# ASSESSMENT REPORT

## Shoalhaven Starches Expansion Project
## Modification to Mandatory Odour Controls

---

### 1. BACKGROUND

Shoalhaven Starches Pty Ltd (the Proponent) operates a factory off Bolong Road on the outskirts of Nowra in the Shoalhaven local government area (see Figure 1).

The factory processes wheat and grain transported by rail from central NSW to produce starch, gluten, ethanol and other related products for the food, beverage, confectionary, paper and motor transport industries. The wastewater from the factory is treated and irrigated on a nearby 'environmental farm'.


***Figure 1** - Shoalhaven Starches processing plant and environmental farm*

The operation has had a history of odour problems.

In 2006, the Proponent was fined by the Land and Environment Court for producing offensive odour, and required to undertake a comprehensive audit of all odour sources at the factory and environmental farm (see Appendix G).

The odour audit was completed by GHD in 2007 (see Appendix F), and concluded that:

*"[Of the] overall odour emissions from the factory and environmental farm, the environmental farm generated 84% of the emissions, the starch plant around 7%, the DDG [Dried Distiller's Grain] plant 6%, ethanol plant 3% and the glucose and distillation plants contributing less than 1%. Of the emissions from the environmental farm, the spray irrigators generated 85% of the odour emissions. This was attributed to release of the volatile odorous compounds from the wastewater by the use of mist nozzles."*

It also recommended the implementation of a range of odour controls to reduce the odour impacts of both the factory and environmental farm, with the most significant measure being the installation of a wastewater treatment plant on the environmental farm.

In November 2007, the Proponent lodged an application under Part 3A of the *Environmental Planning & Assessment Act 1979* (EP&A Act) seeking approval for:

- the implementation of a selection of the odour controls detailed in the 2007 odour audit (see Table 1 below); and
- an increase in the ethanol production of the factory from 126 mega-litres a year to 300 mega-litres a year.

***Table 1** - Proposed odour control measures and implementation stages in the Part 3A application.*

| ***Odour Source*** | ***Odour Control*** |
|---|---|
| ***Stage 1*** | ***Proposed to commence April 2009, subject to date of approval*** |
| *DDG Plant* | Install a bioscrubber and duct key odour sources to the bioscrubber |
| | Install wet legs on tanks to condense vapour emissions. Wet legs to be installed on odour sources not ducted to the bioscrubber at this stage |
| | Undertake housekeeping such as ductwork cleaning and maintenance to prevent the build up of putrescent contamination |
| | Install a Pelletiser Plant for the DDG product |
| *Ethanol Plant* | Decommission cooling towers |
| | Install wet legs on tanks to condense vapour emissions |
| *Starch Plant* | Undertake housekeeping such as ductwork cleaning and maintenance |
| | Decommission kestner dryer |
| *Glucose Plant* | Install wet legs on enzyme tanks to condense vapour emissions |
| *Flour Mill* | Improve dispersion from cyclone and fabric filters |
| *Environmental Farm* | Install a biological wastewater treatment plant |
| ***Stage 2*** | ***To assess within 6 months of completing Stage 1 controls*** |
| *DDG Plant* | Duct condenser drain decanters to bioscrubber |
| *Ethanol Plant* | Install a bioscrubber and duct propagation and farm tanks to bioscrubber |
| *Glucose Plant* | Install a bioscrubber and duct enzyme tanks to bioscrubber |
| ***Stage 3*** | ***If required, depending on the outcomes of Stage 2 implementation*** |
| *DDG Plant* | Duct light phase tank to bioscrubber |
| *Ethanol Plant and Distillery* | Duct remaining odour sources to bioscrubber |
| *Glucose Plant* | Duct remaining odour sources to bioscrubber |
| *Starch Plant* | Duct remaining odour sources to bioscrubber |
| | Install a common tall stack for emissions from gluten and starch dryers and the dry gluten bin |

In January 2009, following a review by the Planning Assessment Commission, the Minister approved the application subject to strict conditions (see the Director-General's Report and existing conditions of approval in Appendix E).

These conditions required the Proponent to:

- implement a number of 'mandatory odour controls' before increasing the ethanol production of the factory; and
- commission regular odour audits of the operation's performance; and if necessary, implement a range of 'additional odour controls'.

## 2. PROPOSED MODIFICATION

One of the by-products of ethanol production is Dried Distillers Grain (DDG). It is recovered from the wastewater of the fermentation process, and then dried into a powder. The powder is odourous and susceptible to air dispersion.

Under the mandatory odour controls of the project approval, the Proponent is required to:

- install a DDG pelletiser at the DDG recovery plant, which would turn the dry DDG powder into pellets and make it less susceptible to air dispersion; and
- install heavy curtains on the load-out shed door to reduce the fugitive DDG powder and odour emissions from the truck loading process.

On 12 December 2010, the Proponent requested a modification to the project approval under 75W of the EP&A Act.

The proposed modification involves:

- deleting the mandatory requirements to install a DDG pelletiser at the DDG recovery plant and heavy curtains on the load-out shed; and
- installing alternate odour controls.

The alternate odour controls include:

**Alternate Odour Control One - Moduflex Bellows Feeders on the DDG load chute:**

The bulk load-out chutes are to be fitted with Moduflex Bellow Feeders and dust-extractors. A Moduflex Bellows feeder is a proprietary load-system that uses a flexible and extendable chute to bulk-fill a truck from the bottom up; minimising powder drift. The dust extraction system would be ducted to the recently installed bio-filter.

Figures 2 and 3 show the performance of a similar bottom-fill chute fitted with dust extractors.


***Figure 2** - A load-chute with dust extractor operating*


***Figure 3** - A load chute with dust extractor switched off*

Figure 4 shows the location of the bottom fill chute within the elevation of the DDG plant (on the left) and load-out shed (on the right).

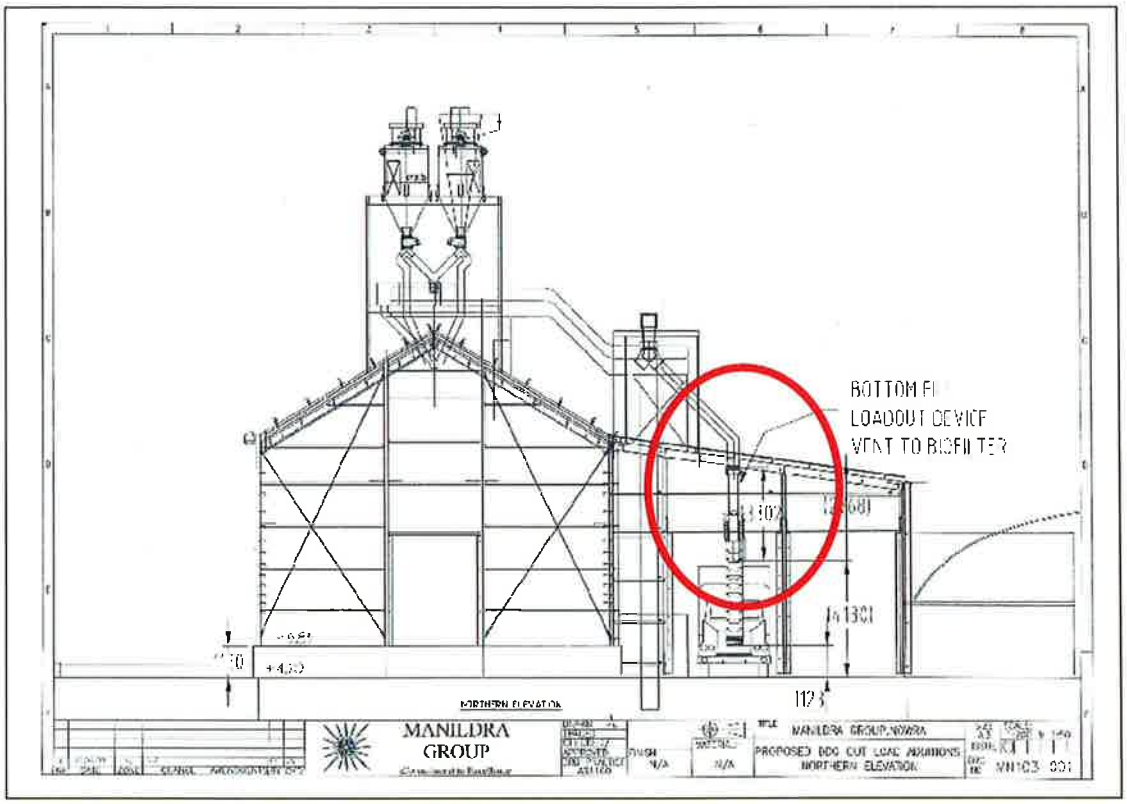


***Figure 4*** *- Elevation showing bottom fill load chute*

**Alternate Odour Control Two – Extending the load-out shed to the south:**

The load out shed awning is to be extended to the south and fully enclosed with motorised doors. This would allow a full size truck to be contained wholly within the load out shed while the doors are closed, preventing an air tunnel and minimising fugitive emissions of DDG while the truck is bulk loaded (see Figure 5).

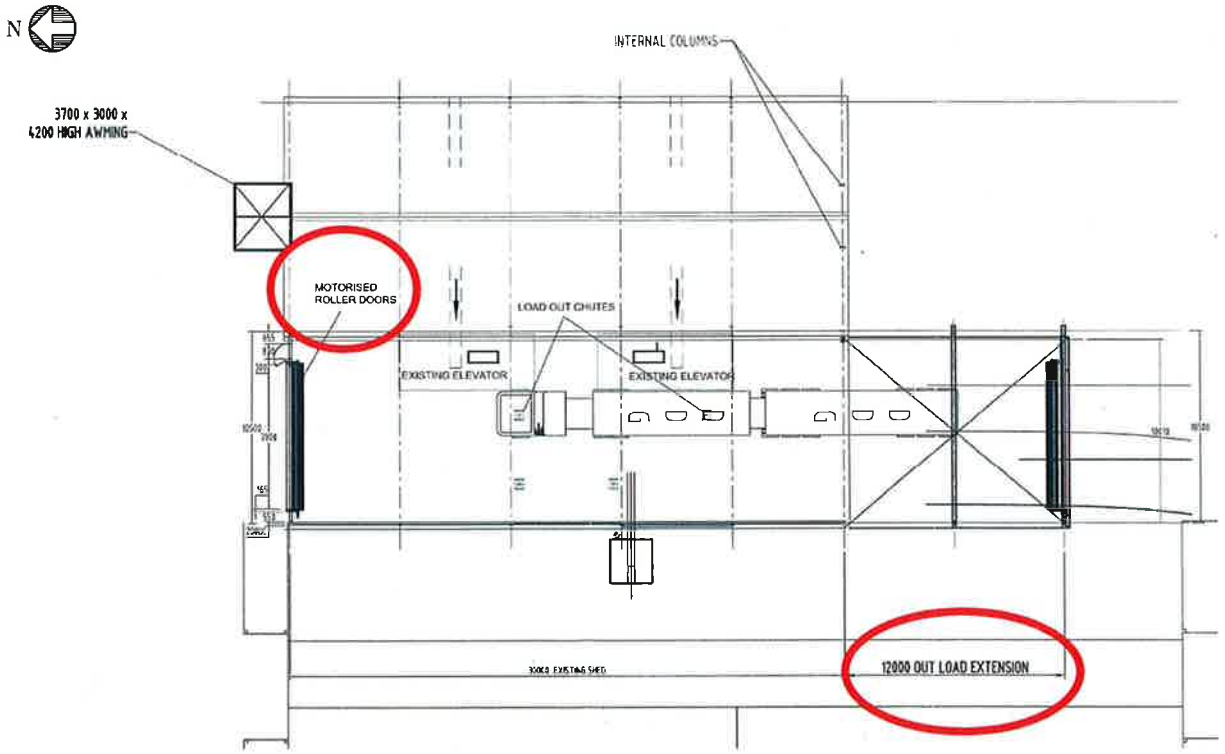


***Figure 5*** *- Plan showing extension to southern awning of load-out shed*

**Alternate Odour Control Three – Ducting air from the Palmer Cooler and DDG Recovery Plant to the boilers for odour destruction:**

The Palmer Cooler discharge stack and the DDG Recovery plant would be ducted to collect odourous emissions and direct them to the boiler system. A Palmer Cooler is a proprietary air-cooling device. It blows refrigerated air onto incoming DDG to cool it. Odours from the cooling process would be destroyed in the boilers and any remaining odours would be dispersed through the 54 metre high boiler stack (see ductwork from the Palmer cooler under construction in Figure 6)

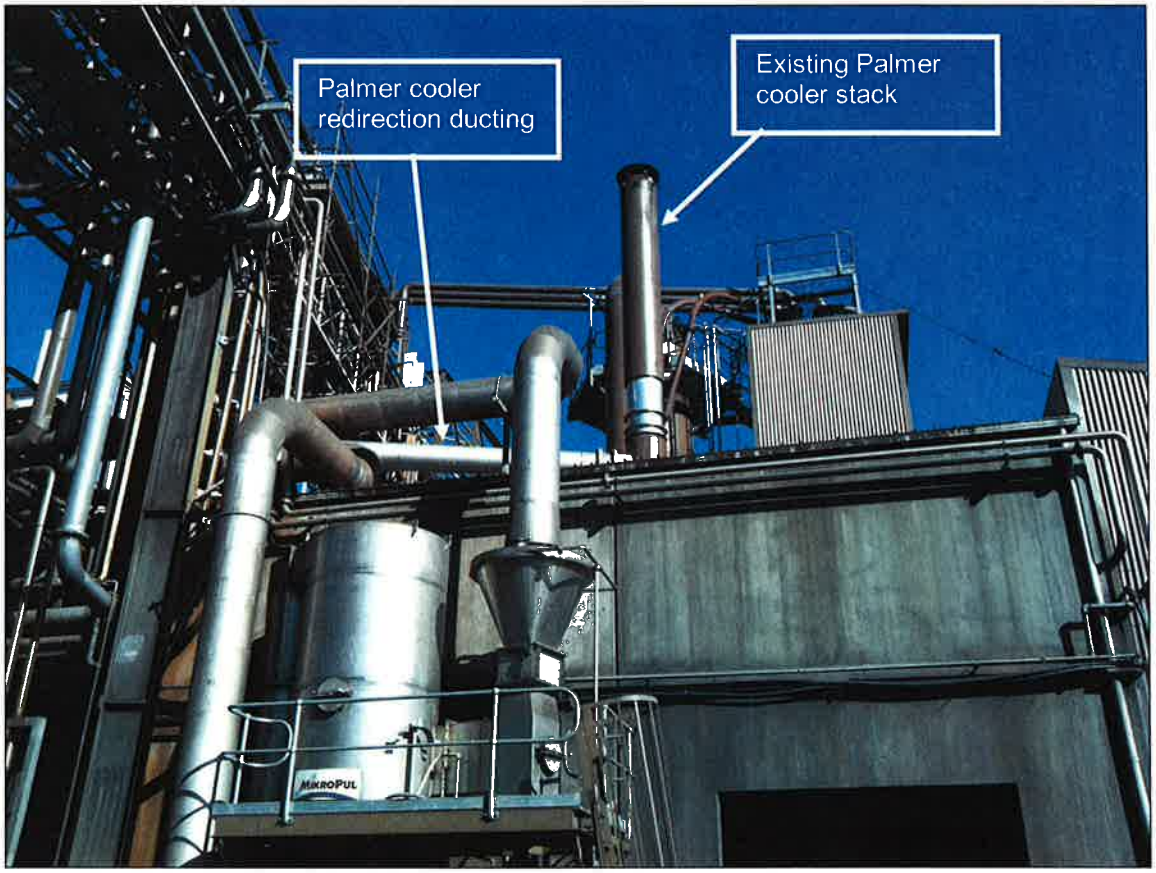


***Figure 6** - Photo showing ductwork from Palmer Cooler under construction*

**Alternate Odour Control Four – Ducting air from the DDG-Evaporator to the recently installed bio-filter for odour destruction:**

A ducting system would be installed in the DDG evaporator area to collect odourous air emissions and direct them to a bio-filter via a venturi scrubber and cyclone device (see Figure 7). The bio-filter is filled with a biological medium that destroys odours. A venturi scrubber uses high velocity air to atomise water, which traps dust particles. A cyclone device uses the centripetal force of fast moving air in a vortex to separate the trapped dust particles from the air stream to prevent bio-filter clogging.

***Figure 7** - Photograph of the recently installed bio-filter*

The proposed modification is described in full in the Proponent's application (see Appendix C).

**Incorrect terminology in the original approval**

For clarity, the Department also recommends amending the following terms in the original approval:

- the '*load-out tent*' referred to in the approval is a steel structure covered in shade cloth. The tent is mainly used for stockpiling cooled DDG for infrequent domestic clients and not for bulk loading. It is not a significant source of odour. It will be renamed the "storage tent"; and
- most truck-loading takes place inside what is referred to as the '*product storage shed*'. The "product storage shed" would instead be referred to as the "load-out shed".

The correct terms are used in this report and in the recommended notice of modification. Figure 8 shows a photograph of the DDG plant (on the left), load-out shed (middle) and the storage tent (right).

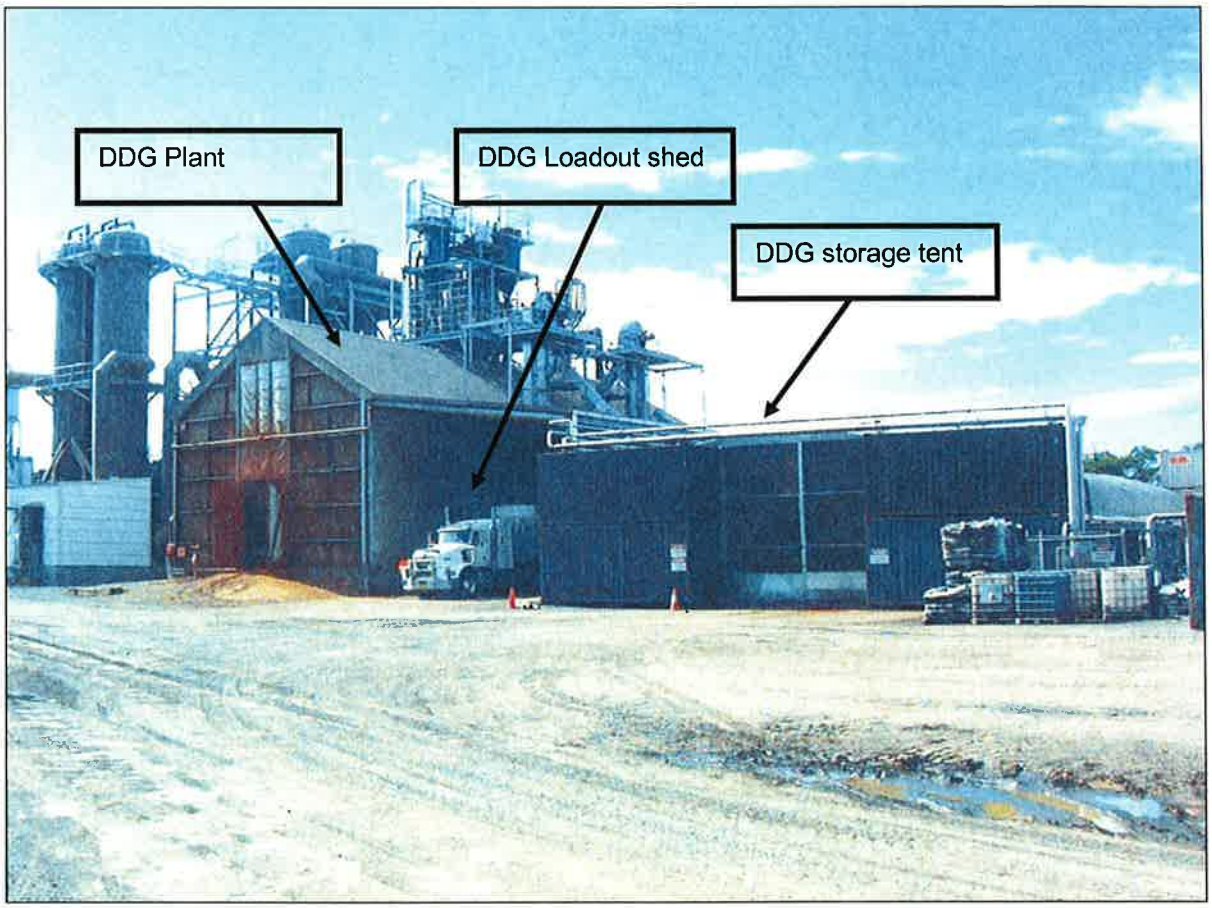


***Figure 8*** *- Photograph of the DDG plant and load facilities*

Figure 9 (over the page) highlights the part of the subject site where the proposed modification work is to be carried out.

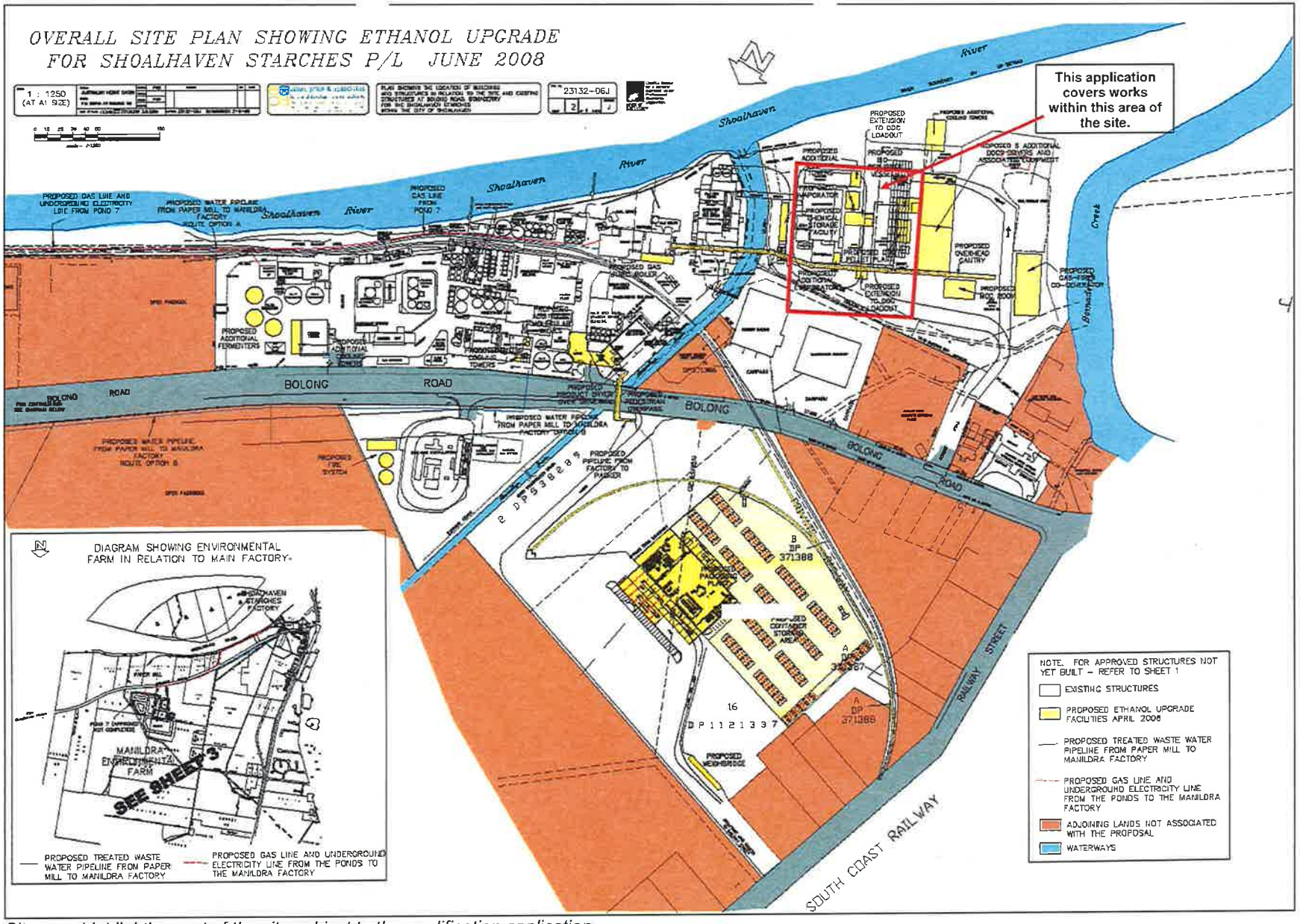


***Figure 9*** *- Site map highlighting part of the site subject to the modification application*

## 3. STATUTORY CONTEXT

### 3.1 Approval Authority

The Minister was the approval authority for the original project application, and is consequently the approval authority for this modification application. However, as the Proponent has made reportable political donations, this Application is required to be determined by the Planning Assessment Commission under the Minister's delegation of 28 May 2011.

### 3.2 Section 75W – EP&A Act 1979

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

The Department has reviewed the scale and nature of the proposed modification, and is satisfied that it can be characterised as a genuine modification to the original project as:

- it would not change the essential function or capacity of the factory, for which approval was granted;
- the potential impacts of the proposed modification would be minor; and
- the revised odour controls would be as good as (if not better than) the mandatory controls specified for the DDG Pelletiser in the original project approval.

## 4. CONSULTATION

While the Department is not required to formally notify the application, it consulted with the Office of Environment and Heritage (OEH) and Shoalhaven City Council; and sought expert advice from PAE Holmes. It also made the application publicly available on its website.

**Office of Environment and Heritage (OEH):**

The OEH (formerly Department of Environment, Climate Change and Water) supports the proposed modification provided the odour controls are implemented before the Proponent is allowed to increase the ethanol production of the facility (see Appendix B).

**Shoalhaven City Council**

Shoalhaven City Council does not object to the proposed modification (see Appendix B) and has recommended a number of conditions be imposed on the Proponent.

**PAE Holmes:**

In assessing the proposed modification, the Department sought technical advice from PAE Holmes. PAE Holmes has extensive knowledge of both the factory and environmental farm as it provided independent odour advice to the Department during the assessment of the original project approval, and recently carried out the independent odour audit of the site under the conditions of the existing project approval (see Appendix D).

PAE Holmes confirmed the findings of the recent audit which concluded:

- that the Project had made good progress towards implementing the mandatory odour controls required under the existing project approval, and should be able to increase the ethanol production rate of the factory within the next few months; and
- that the alternate odour controls for the DDG Pelletiser (which are the subject of this application) would be just as effective as (if not better than) the current controls in the project approval.

## 5. CONSIDERATION

### 5.1 Odour

The Department has assessed the merits of the proposed modification. During this assessment, the Department has considered the:

- environmental assessment and Director-General's assessment report of the original project application;
- existing conditions of approval;
- PEA Holmes's recent odour audit of the factory and environmental farm;
- documentation supporting the proposed modification;
- relevant environmental planning instruments, policies and guidelines; and
- requirements of the EP&A Act, including the objects of the Act.

The conclusions of this assessment are summarised in Table 2.

***Table 2** – Assessment of key issues*

| *Issue* | *Assessment* | *Recommendation* |
|---|---|---|
| Odour | Both the OEH and PAE Holmes are satisfied that the alternate odour controls proposed are as good as, and probably better than the existing controls required by the project approval (the DDG Pellitiser and heavy curtains at the load out shed). Consequently, they would maintain or improve the odour controls of the operation as a whole. | • Add the alternate odour controls to the list of mandatory odour controls in Appendix 3 of the project approval.<br>• Move the requirement to pellitise DDG product from the list of mandatory odour controls to the list of additional odour controls in Appendix 3 of the project approval.<br>• Require the Proponent to confirm that the biofilter is capable of accommodating the additional load from the DDG evaporator area prior to commissioning the proposed duct work to the biofilter.<br>• Update the existing Odour Management Plan to accommodate the alternate odour controls.<br>• The effectiveness of the alternate controls would be reviewed in the next Independent Odour Audit in January 2012. |
| Air Quality | • The minor construction impacts could be suitably controlled with implementation of the standard dust mitigation measures.<br>• The operational impacts would be unchanged. | No change to existing conditions. |
| Noise | The minor construction noise impacts of the proposal would not alter the noise impacts of the facility, and could be carried out within the existing noise limits | No change to existing conditions. |
| Soil and Water | The potential construction impacts could be controlled by the implementation of suitable erosion and sediment control measures. | No change to existing conditions. |
| Visual | The additional building works would be indistinguishable from the existing buildings within the large factory complex. | No change to existing conditions. |
| Biodiversity & Heritage | All building works would be carried out on disturbed land, so there would be no change to existing impacts. | No change to existing conditions. |
| Hazards | The proposal would not alter the hazards or risks of the operation. | No change to existing conditions. |

Based on this assessment, the Department is satisfied that the environmental impacts of the proposed modification would be negligible.

Along with OEH and PAE Holmes, it is also satisfied that the alternate odour controls being proposed would be just as effective as the mandatory odour controls they are seeking to replace. Consequently, the approval of these alternate controls would not water down the requirements of the original approval which were directed towards achieving substantial reductions in the odour emission of the factory and associated environmental farm before the Proponent is allowed to increase the ethanol production rate of the factory.

The Department is therefore satisfied that the proposed modification is acceptable, and should be approved subject to some minor changes to the existing conditions of the project approval.

## 6. RECOMMENDATION

It is RECOMMENDED that the Planning Assessment Commission:

- approve the proposed modification under Section 75W of the EP&A Act; and
- sign the attached notice of modification (in Appendix A).

DKitto 26/8/11

David Kitto
**Director**
**Mining and Industry Projects**

25.8.11

Chris Wilson
**Executive Director**
**Major Projects Assessment**

31/8/11

Richard Pearson
**Deputy Director-General**
**Development Assessment and Systems Performance**

SHaddad

Sam Haddad
**Director-General**

2/9/2011