 6 (continued)**

| *SLEP 2014 Clause* | *Provisions* | *Comments* |
|---|---|---|
| *Clause 7.8*<br>*Scenic protection* | *(1) The objective of this clause is to protect the natural environmental and scenic amenity of land that is of high scenic value.*<br>*(2) This clause applies to land identified as "Scenic Protection" on the Scenic Protection Area Map.*<br>*(3) In deciding whether to grant development consent for development on land to which this clause applies, the consent authority must:*<br>*(a) consider the visual impact of the development when viewed from a public place and be satisfied that the development will involve the taking of measures that will minimise any detrimental visual impact, and*<br>*(b) consider the number, type and location of existing trees and shrubs that are to be retained and the extent of landscaping to be carried out on the site, and*<br>*(c) consider the siting of the proposed buildings.* | The subject land is not identified as being within a "*Scenic Protection"* area by *Scenic Protection Area Mapping* that accompanies the SLEP 2014.<br>The provisions of this clause therefore do not apply to the subject site.<br>The visual impact associated with this proposal are discussed in Section 7.2.5 of this SEE. |
| *Clause 7.9*<br>*HMAS Albatross airspace operations* | (*1) The objectives of this clause are as follows—*<br>*(a) to provide for the effective and on-going operation of the HMAS Albatross Military Airfield by ensuring that such operation is not compromised by proposed development that penetrates the Limitation or Operations Surface for that airport,*<br>*(b) to protect the community from undue risk from that operation.*<br>*(2) If a development application is received and the consent authority is satisfied that the proposed development will penetrate the Limitation or Operations Surface, the consent authority must not grant development consent unless it has consulted with the relevant Commonwealth body about the application.*<br>*(3) The consent authority may grant development consent for the development if the relevant Commonwealth body advises that—*<br>*(a) the development will penetrate the Limitation or Operations Surface but it has no objection to its construction, or*<br>*(b) the development will not penetrate the Limitation or Operations Surface.* | The Department of Defence were consulted have not raised any specific issues to this Modification Proposal (**Annexure 1**). |

**Table 6 (continued)**

| *SLEP 2014 Clause* | *Provisions* | *Comments* |
|---|---|---|
| | *(4) The consent authority must not grant development consent for the development if the relevant Commonwealth body advises that the development will penetrate the Limitation or Operations Surface and should not be carried out.*<br>*(5) In this clause—*<br>***Limitation or Operations Surface** means the Obstacle Limitation Surface or the Procedures for Air Navigation Services Operations Surface as shown on the Obstacle Limitation Surface Map or the Procedures for Air Navigation Services Operations Surface Map for the HMAS Albatross Military Airfield.*<br>***relevant Commonwealth body** means the body, under Commonwealth legislation, that is responsible for development approvals for development that penetrates the Limitation or Operations Surface for the HMAS Albatross Military Airfield.* | |

### 7.1.3 Development Control Plans (DCP) and Policies

***Shoalhaven Development Control Plan (DCP) 2014***

Given the nature of the works associated with this modification proposal it is considered the provisions of the Shoalhaven DCP 2014 are not directly relevant to this modification application apart from the provisions of *Chapter G9: Development on Flood Prone Land*.

The SEE is supported by a Flood Compliance Report prepared by WMAwater which addresses flooding issues which arise in relation to this Modification Proposal. A copy of the WMAwater submission is included in **Annexure 5** of this SEE. Flooding issues are further in Section 7.2.5 of this SEE.

**Table 7** below is an extract from the WMAwater submission addressing the relevant provisions (section 5.1) of Chapter G9 of the Shoalhaven DCP 2014.

**Table 7**

**Performance Criteria – General (Section 5.1 DCP 2014)**
**Extract from WMAwater Flood Compliance Report**

| *Performance Criteria* | *Response* |
|---|---|
| **P1 Development or work on flood prone land will meet the following:** | |
| *The development will not increase the risk to life or safety of persons during a flood event on the development site and adjoining land.* | No additional workers will be on the site as a result of the proposed works. Approximately 20 workers will be relocated from the existing plant site to the new packing plant site. |
| *The development or work will not unduly restrict the flow behaviour of floodwaters.* | Refer Hydraulic Impact Assessment. |
| *The development or work will not unduly increase the level or flow of floodwaters or stormwater runoff on land in the vicinity. The development or work will not exacerbate the adverse consequences of floodwaters flowing on the land with regard to erosion, siltation and destruction of vegetation.* | The proposed development is within existing built-up industrial land with minimal vegetation on the site. All runoff under existing and future conditions will reach the ground in nearly identical locations and thus the works will have no impact on erosion or siltation. |
| *The structural characteristics of any building or work that are the subject of the application are capable of withstanding flooding in accordance with the requirements of the Council.* | A separate structural report will be provided. |
| *The development will not become unsafe during floods or result in moving debris that potentially threatens the safety of people or the integrity of structures.* | A separate structural report on the potential failure of existing buildings and stored equipment and product will be provided. |
| *Potential damage due to inundation of proposed buildings and structures is minimised.* | Inundation of the site and the proposed plant and / or debris impact may cause damage to electrical and other components feeding the |

**Table 7 (continued)**

| *Performance Criteria* | *Response* |
|---|---|
| | equipment as well as damage to the plant itself. These issues will be considered in an updated Shoalhaven Starches Flood Plan taking into account the proposed works. |
| *The development will not obstruct escape routes for both people and stock in the event of a flood.* | The proposed works will not occupy escape routes or cause workers to become trapped. |
| *The development will not unduly increase dependency on emergency services.* | The works will not increase the number of workers from Shoalhaven Starches who may be subject to flood risk as a result of the proposed works. |
| *Interaction of flooding from all possible sources has been taken into account in assessing the proposed development against risks to life and property resulting from any adverse hydraulic impacts.* | Refer Hydraulic Impact Assessment below. |
| *The development will not adversely affect the integrity of floodplains and floodway's, including riparian vegetation, fluvial geomorphologic environmental processes and water quality.* | The works will be constructed on land that is partly designated as high hazard floodway in the 1% AEP event. The site is industrial land with limited existing vegetation and is beyond the influence of normal fluvial geomorphic processes. The works will have no impact on water quality. |

### 7.1.4 Protection of the Environment Operations Act and Associated Regulations

The existing Shoalhaven Starches factory site and Environmental Farm are subject to an Environmental Protection Licence (EPL) under the Protection of the Environment Operations Act 1997 (POEO Act) (EPL No. 883) issued by the EPA. The licence imposes requirements in terms of:

- discharges to air, water and land;
- irrigation controls;
- management of irrigation;
- maintenance of irrigation reticulation;
- odour control;
- noise.

If approved, the proposed modification may necessitate the terms/provisions of this licence to be also reviewed.

## 7.2 THE LIKELY IMPACTS OF THE DEVELOPMENT, INCLUDING ENVIRONMENTAL IMPACTS ON BOTH NATURAL AND BUILT ENVIRONMENTS, AND SOCIAL AND ECONOMIC IMPACTS IN THE LOCALITY

### 7.2.1 Risk Assessment of Potential Environmental Impacts

The purpose of this section of the SEE is to provide a risk assessment of the potential environmental impacts associated with the modification proposal. This section (**Table 8**) compares the potential impacts from the proposed modification against the approved project. The comparison uses the key environmental impacts assessed in the original EA that supported the original MP06_0228 and summarises the relative change in environmental impacts associated with the proposed modification.

## Table 8
## Risk Assessment

| *Relative Change in Environmental Impact* | *Additional Management or Mitigation Measures Required* | *Significance of Issue with this Modification Proposal* |
|---|---|---|
| **Air Quality (including Odour) Assessment** | | |
| One of the primary issues that was addressed in the original EA for the Shoalhaven Starches Expansion Project concerned the need for a comprehensive air quality assessment (including odour assessment) and reduction of odours as part of the project.<br>This SEE is supported by an Air Quality Assessment prepared by GHD which addresses the relevant aspects of this Modification Application in terms of air quality (including odour) impacts.<br>GHD's assessment concludes:<br>o Odour dispersion modelling was undertaken by GHD for the quarter with maximum odour emissions (in accordance with the methodology previously adopted for past modification air quality assessments) (Quarter 2) and for the most recent quarter (Quarter 3).<br>➢ Modelling of the Quarter 2 by GHD predicted a marginal increase in odour impacts resulting in an exceedance at residential receptors R2 and R3. This exceedance was primarily attributed to high quarterly odour sampling results.<br>➢ Modelling of the most recent quarter 3 predicted compliance of the odour criteria at all residential receptors.<br>o Dispersion modelling of particulates, combustion products, PAH, VOCs and metals was undertaken for base and mitigation scenarios.<br>For both base and mitigation scenarios, minor exceedances of the cumulative 24 hour $PM_{10}$ and $PM_{2.5}$ criteria were predicted by GHD at commercial receptor C1. These exceedances were primarily attributed to high background concentrations that occurred on the days where exceedances were predicted. | GHD recommend that an investigation be undertaken into opportunities to use gas fired boilers instead of coal.<br>In this regard, Shoalhaven Starches will be incorporating the conversion of coal fired boilers to gas as part of the future proposal to construct a gas fired co-generation plant as part of the future Modification 23. | This issue is further addressed in Section 7.2.2 of this SEE. |

**Table 8 (continued)**

| *Relative Change in Environmental Impact* | *Additional Management or Mitigation Measures Required* | *Significance of Issue with this Modification Proposal* |
|---|---|---|
| ➢ For the base scenario, nitrogen dioxide concentrations were predicted by GHD to exceed the criteria at\ commercial/industrial sensitive receptor C1 for two hours of the modelled year (0.02% of the time) and C2 for one hour of the modelled year C2 (0.05% of the time) for the base scenario. There were no predicted exceedances of the nitrogen dioxide criteria in the mitigation scenario where the use of coal boiler 8 was replaced with the use of gas boiler 7 and gas boiler 8.<br>○ Compliance was predicted by GHD for all other air quality species for both scenarios. | | |
| **Transport and Traffic** | | |
| The proposed modification to the approved Packing Plant associated with this Modification Proposal has arisen as a result of the increase in range of products that will be produced from the site following Mod 16, and the need to accommodate these different products in the packing plant process. These modifications have not resulted however in any increase in the amount of product that needs to be transported to and from this site.<br>The proposed new third rail siding is proposed to enable storage of additional rail wagons and enable wagons to be taken off line for maintenance purposes. It will not have any significant impact on train movements across Bolong Road.<br>Given these circumstances it is considered the proposal will not raise any traffic issues that will require further consideration as part of any Modification Application. | No additional management or mitigative measures are proposed in terms of traffic or car parking. | Not a key issue. This issue is not further addressed in this SEE. |
| **Site Contamination** | | |
| The areas of the subject site associated with this Modification Application are similar to those previously examined by Coffey Environments ("Coffey's") as part of their report titled *Preliminary Environmental Site Assessment and Geotechnical Investigation, Proposed Ethanol Expansion, Shoalhaven Starches, Bolong Road, Bomaderry"* which supported the original Project Application for the Shoalhaven Starches Expansion Project. | No additional management or mitigative measures are proposed in terms of this issue. | Not a key issue. This issue is not further addressed in this SEE. |

**Table 8 (continued)**

| *Relative Change in Environmental Impact* | *Additional Management or Mitigation Measures Required* | *Significance of Issue with this Modification Proposal* |
|---|---|---|
| Coffey's in this previous report addressed the issue of site contamination including in relation to the Packing Plant site. Coffey's previously identified petroleum hydrocarbon contamination and fragments of Asbestos Containing Material (ACM) within the central western part of the Packing Plant site which appeared to contain fill materials and ramping west towards neighbouring properties. This assessment concluded that this part of the site required further assessment and remediation / management with respect to the identified contamination.<br>Under the Project Approval a site audit statement prepared by an accredited site auditor, (indicating the site was suitable for its intended use(s) was required to be undertaken before any works could commence on this overall site. A site audit statement was provided by Tim Chambers of Environmental Strategies, and submitted to the Department on the 8th July 2016. The Department in a letter dated 16th March 2017 confirmed this statement satisfied the requirement of Condition 20 of the Project Approval. | | |
| **Acid Sulphate Soils** | | |
| All of the subject site is identified as potentially containing acid sulphate soils. The areas of the subject site associated with this Modification Application are similar to those previously examined by Coffey's report referred to above, and which included an assessment of ASS. With respect to ASS, Coffey's identified with respect to the Packing Plant site that:<br>*Sampling locations in this area generally recorded topsoil/alluvial and estuarine soils. Estuarine soils were generally noted in the northern and eastern parts of this area which are typically the lower lying parts. Typically stiffer alluvial soils were noted in the central and southern parts of this area. The estuarine soils were typically dark grey and black clayey silts whilst alluvial soils were typically sandy and silty clays.*<br>*Field screening results generally recorded pH values greater than 4. After oxidation with $H_2O_2$, some samples recorded pH values below 3* | No additional management or mitigative measures are proposed in terms of this issue. | Not a key issue. This issue is not further addressed in this SEE. |

**Table 8 (continued)**

| *Relative Change in Environmental Impact* | *Additional Management or Mitigation Measures Required* | *Significance of Issue with this Modification Proposal* |
|---|---|---|
| *which suggests the potential presence of unoxidised sulfides. Laboratory results are presented in Table LR11. These results indicated TAA values ranging between 22m/t and 123m/t suggesting soils are actual ASS. SCR results typically suggest that the soils do not have unoxidised sulfides that would lead to further oxidation, except for one sample collected from CTP28/1.0-1.1m.*<br><br>*Results also suggest that not all of the acidity is sulphuric, but sufficient sulphuric acidity is present to designate these soils as Actual ASS. Sample results for a test pit excavated near the southern end of the proposed footbridge over Bolong Road did not indicate the presence of ASS.*<br><br>The Coffey's report then went on to conclude about ASS and the Packing Plant site:<br><br>*We would recommend that an Acid Sulfate Soils Management Plan (ASSMP) be prepared for the packing plant and areas of the site where soil disturbances are likely to intersect ASS. Depending on further details of the proposed development and level of disturbance, further assessment could be carried out to increase the confidence in the lateral and vertical extent of the ASS. It is probable that acid sulphate soils could occur at depths beyond those assessed in this study.*<br><br>*Should the proposed depth of disturbance change or different soils be encountered, then this would need to be re-assessed*.<br><br>An Acid Sulphate Soils Management Plan (ASSMP) in accordance with Condition 21 of the original Project Approval has been formulated for the Packing Plant site. This issue does not require to be further addressed as part of this Modification Application provided any future development on the land is carried out consistent with the recommendations of the ASSMP that has been formulated for this site. | | |

**Table 8 (continued)**

| *Relative Change in Environmental Impact* | *Additional Management or Mitigation Measures Required* | *Significance of Issue with this Modification Proposal* |
|---|---|---|
| **Noise** | | |
| This SEE is supported by an Environmental Noise Impact Assessment prepared by Harwood Acoustics Pty Ltd. A copy of this assessment is included in **Annexure 4** to this SEE. The noise assessment includes recommendations which seek to reduce the level of noise emission from the items of plant and equipment associated with this modification to within the noise design goals derived from Environment Protection Licence 883 noise limits at each receptor location.<br>A final assessment of required noise controls will need to be undertaken at the time of the Design Noise Verification process prior to construction, to ensure the noise design goals are met at all receptors.<br>The level of noise emission from the construction phase of the project, according to Harwood Acoustics, will be within the noisemanagement levels set by the NSW EPA's *Interim Construction Noise Guideline*.<br>None the less, construction noise mitigation measures are included in the Construction Safety & Environmental Management Plan prepared by Shoalhaven Starches. | In summary, the Environmental Noise Impact Assessment prepared by Harwood Acoustics includes a range of recommendations for noise mitigation associated with this Modification Proposal. These recommendations are discussed in Section 7.2.3 of this SEE. | Noise impacts are further addressed in Section 7.2.3 of this SEE. |
| **Hazards** | | |
| The Modification Application is supported by a Preliminary Hazard Analysis (PHA) prepared by Pinnacle Risk Management which assesses the risks associated with the proposed modifications and compares against relevant risk criteria. The PHA identifies that the proposed modifications will comply with all risk criteria.<br>Societal risk, area cumulative risk and environmental risk are also concluded to be acceptable. | The PHA prepared by Pinnacle Risk makes no further recommendations in relation to tis Modification Proposal. | The SEE is supported by a PHA prepared by Pinnacle Risk Management addressing this issue (**Annexure 6**). This issue is further addressing Section 7.2.4 of this SEE. |

**Table 8 (continued)**

| *Relative Change in Environmental Impact* | *Additional Management or Mitigation Measures Required* | *Significance of Issue with this Modification Proposal* |
|---|---|---|
| **Flooding** | | |
| The subject site is inundated during the 1% Annual Exceedance Probability (AEP) flood event by floodwaters from the Shoalhaven River. The sites are categorised as high hazard floodway and high hazard flood storage. This Modification Application is supported by an assessment submission prepared by WMAwater ("WMA") (**Annexure 5**).<br>The submission prepared by WMAwater identifies that that a comparison of peak flood levels between the approved and proposed works for the 1% AEP event indicate that the maximum increase in 1% AEP flood level outside the Shoalhaven Starches plant is up to 0.05m at the rail crossing of Bolong Road with increases in flood level generally limited to within the Shoalhaven Starches plant. | No additional management or mitigation measures proposed. | The SEE is supported by a submission prepared by WMAwater addressing this issue (**Annexure 5**). This issue is further addressing Section 7.2.6 of this SEE. |
| **Waste Management** | | |
| The proposed modifications will not alter the way waste is managed on the site. The site is already subject to an existing Waste Management Plan prepared in accordance with the original Project Approval. | No additional management or mitigation measures proposed, although any approval for this Modification Application should require the existing Waste Management Plan to be revised to incorporate the elements that form part of this Modification Application. | Not a key issue. This issue is not further addressed in this SEE. |
| **Site Stormwater Management** | | |
| A Stormwater Assessment was prepared by Allen Price and Scarratts in relation to Mod. 16. This assessment included the area of the site associated with this Modification Proposal. This Modification Proposal does not alter the findings of this previous assessment. | No additional management or mitigation measures proposed. | Not a key issue. This issue is not further addressed in this SEE. |
| **Visual Impact** | | |
| The majority of the works associated with this modification will be situated within the vicinity of existing approved industrial development of a similar scale to that which is proposed. | No additional management or mitigation measures proposed. | The visual impacts associated with this modification proposal are addressed in Section 7.2.5 of this SEE. |

**Table 8 (continued)**

| *Relative Change in Environmental Impact* | *Additional Management or Mitigation Measures Required* | *Significance of Issue with this Modification Proposal* |
|---|---|---|
| **Flora and Fauna** | | |
| The proposed works associated with this modification will all be located within the factory site, which is largely devoid of vegetation.<br>The original Flora and Fauna Assessment carried out by Kevin Mills & Associates for the Expansion Project did not identify any specific ecological constraints with this part of the site.<br>The proposal will not require any additional native vegetation to be disturbed. No change in environmental impacts from that originally identified in the EA are envisaged. | No additional management or mitigation measures proposed. | Not a key issue. This issue is not further addressed in this SEE. |
| **Heritage and Archaeological** | | |
| The proposed works associated with this modification will be located within areas of the site which was not previously identified by the EA for the Shoalhaven Starches Expansion Project as an area subject to either Aboriginal or European cultural heritage significance. The original Aboriginal Archaeological Assessment that supported the EA prepared by South East Archaeology did not identify any constraints with respect to the parts of the site associated with this modification proposal. The proposed works will have no additional impact in terms of indigenous or non-indigenous heritage.<br>No change in environmental impacts from that originally identified in EA. | No additional management or mitigation measures proposed. | Not a key issue. This issue is not further addressed in this SEE. |
| **Effluent Irrigation and Storage** | | |
| This Modification Proposal will not increase waste waters that will need to be generated, treated and disposed. This Modification Application does not seek to alter the existing approve wastewater treatment and disposal measures for the existing site operations. | No additional management or mitigation measures proposed. | Not a key issue. This issue is not further addressed in this SEE. |

**Table 8 (continued)**

| *Relative Change in Environmental Impact* | *Additional Management or Mitigation Measures Required* | *Significance of Issue with this Modification Proposal* |
|---|---|---|
| **Wastewater Treatment** | | |
| *Water Discharges*<br>The Shoalhaven Starches Factory and Environmental Farm are licensed premises under the Protection of the Environmental Operations Act. Wastewater discharges from the site are licensed by the DEC (EPL 883).<br>The plant has a licensed outfall into the Shoalhaven River. The outfall point is a 50 cm diameter metal pipe discharging at the end of an existing jetty. It also has a cooling water discharge comprising a 50 cm diameter pipe which discharges onto a gabion spillway.<br>Under the terms of the Company's EPL discharge streams associated with the plant include:<br>• river water passed through the boiler condensers and the primary side of the heat exchangers;<br>• boiler water treatment plant regeneration waters; and<br>• pH adjusted glucose plant ion exchange unit regeneration waters.<br>All these must be discharged from the cooling water discharges.<br>The limiting conditions in relation to these discharges include:<br>• The volume of water discharged from the cooling water discharges must not exceed 100,000 kilolitres per day.<br>• The wastewaters discharged at both points shall not exceed a temperature of 32°C.<br>• This Modification Proposal will not involve any changes to these discharge waters. | No additional management or mitigation measures. | Not a key issue. This issue is not further addressed in this SEE. |

**Table 8 (continued)**

| *Relative Change in Environmental Impact* | *Additional Management or Mitigation Measures Required* | *Significance of Issue with this Modification Proposal* |
|---|---|---|
| **Geotechnical and Riverbank Stability** | | |
| GHD were engaged to undertake a geotechnical assessment of the proposed modifications in relation to the stability of the banks of Abernethy's Creek (**Annexure 7**). This assessment demonstrates:<br>• The development of the third rail siding on the northern side of Bolong Road will not adversely affect the stability of the western bank of Abernethy's Creek;<br>• The pipe bridge extending from the Packing Plant to the creek and the pipe gantry extending over Abernethy's Creek south of Bolong Road should not affect the stability of the creek either, provided the structures are supported on piles extending to rock. | The Geotechnical and Riverbank Stability Assessment undertaken by GHD demonstrates that the factor of safety in respect to the stability of the creek bank following the rail siding construction is acceptable for the short and long term conditions.<br>According to GHD other geotechnical aspects relating to the third rail embankment design that should be considered in the design,construction and ongoing operation of the Packing Plant and associated infrastructure include:<br>• *The stability of local batters within the third rail siding formation. Currently the fill batter for the third railembankment is considered too steep.*<br>• *The extent of settlement over the rail siding and adjacent land, including long term settlement and differentialsettlement.*<br>• *The rate of placement of pre-load will need to be carefully controlled during construction to avoid rapid loadingwhich can result in failure through the soft soil zone.*<br>• *Increased loading over the ground surface, ground disturbances or changes in the site surface profile between the Packing Plant and Abernethy's Creek may adversely influence settlement and local and /orstability."* | This issue is further addressed in Section 7.2.7 of this SEE. |

### 7.2.2 Air Quality Issues

GHD were engaged to conduct an air quality impact assessment for the proposed modifications associated with this Modification Application (**Annexure 3**). This section of the SEE provides a summary of the findings of the GHD Air Quality Impact Assessment for this Modification Application.

The site is proximate to a number of sensitive receptors. The township of Bomaderry lies to the northwest of the factory and west of the packing plant. Nowra is situated south of the plant. Commercial and industrial sensitive receptors are located directly adjacent to the site and across from it along Bolong Road.

According to GHD, the nearest residential sensitive receptors are located between 150 to 1300 metres from the site. The nearest commercial/industrial sensitive receptors (denoted by a receptor ID beginning with C) and residential sensitive receptors (denoted by a receptor ID beginning with R). The sensitive receptors as identified by GHD are shown in **Figure 16**.

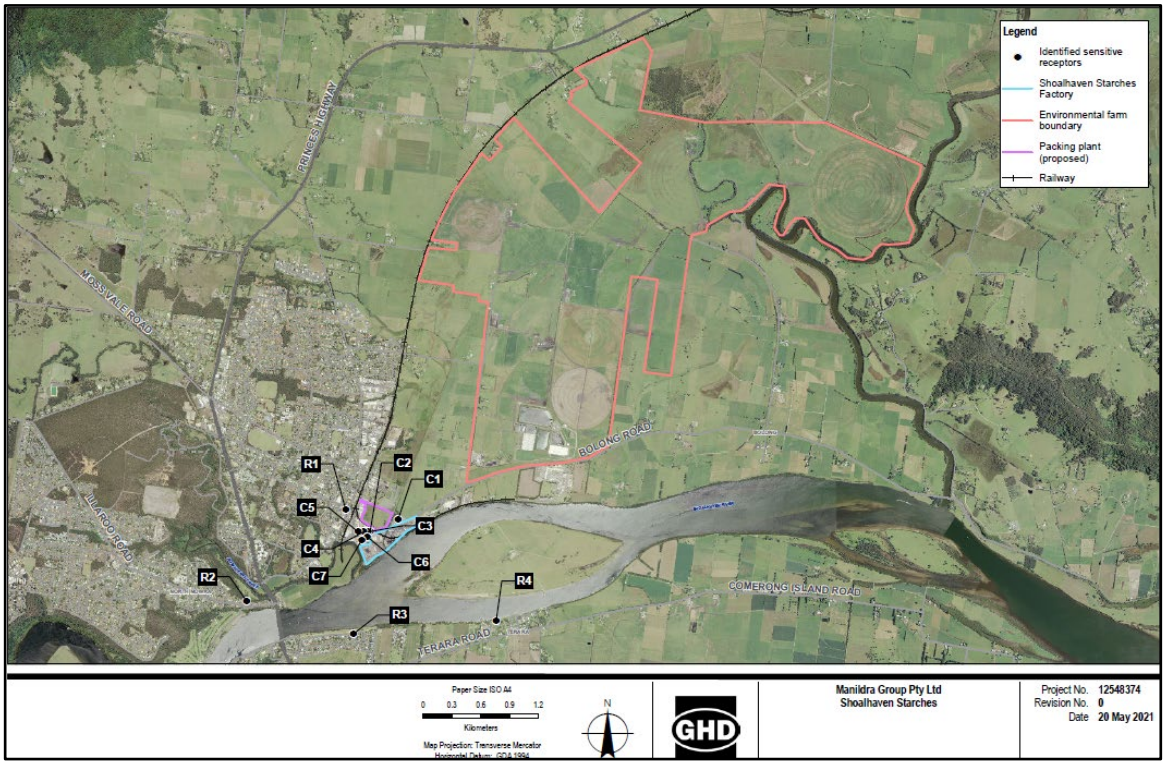


**Figure 16: Nearest Sensitive Receptors (GHD).**

#### *7.2.2.1 Meteorological data*

A 12-month dataset was constructed by GHD using the 3D prognostic modelling package, TAPM and the diagnostic 3D meteorological model, CALMET for the period from January

to December 2004. This 12 month period was chosen to be consistent with previous modelling undertaken for the 2008 Air Quality Assessment, approved at the time by EPA and to allow to a direct comparison to previous modelling.

An annual wind rose generated by GHD using CALMET is provided in **Figure 17** to show the wind field at the factory.

According to GHD the following trends are evident from **Figure 17**:

- Annual average wind speed of 3.2 m/s.
- Winds are most prevalent from the west and west north-west, accounting for around one third of all winds.
- Winds are least prevalent along the north-south axis.
- Light winds (shown in grey) are more prevalent from the north-west.
- Drainage flows occurring during stable conditions at night time are dominated by the following distinct features (in order of scale):
    - Shoalhaven River running west to east through the site;
    - Browns Mountains to the northwest of the site;
    - Yalwal State Forest mountain range to the west.

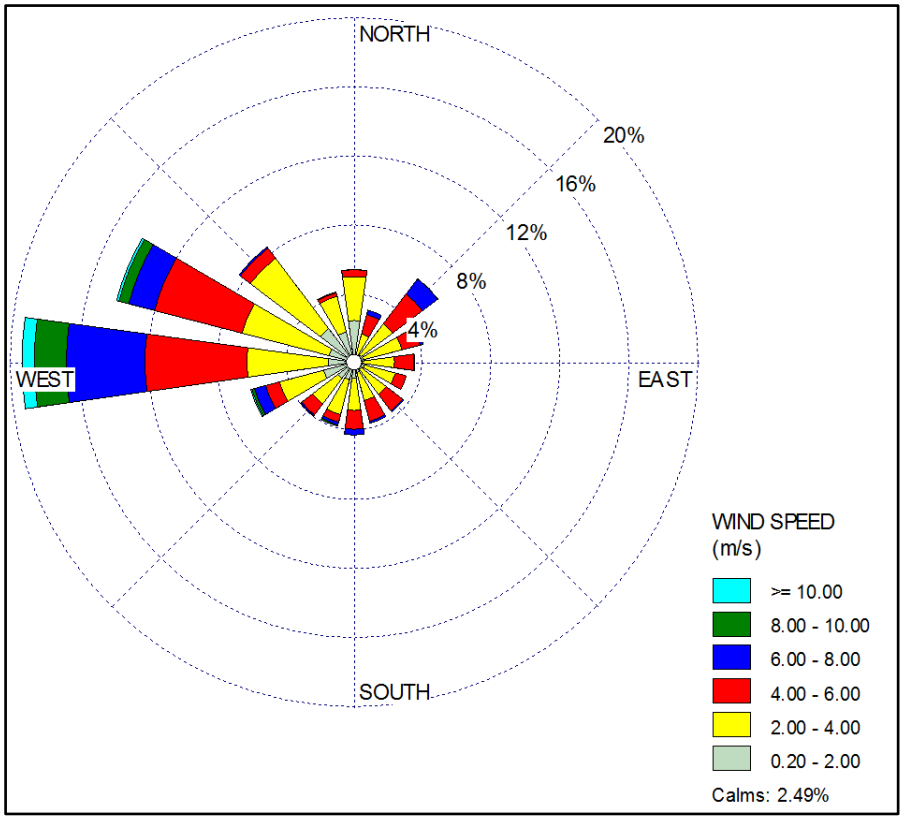


**Figure 17: CALMET wind rose for the factory.**

#### *7.2.2.2 Odour assessment*

*Approach*

Odour sampling is conducted quarterly at Shoalhaven Starches, with varying results due to site conditions at the time of sampling, and the inherent variability and errors involved in odour sampling and olfactometry. According to GHD, the Quarter with the overall highest site odour emission rate is chosen for modelling in order to predict a general worst-case of potential odour impacts from the site.

Conservatively, sources with different odour characteristics are all included in the cumulative odour model including sources with offensive odour (such as the DDG Plant, Ethanol Plant, Distillery, Biofilters and Farm) and sources with odour not observed to be offensive (such as Starch & Glucose dryers, Boilers and Packing Plant).

Odour sampling Quarter 2 was found to have the highest overall odour profile in the last year, however the highest contributors in this quarter were:

- Biofilters A and B (odour emissions increased by 358% and 426% respectively compared to Mod 19);
- Ethanol Recovery Scrubber Discharge (odour emissions increased by 25% compared to Mod 19);
- Gluten dryers 3 and 4 and Starch dryer 3 (odour emissions increased by 152%, 120% and 79% respectively compared to Mod 19).

These sources increased substantially compared to the previous values used in Mod 19, although, according to GHD, site operations have not significantly changed and there is no general trend of increases over time, other than this single high quarter. Therefore, these increases are attributed to natural variances in the sampling methodology.

While it is important to see how these high odour sources influence off-site odour impacts, the increase in predicted odour impacts is not, according to GHD, a result of Mod 21 and highlights potential areas for improvements in odour control.

In order to demonstrate that the site is not increasing odour impacts the following modelling methodology was undertaken by GHD:

- Quarter with maximum odour emissions modelled (in accordance with the methodology adopted for past modification air quality assessments) (Quarter 2) (Q2);
- Most recent quarter (Quarter 3) (Q3) modelled to demonstrate that latest site odour footprint has not increased compared to Mod 19.

According to GHD, the Modification Proposal will have negligible impact on the total site odour emission rate. Based upon the above review, GHD recommend the following changes outside of the Modification Proposal that Shoalhaven Starches should investigate to reduce odour emissions as part of the modification.

*Additional recommended odour mitigation*

A review of the biofilter sampling over the last seven years by GHD has shown a large increase in odour. This corresponds with Shoalhaven Starches directing odorous air from DDG Dryer 4 (DDG4) (flow rate of 1300 m3/h) to the biofilters. There have also been some spikes in measurements during periods when biofilter media was changed and they were being stabilised. GHD anticipate that odorous air from DDG4 is contributing to overloading the biofilters and consequently resulting in higher than expected odour emissions from the biofilters.

In order to reduce odours from the existing biofilters to concentrations expected of a well performing biofilter, Shoalhaven Starches propose to install additional approved biofilter capacity. The biofilter would be located in the previously approved location next to biofilters A and B which will result in improved odour performance and would be capable of treating a higher volume of odorous air.

This upgrade is to be done concurrently with Mod 21. Implementation of the upgrade is anticipated to reduce biofilter odour concentrations to levels observed prior to the diversion of odorous air from DDG4. Therefore, odour concentrations from biofilter sampling undertaken prior to the diversion of odorous air from DDG4 have been used in this assessment.

*Predicted odour impacts*

**Figure 18** shows the predicted 99$^{th}$ percentile odour impacts by GHD for the Modification Proposal operations based upon Quarter 2 and Quarter 3 odour sampling concentrations and the previous modifications.

According to GHD the predicted odour levels for the Modification Proposal Q2 show a slight increase in odour at receptors R1 – R4, C1, C4, C5 and C7 compared to Mod 19; while predicted odour levels for this Modification Proposal Q3 show a slight decrease at receptors C2, C3 and C6 compared to Mod 19.

The fluctuation in odour predictions for this Modification Proposal compared with the previous modification is attributed by GHD to variability in odour sampling. The results for the Modification Proposal Q3 show that the impact assessment odour criteria are achieved at all residential sensitive receptors.

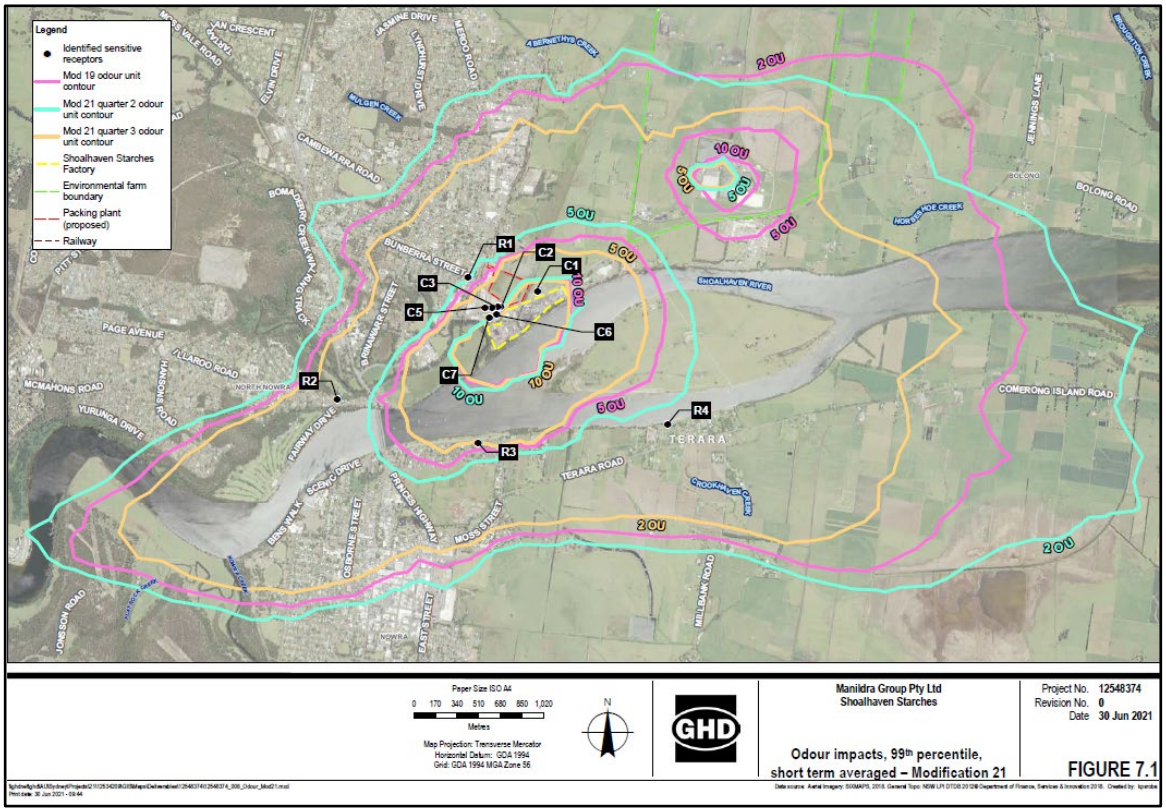


**Figure 18: Odour impacts, 99th percentile short term averaged – Modification 21 (GHD).**

Seven commercial/industrial receptors are included in GHD's assessment. These are all located within approximately 125 m of the site. One second, 99th percentile odour impacts have been predicted by GHD based on the hours of operation of the receptors.

According to GHD, the predicted marginal exceedances of the 6 OU criteria for the Modification Proposal (assumed the same criteria as R1) at commercial/industrial receptors C2, C3, C4, C5, and C7 due to the higher quarterly odour sampling results.

Commercial receptors C1 and C6 are located approximately 45 and 80 metres from the site. Given the industrial nature of these receptor, and its existing proximity to the site, GHD indicate no significant odour impacts are anticipated from the proposal.

Two odour complaints (one in October 2020 and one in March 2021) attributed to the Shoalhaven Starches plant was received in the last year.

#### *7.2.2.3 Air Quality Assessment*

***Predicted air quality impacts***

*Particulates*

*Incremental particulate matter*

The impact of dust emissions principally relates to the potential effect on human health of inhalation of particles in the air column, and it is the finer fraction that have the greater potential to cause respiratory health effects. EPA have advised to assess $PM_{2.5}$, if $PM_{10}$ impacts are therefore significant. As the boilers are proposed to be converted to gas fired, GHD anticipate particulate emissions would be primarily composed of finer fraction particulates.

According to GHD the worst case predicted incremental 24 hour $PM_{10}$ level at a residential sensitive receptor is at R1 with a level of 7.7 µg/m$^3$ for the base scenario and 7.6 µg/m$^3$ for the mitigation scenario.

*Cumulative particulate matter (base scenario)*

GHD's assessment demonstrates full compliance with the $PM_{2.5}$ and $PM_{10}$ 24 hour criteria at the worst impacted residential sensitive receptor R1.

GHD's assessment predicts exceedances of the $PM_{10}$ 24 hour criteria for 3 days and the $PM_{2.5}$ 24 hour criteria for 4 days of the year at the worst impacted commercial receptor C6. According to GHD the exceedances are primarily attributed to high background concentrations as background $PM_{10}$ accounts for 94%, 92% and 97% of the criteria and background $PM_{2.5}$ accounts for 89%, 80%, 58% and 65% of the criteria on the days of the predicted exceedances.

Plots of the predicted 24 hour maximum $PM_{10}$ levels are provided in **Figure 19** (incremental impact) and in **Figure 20** (cumulative impact with 70th percentile PM10 levels at Albion Park South 2016 for comparative purposes).

Plots of the predicted 24 hour maximum $PM_{2.5}$ levels are provided in **Figure 21** (cumulative impact with 70$^{th}$ percentile $PM_{2.5}$ levels at Albion Park South 2016 for comparative purposes).

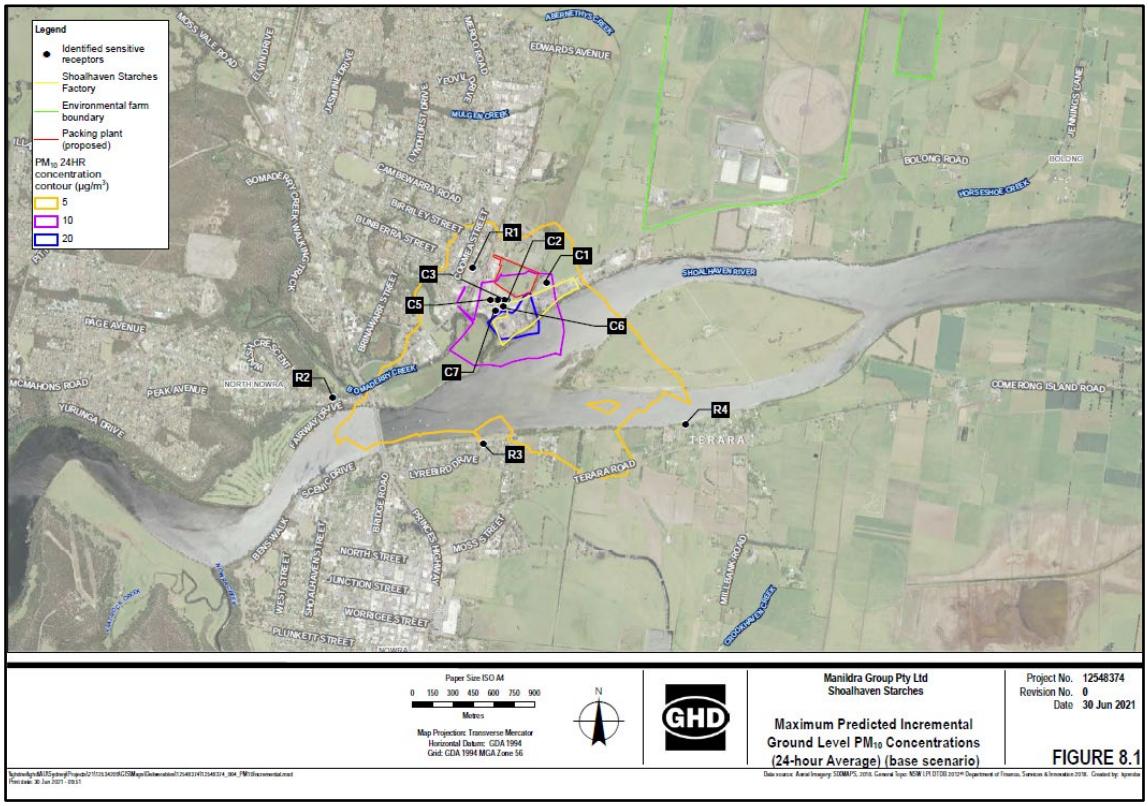


**Figure 19: Maximum predicted Incremental Ground Level $PM_{10}$ Concentrations (24-hour average) (base scenario) (GHD)**

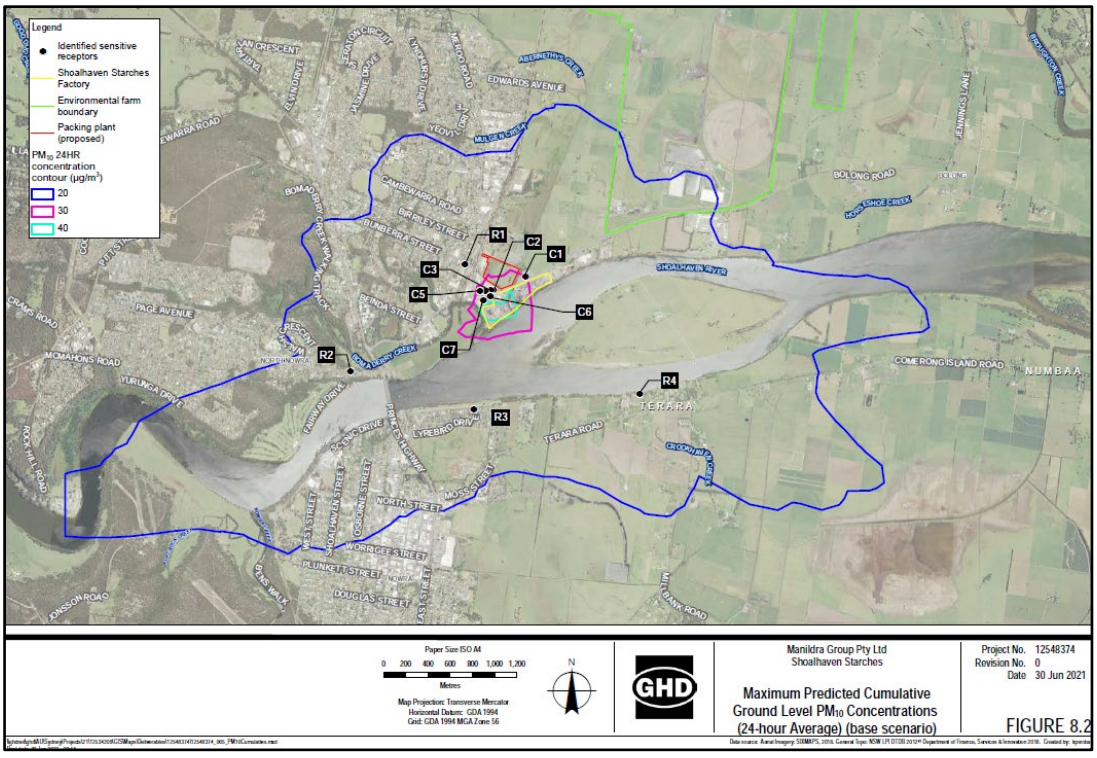


**Figure 20: Maximum Predicted cumulative Ground Level $PM_{10}$ Concentrations (24-hour Average) (base scenario)**

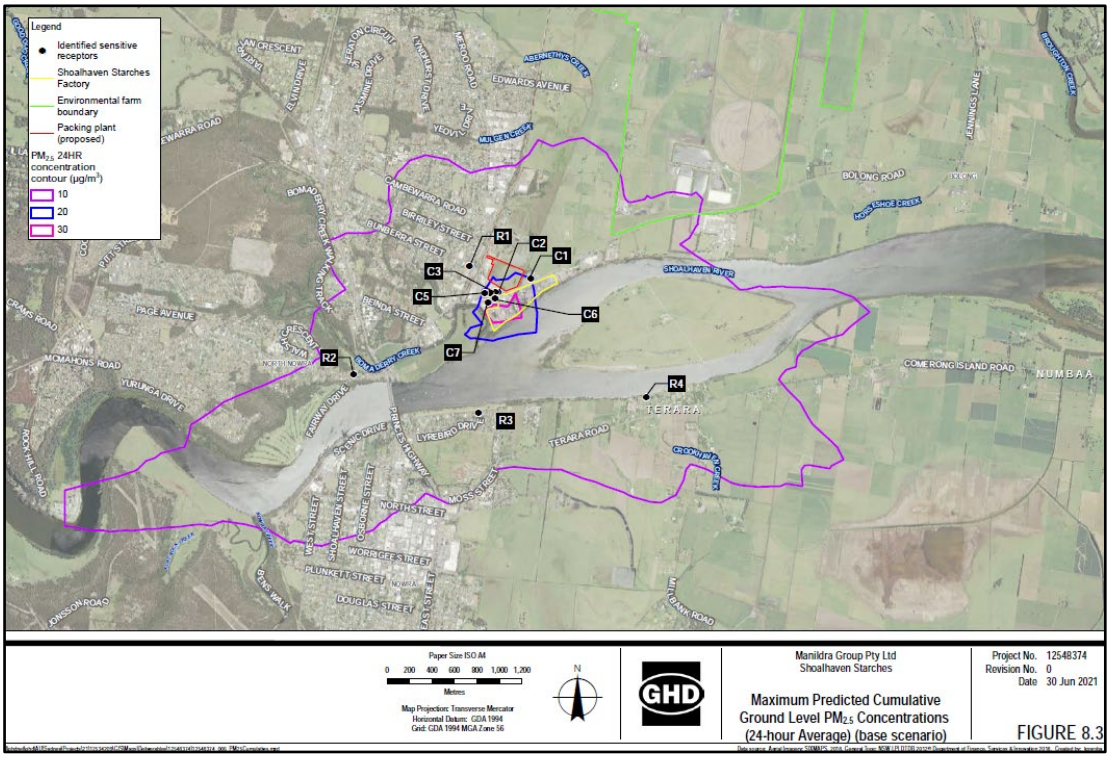


**Figure 21: Maximum Predicted Cumulative Ground Level $PM_{2.5}$ Concentrations (24-hour Average) (base scenario) (GHD)**

*Cumulative particulate matter (mitigation scenario)*

According to GHD the top predicted, measured and total concentrations at the most impacted residential receptor (R1) and commercial receptor (C6) for the Modification Proposal mitigation scenario demonstrate full compliance with the $PM_{2.5}$ and $PM_{10}$ 24 hour criteria at the worst impacted residential sensitive receptor R1.

GHD's assessment predicts exceedances of the $PM_{10}$ 24 hour criteria for 3 days and the PM2.5 24 hour criteria for 4 days of the year at the worst impacted commercial receptor C6. According to GHD the exceedances are primarily attributed to high background concentrations as background $PM_{10}$ accounts for 94%, 92% and 97% of the criteria and background $PM_{2.5}$ accounts for 89%, 80%, 58% and 65% of the criteria on the days of the predicted exceedances.

Plots of the predicted 24 hour maximum $PM_{10}$ levels are provided in **Figure 22** (incremental impact) and in **Figure 23** (cumulative impact with 70th percentile PM10 levels at Albion Park South 2016 for comparative purposes).

Plots of the predicted 24 hour maximum $PM_{2.5}$ levels are provided in **Figure 24** (cumulative impact with $70^{th}$ percentile $PM_{2.5}$ levels at Albion Park South 2016 for comparative purposes).

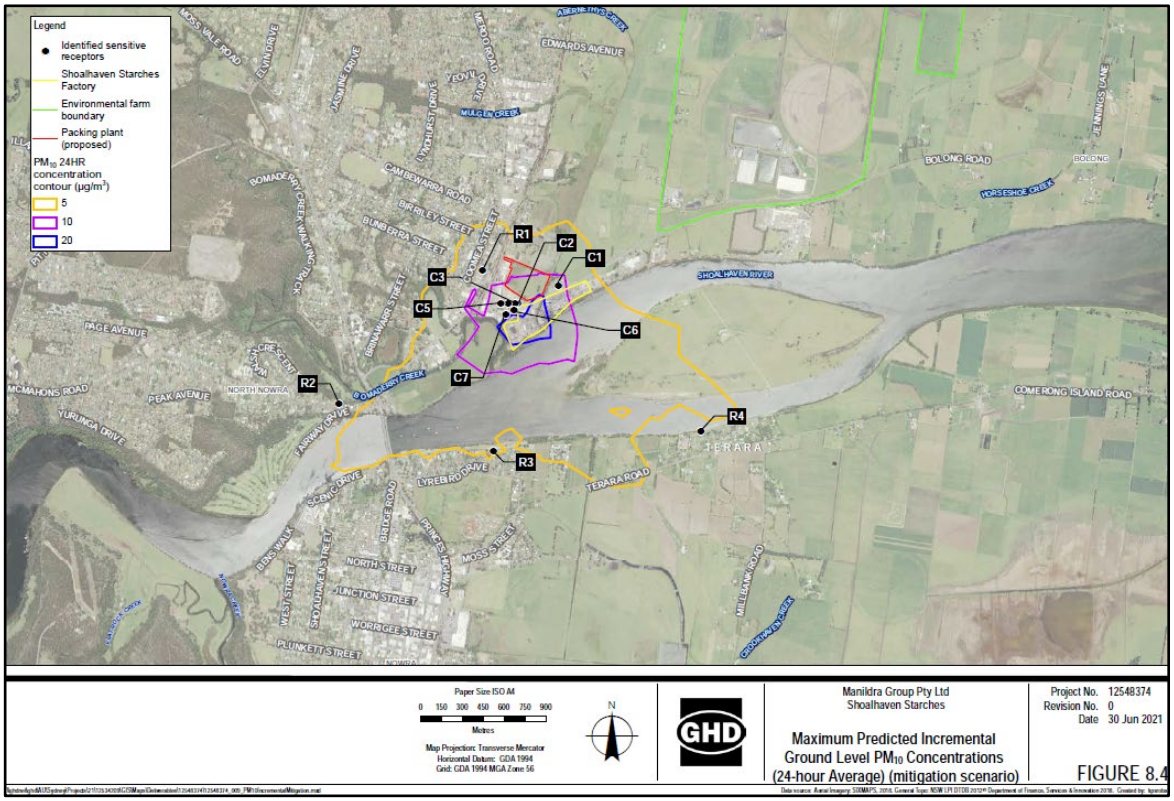


**Figure 22: Maximum Predicted Incremental Ground Level $PM_{10}$ Concentrations (24-hour Average) (Mitigation Scenario) (GHD).**

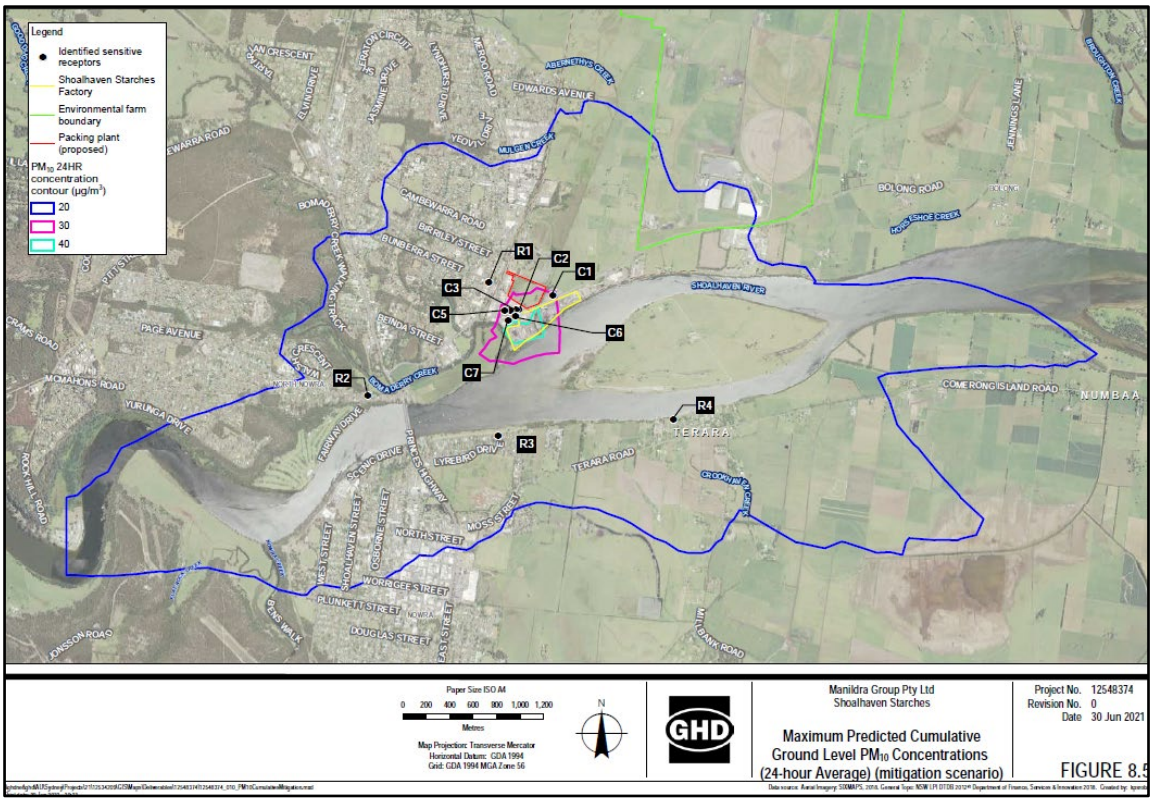


**Figure 23: Maximum Predicted Cumulative Ground Level $PM_{10}$ Concentrations (24-Average) (Mitigation Scenario).**

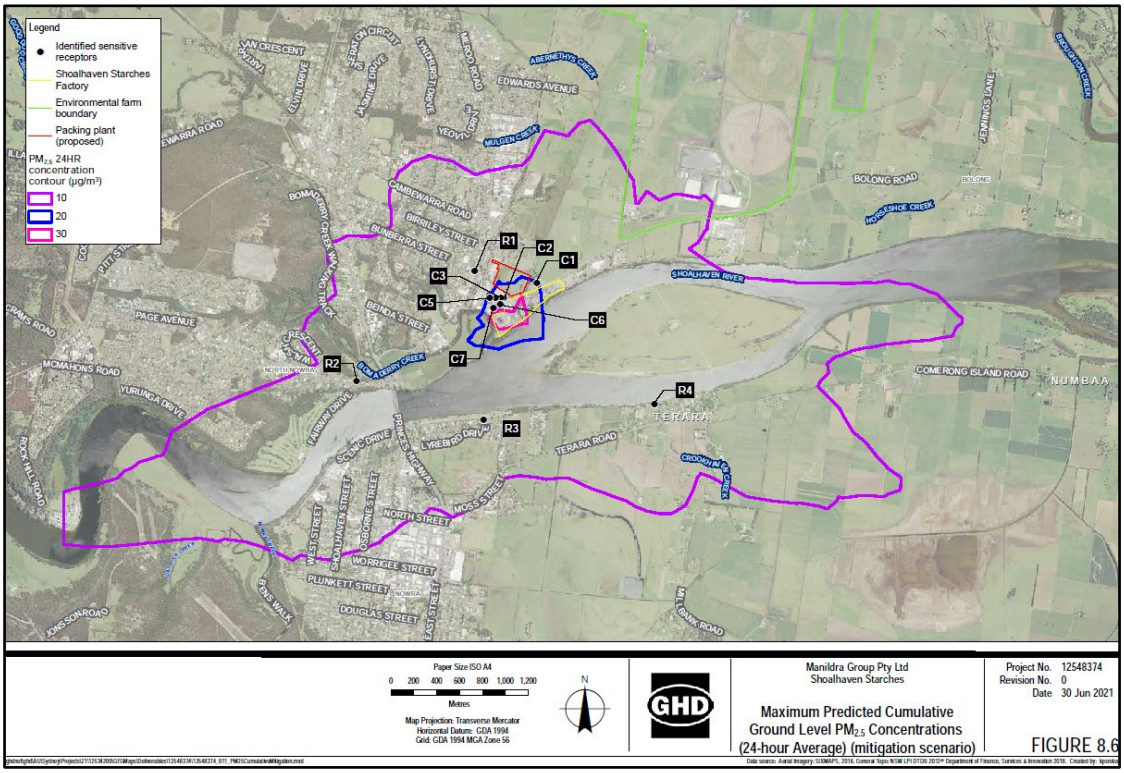


**Figure 24: Maximum Predicted Cumulative Ground Level $PM_{2.5}$ Concentrations (24-Hour Average) (mitigation scenario) (GHD).**

### *Products of Combustion*

The primary pollutants in coal and gas fired boiler emissions are oxides of nitrogen ($NO_x$), formed by the high temperatures in the combustors, carbon monoxide (CO), VOCs, and polycyclic aromatic hydrocarbons (PAH) all formed by incomplete combustion of the fuel.

All pollutants have all been assessed by GHD against their relevant criteria from the EPA's Approved Methods.

For the base scenario:

- Compliance was predicted by GHD at all receptors for $SO_2$, CO, HF and HCL
- The predicted levels for nitrogen dioxide exceed the criteria at all receptors assuming 100% of $NO_x$ will be converted to $NO_2$. According to GHD this is considered extremely conservative as in reality, only a fraction of the NO will be converted to $NO_2$.
- Therefore, a more detailed assessment was undertaken by GHD based on NO reacting with ozone in the atmosphere to form $NO_2$. Background ozone data was sourced by GHD from Kembla Grange for the year 2004. Using this method exceedances were predicted by GHD at commercial/industrial sensitive receptor C1 for two hours of the modelled year (0.02% of the time) and at receptor C2 for one hour of the modelled year C2 (0.05% of the time).

For the mitigation scenario:

- Compliance was predicted at all receptors for $SO_2$, CO, HF and HCL
- The predicted levels for nitrogen dioxide exceed the criteria at commercial/industrial sensitive receptors C1, C2, C3, C6 and C7 assuming 100% of $NO_x$ will be converted to $NO_2$ as per Method 1 of the Approved Methods.
- Compliance was predicted at all receptors for $NO_2$ using Method 2 of the Approved Methods.

*Effect of Mod 21 changes*

According to GHD minor variances between the Modification Proposal base scenario and previous Mod 19 were predicted. These variances were attributed to fluctuations in combustion emission sampling data.

The Modification Proposal mitigation scenario was predicted by GHD to reduce combustion pollutant impacts compared with Mod 21 base scenario. This is attributed to the Modification Proposal mitigation scenario use of gas as a fuel source to replace coal as air emissions from gas are typically lower than coal.

***PAH, VOCs and metals***

The maximum predicted (99.9 percentile, 1-hour average) ground level incremental PAH, VOC and metal concentrations (with the exception of lead which is presented as a 100 percentile annually averaged concentration to align with its assessment criteria), within and beyond the factory site boundary for the base and mitigation scenarios are, according to GHD, significantly lower than the respective EPA principal toxic air pollutant criteria for all substances both within and beyond the site boundary.

*Effect of Mod 21 changes*

According to GHD no new sources of PAH, VOC or metal emissions are proposed as part of the Modification Proposal base scenario compared to those assessed in Mod 19. Minor variations in predicted concentrations for the Modification Proposal mitigation scenario are attributed by GHD to the proposed boilers operation and fuel usage changes.

The Air Quality Assessment carried out by GHD in relation to this Modification proposal concludes:

> *"GHD was engaged by Manildra to conduct an air quality and odour impact assessment for a proposed modification to the approved SSEP. The modification proposes to modify the packing plant, install an additional raw waste water tank within the Environmental Farm and increase the indirect cooking capacity by 50%.*

*In addition, Manildra propose to install additional approved biofilter capacity in the previously approved location to improve odour performance. It is recommended that Manildra have additional biofilter capacity installed prior to commissioning of Mod 21.*

*Odour dispersion modelling was undertaken for the quarter with maximum odour emissions (in accordance with the methodology adopted for past modification air quality assessments) (Quarter 2) and for the most recent quarter (Quarter 3).*

*Modelling of the quarter 2 predicted a marginal increase in odour impacts resulting in an exceedance at residential receptors R2 and R3. This exceedance was primarily attributed to high quarterly odour sampling results.*

*Modelling of the most recent quarter 3 predicted compliance of the odour criteria at all residential receptors.*

*Dispersion modelling of particulates, combustion products, PAH, VOCs and metals was undertaken for base and mitigation scenarios.*

*For both base and mitigation scenarios, minor exceedances of the cumulative 24 hour $PM_{10}$ and $PM_{2.5}$ criteria were predicted at commercial receptor C1. These particular matter exceedances were primarily attributed to high background concentrations that occurred on the days where exceedances were predicted.*

*For the base scenario, nitrogen dioxide concentrations were predicted to exceed the criteria at commercial/industrial sensitive receptor C1 for two hours of the modelled year (0.02% of the time) and C2 for one hour of the modelled year C2 (0.05% of the time) for the base scenario. There were no predicted exceedances of the nitrogen dioxide criteria in the mitigation scenario where the use of coal boiler 8 was replaced with the use of gas boiler 7 and gas boiler 8.*

*Therefore is it recommended that Manildra investigate opportunities to use gas fired boilers instead of coal. It is understood that Manildra will be incorporating the conversion of coal fired boilers to gas as part of the future proposal to construct a gas fired co-generation plant as part of the future Modification 23.*

*Compliance was predicted for all other air quality species for both scenarios."*

### 7.2.3 Noise Impact Issues

Harwood Acoustics were engaged to conduct a noise impact assessment for the proposed modifications associated with this Modification Application (**Annexure 4**). A copy of Harwood Acoustics findings in relation to this current Modification Application as a result of this review is included as **Annexure 4** to this SEE. This section of the SEE provides a summary of the findings of the Environmental Noise Impact Assessment prepared by Harwood Acoustics for this Modification Application.

The area surrounding Shoalhaven Starches is a mix of commercial, industrial and residentialpremises with vacant land, owned by the Manildra Group, to the north.

The nearest residential receptor locations to the Modification Proposal considered by Harwood Acoustics are:

- Location 1 – Nobblers Lane, Terara approximately 1745 metres to the south-east;
- Location 2 – Riverview Road, Nowra approximately 1260 metres to the south-west;
- Location 3 – Meroo Street, Bomaderry approximately 310 metres to the west;
- Location 4 – Coomea Street, Bomaderry approximately 400 metres to the north-west.

The above locations are listed in keeping with the order shown in Environment Protection Licence number 883.

Distances are based on the centre of the packing plant building to each receptor as a referenceonly, as various noise producing aspects of the proposal are at varying distances from each receptor, as is considered in all calculations. The Shoalhaven Starches site and receptor locations are shown in **Figure 25** along with some of the main components of the proposal.


**Figure 25: Location of closest residential receptors (Harwood Acoustics)**

#### *7.2.3.1 Noise criteria*

The following is an outline of the noise guidelines applicable to this Modification Proposal and establishes the project specific noise goals.

***NSW Department of Planning, Industry and Environment***

*Existing Project Approval*

Project Approval for Application No. 06_0228, provided by the Minister for Planning, dated January 2009, Schedule 2, 'Terms of Approval' states:

> *"Condition 2*
> *The applicant shall carry out the development generally in accordance with the:*
> *a) EA and associated site plans (see Appendix 2).*
> *Condition 2A*
> *The applicant shall carry out the development generally in accordance with the:*
> *a) Statement of commitments,*
> *b) Conditions of this consent, and*
> *c) Revised statement of commitments for Appendix 6."*

The original Project Approval incorporates noise mitigation measures recommended in the '*Acoustical Assessment, Proposed Ethanol Upgrade, Shoalhaven Starches'* – prepared by TheAcoustic Group Pty Ltd, ref 38.3849.R52:ZJM, dated 26 June 2008. This document forms partof the EA and statement of commitments and it is implicit that the noise control recommendations within this document are required to be implemented as part of the Project Approval.

Schedule 3, Conditions 11 to 14 inclusive of the Project Approval, also refer to noise emissionand are summarised as follows:

- Condition 11 relates to restricted hours of construction activities.
- Condition 12 reiterates thenoise limits contained with Environment Protection Licence 883.
- Condition 13 requires thatall feasible and reasonable noise mitigation measures must be implemented during the construction phase of the project.
- Condition 14 required the preparation of a noise management plan.

*NSW EPA's Environment Protection Licence*

Shoalhaven Starches operates under Environment Protection Licence 883 issued by the NSWEnvironment Protection Authority.

Section L5 'Noise Limits' of the licence states:

> *"L5.1 the $L_{Aeq\ (15min)}$* sound pressure level contribution generated from the premises must notexceed the following levels when measured at or near the boundary of any residential premises:*
>
> *a) 38 dBA at locations in Terara on the south side of the Shoalhaven River,*
>
> *b) 38 dBA at locations in Nowra on the south side of the Shoalhaven River,*
>
> *c) 42 dBA at locations in Meroo Street, Bomaderry,*
>
> *d) 40 dBA at other locations in Bomaderry."*

These noise limits apply to the overall operation of the Shoalhaven Starches complex.

*Shoalhaven Starches Noise Management Plan*

The Project Approval for the Shoalhaven Starches Expansion Project required the preparation of a Noise Management Plan for addressing and managing noise emission from the expansion project.

The Shoalhaven Starches Noise Management Plan originally prepared 31 October 2009 and revised 7 September 2010 addresses, among other things, acoustic criteria relating to the Shoalhaven Starches complex and any new developments. Section 3 of the plan lists noise limits from the Environmental Protection Licence as shown in Section 4.1 above and states:

> *"Compliance testing conducted on a regular basis on behalf of the Mill* [Shoalhaven Starches complex] *has found noise emission from the premises satisfiesthe EPA criteria as a result of works on the Shoalhaven Starches site. In order to ensure that there is no increase in noise emission from the subject premises, with respect to the noise criteria nominated by the EPA in License Condition 6.3* [now 5.1]*, the design goal for such additional plant should be at least 10 dB below the criteria nominated by the EPA."*

Given the number of modifications subsequent to the original approval and location of new noise sources, Harwood Acoustic's recommend that the noise design goals are set to a minimum 15 dB below the EPL noise limits henceforth.

*Construction Noise Criteria*

The NSW EPA published the *Interim Construction Noise Guideline* in July 2009. While some noise from construction sites is inevitable, the aim of the Guideline is to protect the majority of residences and other sensitive land uses from noise pollution most of the time.

The Guideline presents two ways of assessing construction noise impacts; the quantitative method and the qualitative method.

The quantitative method is generally suited to longer term construction projects and involvespredicting noise levels from the construction phase and comparing them with noise management levels given in the guideline.

The qualitative method for assessing construction noise is a simplified way to identify the cause of potential noise impacts and may be used for short-term works, such as repair and maintenance projects of short duration.

In this instance the entire construction phase may take several months although significant noise producing aspects, such as piling, if required, will last a total of approximately two weeks.

Table 2 in Section 4 of the Guideline sets out noise management levels at affected residencesand how they are to be applied during normal construction hours. The noise management level is derived from the rating background level (RBL) plus 10 dB in accordance with the Guideline. This level is considered to be the 'noise affected level' which represents the point above which there may be some community reaction to noise.

Harwood Acoustics have carried out numerous noise surveys in Nowra, Bomaderry and Terara and hasfound daytime background noise levels range between 33 and 40 dBA depending on the location, as shown in **Table 9** below.

**Table 9**

**Rating Background Levels – Nowra, Terara and Bomaderry, NSW**

| ***Location*** | ***Time of Day*** | ***Rating Background Level ($L_{90}$)*** |
|---|---|---|
| 135 Terara Road, Terara<br>March 2012 | Day<br>(7 am to 6 pm) | **33 dBA** |
| 55 Terara Road, Nowra<br>February 2015 | Day<br>(7 am to 6 pm) | **36 dBA** |
| Cambewarra Rd, Bomaderry<br>July2010 | Day<br>(7 am to 6 pm) | **40 dBA** |
| Shoalhaven Village Caravan Park, Nowra<br>March 2012 | Day<br>(7 am to 6 pm) | **40 dBA** |

For the purpose of determining the potential for community reaction to noise emission from construction activities, previously measured background noise levels in the vicinity of each receptor location have been used to determine the noise management levels as shown in **Table 10** below.

**Table 10**

**$L_{eq}$ Noise Management Levels from Construction Activities**

| *Receptor Location* | *Noise Management Level* | *How to Apply* |
|---|---|---|
| Location 1 (Terara) | **43 dBA** (33 + 10) | The noise affected level represents the point above which there may be some community reaction to noise.<br>▪ Where the predicted or measured $L_{Aeq\ (15\ min)}$ noise level is greater than the noise affected level, the proponent should apply all feasible and reasonable* work practices to meet the noise affected level.<br>▪ The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details. |
| Location 2 (Nowra) | **50 dBA** (40 + 10) | |
| Locations3 & 4 (Bomaderry) | **48 dBA** (38 + 10) | |
| | **Highly noise affected 75 dB(A)** | The highly noise affected level represents the point above which there may be strong community reaction to noise.<br>▪ Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account:<br>1. times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoonfor works near residences)<br>2. if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times. |

** Section 6, "work practices" of The Interim Construction Noise Guideline, states:-*

*"there are no prescribed noise controls for construction works. Instead, all feasible and reasonable workpractices should be implemented to minimise noise impacts.*

*This approach gives construction site managers and construction workers the greatest flexibility to manage noise".*

*Definitions of the terms feasible and reasonable are given in Section 1.4 of the Guideline.*

*The 'highly noise affected' level of 75 dBA represents the point above which there may be strong community reaction to noise. This level is provided in the Guideline and is not based on the RBL.*

*Project Specific Noise Goals*

According to Harwood Acoustics the most relevant criteria for this Modification Proposal are:

*Operational Phase (Environment Protection Licence noise limits less **15 dB**):*

- 23 dBA ($L_{eq,\ 15\ minute}$) at locations in Terara on the south side of the Shoalhaven River,
- 23 dBA ($L_{eq,\ 15\ minute}$) at locations in Nowra on the south side of the Shoalhaven River,
- 27 dBA ($L_{eq,\ 15\ minute}$) at locations in Meroo Street, Bomaderry,
- 25 dBA ($L_{eq,\ 15\ minute}$) at other locations in Bomaderry.

*Construction Phase Noise Management Levels*

- 43 dBA ($L_{eq,\ 15\ minute}$) at locations in Terara,
- 48 dBA ($L_{eq,\ 15\ minute}$) at locations in Bomaderry, and
- 50 BA ($L_{eq,\ 15\ minute}$) at locations in Nowra.

The criteria are to be assessed at the most-affected point on or within the residential property boundary or, if that is more than 30 metres from the residence, at the most-affected point within 30 metres of the residence. For upper floors, the noise is assessed outside the nearest window.

#### *7.2.3.2 Various Plant Noise Emission*

*Plant and Equipment Source Noise Levels*

Noise sources associated with this modification will include the follow:

- motors and fans at the top of the silos and baghouses within the proposed expansion of the packing plant
- sifters within the packing plant building,
- motors located at the base of the secondary silos below the sifter level,
- motors and fans at the top of the silos and baghouses within the proposed penthouse at the top of the external silos which will be located on the south eastern side of the packing plant,
- compressors associated with the nitrogen generator,
- transfer pumps associated with the two fermentations tanks, and
- pumps associated with the indirect cooking plant.

Harwood Acoustics have carried out a number of noise surveys within and around the Shoalhaven Starches site which have included most recently surveys of the existing packing sheds and the associated silos, baghouses and sifters. Previous assessments have included noise measurements of the transfer pumps servicing the fermenters as well as general pumps, motors and compressors.

**Table 11** below therefore provides a schedule of octave band and overall 'A' frequency weighted sound power levels, in decibels re: 1 pW, derived from previous site measurements.

**Table 11**

**$L_{eq}$ Sound Power Levels – Plant and Equipment**

| *Description* | *$L_{eq,\ 15\ minute}$ Sound Power Level(dBA)* |
|---|---|
| Silo motor and fan | **87** |
| Silo motor with baghouse pulse | **84** |
| Sifter | **84** |
| Transfer pump (fermenter) | **93** |
| Nitrogen generator compressor | **76** |
| Indirect cooking pumps | **90 – 93** |
| Blowers (product blowers) | **110** |

*Packing plant noise sources discussion*

Previous noise impact assessments relating the approved packing plant, container storage yard and rail spur have been carried out as follows:

- Noise Impact Assessment titled 'Acoustical Assessment, Proposed Ethanol Upgrade, Shoalhaven Starches' prepared by The Acoustic Group, ref 38.3849.R52:ZJM, dated June 2008,
- Environmental Noise Impact Assessment, prepared by Day Design Pty Ltd, reference 5843-1.1R dated 15 March 2016, and
- Notice of Modification Packing Plant and Container Storage Yard, prepared by HarwoodAcoustics, reference 1609006E-R dated September 2016.

The assessments covered the level of noise emission from the operation of the packing plantbuilding (as it was proposed at the respective times) as well as forklift movements outside ofthe building in the container yard, the movement of containers and the loading and unloadingof trains including the train movements, both locomotive and shunting of wagons.

A number of physical and administrative noise controls were recommended and many of these have formed part of the conditions of approval.

The proposed alterations to the packing plant that are associated with this Modification Proposal do not include any new noise sources other than those associated with the silos and the blowersas detailed in **Table 11** above, that have not been previously assessed.

For example, the additional rail spur proposed as part of this modification will not involve the operation of additional locomotives or additional forklift movements that have not formed part of previous assessments.

For this reason, the noise design goals for this Modification Proposal according to Harwood Acoustics are stringent, to ensure that any new noise sources that are not part of current operations, or previously assessed operations, do not increase overall site noise. To this end, there is no consideration given to modelling previous noise sources, that already form part of the previous assessments and contribute to the reason for the stringent noise goals.

A noise design verification will be carried out to ensure that the noise controls are appropriate and adequately implemented in the final design prior to construction and adjusted if and where necessary.

#### *7.2.3.3 Noise Level Predictions*

### *Predicted Noise Levels*

Noise levels predicted by Hartwood Acoustics at each receptor location are shown in **Table 12** below.

The predicted noise levels assume recommendations made in Section 6 of Harwood Acoustics' Assessment havebeen implemented.

**Table 12**

**Predicted Noise Levels at Receptor Locations**

| ***Description*** | ***Predicted Noise Level $L_{eq,\ 15\ minute}$ (dBA)at Receptor Location*** | | | |
|---|---|---|---|---|
| | ***Location 1*** | ***Location 2*** | ***Location 3*** | ***Location 4*** |
| **Design Noise Goal ($L_{eq,\ 15\ minute}$)** | **23** | **23** | **27** | **25** |
| Silos within packing plant building | 11 | 13 | 22 | 20 |
| Silo motors within penthouse | 7 | 8 | 13 | 12 |
| Nitrogen Generator | 1 | 3 | 13 | 13 |
| Indirect Cooking | 14 | 15 | 20 | 19 |
| Fermentation Transfer Pumps | 13 | 2 | 14 | 14 |
| Blowers | 3 | 3 | 10 | 9 |
| **Combined** | **18** | **18** | **24** | **24** |
| ***Complies*** | ***Yes*** | ***Yes*** | ***Yes*** | ***Yes*** |

The calculations and predictions in **Table 12** consider distance loss to each receptor as well as the following:

- Construction of packing plant building and penthouse in accordance with the recommendations made in Section 7.2.3.4 below;

- Sound power levels as detailed in **Table 11**;
- Reduction from acoustic enclosure for blowers as recommended in Section 7.2.3.5 below;
- Reduction from localised treatment of fermentation pumps as detailed in Section 7.2.3.5 below.

*Modifying Factor Assessment*

**Table 13** below shows the predicted level of noise emission from all new plant combined at the nearest receptor in Bomaderry (R3) in terms of the octave band and overall A frequency weighted sound pressure levels.

**Table 13**

**Predicted $L_{eq}$ Sound Pressure Levels – Combined Plant at R3**

| ***Plant item*** | ***dBA*** | ***Sound Power Levels (dB) at Octave Band Centre Frequencies (Hz)*** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | ***63*** | ***125*** | ***250*** | ***500*** | ***1k*** | ***2k*** | ***4k*** | ***8k*** |
| All plant combined | 24 | 32 | 27 | 22 | 20 | 19 | 15 | 12 | 9 |

A preliminary assessment of the potential for low frequency noise is conducted by comparing the predicted A frequency weighted and C frequency weighted noise levels, as is required by the *Noise Policy for Industry* 2017 Fact Sheet C.

The difference in A weighted and C weighted levels is **10 dB**.

According to Harwood Acoustics a correction to the predicted noise level is to be applied where the difference in the predicted A weighted and C weighted noise levels is greater than 15 dB. A comparison of the one-third octave noise levels with the prescribed base levels is required to be undertaken only when thedifference between the overall A and C weighted levels exceeds 15 dB. That is not the case in this instance.

None of the items of plant measured up close contains tonal characteristics and given the lowlevel of predicted noise (26 dBA), being essentially inaudible at the closest receptors to the site, according to Harwood Acoustics the noise levels are not expected to contain tonal characteristics at any receptor location.

Consequently, Harwood Acoustics indicate that no modifying factor adjustments are considered applicable to this modification.

#### *7.2.3.4 Construction Noise Emission*

The construction of the packing plant building, container yard area, noise wall and rail spur are assessed in previous assessments that form part of the approval for the overall packing plant development.

Construction works associated with this modification will therefore consist of piling (for the fermenter tanks only), pouring of concrete slabs for the nitrogen generator and the installation of all plant and equipment.

**Table 14** below shows a schedule of sound power levels for typical construction equipment.

**Table 14**

**Typical Construction Equipment – $L_{eq}$ Sound Power Levels**

| *Description* | *$L_{eq}$ Sound Power Level (dBA)* |
|---|---|
| Auger Piling (CFA Rig) | 113 |
| Hammer or Driven Piling | 118 |
| Mobile Crane (Diesel) | 110 |
| Concrete Truck / Pump | 105 |
| Grinder | 105 |
| Power Saw | 101 |

**Table 15** below shows the predicted level of potential noise emission from construction activities at each of the receptor locations.

**Table 15**

**Predicted Noise Levels at Receptor Locations – Construction Phase**

| *Description* | *Predicted Noise Level $L_{eq,\ 15\ minute}$ (dBA)at Receptor Locations* | | | |
|---|---|---|---|---|
| | *Location 1* | *Location 2* | *Location 3* | *Location 4* |
| **Noise Design Goal($L_{eq,\ 15\ minute}$)** | **43** | **50** | **48** | **48** |
| With hammer piling | 42 | 43 | 47 | 46 |
| With auger piling | 37 | 38 | 42 | 41 |
| Construction activity(no piling) | 29 – 30 | 30 – 34 | 36 – 46 | 35 – 45 |
| ***Complies*** | ***Yes*** | ***Yes*** | ***Yes*** | ***Yes*** |

Notwithstanding the potential for compliance with the construction noise limits, ShoalhavenStarches will prepare a Construction Safety & Environmental Management Plan for this project.

#### *7.2.3.5 Recommended Noise Controls*

The noise levels predicted by Harwood Acoustics assume that the following noise control measures have been implemented and continue to be adhered to.

***Packing Plant and Penthouse Building Construction***

*Walls*

- All external walls and the roofs of the packing plant extension and the penthouse above the external silos should achieve a minimum weighted sound reduction index ($R_w$) rating of 33, for example:
- *'Kingspan' Europanel S5 Extra series* 100 mm thick (minimum) or *Rockspan Extra* 100 mm thick (minimum) (https://www.kingspan.com/au/en-au/products-brands/insulated-roof- wall-panel-systems/wall-panel-systems).
- Architectural Roof Panelling system *'K-Dek (KS 1000 KD)'* with an internal layerof 13 mm thick sound rated plasterboard, or 9 mm thick fibre cement sheet fixed directly to one side, or equivalent* (*https://www.kingspan.com/au/en-au/products-brands/insulated-roof-wall-panel- systems/wall-panel-systems).*

  * to be confirmed prior to construction.

**NB** Once the construction material for the walls and roof are finalised Harwood Acoustics indicates that confirmation should be sought to ensure that the acoustical performance of the chosen construction satisfies the required sound reduction in each octave band centre frequency.

*Ventilation Penetrations*

Harwood Acoustics indicates that there should be no acoustically untreated penetrations in the walls or roof of the packing plant extension or the penthouse.

- Any penetrations must not undermine the acoustical performance of the wall or roof system ($R_w$ 33 minimum).
- Ventilation fans where required must be acoustically treated to ensure that thenoise design goals are not exceeded at any receptor location, this may be done,if required by the installation of acoustical silencers, lined ductwork, acoustic louvres or a combination.
- The selection of and requirement for ventilation fans in the proposed packing plant building extension and the penthouse, for silo motors) are not finalised at this stage. A detailed noise control design will be undertaken once these selections have been

finalised during the noise design verification process priorto construction as required by Condition 14 M of the Project Approval.

***Blower Acoustical Enclosures***

The two blowers will be located within the existing main packing building located approximately in the centre of the facility. According to Harwood Acoustics:

- The acoustic enclosures are required to provide a minimum reduction of **35 dB** from each blower which may be achieved using, for example concrete, or approved acoustically equivalent construction.
- A detailed noise control design will be undertaken during the noise design verification process prior to the issue of a Construction Certificate to ensure that any ventilation requirements are satisfied.

***Fermenter Transfer Pumps***

Based on the noise level of a typical fermenter transfer pump ($L_w$ 93 dBA) and the potential for four (4) pumps, an additional **10 dB** reduction in noise will be required from these items of plant at receptors R3 and R4 in Bomaderry.

This may be achieved by a combination of selecting alternative, lower noise models; erecting sound barrier screening atop the concrete bund walls in close proximity to each pump or enclosing the pumps,

Again, Harwood Acoustics recommend that a final certification of the design and required methods of attenuation will be undertaken during the noise design phase. Given the location of the pumps relative to the receptors, the required reduction in noise from these pumps can be readily achieved.

The Environmental Noise Assessment prepared by Harwood Acoustics concludes in relation to this Modification Proposal:

> *"An assessment of the potential noise impact from the proposed alterations to the approved northern packing plant and other works at Shoalhaven Starches on Bolong Road, Bomaderry,NSW has been undertaken. The modification also includes the construction of a nitrogen generator, an indirect cooking plant, the installation of the two new blowers and two new fermenters and the relocation of an approved car park.*
>
> *Noise producing aspects of this proposed modification include the motors and fans associatedwith new silos at the packing plant, as well as those associated with the nitrogen generator and indirect cooking plant, pumps associated with the fermentation tanks and the new blowers.*
>
> *Recommendations are made in Section 6 of this Report to reduce the level of noise emission from the items of plant and equipment associated with this*

*modification to within the noise design goals derived from Environment Protection Licence 883 noise limits at each receptor location.*

*A final assessment of required noise controls will be undertaken at the time of the Design Noise Verification process prior to construction, to ensure the noise design goals are met at all receptors.*

*The level of noise emission from the construction phase of the project will be within the noise management levels set by the NSW EPA's Interim Construction Noise Guideline.*

*None the less, construction noise mitigation measures are included in the Construction Safety & Environmental Management Plan prepared by Shoalhaven Starches."*

### 7.2.4 Preliminary Hazard Analysis

Pinnacle Risk were engaged to undertake a Preliminary Hazard Analysis (PHA) for the Modification Proposal (**Annexure 6**). This section of the SEE provides a summary of the findings of the Preliminary Hazard Analysis prepared by Pinnacle Risk Management for this Modification Application

The risks associated with the proposed modifications have been assessed by Pinnacle Risk Management and compared against relevant risk criteria issued by the DPIE (**Table 16**).

.

## Table 16

**HIPAP 4 Risk Criteria Compliance** (Pinnacle Risk Management)

| *Description* | *Risk Criteria* | *Comments* | *Risk Acceptable?* |
|---|---|---|---|
| Fatality risk to sensitive uses, including hospitals, schools, aged care. | 0.5 x $10^{-6}$ per year | No adverse levels of radiant heat or explosion overpressures to impact any of these land users. For example, the 14 kPa explosion overpressure is estimated to remain on-site for a confined dust explosion within the Packing Plant building. | Yes |
| Fatality risk to residential and hotels. | 1 x $10^{-6}$ per year | No adverse levels of radiant heat or explosion overpressures to impact any of these land users. For example, the 14 kPa explosion overpressure is estimated to remain on-site for a confined dust explosion within the Packing Plant building. | Yes |
| Fatality risk to commercial areas, including offices, retail centres, warehouses. | 5 x $10^{-6}$ per year | No adverse levels of radiant heat or explosion overpressures to impact any of these land users. For example, the 14 kPa explosion overpressure is estimated to remain on-site for a confined dust explosion within the Packing Plant building. | Yes |
| Fatality risk to sporting complexes and active open spaces. | 10 x $10^{-6}$ per year | The are no sporting complexes or active open spaces where adverse levels of radiant heat or explosion overpressures are expected. | Yes |
| Fatality risk to be contained within the boundary of an industrial site. | 50 x $10^{-6}$ per year | The 14 kPa explosion overpressure is estimated to remain on-site for a confined dust explosion within the Packing Plant building, therefore, no off-site fatality risk is estimated. | Yes |
| Injury risk – incident heat flux radiation at residential areas should not exceed 4.7 kW/$m^2$ at frequencies of more than 50 chances in a million per year or incident explosion overpressure at residential areas should not exceed 7 kPa at frequencies of more than 50 chances in a million per year. | 50 x $10^{-6}$ per year | No adverse levels of radiant heat or explosion overpressures to impact any residential areas. | Yes |

**Table 16 (continued)**

| *Description* | *Risk Criteria* | *Comments* | *Risk Acceptable?* |
|---|---|---|---|
| Toxic exposure - Toxic concentrations in residential areas which would be seriously injurious to sensitive members of the community following a relatively short period of exposure. | 10 x $10^{-6}$ per year | No toxic gases associated with this modification. | Yes |
| Toxic exposure - Toxic concentrations in residential areas which should cause irritation to eyes or throat, coughing or other acute physiological responses in sensitive members of the community. | 50 x $10^{-6}$ per year | No toxic gases associated with this modification. | Yes |
| Propagation due to Fire and Explosion – exceed radiant heat levels of 23 kW/$m^2$ or explosion overpressures of 14 kPa in adjacent industrial facilities. | 50 x $10^{-6}$ per year | As the 14 kPa explosion overpressure is estimated to remain on-site for a confined dust explosion within the Packing Plant building then this criterion is satisfied. | Yes |

The PHA prepared by Pinnacle Risk Management concludes:

> *"The risks associated with the proposed modifications to the Packing Plant and Other Works at the Shoalhaven Starches Bomaderry site have been assessed and compared against the DoP risk criteria.*
>
> *The results presented in this report show compliance with all risk criteria.*
>
> *Societal risk, area cumulative risk and environmental risk are also concluded to be acceptable.*
>
> *The primary reason for the low risk levels from the modifications is the significant explosion overpressures remain on-site. The "Other Works" do not involve hazardous materials that can cause fires, explosions or toxic gas emissions with off-site impacts.*
>
> *Based on the analysis in this revised PHA, there are no further recommendations to be made."*

### 7.2.5 Visual Impact

The Shoalhaven Starches factory site is situated on Bolong Road, the gateway to Bomaderry, within an area currently containing a mixture of rural and industrial land uses. These different land uses contrast with each other and result in a mixed visual character.

The rural areas, much of which comprises the Shoalhaven Starches Environmental Farm, are generally flat to gently undulating and planted with pasture grasses. These areas have a typical rural/agricultural character, common throughout the region. To the north and forming a background to the rural landscape are the timbered slopes of the Cambewarra escarpment.

The Shoalhaven Starches factory complex is characterised by typical industrial structures with an overall bulk and scale that dominates the surrounding locality. The site, despite being partially screened by vegetation along Bolong Road, the Shoalhaven River and Abernethy's Creek visually dominates the immediate locality. The development is particularly exposed to view along Bolong Road. This view reveals some of the internal structures within the site including recovery and storage tanks, car park, fermentation tanks and the Ethanol Plant. Overall, the appearance of the site is typical of an industrial facility of this scale and nature.

The most relevant vantage points from where the overall factory site is visible (see **Figure 26**) would include:

- The Princes Highway – views of the existing factory site are possible from selected locations along the Princes Highway north of Bomaderry, travelling in both a northerly and southerly direction. Whilst the factory site is visible in the landscape, its overall visual impact is reduced by virtue of the distance between the plant; the intermittent

nature of the views; a rise in topography which screens the site from view; and vegetation.

- Burraga (Pig) Island – Burraga Island is situated in the middle of the Shoalhaven River and provides the closest vantage point to the southern boundary of the site. The island however is privately owned and not accessible to the public. Vegetation screening along the riverbank adjacent to the site also reduces the visibility of the existing buildings and structures.
- Bolong Road – Bolong Road runs along the frontage of the site. Views of the factory are possible when travelling in either an easterly or westerly direction. Some attempts have been made to provide some tree planting along the boundaries to "soften" the appearance of the development. The existing building forms and structures are however clearly visible to motorists travelling along this stretch of Bolong Road.
- Nowra Bridge – The Nowra Bridge crosses the Shoalhaven River and provides limited opportunities for views of the factory site. The dominant visual elements from the bridge are the river, vegetation along the riverbanks and the escarpment. The visual impact of the factory site is reduced by distance as well as the bridge structure which permits only glimpses of the site.
- Bomaderry urban area – The existing plant is visible from a number of locations within the eastern outskirts of Bomaderry. Bomaderry is slightly elevated and some locations within the urban area do have extensive views of the site.
- Terara – Distant views of the Plant are possible from a number of vantage points in and around the village of Terara on the southern bank of the River. The visual impact of the site however is reduced by distance, the intervening landform of Burraga (Pig) Island and the vegetated riverbanks.
- Riverview Road – Views of the site are available from residential development on the southern bank of the Shoalhaven River. Vegetation along both the northern and southern banks of the river partially screen the site from view.
- Cambewarra Lookout – Cambewarra lookout is a popular tourist lookout providing panoramic views over the Shoalhaven floodplain and estuary. Shoalhaven Starches, like the other significant industrial sites, is visible from the lookout.

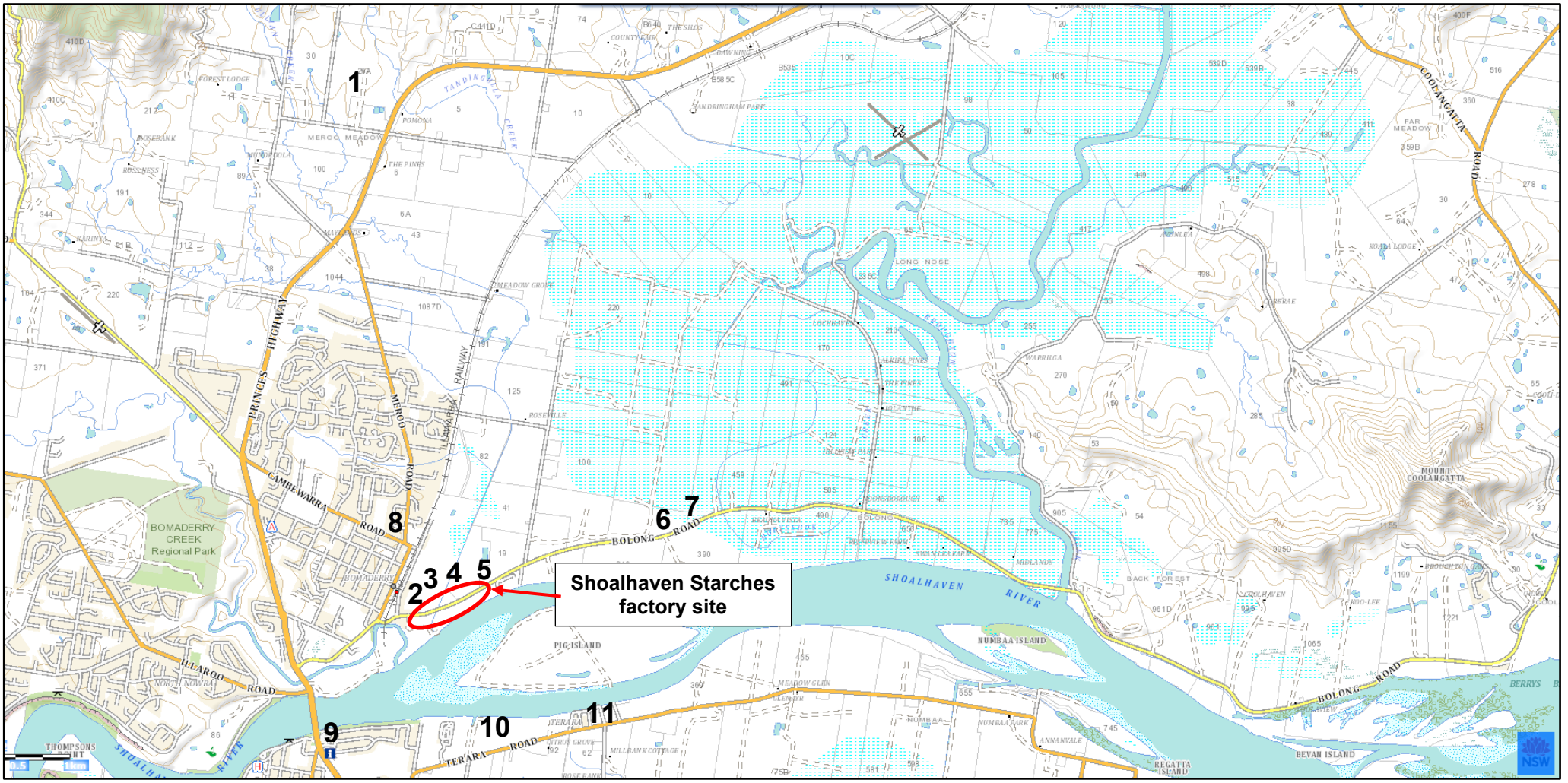


**Figure 26: Vantage Points for Plates 1 – 11.**

***Visual Impact of Proposal***

This modification proposal involves several components that have relevance in terms of potential visual impacts including:

*Packing Plant Modifications*

The Packing Plant Modification will involve a partial increase in the height of this approved development with the addition of the packer feed silo housing and the housing of the additional product silos. The overall development will have an increased building height from about 18 metres to 34.75 metres above the approved ground level. It should be noted that this increase in height relates to part of the building and not the overall approved building. These works will all be potentially visible from the Bolong Road frontage of the site as well as from the Bomaderry urban area.

*Modification to gantries*

The Modification Proposal will also involve a slight relocation of the gantry structure that will carry pipework between the factory site and the Packing Plant, including the increase in height of these structures above the approved ground levels on the Packing Plant site. In addition, it is also proposed provide additional gantries to cross Abernethy's Creek that will connect the factory site to the Packing Plant site. These gantries will mainly be potentially visible from along the Bolong Road frontage of the site.

*Indirect Cooking and associated works*

Given the Indirect Cooking facility and its associated works are sited generally centrally within the factory site it is not expected that this part of the Modification Proposal will result in a significant visual impact within the broader landscape.

*Nitrogen Generator and associated works*

The Nitrogen Generator will be housed within a 3.4 m high structure, and will also include a series of tanks which will range in height form 3.4 metres to 10 metres in height. This component of the Modification Proposal will be sited a minimum within 2 metres of the Bolong Road frontage of the site to the east of the existing and approved Ethanol Plant. These works will all be potentially visible from the Bolong frontage of the site.

*Additional two fermenters and associated works*

The additional two fermenters will be sited to the east of existing evaporators and approved cooling towers and partly within the area identified for the ISO Container storage area. The fermenters will require the construction of additional pipe bridges to connect with the existing pipework supporting the existing fermenters further to the west. The siting

of these additional fermenters will also require the relocation of the approved ISO Container storage area and approved car parking further to the east. These works will all potentially be visible from the Bolong Road frontage of the site; as well as potential from lands across the Shoalhaven River to the south.

*Additional Buffer Tank*

The Modification Proposal also includes an additional Buffer Tank to be sited to the north-east of the existing Buffer Tank which is sited adjacent to the Oxidation Pond that forms part of the overall Wastewater Treatment Plant and its associated wet weather storage dams located on the northern side of Bolong Road. This additional Buffer Tank has the potential to be visible from the Bolong Road frontage of this part of the site.

*The Princes Highway*

The Shoalhaven Starches factory is mainly visible from a section of the Princes Highway between Boxsells Lane and Devitts Lane, Jaspers Brush (refer **Plate 1**). Due to the configuration of the highway and the siting of the factory, only southbound vehicles view the site. Vantage points along this section of the highway are 4.5 to 5.0 km from the site. The site becomes less exposed and is eventually obscured by a rise in topography further south of Boxsells Lane.

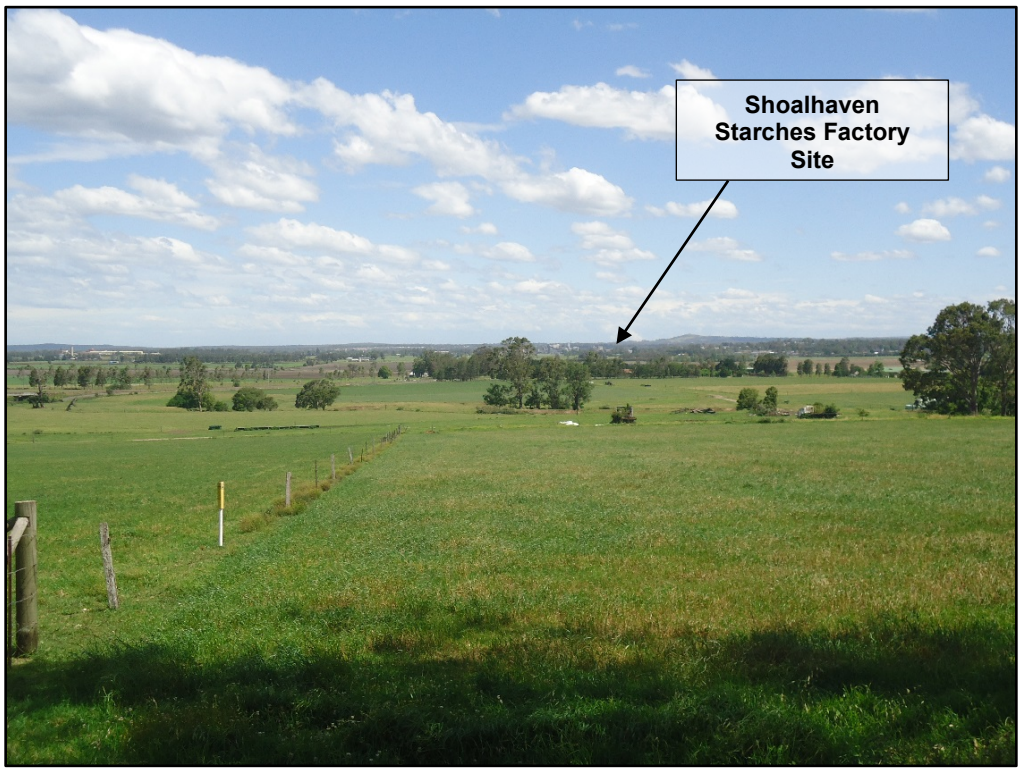


**Plate 1:** View of Shoalhaven Starches Factory from Princes Highway (within vicinity of Devitts Lane).
(Site of proposed works not clearly visible from this vantage point.)

Given the distance from these vantage points the factory site is only barely visible. The rising topography upon which Bomaderry is sited screens the western portion of the site, as does intervening vegetation.

Given the distance of these views, and the screening of the site attributed to terrain and vegetation it is considered the works associated with this modification proposal will not adversely impact on views from these vantage points.

*Bolong Road*

The existing factory site is clearly visible from along Bolong Road by vehicles approaching from the east and west, and along the frontage of the site. The following works associated with this Modification Proposal will be visible when viewed from along Bolong Road:

- Modifications associated with the Packing Plant site;
- Additional gantries across Abernethy's Creek on south side of Bolong Road;
- The Nitrogen Generator and associated storage vessels and tanks;
- The additional Fermentation Tanks;
- The additional Buffer Tank associate with the Wastewater Treatment Plant on the northern side of Bolong Road.

*Modification to the approved Packing Plant Site*

**Plate 2** below is a view of the Packing Plant located on the northern side of Bolong Road when viewed from Bolong Road. Site works are presently underway in accordance with the Project Approval.

The proposed modifications to the Packing Plant associated with this Modification will result in a larger overall building, in terms of height, when compared to that which was originally approved. The overall footprint however will remain relatively similar to the approved project.

The modified Packing Plant building will be clearly visible from along the Bolong Road frontage of the site, particularly given it will be located on a slightly elevated development platform. This was also the case with the approved development. This view however will be somewhat mitigated by:

- Existing industrial developments situated along Bolong Road;
- The Packing Plant development will be set back from the Bolong Road frontage and generally to the rear of existing industrial development.

- The Packing Plant building will also be situated to the rear of the approved container storage area. Stacked containers will also partially screen the prosed modified building from view.

Whilst the modified Packing Plant building will be larger than that which was originally approved; the modified development will not be dissimilar to other buildings within the overall Shoalhaven Starches factory complex.

Given these circumstances it is our view that the modified Packing plant will not be out of character with development in the vicinity and will not result in an adverse visual impact within the broader landscape.

**Plate 2:** View of Packing Plant Site form Bolong Road.

*Additional gantries across Abernethy's Creek*

The proposed gantries that will cross Abernethy's Creek will be set back from Bolong Road, and will be partially screened by the existing Packing Plant located on the south side of Bolong Road to the west; and the electrical sub-station situated on the eastern bank of Abernethy's Creek. These works will also be seen in context of existing structures that already cross this watercourse. In this regard this watercourse is heavily influenced by existing industrial development associated with the existing factory complex. Given these circumstances it is not considered these works will have a significant visual impact when vied form Bolong Road.

*Nitrogen Generator and associated Vessels*

The Nitrogen Generator will comprise relatively low scale structures when compared to other structures within the factory complex. The Nitrogen Generator will be housed in a container like structure with a height of only 3.4 metres. The Nitrogen tanks themselves will have a height of 6.4 metres. These structures will however be situated within relatively close proximity of the Bolong Road frontage being set back a minimum of 2 metres from this boundary.

These proposed structures however should be seen in context of the other development within the immediately vicinity including the Ethanol Plant, Ethanol Storage Tanks, and the Ethanol Loadout all of which dominate the view from this part of Bolong Road. The proposed Nitrogen Generation facility will not be a significant structure in context of these adjacent plant (**Plate 3**).

In our view however it will be important that landscape screening be re-established along this section of the Bolong Road frontage following the installation of this plant to visually soften this plant when viewed from along the Bolong Road frontage.

**Plate 3:** View of Location of Proposed Nitrogen Generator Facility from along Bolong Road.

*Additional Fermentation Tanks*

The additional two Fermentation Tanks and their associated gantries and pipework are to be sited to the east of the existing Evaporator and approved cooling towers. An existing

Fermenter Tank storage area (**Plate 4**) is situated to the west of the existing Evaporators and approximately 60 metres to the west of the proposed two additional Fermentation Tanks.

**Plate 4:** Existing Fermenter Tanks to west of location of Proposed Additional Fermentation Tanks No. 18 and 19.

The proposed additional Fermentation Tanks will have identical dimensions and height when compared to the existing Fermentation Tanks with a height of 30 metres above ground level. **Plate 5** provide a view from Bolong Road of the location of the proposed new Fermentation Tanks.

It evident from **Plate 5** that the proposed new addition fermentation Tanks will be a visual continuation of the existing plant within this vicinity of the site including the existing Fermentation Tanks and Evaporators. In this regard this area of the site is also the location of the approved ISO Container storage area.

The proposed additional Fermentation Tanks will be sited within part of the site that already contains plant and equipment of a similar scale, appearance and height as that which is proposed. The proposed Fermentation Tanks will therefore not be out of character with the prevailing nature of development in this part of the site. Whilst the tanks will be visible along Bolong Road, this is the case with the prevailing nature of development and not inconsistent with the industrial zoning that applies to the land.

Under these circumstances it is considered the proposed Fermentation Tanks will not adversely impact the scenic qualities from this vantage point.

**Plate 5:** View of Location of Additional Fermentation Tanks when viewed from along Bolong Road.

*Additional Buffer Tank*

The additional Buffer Tank proposed is to be sited to the north-east of the existing Buffer Tank. The existing Buffer Tank is sited adjacent to the existing Oxidisation Pond that forms part of the overall Wastewater Treatment Plant and system. It is proposed to site the additional Buffer Tank approximately 35 metres to the north-east of the existing Buffer Tank. It is not possible to site the additional Buffer Tank any closer to the existing Tank due to the constraints imposed by the existing electricity easement and the batter slope of the Oxidisation Pond.

As evident from **Plate 6** the existing Buffer Tank and Oxidation Pond are well screened from view along Bolong Road by a tree screen that has been established along the Bolong Road frontage of the site.

The tree screen however is somewhat less well established along the eastern boundary of the property, particularly towards the Bolong Road frontage (**Plate 7**). There is the potential that the proposed additional Buffer Tank could be visible, at least partially from this particular vantage point shown in **Plate 7**. In order to reduce any visual impact arising from the proposed additional Buffer Tank it is recommended that additional tree plantings be undertaken along this section of this boundary.

**Plate 6:** View of existing tree screen along Bolong Road frontage in the vicinity of Wastewater Treatment System and Ponds.

**Plate 7:** View of Location of additional Buffer Tank when viewed from along Bolong Road.

*Bomaderry Urban Area*

The township of Bomaderry is slightly elevated and some locations within this urban area have extensive views of the site (refer **Plate 8**).

In light of the prevailing scale of existing development located within Shoalhaven Starches site the proposed modification works will be largely viewed as part of the Shoalhaven factory site. The works associated with this Modification Proposal and most notably the proposed modifications to the Packing Plant site, Nitrogen Generator and Fermentation Tanks will be largely or partially screened by existing industrial development when viewed from this vantage point. These works will be of a scale and character of development that will be in keeping with the prevailing scale and character of development associated with the Shoalhaven Starches factory site.

**Plate 8:** View of Shoalhaven Starches factory site from corner of Railway Street and Cambewarra Road, Bomaderry.

*Nowra Bridge*

The view from Nowra Bridge to the east is mainly dominated by the river, riparian vegetation and the floodplain (refer **Plate 9**).

The site is largely obscured by riverside vegetation. The Packing Plant site is not visible from this vantage point. Given the proposed Indirect Cooking Facility, Nitrogen Generator and Fermenters are all sited to the eastern side of the existing development (and therefore

further away from this vantage point) these works will not be overly visually prominent from this vantage point.

**Plate 9:** View of Shoalhaven Starches factory site from Nowra Bridge over the Shoalhaven River.

*Riverview Road*

**Plate 10** below provides a view of the Shoalhaven Starches factory site from Riverview Road located on the south side of the Shoalhaven River. This view is from a distance of about 750 metres. Riverside vegetation along both the northern and southern banks of the river, as well as Bomaderry Creek, soften much of the site from view. The proposed works are generally situated to the north and east of existing development that is visible from this vantage point and will therefore be screened from view from this vantage point by either this existing development or by vegetation.

**Plate 10:** View of Shoalhaven Starches factory site from Riverview Road area.

*Terara*

The village of Terara is approximately 1.5 kilometres from the factory. The view of the Shoalhaven Starches factory site as seen from the banks of the Shoalhaven River adjacent to the village of Terara is shown in **Plate 11**.

The existing Fermenters and Evaporators located to the east of the site are partially visible from this vantage point. The proposed new Fermenters and the relocated ISO Container Storage area will be partially visible from this vantage point; however, it will be seen in context of the existing ethanol plant. It is unlikely that other works associated with this Modification Proposal will be visible from this vantage points as they will be largely screened or seen in context of the existing factory development. Furthermore, the view from this vantage point is across and over Burraga (Pig) Island. Vegetation on the island and along the northern banks of Shoalhaven River also help to obscure the view of the site.

**Plate 11:** View of Shoalhaven Starches factory site from village of Terara.

*Cambewarra Lookout*

Cambewarra Lookout is situated about 7 km to the north-west of the site. Views from the lookout are from an elevation over 620 m ASL and encompass the Shoalhaven River floodplain and the coast including Jervis Bay. Whilst the factory site is visible from this vantage point, due to scale of the view, it would be extremely difficult to make out the works associated with the project from this vantage point.

Overall, it is considered that the proposed works will not create a significant adverse visual impact due, principally, due to the works comprising a scale and character consistent with existing development on the site. There are however measures which Shoalhaven Starches could undertake to minimise the visual impact of the proposal. Where appropriate and possible, the proposed structures should be constructed of similar materials as those previously used on the site and be of a non-reflective nature. Colours should blend with existing structures on the site to ensure visual harmony. Consideration should be given to incorporating a cladding colour, if possible, which will match existing development on the site. With respect to the additional Buffer Tank, infill tree planting within the existing boundary tree planting screen should assist with screening the view of tis tank overtime, as it has successfully achieved along the Bolong Road frontage.

### 7.2.6 Flooding

WMAwater were engaged to undertake a Flood Compliance Report for the proposed modifications associated with this Modification Application (**Annexure 5**). The proposed works are inundated in the 1% Annual Exceedance Probability (AEP) flood event by floodwaters from the Shoalhaven River. The flood assessment prepared by WMAwater provides an assessment of the implications of the Modification Proposal on flood levels, flows and velocities. The land across the plant area on which the works are located is of variable ground level with areas of shallow and relatively deep inundation in a 1% AEP event. According to WMAwater part of the subject site would be defined as High Hazard, part Floodway and part Flood Storage.

WMAwater (formerly known as Webb McKeown & Associates) undertook the 1990 Shoalhaven River Flood Study and subsequent 2008 Floodplain Risk Management Study and Plan for Shoalhaven City Council. WMAwater have also undertaken many similar flood assessments for Shoalhaven Starches in the past and are therefore very familiar with flooding in the Shoalhaven River floodplain and the implications for flooding of further development in the northern floodplain and along Bolong Road.

***Hydraulic Impact Assessment***

*Overview of Flooding on the Northern Floodplain*

Ponding of water in low lying areas on the northern floodplain of the Shoalhaven River occurs following periods of heavy and continuous rain. Some parts of the land are only 1 m above high tide and consequently are frequently inundated. This results from direct rainfall over the area and also from overflow from the creeks which flow through the area. In larger floods, both Abernethy's Drain and Bomaderry Creek will overtop their banks and inundate the area. This would have occurred in March 1978 and the other floods which occurred in the 1970's (August 1974, June 1975 and October 1976) as well as the April 1988 event. According to residents' reports none of these floods overtopped the northern river bank to any significant extent, in the vicinity of the Shoalhaven Starches plant or the former Paper Mill.

The existing and proposed works, since approximately 1990, on the northern floodplain do not increase flood levels in these "small" floods as there is no significant velocity and the area is a very large storage basin. The largest of these events occurred in March 1978 which approximated a 5% AEP flood. For the above reasons, according to WMAwater, construction of the existing works since 1990, plus the proposed works on the northern floodplain, will not cause any significant increases in flood levels for these events. These

are the most frequent events that affect the area, and the above five historical events are typical examples.

However, floods larger than March 1978 will occur and they will overtop the bank, causing a significant inflow of floodwaters to the area. In these larger overtopping floods, the proposed and existing works since 1990 on the northern floodplain will have an impact upon flood levels by restricting flow (conveyance) and reducing temporary floodplain storage. These are much rarer events and generally most of the northern floodplain is inundated by up to 3 m depth of water. Some parts of the Shoalhaven Starches plant are already inundated by up to 1.5 m depth of water and consequently the small increase in level caused by the existing and proposed works since 1990 is unlikely to be significant. Hydraulic modelling of floods is undertaken to assess the impacts on the northern floodplain of all further development within the Shoalhaven Starches plant.

***Overview of Hydraulic Modelling***

The 1990 Lower Shoalhaven River Flood Study was commissioned by the NSW Government Public Works and determined design flood levels along the river and adjoining floodplain. From approximately the year 2000 to 2010 the hydraulic computer model, termed the CELLS model, established in that study was used by WMAwater, on behalf of Shoalhaven Starches, to evaluate the potential increases in flood level due to further works on the northern floodplain, including expansion of the plant itself and construction of the storage ponds.

The CELLS model of the Shoalhaven River represented the channel and floodplain as a series of interconnected cells, termed either river or floodplain cells. Since 1990 there have been significant advancements in the field of hydraulic modelling using more complex computer software that allows the river and floodplain to be discretised into a grid. This is typically 15 m by 15 m on large rivers and up to 2 m by 2 m on small urban catchments. These models are termed 2 Dimensional (2D) in that they determine the flow direction between grid cells producing vector velocities. These models are thus able to define the topography more accurately and in turn can more accurately represent the hydraulic effects of even a small development on a large floodplain. In 2013, Shoalhaven Starches commissioned WMAwater to update the Shoalhaven River Flood Study to current best practice using the TUFLOW 2D hydraulic modelling software.

2D hydraulic models require detailed survey data and this has only become possible with the advent of what is known as Airborne Laser Scanning survey (ALS) or Light Detecting and Ranging (LIDAR). ALS uses laser technology that is emitted from a plane to define the ground levels (height in m AHD) and co-ordinates of points on the ground or on

buildings. ALS cannot penetrate deep water in the Shoalhaven River and a detailed bathymetric survey of the river is therefore also required. Ortho-rectified digital aerial photography is also required in combination with ALS to ensure that buildings and other features on the floodplain are accurately accounted for.

The construction of any works on the floodplain will cause a loss of temporary floodplain storage and a loss of hydraulic conveyance and these are simulated in the hydraulic model. The resulting increase in floodplain will depend upon the magnitude of these losses. However, generally the loss of temporary floodplain storage is of much less importance than the loss of hydraulic conveyance, as the areal extent of the existing and proposed works represents a very small proportion of the approximately 100 $km^2$ area of the Shoalhaven River floodplain.

***Impact of Flooding within the Heavily Built-up Area of the Plant***

**Figure 27** below indicates the extensively built-up area of the plant (within the red polygon). Thus, the flow path of floodwaters from the Shoalhaven River over the riverbank and towards Bolong Road is already significantly impeded by this built-up area. The loss of hydraulic conveyance depends on the extent of the restriction to a flowpath caused by the works. Prior to construction of the plant there would have been significant flow through the site during a flood, as there is across any riverbank.

However, since approximately 1960 the ongoing construction of the plant has effectively blocked the flow path through this heavily built-up area of the plant site. This issue has been investigated in WMAwater's October 2000 report titled "*Further Development within the Manildra Starches Plant off Bolong Road, Bomaderry - Hydraulic Assessment*". In summary an agreement was reached that any future development within the intensively built-up area, as indicated on **Figure 27** would not require hydraulic modelling to quantify the hydraulic impacts of any future development. The main reasons being that:

- any additional plant within this area would provide minimal additional reduction in conveyance or temporary floodplain storage due to the limited space available;
- roads and pathways act as flowpaths and will always be required within this area, thus there is a limit on the extent of possible restriction to these flow paths;
- hydraulic modelling is unable to accurately assess the hydraulic impacts of pipe networks and plant which currently exist in this area; thus, the impact of additional similar works also cannot be accurately quantified.

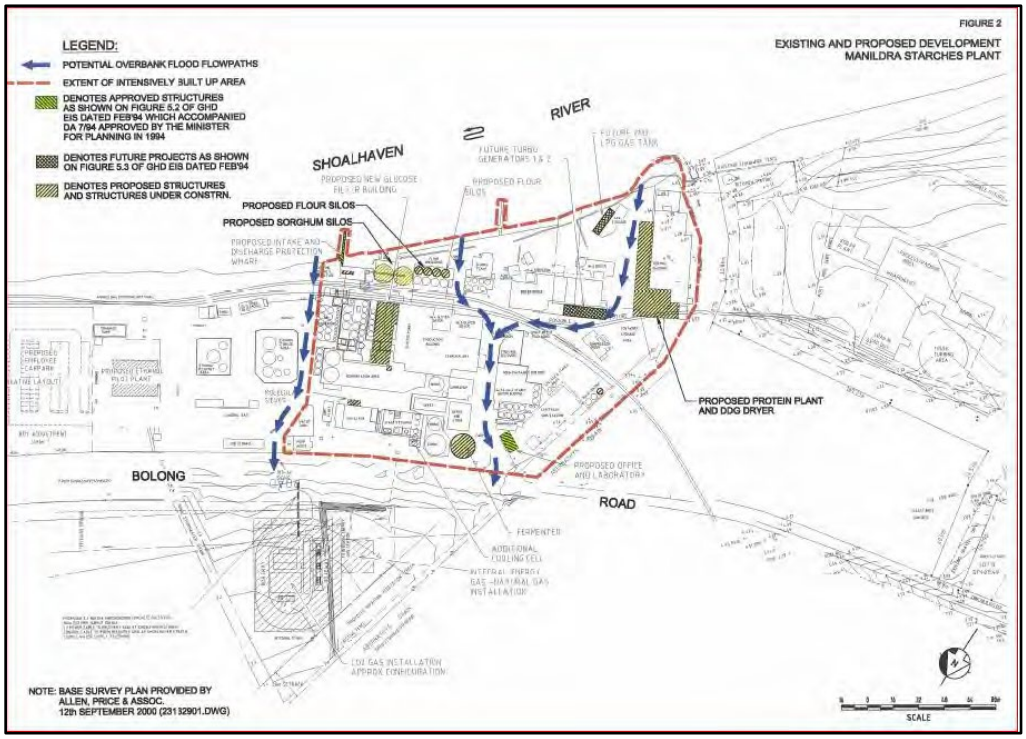


**Figure 27: Plan showing the heavily built-up area of the plant (WMAwater).**

***Results from TUFLOW Hydraulic Modelling***

The proposed works associated with the Modification Proposal were incorporated into the TUFLOW hydraulic model by WMAwater. According to WMAwater a comparison of peak flood levels between the approved and proposed works for the 1% AEP event indicate that the maximum increase in 1% AEP flood level outside the Shoalhaven Starches plant is up to 0.05 m at the rail crossing of Bolong Road with increases in flood level generally limited to within the Shoalhaven Starches plant.

### 7.2.7 Geotechnical and Riverbank Stability

GHD were engaged to undertake a geotechnical assessment of the proposed modifications in relation to the stability of the banks of Abernethy's Creek (**Annexure 7**). This section of the SEE provides a summary of the findings of this GHD assessment for this Modification Application.

The Geotechnical and Riverbank Stability Assessment undertaken by GHD concentrated on two areas associated with this Modification Proposal and labelled Area 1 and Area 2 in the **Figure 28** below.

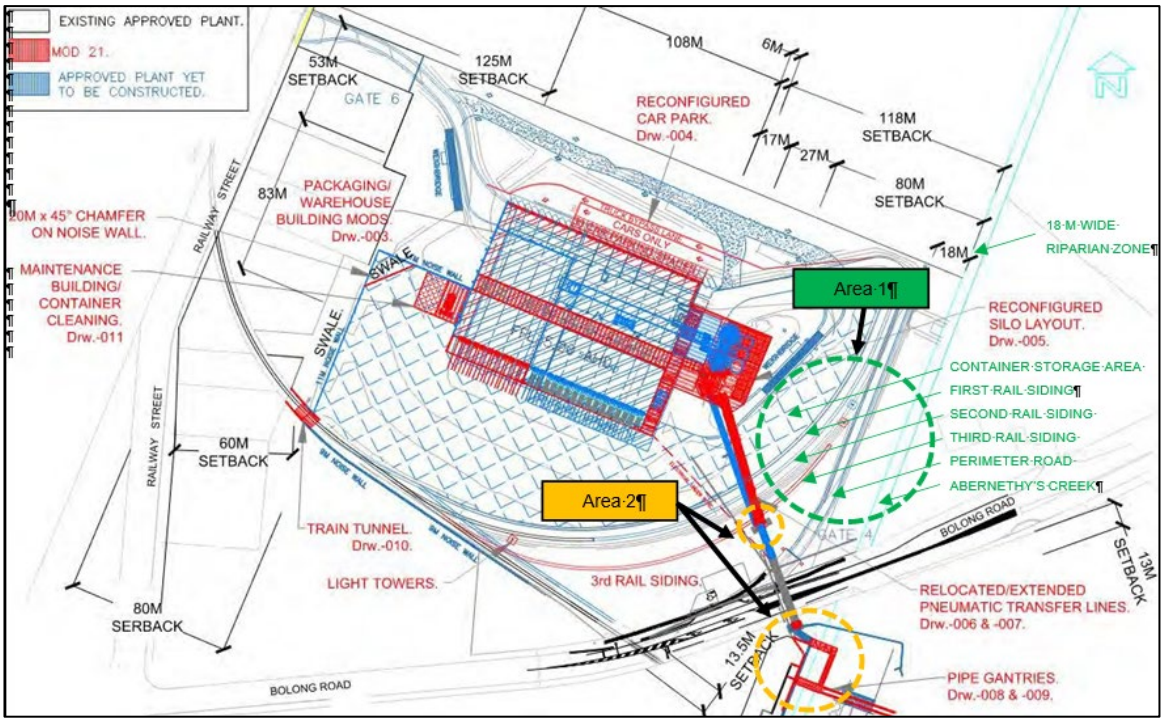


**Figure 28: Areas of Interest GHD Geotechnical and Riverbank Stability Assessment.**

Area 1 refers to the portion of the development where a third rail siding is proposed. This area is also influenced by loading within the adjacent container storage area, two other rail sidings and associated embankments, and the internal perimeter road. Key considerations in relation to the combined loadand potential effects on Abernethy's Creek bank stability are:

- There is an 18 m wide riparian zone between the nearest bank of Abernathy's Creek and the ring road.
- The first and second rail siding will be founded on structural fill embankments. It is assumed the third rail siding will be founded on an extension of the structural fill embankment supporting the first and second rail siding. Design drawings of the structural fill for the first and second rail siding are provided in the SMEC report.

Area 2 refers to the portion of the development where proposed gantries may affect the stability of the eastern and western bank of Abernathy's Creek. It is expected that the pipe bridge and gantries will be supported on piles or connected to buildings supported by piles socketed into bedrock.

A slope stability analysis was carried out by GHD to assess the potential influence of the proposed third rail siding and associated preloading works on the creek bank stability of the western bank of Abernethy's Creek at Area 1.

The centre of the third rail siding is located at a minimum distance of approximately 30 m from the western bank of Abernethy's Creek. The third rail siding will be founded on a structural fill embankment which will be subjected to preloading and will extend closer to the western bank of Abernethy's Creek. A perimeter road will also be constructed between the third rail siding embankment and Abernethy's Creek.

A designated 18 m wide riparian zone is located adjacent to the western bank of Abernathy's Creek, hence, current Packing Plant development including earthworks will be limited by this site constraint, that is, the fill platform and additional structures will be located at least 18 m from the western bank of Abernethy's Creek.

The stability analyses carried out by GHD considered train loads, heavy vehicle loads, preloading surcharge loads, constructionloads, and shipping container storage loads.

Structures relating to the proposed pipe bridge and gantry were assumed by GHD to be supported on piles, or supported by buildings founded on piles, with all building loads transferred to the underlying rock.

The results of the stability analyses undertaken by GHD are summarised in **Table 17** below, including resulting Factors of Safety (FoS) for the different construction stage and groundwater conditions, and the required minimum FoS. These required minimum FoS are, according to GHD, reasonable values for the embankment life stage and groundwater conditions.

**Table 17**

**Summary of Slope Stability Analyses**

| *Scenario No.* | *Embankment life stage* | *Groundwater condition* | *FoS* | *Required minimum FoS* |
|---|---|---|---|---|
| *1* | *Short term (with preloadingsurcharge)* | *Normal* | *1.56* | *1.30* |
| *2* | *Short term (with preloadingsurcharge)* | *Flood* | *1.28* | *1.20* |
| *3* | *Long term (no preloading surcharge)* | *Normal* | *1.73* | *1.50* |
| *4* | *Long term (no preloading surcharge)* | *Flood* | *1.61* | *1.20* |

The Geotechnical and Riverbank Stability Assessment prepared by GHD concludes:

> *The analyses show that the failure scenarios are driven by slope instability within the rail embankment and are limited to the perimeter road embankment. All scenarios considered have an FoS greater than the required minimum, indicating stable conditions based on the design levels of the proposed third rail siding embankment.*

*Hence, we conclude that the development of the proposed third rail siding embankment for the Packing Plant at Area 1, will not adversely affect the stability of the western bank of Abernethy's Creek.*

*The slope stability analyses are based on the assumptions outlined above. If any aspects of the assumptions made are incorrect or significant changes occur to the current site conditions or proposed development, then GHD should be notified, and the analyses should be re-assessed.*

*In regard to the proposed structures in Area 2, namely pipe bridge extending towards the creek from the proposed Packing Plant and the pipe gantry structure south of Bolong Road over Abernethy's Creek, these should not affect the stability of the creek banks, provided the structures are supported on piles extending to rock*

The Geotechnical and Riverbank Stability Assessment prepared by GHD makes the following recommendations:

*"The objective of this geotechnical assessment was to advise on the effects of a proposed third rail siding and other structures associated with the Packing Plant development on the stability of the western bank of Abernethy's Creek. This assessment has shown that the factor of safety in respect to the stability of the creek bank following the rail siding construction is acceptable for the short and long term conditions.*

*Other geotechnical aspects relating to the third rail embankment design that should be considered in the design, construction and ongoing operation of the Packing Plant and associated infrastructure include:*

- *The stability of local batters within the third rail siding formation. Currently the fill batter for the third rail embankment is considered too steep.*
- *The extent of settlement over the rail siding and adjacent land, including long term settlement and differential settlement.*
- *The rate of placement of pre-load will need to be carefully controlled during construction to avoid rapid loading which can result in failure through the soft soil zone.*
- *Increased loading over the ground surface, ground disturbances or changes in the site surface profile between the Packing Plant and Abernethy's Creek may adversely influence settlement and local and /or stability."*

## 7.3 THE SUITABILITY OF THE SITE FOR DEVELOPMENT

In our view the site is suitable for the development, and including the development as modified by this application:

- The subject land is suitably zoned and the proposal satisfies state and local planning provisions applying to the land.

- The modified proposal will not have any significant additional impacts on the environmental values of this locality over and above those envisaged by the original approved development.
- The modified development will not result in any significant adverse effects on local amenity.
- The modification proposal does not seek to alter the approved physical extent of operations. Under these circumstances the proposal will not result in any increased inputs to the production process; increased production; or increases in traffic or other impacts on the locality.

Given these circumstances it is our view that the subject site is suitable for the proposed development.

## 7.4 SUBMISSIONS

Any submissions made as part of any exhibition or referral of the Modification Application to government agencies will need to be taken into consideration by Department when it determines the application.

## 7.5 THE PUBLIC INTEREST

It is our view that the modification proposal is in the public interest:

- The proposal is consistent with the objectives of state and local planning provisions applying to the site.
- The modified proposal will not result in any significant adverse environmental impacts.
- The modified proposal will not result in any significant amenity impacts in the locality.
- The modified proposal will be substantially the same development as that approved under the Project Approval.

# 8.0 CONCLUSION

The Shoalhaven Starches factory located on Bolong Road, Bomaderry produces a range of products for the food, beverage, confectionary, paper and motor transport industries including starch, gluten, glucose and ethanol.

Project Approval MP06_0228 was granted by the Minister for Planning on the 28th January 2009 for the Shoalhaven Starches Expansion Project. This approval also encapsulated previous approvals for the site into one overall approval for the site (at that time).

The Shoalhaven Starches Expansion Project sought to increase ethanol production at the Bomaderry plant in a staged manner from 126 million litres per year to 300 million litres per year. To accomplish the increase in ethanol production, this project required a series of plant upgrades and increase in throughput of raw materials, principally flour and grain.

Following the Minister's determination Shoalhaven Starches have been implementing and commissioning works in accordance with this approval.

Under Project Approval MP 06_0228 Shoalhaven Starches obtained approval to establish a new Packing Plant, container loading area and a rail spur line on the northern side of Bolong Road. These works also required the provision of an overhead bridge structure to allow product to be transferred and safe pedestrian movement across Bolong Road.

In 2019 the the Independent Planning Commission approved Mod 16 which included the construction of a Specialty Product Facility and additional Gluten Dryer. The Specialty Products Building would enable the production of an increased range of specialised products as an extension to Shoalhaven Starches existing product line. The specialty products will comprise a range of modified gluten products for the food industry; and modified starches for both paper manufacturing as well as food production.

Shoalhaven Starches have now identified that as a result of the increase in range of different specialised products that will now be able to be produced as a result of Mod 16; amendments will be required to the approved Packing Plant on the northern side of Bolong Road to accommodate the packaging requirements this increased range of specialised products.

In addition, this Modification Application will include other works not directly related to the modifications to the Packing Plant.

The Modification Application will not involve changes to the size, scale or intensity of the existing Shoalhaven Starches operations. The modification proposal will not result in any increases in production rates from the site, nor will it involve any changes in level of impacts arising from the approved development.

The Shoalhaven Starches Expansion Project was a 'transitional Part 3A Project" for the purposes of Schedule 6A of the Environmental Planning & Assessment Act. As of the 1st March 2018 the transitional arrangements for former Part 3A projects have been discontinued. The discontinuation of the transitional arrangements for Part 3A projects and concept plans means that modifications are assessed through the State Significant Development (SSD) pathway. As such this Modification Application is made pursuant to Section 4.55(1A) of the Environmental Planning & Assessment Act 1979.

This SEE therefore supports a modification application made pursuant to Section 4.55(1A) of the Environmental Planning & Assessment Act.

The preparation of this SEE has been undertaken following consultation with the Department of Planning, Industry and Environment, EPA, NRAR, Fire & Rescue NSW, Shoalhaven City Council and the Australian Department of Defence.

The SEE is also supported by the following expert assessments:

- An Air Quality Impact Assessment by GHD (**Annexure 3**). GHD recommends that that an investigation be undertaken to identify opportunities to use gas fired boilers instead of coal. In this regard, Shoalhaven Starches will be incorporating the conversion of coal fired boilers to gas as part of the future proposal to construct a gas fired co-generation plant as part of the future Modification 23.

  Compliance was predicted by GHD for all other air quality species for both scenarios.

- A Noise Assessment by Harwood Acoustics (**Annexure 4**) which includes recommendations that will reduce the level of noise emission from the items of plant and equipment associated with this modification to within the noise design goals derived from Environment Protection Licence 883 noise limits at each receptor location.

- A Flood Assessment prepared by WMAwater (**Annexure 5**) which concludes that a comparison of peak flood levels between the approved and proposed works for the 1% AEP event indicate that the maximum increase in 1% AEP flood level outside the Shoalhaven Starches plant is up to 0.05 m at the rail crossing of Bolong Road with increases in flood level generally limited to within the Shoalhaven Starches plant.

- A Preliminary Hazard Analysis (PHA) undertaken by Pinnacle Risk Management (**Annexure 6**) that assesses the risks associated with the proposed modifications and compares them against the relevant risk criteria. The PHA demonstrates the Modification Proposal will comply with all risk criteria. The PHA also concludes that societal risk, area cumulative risk and environmental risk will be acceptable.

- A Geotechnical Assessment that included an analysis of the impact of the proposed modification on riverbank stability by GHD (**Annexure 7**) demonstrates the development of the third rail siding on the northern side of Bolong Road will not adversely affect the stability of the western bank of Abernethy's Creek. Similarly in regard to the pipe bridge extending from the Packing Plant to the creek and the pipe gantry extending over Abernethy's Creek south of Bolong Road should not affect the stability of the creek either, provided the structures are supported on piles extending to rock.

The Modification Application will not involve changes to the size, scale or intensity of the existing Shoalhaven Starches operations. The modification proposal will not result in any increases in production rates from the site, nor will it involve any changes in level of impacts arising from the approved development.

It is considered that this Modification Application; will have minimal environmental impact; and the development to which Project Approval MP06_0228 as modified relates will be substantially the same development as the development for which this consent was originally granted and before that consent as originally granted was modified.

The SEE includes an assessment of the proposal having regard to the relevant matters for consideration as listed under Section 4.15 of the Environmental Planning and Assessment Act, 1979. The assessment concludes that the modification proposal, within its local context, is satisfactory and should be approved.

Approval for this Modification Application is sought.

Stephen Richardson.

**Stephen Richardson RPIA**
**COWMAN STODDART PTY LTD**

# ANNEXURE 1

## Responses from Government Agencies

**Shoalhaven Starches**
**Bolong Road, Bomaderry**

# ANNEXURE 2

## Plans of Modification Proposal

**Shoalhaven Starches**
**Bolong Road, Bomaderry**

# ANNEXURE 3

**Air Quality Assessment**

**prepared by**

**GHD Pty Ltd**

**Shoalhaven Starches**
**Bolong Road, Bomaderry**

# ANNEXURE 4

## Environmental Noise Impact Assessment

**prepared by**

**Harwood Acoustics**

**Shoalhaven Starches**
**Bolong Road, Bomaderry**

# ANNEXURE 5

## Flood Compliance Report

**prepared by**

**WMAwater**

**Shoalhaven Starches**
**Bolong Road, Bomaderry**

COWMAN STODDART PTY LTD

# ANNEXURE 6

**Preliminary Hazard Analysis**

**prepared by**

**Pinnacle Risk Pty Ltd**

**Shoalhaven Starches**
**Bolong Road, Bomaderry**

# ANNEXURE 7

**Geotechnical Assessment including**

**Creek Bank Stability – Abernethy's Creek**

**prepared by**

**GHD Pty Ltd**

**Shoalhaven Starches**
**Bolong Road, Bomaderry**

# ANNEXURE 8

**Clause 4.6 Written Request**

**prepared by**

**Cowman Stoddart Pty Ltd**

**Shoalhaven Starches**
**Bolong Road, Bomaderry**