



Biofuel Innovations Australia

Project Memorandum Junee Ethanol Refinery

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EXECUTIVE SUMMARY

BIOFUEL INNOVATIONS AUSTRALIA PTY LTD (“Biofuel Innovations Australia”) seeks approval for a State Significant Development (SSD) being the development of an ethanol production facility located in Junee (“Junee Ethanol Refinery”), NSW pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The proposal can be defined as a SSD because it is a development for the purpose of an ethanol plant that has a capital investment value of over \$150 million, and therefore meets the criteria in Clause 23(3) of Schedule 1 of State Environmental Planning Policy (State and Regional Development) 2011.

The Junee Ethanol Refinery will have a capacity of producing 230 mega litres (ML) annually and will include several grain storage silos, a wastewater treatment facility and an irrigation area which will be irrigated with treated wastewater as part of a wastewater recycling system.

The Junee Ethanol Refinery will operate 24 hours per day, seven days a week. It will be capable of processing a range of locally grown wheat grain. Utilising only the carbohydrate (starch) in the wheat, the primary output from the production is fuel graded ethanol to be sold to the major petroleum companies as additive to regular ULP to produce E10.

The co-products of the ethanol production process will be a dried distiller grain syrup (DDGS), and/or carbon dioxide (CO₂). DDGS will be sold as high nutrient protein meal. As it is dried, it has a long shelf life and can be transported and stored on farms without any concern about contamination. Distillers syrup is a high protein (higher nutritional value) substitute for molasses, which is widely used in feedlots for livestock nutrition. Syrup also forms a basis for the production of effective liquid biological fertilisers that improve soil and plant health, reducing the farmer’s reliance on imported synthetic fertilisers. A portion of the syrup will be added to distillers grain to improve quality, reduce energy use in drying and to help prevent dust.

The Junee Ethanol Refinery will be using off takes from existing utilities (electricity, telecommunication and portable town water supply) and raw water for the plant also will be supplied from Junee town water supply facilities.

The objective of the project is to exploit a lack of production capacity to meet current and fast growing domestic ethanol demand. The proposal is for a 230 ML plant on the Olympic Highway at Marina in NSW (near Junee). The Junee Ethanol Refinery will ultimately form part of a larger 58 hectare “green energy park” development site. Significant lack of capacity to supply exists in the market today. This makes the next move to create capacity the most advantageous, ideally positioned to sell into the undersupplied Australian market.

Biofuel Innovations Australia has recently entered into a contract for an option to purchase a 58 hectare greenfield site 10 kilometres north east of Junee, in the Junee Shire Council area. It has a 1 kilometre frontage to the main southern rail line and the Olympic Highway.

Currently Biofuel Innovations Australia has engaged several engineers to undertake an Environmental Assessment for the construction and operation of the Junee Ethanol Refinery.

This document describes the proposal of the environmental implications associated with the key issues of the proposed development and identifies subsequent management or mitigation measures.

Assessment Method

Outlined herein, key issues of odour, wastewater, water and soils, noise, air quality, flooding, waste management, visual, flora and fauna, heritage, transport and access, hazards and risk, and greenhouse are considered. All of these issues have been identified during extensive the projects initial consultation and technical review process.

Construction

Construction works are predicted to last for 12 months. Potential impacts of construction activities relate to nuisance-related dust generation, erosion and movement of sediment laden run-off from excavated or disturbed area, potentially contaminating fuel or chemical spills, minor noise level criteria exceeds at the nearby residences, construction-related traffic and the visual impact of construction equipment and materials. It is of note that the proposed site is 1.2 kilometres away from the nearest residential home.

Any impacts will be minimal and short term only and can be managed by adherence to a Construction Environmental Management Plan (CEMP) which will be developed for the project. Potential construction impacts upon ecology are discussed below.

Surface Water Management

The raw water required for the plant will be 3264 ML/day supplied by Junee's town water supply (Goldenfields Water). The water line from Junee's water supply facility to the site is already constructed and in place.

The proposed water management system will be designed to maximise recycling. All water used within the ethanol production process will be either recycled for further use within the plant following treatment, or pumped to an aerated lagoon for use of irrigation.

The aerated lagoon will be sized to limit the allowable frequency of uncontrolled discharge (which would inevitably occur as a result of prolonged rainfall events) i.e. the 75th percentile rainfall event, in accordance with NSW Department of Environment and Conservation (DEC) Environmental Guidelines: Use of Effluent by Irrigation. Modelling indicates that no leaching or soil accumulation of nutrients is predicted to occur from irrigation.

To avoid potential impacts and ensure sustainable use of the wastewater, a detailed irrigation plan will be developed prior to commencement of irrigation and following a full analysis soil infiltration rates and hydraulic conductivity of the irrigation area. The proposed wastewater management system ensures no discharges of plant wastewater or storm water from the site up to the 75th percentile rainfall event. Hence no adverse impacts to receiving waters and associated flora and fauna are expected to result from discharges of wastewater or potentially contaminated run-off.

The site is not expected to be subject to flooding and the development is not expected to impact flood behaviour in areas surrounding the site.

Air Quality and Odour

The Junee Ethanol Refinery will be constructed using a closed loop processing technology, which avoids the risk of any possible to leak of toxicity based air or odours pollutants. Any odours will be combusted (over 800°C) within a hot deodorizing furnace (using a thermal oxidation system) and exhausted to the atmosphere.

The results of air quality dispersion modelling (“assessment of spreading air pollution concentration in nearby area of the plant” – Gaussian plume equation that is attached in separate file) found that the predicted ground level concentrations were well below the relevant NSW DEC criteria. Pollution control equipment is included in the plant design to minimise emission and mitigation measures will be implemented to control particulate and odour emissions.

Wastewater and Waste Management

The Junee Ethanol Refinery will meet the requirement of NSW Waste Management Hierarchy by avoiding, reusing, recycle/reprocess and disposing of wastewater and waste. All wastewater from the ethanol production processes will be either recycled for further use within the plant or used for irrigation. For rainy season, aerated lagoon will be constructed in close proximity to the plant to store, not discharge, the treated water. Co-products of the ethanol production processes (DDGS) will be recycled and supplied to the farm for stock feed.

Accordingly, there are very few waste products to disposal outside of the production process. Plant chemical containers and routine maintenance consumables such as oil and grease will be stored in an isolated area and collected by a licensed waste contractor as required. The small amount of inert, general domestic waste generated within the site office, will be collected in appropriate bins and recycling containers for disposal by Council.

Noise

The site is located 10 kilometres north east of Junee and 1.2 kilometres from nearest residence. In the early stage of designing the facilities, noise mitigation measures will be utilised. Only equipment performing storage type functions, without the potential to generate significant noise, will remain outside of the plant.

Noise measurement undertaken by our manufacturers (please see the calculation basis for numbers on noise emission that is attached separately) found general noise levels will be 29.3 dB at all times during the day and night which is within relevant DEC criteria. Accordingly, no sleep disturbance due to the operation of the proposed facility is expected. Traffic noise level will increase nearby the plant; however this will remain below relevant limited as outlined by DEC.

Greenhouse Gas Assessment

The Australian Government has agreed to adopt the European Economic Union (EEC) Directive 2009/28/EC as the standard for its biofuels framework. This Directive has mandated a 35% reduction in greenhouse gas (GHG) emission by 2012 for biofuel production facilities (measured against production of crude oil).

Currently operating ethanol plants in Australia will struggle to achieve this benchmark. All facilities using our technology around the world, are already achieving reductions of over 50% of GHG emissions, a target not required until 2018. GHG emissions could be as much as 80%, once captured CO₂ can be commercially redeployed. Biofuel innovations Australia is adopting world's best practice and will produce the 'greenest' ethanol in Australia.

Flora and Fauna

No threatened flora or fauna species or endangered ecological communities were recorded on-site during desktop assessment or field investigation. But mitigation measures will be included in the future to address the potential for construction and operational noise, dust and lighting to deter birds from utilising the native trees surrounding the site.

Visual Amenity

Our site will be located in a key wheat growing region of NSW with ideal rail access to further wheat growing markets interstate and to the north of NSW. There are few visual receptors and none have elevated views of the site.

From the site, viewpoints from the neighbouring occupied residences are beyond visibility range. The proposed silos and grain storage bunkers will be similar to those on the adjoining properties and common throughout the nearby region. Subject to the implementation of recommended mitigation measures, operation of the Junee Ethanol Refinery, including lighting and the introduction of built form elements is not expected to adversely affect the visual amenity of the surrounding area.

Aboriginal Heritage

No aboriginal heritage sites or values associated with the site were identified during the archaeological inspection, desktop assessment. The proposal will have no impact on known Aboriginal heritage sites or values and no further archaeological work, such as excavation, collection or monitoring, is required.

On 10 February 2007, Wagga Wagga Local Aboriginal Land Council's Mr John Little confirmed "there were no findings of Aboriginal artifacts or evidence of Aboriginal Sites or stone tools" on the proposed development.

Traffic and Transport

The Junee Ethanol Refinery will be located on the Olympic Highway, 1.2 kilometres from the closest residence and 10 kilometres north east of Junee. In the construction and operation phase, the facilities are predicted to generate about 400 trips per day (200 vehicles), approximately 300 of which is expected by heavy vehicles. The predicted additional traffic volumes will not cause any affected road to exceed its potential daily traffic capacity of 3000 to 5000 vehicles per day as stated by Austroads (1998). All heavy vehicles associated with the facility will use approved B-double routes, including the designated routes through Junee to ensure any impacts are minimised.

The Operation of the Junee Ethanol Refinery will not pose a road safety issue to the external network when taking into consideration sight distances at the access point, existing traffic volumes, and the capacity of key intersection and haulage routes. In the future, it will be necessary to upgrade the site access intersection to cater for turning heavy vehicles.

Hazards and Risks

The Junee Ethanol Refinery project is considered to be “potentially hazardous”, in accordance with the definition given in State Environmental Planning Policy No. 33 – Hazardous and Offensive Development. The preliminary hazard analysis undertaken for the project identified hazardous substances handled at the site to include compressed natural gas, ethanol, sulphuric acid, sodium hydroxide, grain and high pressure steam. In accordance with Department of Infrastructure, Planning and Natural Resources (DIPNR) (1992a) Hazardous Industry Planning Advisory Paper (HIPAP) No. 6 – Guidelines for Hazard Analysis and DIPNR (1997) Multi Level Risk Assessment, hazardous incident scenarios with the potential for off-site impact, that is ethanol and compressed natural gas fires, were assessed.

It was found that the development does not have the potential for off-site impact (fatality, injury or off-site escalation) and therefore would not affect places beyond the site boundary, including nearby residences. Further studies will be prepared during the detailed design, construction and operational phases of the project.

Design of all systems with respect to fire/emergency measures and procedures will be in compliance with the appropriate Australian Standard.

Social Implications

The local region is well resourced to provide the full range of construction and operational expertise required to build and operate the refinery. It is estimated the Junee Ethanol Refinery project will inject \$150 million into the local region’s economy.

In total, an estimated 1250 jobs will be positively affected by the additional economic activity. Other benefits include: domestic supply of protein rich livestock feed and a centre of excellence for efficient fuel production and agricultural nutritional improvement, over the longer term.

The Junee Ethanol Refinery project will generate 500 jobs during construction, and 55 permanent jobs for operation and ongoing management, contributing an additional \$5 million into the local economy annually. The permanent jobs will be well paid and strongly sought-after, at an average wage of A\$78,000 per annum.

Ongoing plant maintenance will contribute a further \$1.5 million per annum to local trades. Also the purchase of grain input will inject a further \$150 million annually into the local economy and provide a stable local market for wheat growers.

1. INTRODUCTION

1.1 Biofuel Innovations Australia Pty Ltd

Biofuel Innovations Australia Pty Ltd is the corporation which is established to produce the fuel grade ethanol, dried distiller grain and syrup in the name of the “Junee Ethanol Refinery”

The vast amount of data and studies on already completed and compiled herein were collected and prepared by Biofuel Innovations Australia’s engineering and technical partner.

1.2 Identified Need for the Project

The Environmental Benefits include that:

- ❖ Ethanol is used as sustainable, renewable inputs;
- ❖ Ethanol is biodegradable, water soluble and non-carcinogenic;
- ❖ As a mix in E10, it reduces greenhouse gas emissions by 12–19% over ULP;
- ❖ Petrol engines accounted for circa 9–10% of Australia’s greenhouse gas (GHG) emissions in 2007;
- ❖ Fuel grade ethanol produced by Biofuel innovations Australia, where used in E10, will reduce CO₂ emissions by 30% and fine particle emissions by over 50% compared to unleaded petrol (ULP);
- ❖ Results in higher engine efficiency due to ethanol’s higher octane level;
- ❖ E10 will lift octane level of ULP from 91 to 94. This creates more efficient engine ‘burn’, meaning less power is required on average to produce the same motion;
- ❖ Preservation of existing natural resources, therefore slowing down depletion of Australia’s resource of light crude oil (expected to run out in 30 years at current demand levels);

- ❖ With improvement in farming and production practices, the natural photosynthetic growth and then combustion of biofuels is approaching a carbon-neutral life cycle. It represents a cyclical process of shifting carbon between the land and the atmosphere in the fast atmosphere-land-ocean carbon cycle. Therefore, the replacing of fossil fuels with biofuels means carbon, otherwise released in fossil fuels, is left in the ground and out of the atmosphere.

1.2.1 The Economic Benefits in the Community

There are a number of key economic reasons why blended ethanol will provide significant benefits to our community and why the industry is supported by government. For example, the national balance of payments is positively impacted by:

- ❖ Reduced dependence on imported fossil fuels representing 40–50% of Australia’s fuel requirements;
- ❖ Reducing importation of crude oil and refined petroleum, which make up 9.8% of total imports. E10 blend across Australia would displace the importation of around 12.5 million BBL of unleaded petrol, reducing imported refined petroleum by approximately \$1.4 billion;
- ❖ Reducing the need for Protein Meal imports for feedlot operators through the sale of protein rich distillers grains from local production.

1.2.2 Additional Economic Benefits

- ❖ Research has shown that blending ethanol will reduce average fuel prices for all users;
- ❖ Boost to regional economies – The “Juneethanol Plant” project delivers an estimated 1250 jobs (direct and indirect) and injects approximately \$200 million into the local economy per year;
- ❖ Secures a more reliable local market for Australian grain growers, through consistent demand from local ethanol production requirements. Low quality grain not suitable for human consumption can be used for ethanol production;
- ❖ Reduces reliance on grain export markets;

- ❖ The majority of Australian grain is currently exported. Reducing the need to export is an increasingly important benefit, as there are moves by the EEC (European Economic Community) to impose 'sustainability criteria' on imported grain crops to protect the local EEC agriculture industry.

1.2.3 Government Policy Driving Industry Dynamics

The Australian Federal Government has shown strong support for ethanol, recently boosting the concessional taxation environment provided to domestic producers. Furthermore, State Governments are driving demand in a move to establish ethanol volume mandates.

The NSW Government has increased mandated ethanol content from 4% of all petrol sales to 6% as of 1 October 2011. The total phase out of regular ULP (unleaded petrol) in favour of E10 has been delayed. Both targets have been delayed due to insufficient domestic supply. The increase to 6 % will require 650ML of ethanol to meet demand in NSW alone, based on current petrol consumption (current national production of ethanol is under 400ML).

Government mandated demand is projected to grow to over 1.9GL p.a. by 2019. However, Australian capacity expansion through organic growth in domestic ethanol production is estimated to grow by only 6.5% to 408ML, by 2019. Mandates are critical to drive market demand for ethanol. Between New South Wales and Queensland, a move to re-institute 6% and 5% mandate targets respectively will require 835ML.

In contrast, domestic capacity to supply will grow to only 570ML in late 2014, assuming the Juneethanol project comes into full capacity production and others expand as planned. It is anticipated that once Governments see capacity expand, mandate programs will be reinstated.

1.3 Methodology

In the assessment of the Junee Ethanol Refinery, it has included input from a range of disciplines including odour, wastewater, water and soils, noise, air quality, flooding, waste management, visual, flora and fauna, heritage, transport and access, hazards and risk, and greenhouse. Technical reports have been prepared which investigated the environmental implications of the project and provided mitigation and management measures.

2. THE LOCALITY AND SITE

The site of the proposed ethanol production facility is a 58 hectare greenfield site, 10 kilometres north east of Junee, in the Junee Shire Council. It has a 1 kilometre frontage to the main southern rail line and the Olympic Highway. The proposed site is in a strong strategic location.

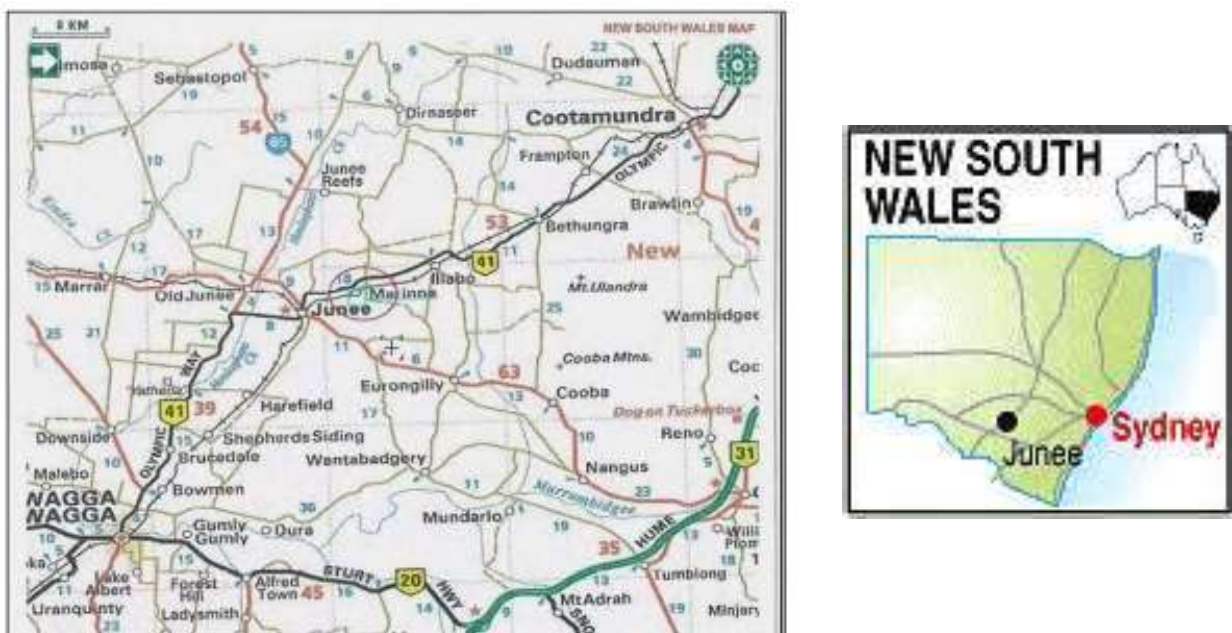


Figure 1 - Ethanol Plant Locality Map

- ❖ Central to the major agricultural area for grain supply and Distillers grain sales;
- ❖ Centrally located for Sydney and Melbourne fuel markets;
- ❖ Good transport links with direct frontage to the Olympic Highway and railway siding access to the dual train line to Sydney and Melbourne ports;
- ❖ Attractive operating costs with ample water, power and natural gas;

- ❖ Ample supply of skilled workforce;
- ❖ Strong local support from community and Junee Shire Council;
- ❖ The Option Contract provides that Biofuel Innovations Australia shall purchase the land when all planning approvals from Planning NSW are obtained.

2.1 The Ethanol Subdivision

A subdivision totalling 20 hectares will be used for construction of the Biofuel Innovations Australia Junee Ethanol Refinery. This will also allow for any future expansion of production capacity.

2.2 The Railway Siding, Silos and Crossing

A nearby railway siding provides direct access to the main southern rail line via a 600 metre rail spur and direct access to the Olympic Highway. It is proposed the rail siding, surrounding silos and land be purchased for the strategic use of the site.

It will provide the main point of access to the site. The siding has historically catered for grain and fertilizer storage and handling and remains fully operational. The rail siding will pay a crucial role in effectively managing logistics surrounding the flow of inputs and outputs, namely grain, ethanol and Distillers grain.



Figure 2 - Ethanol Plan Location Photo

3. THE PROPOSAL

The project aims to realize the environmental, economic and performance benefits of ethanol blended fuel and take advantage of the grain resource within the Riverina region of, NSW. It has been based on an extensive assessment of the environmental context of the site as well as market considerations relating to the availability of source crop, the ethanol product and the co-products of dried distillers grain (DDGS). What follows is a description of the plant, its operation and the ethanol production process.

3.1 *Plant Components*

The plant layout is shown in Figure 3 below and will have a footprint of approximately 584m x 344m, which will include as following:

No	Description	Area (unit: m)	Remark
1	Intake & Cleaning part	77 x 40	
2	Grain Storage (2000 TIB/1EA)	40 x 50	Con't paving
3	Milling Area	37 x 50	Con't paving
4	Gelatinization & Liquefaction Area	35 x 59	Con't paving + 2 floor(steel)
5	Fermentation Area	87 x 59	Con't paving
6	Distillation Area	50 x 26	Con't paving + 2, 3, 4 floor(steel)
7	Product Storage Area	60 x 80	Con't paving
8	Substation Area	20 x 45	Con't paving + Wall + Roof
9	Boiler Area & Air Compressor	70 x 45	Con't paving + Wall + Roof
10	Water Treatment Area	15 x 45	Con't paving + Wall + Roof
11	Cooling Tower Area	25 x 65	Con't paving
12	Evaporator Area	22 x 24	Con't paving + Wall + Roof
13	Dryer Area	47 x 45	Con't paving + Wall + Roof
14	Decanter	44 x 42	Con't paving + Wall + Roof
15	Syrup Tank Area		

16	Stillage Storage Tank Area	37 x 21	Con't paving
17	Control Room	15 x 10	Con't paving + Wall + Roof
18	Maintenance Team	20 x 40	Con't paving + Wall + Roof
19	Office	30 x 70	Con't paving + Wall + Roof(3 floor)
20	Loading Area	14 x 10	Con't paving + Panel Roof
21	Wastewater Treatment Area	73 x 30	



Figure 3 – (Above) Proposed ‘Junee Ethanol Refinery’ Layout

3.2 Utilities and Services

The site will be connected to the existing electricity supply network. The site will be connected to the local telecommunications network. Portable water needs will be met via a piped off take from Junee's existing reticulated water supply. A high security water license will be sought for the plant from the Department of Natural Resources (DNR). This will ensure an adequate supply of water for the production process.

The plant will operate 24 hours per day, seven days a week. It is anticipated that the on-site workforce will comprise 55 people, including six to eight administration staff that will be present during standard working hours. There will be typically three shifts. Shifts will nominally be 7am to 3pm, 3pm to 11pm, and 11pm to 7am.

3.3 Ethanol Production Process

The ethanol production facilities will be capable of processing a range of locally grown wheat. It is important to note that the technology introduced will allow for mixed grains to be used in the plant. This is unique in Australia and will allow the plant to purchase numerous types of grain including; wheat, barley, triticale, sorghum, and corn/maize.

The plant will purchase 'lower' quality grain that is not intended for human consumption and is often hard for local farmers to find a market for. This ensures that The Junee Ethanol Refinery is not constrained by the 'food for fuel debate'. Rather it will take lower quality feed grains, extract its starch (for conversion to ethanol) and the resulting bi-product is a high protein feed.

This wheat must be transported to the site and stored prior to being input into the production process. The production of ethanol involves the milling of the wheat to flour followed by a cooking, fermentation and distillation process. This process converts starch, which comprises up to 75% of the wheat to ethanol.

The ethanol to be produced by Junee Ethanol Refinery will be a fuel blend stock. This product is dehydrated (water removed) stored and at the time of dispatch to market is mixed with petrol. The co-product of the ethanol production process is DDGS which is sold as stock feed.

The following provides a detailed description of the ethanol production process:

PROCESS (1)

Wheat Intake and Unloading Process

a) Grain reception storage

For the unloading the wheat from truck and rail, intake hopper will be constructed (closed type to prevent any dust exhaust). The dust generated inside of the intake hopper when unloading will be collected and treated by bag-filtration.



b) Pre-cleaning

To remove foreign matter rather than ferrous waste from the wheat, a drum screen will be used with the dust generated during the pre-cleaning process being collected and treated through a bag filtration system.

c) Magnetic separator

For removing impurities of ferrous waste from the wheat, magnetic separator will be utilised . Ferrous waste will be collected removed for recycling.



d) De-braning

Wheat then undergoes the de-braning process with the dust generated being collected and treated through a bag filtration system.

e) Hammer Mill

By rotating disk attached hammers to high speed, the wheat will be blown and crushed. The dust of powder which is generated at this time will be collected and treated through a bag filtration system. (90m³ per minute x 5 each).



PROCESS (2)

Fermentation and Distillation Process

a) Mixing

In this mixing process, predefined quantities of the wheat flour, process water and enzyme will be mixed. These materials will be supplied and mixed with a screw mixer firstly and then sent to a further mixing tank. An agitator will mix uniformly during this process. The dust generated from the wheat flour will be collected and treated through the filtration process. Hydrogen ion concentration index will be adjusted to pH 6.2 using caustic soda.

b) Liquefaction

This process requires the liquefaction of the above mixtures. Wheat slurry made from mixtures will be stored in the tank through a number of steam ejectors. The starch in the wheat slurry which reacted with steam which will gelatinized the mixture. The mixture will then be stirred uniformly in the tank through the predetermined liquefaction timetable.

c) Saccharification

Liquefaction slurry will be transported to Saccharification tank by high pressure pumps. Enzyme will be added into the tanks, and controlled within predefined periods of time, and then changed to glucose by way of hydrolysis of starch contained in the wheat slurry. Agitator will be equipped inside tank and will make slurry to be hydrolysed. Hydrogen ion concentration index will be adjusted to pH 6.2 using HCL.

d) Pre Fermentation

Hydrolysed wheat slurry will be transported to Pre Fermentation Tank through feed pumps. With the adding a certain amount of yeast to the tank, yeast and slurry will be mixed uniformly using agitator. In this process, glucose will be decomposed, and CO₂ and ethanol vapour generated will be passed through Vent Scrubber, and at this time these will be absorbed and recovered for future use.

e) Fermentation

Pre Fermentation of slurry will be transported to Fermentation Tank through feed pumps. The slurry stored will be fermented by yeast. At this time generated ethanol and CO₂ will be absorbed and treated by Vent Scrubber for exhausting to the atmosphere.

PROCESS (3)

Distillation Process

a) Mash Tower

Mash will be fed to Mash Tower through feed pumps. Within the Tower, mash will be isolated to ethanol. Ethanol vapour and inert gas will be exhausted through the ventilation system. Through the process, ethanol vapour will be collected in vent scrubber again. This distillate ethanol will be sent to rectification process.



b) Rectification

The ethanol isolated in Mash Tower will be fed to Rectifier Tower passing through feed pump and rectified as 95.5% of ethanol by differential temperature (steam) and sent then to dehydration process. Wastewater generated in this process will be treated in wastewater treatment system.

c) Dehydration

The ethanol (95.5%) isolated in Rectifier Tower will be supplied to the Sieve Column through feed pumps and again dehydrated to more than 99.5% of ethanol and water. Ethanol vapour will be vented in exhaust system and then collected in Vent Scrubber. Wastewater will be treated in the wastewater treatment system.

PROCESS (4)

Production (Bio Ethanol)

a) Storage tank

More than 99.5% of ethanol generated in dehydration system will be stored in storage tank (2000m³ x 4 set). Ethanol vapour generated in the tank during the loading of ethanol will be collected by Vent Scrubber at venting then in exhaust system. Fire extinguisher and protective equipment will be equipped in nearby tank area for emergency fire situation. When loading ethanol, breather valve will be equipped in the top of tank in accordance to API standard to absorb ethanol vapour by Vent Scrubber.

b) Loading system

A loading system is used to load ethanol products From storage tank to tank lorry through feed pump. At this time, ethanol vapour will be generated but these vapours will be collected by vapour collection system safely.



PROCESS (5)

DDG'S Drying Process

a) Stillage Centrifuging

By using centrifuging process, whole stillage will be isolated to thin stillage (167.95 tonnes per hour) and WDG (35.32 tonnes per hour).

b) Evaporation

In the thin stillage evaporation process, the thin spillage will be isolated to syrup (32.2 tonnes per hour) and condensate (120 tonnes per hour) and then, recovered.

c) Mixing

The mixing process is to mix WDG, syrup and bran before the drying process in order to improve quality of DDGS. In this process, there is no possibility to generate any powder due to higher hydrated rate of the mixtures. But some odour will possibly be generated. Therefore any odours will be destructed using the Thermal Oxidation method.

d) Drying for DDGS

CNG which is clean energy will be used in DDGS process as drying heat sources. The powder and odours generated in DDGS process will be collected firstly by the dust collector located in rear of drying equipment and then cleaned for exhausting to the atmosphere. Also, the odours will be combusted with Thermal Oxidation method in seizing furnace of exhaust gas.

e) Cooling for DDGS

It is cooling process of DDGs after drying process. The powder will be generated when cooling air passes through the DDGS. This powder will be collected and treated in bag-filter.

f) Packing and Transportation

Cooling, transporting, storing and packing process of dried DDGs will be a sealed, closed-type of process. Any of the powder generated in this process will be collected and treated by bag-filter.



PROCESS (6)

Wastewater Treatment System in Pre-Treatment for Wastewater

a) Wastewater from Stillage Evaporation (Condensate of Evaporation)

Storage Basin - that occurs in the process of distillation of alcohol. The stillage is solid-liquid separated in centrifuge and the separated solids being transported DDGS drying process. This stillage being transported and concentrated by evaporator. Volatilized fluid is condensed in the condenser and derived condensate. ($Q=2,640\text{m}^3/\text{d} \rightarrow \text{design } 3,000\text{m}^3/\text{d}$). $1,980\text{m}^3/\text{d}$ are pumped to wastewater treatment system and the other $660\text{ (m}^3/\text{d)}$ to reservoir for 12 hours or more (BOD: $2,500\text{mg/L}$, SS: 200mg/L).

b) Wastewater from Cleaning Water

Storage Basin – The wastewater which are floor cleaning water in plant, scrubber cleaning water, backwash of the ion exchange w/w, cooling tower blow down, vacuum pump sealing water etc. (BOD: $1,500\text{mg/L}$, SS : 100mg/L).

c) Wastewater Cooling

Cooling of Wastewater – Because the temperature of condensate scrubbing wastewater is approximately 42~45°C, Indirect cooling needs to maintain 35~38°C to proper mesophilic anaerobic microorganism (45→38°C).

d) Neutralization

That is single phase digestion and a short retention time, and needs to control pH6 over as good microbial activity. (Retention time: 15 minutes)

e) Anaerobic Filter (Digestion)

Anaerobic Digestion – Consisted of two anaerobic fomenters with the gas holder on the top as the form of filter filled with media.

The digestion process begins with bacterial hydrolysis of the input materials in order to break down insoluble organic polymers, such as carbohydrates, and make them available for other bacteria. Acidogenic bacteria then convert the sugars and organic acids into carbon dioxide, hydrogen, ammonia and organic acids. Acetogenic bacteria then convert these resulting organic acids into acetic acid along with additional ammonia, hydrogen, and carbon dioxide. Methanogens finally are able to convert these products methane and carbon dioxide.

f) Aerobic Biological System

Anoxic Basin

Anoxic – Small amount of the nitrogen components which is contained in wastewater is being nitrified in aerobic system, a certain amount of nitrified wastewater is transferred and recycled and denitrified by organic carbon resources become to remove nitrogen gas in result.



Aeration Basin

Aerobic microorganism – As the wastewater being treated in anaerobic filter there have 500–600mg/L BOD. The process is treated BOD 30mg/L, T-N 10mg/L below through the aerobic micro-organism process to be utilised for irrigation.

Sedimentation Basin

Sedimentation – The process to obtain clean water after solid-liquid separation in the form of natural precipitation of generated microorganism under aerobic microorganism.

g) Thickener

The concentration of the Sludge generated from (sedimentation basin is approximated 8000ppm (0.8%) this process make it easier to sludge treatment enriched to 2% by the concentration of the sludge.

h) Advanced Treatment

PCF filtration – The process to removal SS as to be suitable for irrigation finally with PCF install - SS: 10ppm below (irrigation).

i) Aerated Lagoon

All wastewater is to be treated and recycled on site. No- un-treated wastewater or treated wastewater is to be discharged to a stream. Wet weather storage will be around 30 days for wettest month in an average year rainfall. Therefore, designed to make lagoon with aerators to store more than 30 days storm water and to avoid irrigation during to rain.

j) Sludge digestion

Anaerobic digestion - Organic waste generated in production process and final sludge generated from wastewater treatment facilities is aerobic digested so as to recycle compost. Biogas is transferred to boiler and be utilised.

k) Aerobic digestion

Because the gasified and liquefied sludge contains small amount of hydrogen sulfide, ammonia, mercaptan, organic amines, it occurs odour. Therefore, compost it to aerobic digestion and remove odour and then it spill on the farm in the form of liquid compost and install the scrubber on the top of digester. Remove the nitrogen gas in addition.

PROCESS (7)

Water Supply, Recycling and Rescue

Plant water needs will be met by a combination of raw water supplied from the Junee water supply facility and process wastewater that is treated and recycled back into the plant.

The plant will require approximately 5136 tonnes per day of raw water. Accounting for backwash from the raw water treatment facility and evaporation losses from the storage dam, 3264 tonnes per day on average of raw water will need to be supplied from Junee water supply facility to meet this requirement. We will consider re-using 1870 tonnes per day from wastewater treatment system.

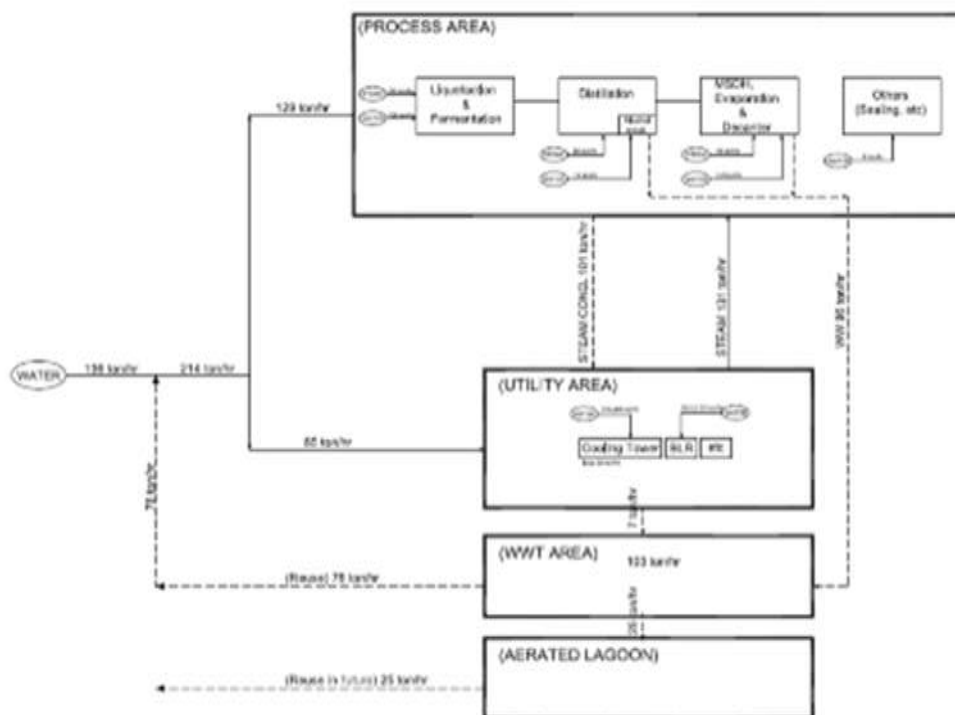


Figure 4 - Diagram of Water Usage

4. PROJECT TIMELINE

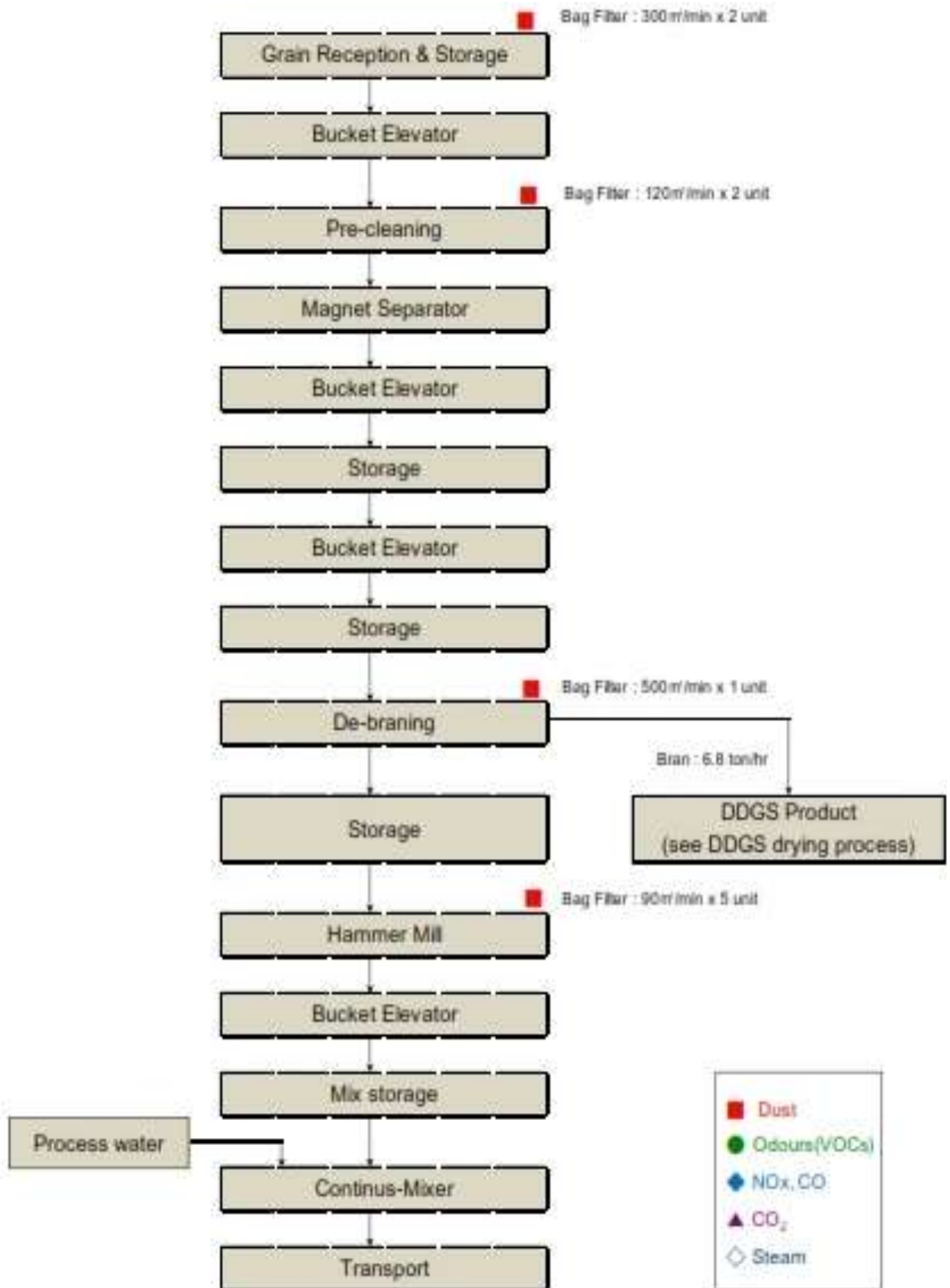
Pending project approval for the proposed ethanol facility, it is anticipated that plant construction will commence in early 2014, and continue for a period of 12 months. Plant operations would be expected to commence in mid-2015.

5. ETHANOL PRODUCTION PROCESS BY FLOWCHART

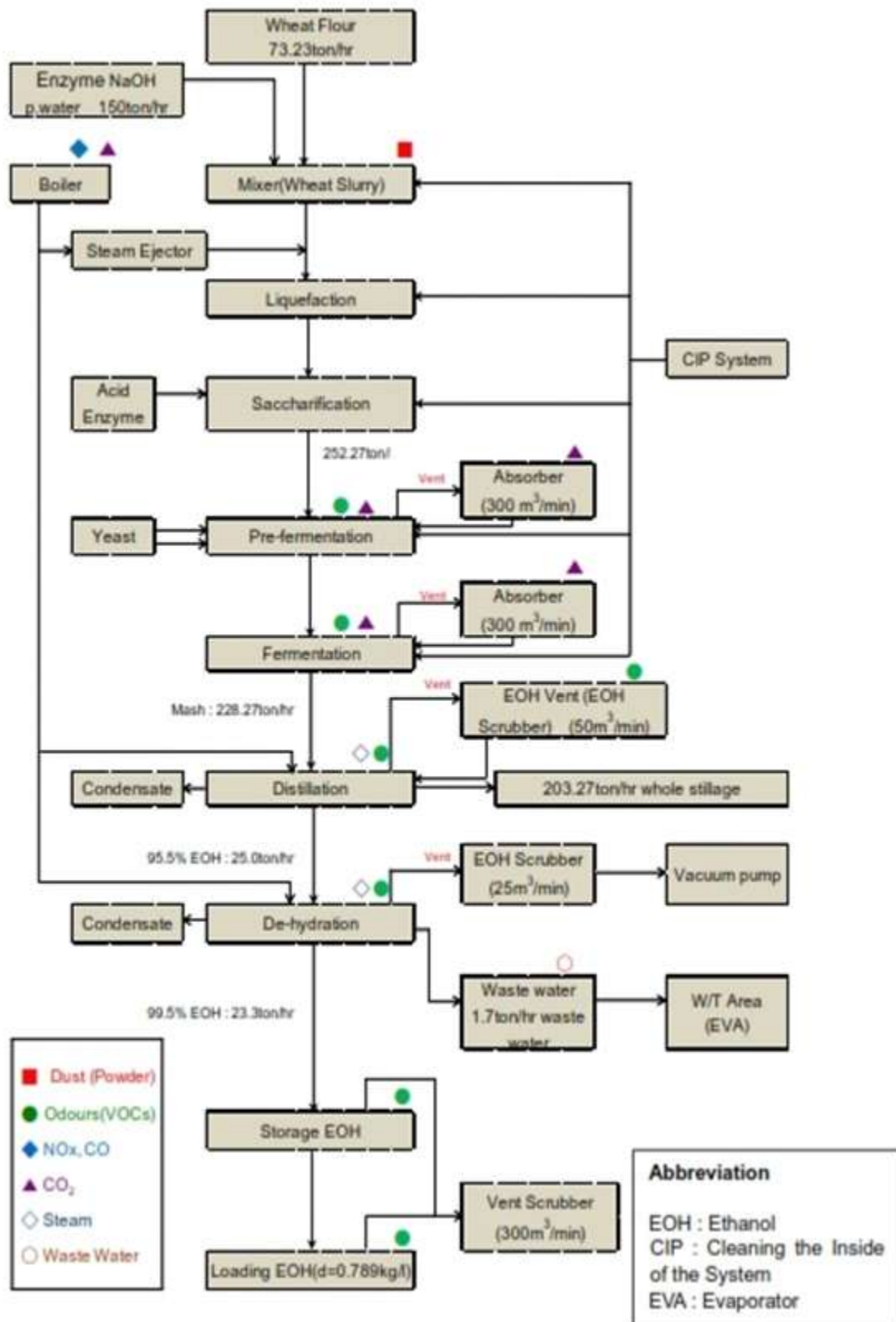
For references on each process, we attach the Process Block Diagrams as follows:

- A. Wheat Intake and Unloading
- B. Fermentation and Distillation
- C. DDGS Drying Process
- D. Wastewater Treatment
- E. Ethanol and DDGS Product

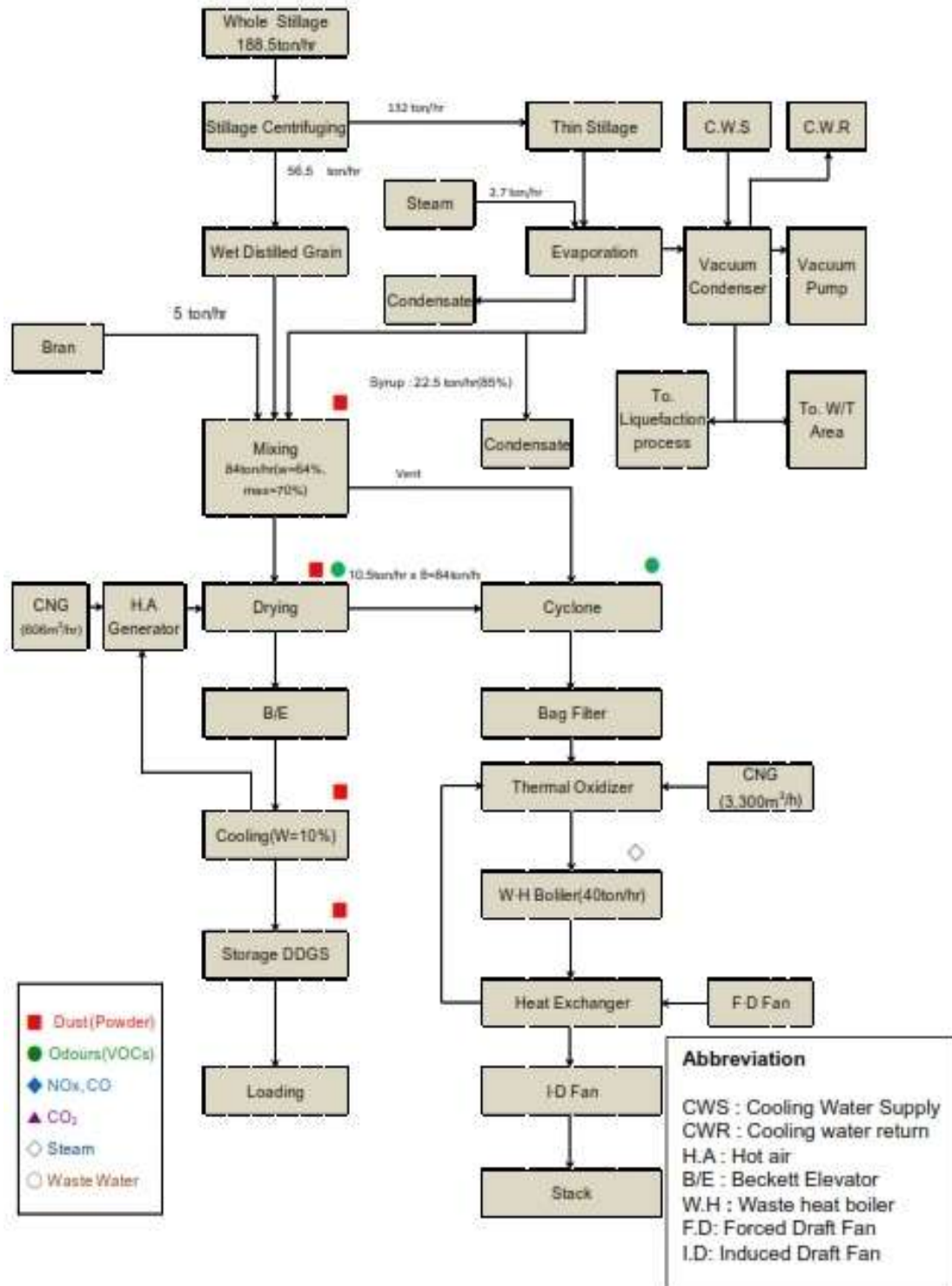
A. Wheat Intake and Unloading Process



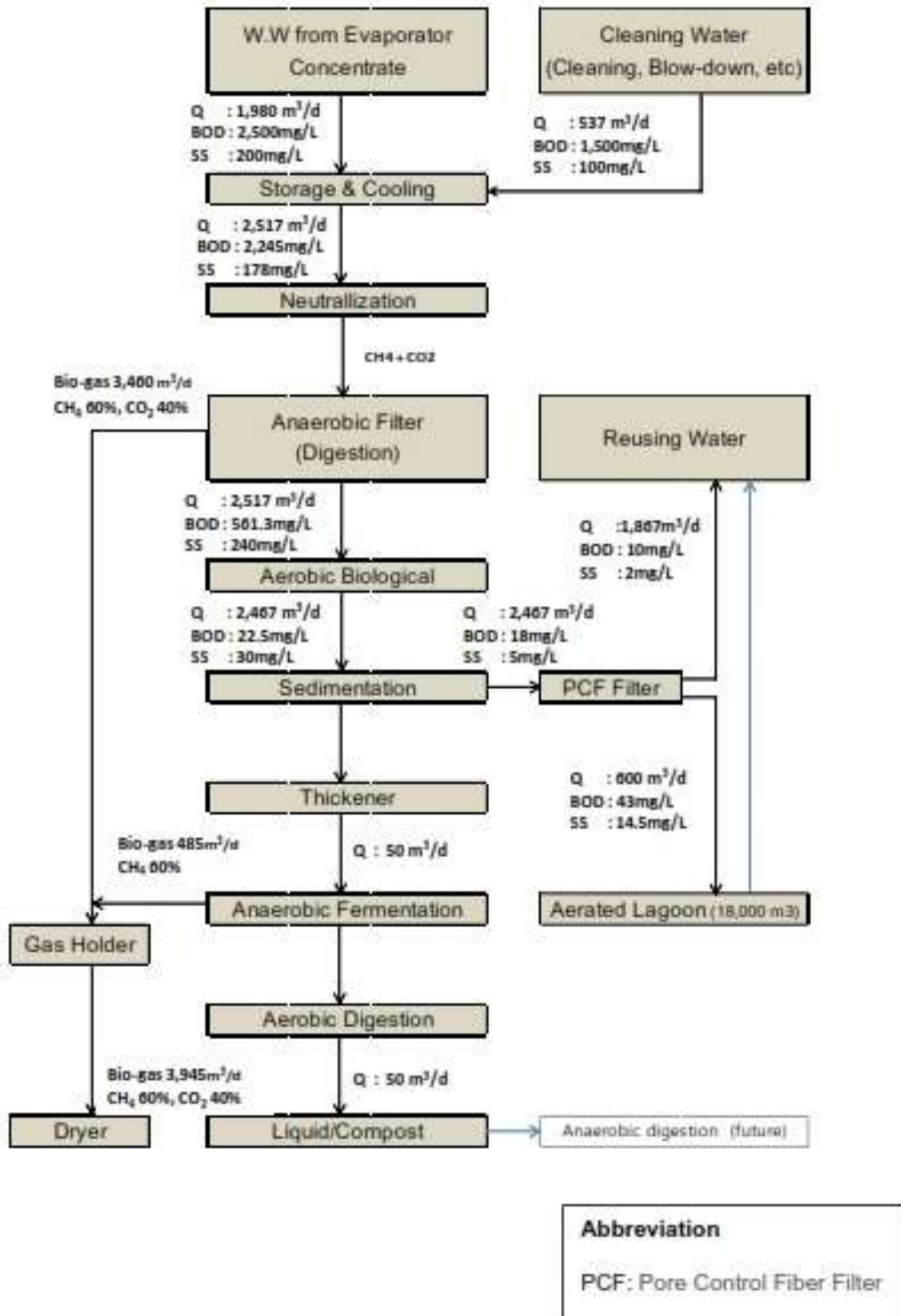
B. Fermentation and Distillation Process



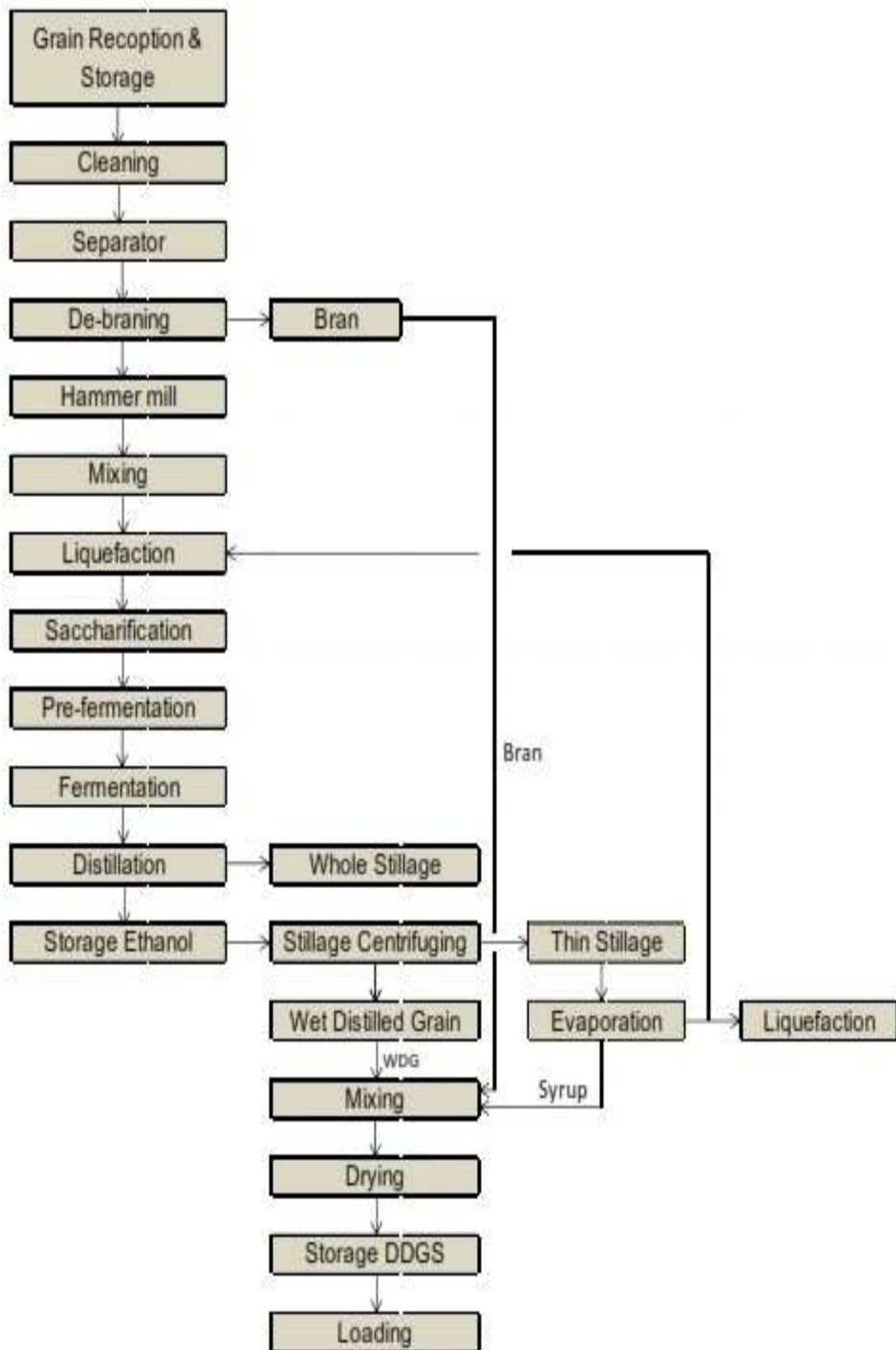
C. DDGS Drying Process



D. Wastewater Treatment Process



E. Ethanol and DDGS Product



6. PROJECT ELUCIDATION

This section of the Project Memorandum deals with the following aspects of the project:

- a) The sites suitability;
- b) Relevant environmental considerations;
- c) Product markets;
- d) Employment & job creation opportunities;
- e) Other industry contribution.

6.1 Suitability of the Site

The proposed site consists of 58 hectares located in the Junee District of NSW, which provides easy access to production inputs and a ready market for stock feed (a significant co-product of production). The site is equidistant between Sydney and Melbourne markets on the major highway which will significantly reduce transportation costs. An existing rail which form part spur off the main Sydney to Melbourne rail line also provides the site with strategic advantages for the logistics of both inputs and outputs of production.

The proposed site is currently zoned 'rural' which allows for ethanol production, the manufacturing of fertilisers and microbial formulations using agricultural products, as well as other renewable energy and bio-conversion projects.

The existing siding area on the site has historically catered for grain and fertiliser storage and handling and remains fully operational. The rail siding will pay a crucial role in effectively managing logistics surrounding the flow of inputs and outputs, namely grain, ethanol and Dried Distillers Grain and Syrup.

Summary:

- The site is central to the major agricultural area for grain supply and distillers grain sales;
- Centrally located for Sydney and Melbourne fuel markets;
- Good transport links with direct frontage to the Olympic Highway and railway siding access to the dual train line to Sydney and Melbourne ports'

- Attractive operating costs with ample water, power and natural gas;
- Ample supply of skilled workforce;
- Strong local support from community and Junee Shire Council.

6.2 Advantageous Distribution Logistics

Currently retail petrol stations are serviced by B-double road tanker trucks. As a result, there are a consistently large number of tanker trucks passing through the Riverina region, which return to their home refinery terminals in Sydney and Melbourne empty.

Ethanol can be loaded in these empty tanker trucks without requiring a 'clean out' procedure, which makes the proposed Junee Ethanol Refinery location a strategically sound location which takes advantage of filling empty petrol tankers making their way back to their respective home terminals for loading.

6.3 Environmental Consideration in Construction Stage

Comprehensive planning of the site and operation has been based on technical investigations to ensure that the proposal does not adversely impact the environmental features of the site and surrounds.

This assessment found no Aboriginal heritage sites or values associated with the site and indicated that it had low potential for archaeological significance. The site has only limited ecological values.

The plant has been located in the central portion of the site to provide separation from potentially sensitive receptors, namely local rural residences and farming operations. The plant is approximately 1.2 kilometres from the closest residence. This is to reduce potential impacts of the proposal on air quality, noise and visual amenity at these locations. Plant siting provides sufficient setback from site boundaries to ensure potential hazardous incidents associated with storage and handling of hazardous materials will not have offsite impacts. Safeguards and systems in place in the plant will minimise the risk of hazards on-site.

6.4 Air Emission Management

There is a potential for air emissions during construction, namely from construction vehicles and dust generation from earthworks. To mitigate the potential emission sources during construction, all vehicles will be maintained to an acceptable standard, vehicle speeds will be restricted to 15 km/h on unsealed roads, and where required dust will be managed by a combination of managing work schedules such that exposed areas are only stripped as construction progresses and/or wetting of bare earth surfaces and internal roads as appropriate.

6.5 Noise Management

It is anticipated that noise emissions will increase during the construction phase of the development, with likely sources including construction equipment and machinery and general construction activities. Fixed sources of noise in the immediate vicinity of the site include the North East Water Wastewater Treatment Plant and other dynamic sources of noise in the immediate vicinity may include farm machinery and vehicular traffic from the Olympic Highway. Mitigation will include public consultation in conjunction with limiting construction activities to normal work hours.

6.6 Surface Water Quality, Erosion and Sediment Management

A suite of measures are available to minimise on-site erosion, reduce and limit sediment discharged from the site and limit any adverse off-site impacts to receiving water. These include stockpiles of large areas of bare soil to have sediment controls placed on the down slope side, stockpiling of excavated soils during construction will be limited to designated locations, no go areas will be established for construction vehicles, sediment fences and low flow diversion bunds will be installed on contours where practicable to control sheet erosion, sediment barriers will be placed around storm water inlets, where practical work schedules will be arranged such that exposed areas are only stripped as construction progresses and establishment of a temporary sediment pond at the site to collect run-off from construction activities.

6.7 Ground Water Management

It is not anticipated that ground water will be impacted during construction. Excavation and foundation design will be undertaken upon the completion of a pre-construction geotechnical survey of the site, which will include consideration of the intersection of ground water. If shallow ground water is detected, the likely result will be modification of engineering design to avoid the need for ground water management by raising design depths.

6.8 Liquid and Dangerous Goods Management

During construction, the management of fuel, lubricants and other chemicals will be in accordance with the relevant standards and legislative requirements with storage and handling procedures to be developed.

Emergency procedures will be documented and emergency equipment will be available in all storage areas. Spill management will be documented and spill management equipment will be available in all areas where hazardous substances and dangerous goods are stored. All dangerous goods will be stored in appropriate containers in designated areas. Containers will be clearly and correctly labelled so the contents are easily identified.

6.9 Greenhouse Gas (GHG) Management

During construction of the proposed development, GHG emissions will be minimal, including construction machinery, associated transport to and from the site, and energy use during construction. Machinery and equipment is to be maintained in good working order, unnecessary transport movement are is to be minimised and energy will be utilised efficiently, in order to limit GHG emissions.

6.10 Heavy Vehicle Traffic

The increase in heavy vehicle traffic associated with the facility would occur along approved B-double routes. These roads are currently subject to low traffic volumes and so the predicted additional traffic volumes will not cause any affected road to exceed its potential daily traffic capacity as defined by Austroads (1988).

6.11 Water Management System

The proposed water management system has been designed to maximise recycling and beneficial use of site water. All water used within the ethanol production process will be either recycled for further use within the plant following treatment, or used for irrigation. This will minimise raw water demands.

6.12 Flooding

The proposed site is **not** flood prone. The proposed wastewater and storm water management systems will ensure no deliberate discharges of plant wastewater or storm water from the site. Hence no adverse impacts to receiving waters and associated flora and fauna are expected to result from discharges of wastewater or potentially contaminate run-off. Development of a detailed irrigation plan will avoid potential impacts from the irrigation with wastewater and ensure sustainable use of the wastewater.

7 MAIN AND CO-PRODUCT MARKET CONSIDERATION

7.1 Ethanol Market

With underlying demand for transport fuels remaining strong well into the future, market growth for ethanol as an alternate fuel or fuel additive is underpinned by a number of factors.

- ❖ Concerns surrounding peak oil and fuel security causing nations to look to alternative renewable fuels to reduce reliance on imported petroleum based fuels;
- ❖ Growing global concern for the environment creating political pressure on world governments, resulting in government policies in support of locally produced ethanol as a renewable energy, through tax concessions and mandates;
- ❖ Growing consumer acceptance of ethanol blended fuel. Sales of ethanol blended fuel grew by 35% and 34% respectively in FY 2010 and FY 2011;
- ❖ Increasing accessibility to ethanol-blended fuels, with retail outlets offering E10 growing to 1690 in Australia (1340 in NSW/QLD) in 2010;

- ❖ While all cars manufactured after 1986 are able to run E10–E15 blended fuel, industry continues to invest significantly in technology research and development;
- ❖ Worldwide shortage of octane enhancing additives, as regulation increasingly restricts the use of traditional octane enhancers (e.g. Benzene, Toluene and Xylene) and as vehicles move to higher compression ratio engines requiring 95 or 98 Octane fuels (RON 95 or 98);
- ❖ Grain exporters meeting increasingly stringent import protection from the EU and USA;
- ❖ Market in Australia will require up to 10 ethanol production facilities over the next 5–8 years.
- ❖ Federal and State Government support for economic stimulus to regional Australia;

7.2 Dried Distillers Grain (DDG)

The technology utilised in the Junee Ethanol Refinery converts the waste starch from the wheat into ethanol. The proteins, minerals and beneficial fats and acids are all left in the grain output resulting in distillers grain with a protein level, approximately 35% as compared to 12% typically in feedstock grain. With three times the protein per tonne compared to raw wheat, this high nutrient distillers grain is highly sought after by the feedlot and dairy industries for livestock feed, as well as less intensive forms of agriculture and aquaculture.

Only DDGS will be sold as high nutrient protein meal. As it is dried, it has a long shelf life and can be transported and stored on farms without any concern about contamination. Distillers grain will be sold into the Riverina, Goulburn Valley and other livestock intensive agricultural markets. Sales will be direct to regional feedlot and dairy operations and nationally thorough agricultural supply outlets.

Additionally, the rail links to major ports open us to lower cost access to export markets. New Zealand's dairy industry imported 1,209,000 tonnes of protein meal in 2010, providing an opportunity to export distillers grains from Australia. Also, due to higher protein meal it is expected that DDGS will also be a sought after export commodity for South East Asia.

7.3 Syrup

The ethanol production process also involves extracting syrup, providing a considerable energy and cost saving.

Distillers syrup is a high protein (higher nutritional value) substitute for molasses, which is widely used in feedlots for livestock nutrition. Syrup also forms a basis for the production of highly effective liquid biological fertilisers that improve soil and plant health, reducing farmers' reliance on imported synthetic fertilisers.

A portion of the syrup will be added to the distillers grain to improve quality, reducing energy use in drying and to help prevent dust.

The market is significant for syrup as a high quality substitute for molasses. Molasses, a co-product of sugar refining, is currently transported a long way from the sugar mills in North Queensland to southern New South Wales and Victoria, for use in feedlot for livestock industries. Not only will the produced syrup be of higher nutritional value than molasses, it will be produced locally for Riverina and Goulburn Valley feedlots and dairy operations. A portion of syrup will also be marketed to liquid fertiliser manufacturers.

7.4 Carbon Dioxide (CO₂)

The CO₂ produced as part of the process is almost medical grade specification. The Junee Ethanol Refinery will include technology for the capture and storage of CO₂. It can then be sold for use in the food and beverage, industrial cleaning and grain storage industries.

8. CONTRIBUTION TO RIVERINA REGION

8.1 Junee Shire – A Thriving Regional Centre

The local region is well resourced to provide the full range of construction and operational expertise required to build and operate the refinery. It is estimated the Junee Ethanol Refinery project will inject \$200 million into the local region's economy. In total, an estimated 1250 jobs will be positively affected by the additional economic activity.

8.2 Employment

The facility will generate approximately 500 jobs during construction, 55 permanent jobs for operation and ongoing management, contributing an additional \$5 million into the local economy. The permanent jobs will be well paid and strongly sought-after, at an average wage of \$78,000 per annum.

8.3 Access to Trades

Ongoing plant maintenance will contribute a further \$1.5 million per annum to local trades.

8.4 Sourcing Inputs & Commodities

The purchase of grain input will inject a further \$150 million annually into the local economy and provide a stable local market for growers.

8.5 Future Development Potential - Recycling Nutrients & Energy

Biofuel Innovation Australia and its business partners will work closely with regional grain growers, other food production industries and organic waste producers to drive sustainability through improved recycling of nutrients (including carbon) back into the soil for healthy plant production, as well as back into meat and fibre production via stock feed.

In light of this, it is envisaged the identified site will comprise a biological fertiliser plant, organic waste digesters and a range of facilities that produce nutritious stock-feed and soil conditioners. The digesters will also produce power for the ethanol plant from methane using biogas electricity generator and the surplus from the site will be sold back to the state-wide grid.

In addition, other renewable energy facilities could include solar energy and the bioconversion of green waste into electricity. Appropriate research and development will also be undertaken into whether distillers grain can potentially be processed into high protein human food and food supplements, which could provide additional revenue streams.

8.6 Zoning

The proposed site will need to be re-zoned 'Rural Industrial' from its current 'rural' designation. This will allow ethanol production, the manufacturing of fertilisers and microbial formulations using agricultural products, as well as other renewable energy and bio-conversion projects.

9. STATUTORY CONTEXT

This section of the Project Memorandum deals with the details of permits, licences and approvals required and the statutory context in which the proposal must be considered.

9.1 *Environment Protection and Biodiversity Conservation Act (1999) Cth*

The *Environment Protection and Biodiversity Conservation Act (Cth)* ('EPBC Act') requires the approval of the Commonwealth Minister for the Environment for actions that may have a significant impact on matters of national environmental significance.

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

- ❖ World heritage properties;
- ❖ Natural heritage places;
- ❖ Ramsar wetlands of international importance;
- ❖ Threatened species or ecological communities listed in the EPBC Act;
- ❖ Migratory species listed in the EPBC Act;
- ❖ Commonwealth marine environments; and
- ❖ Nuclear actions.

A review of the Department of Environment and Heritage (DEH) Protected Matters database confirmed that the site is not a world heritage property or a natural heritage place; nor does the site comprise a Ramsar wetland of international importance or a Commonwealth marine environment and does not include nuclear actions.

An assessment of the potential impact of the proposed facility on listed threatened species, ecological communities and migratory species with potential to occur in the locality concluded that no significant impact is likely. A referral to the federal Minister for Environment and Heritage is therefore not required for the proposal.

9.2 *Environmental Planning and Assessment Act (1979) NSW*

The proposed development will be assessed in accordance with the EP&A Act and the Environmental Planning and Assessment Regulation 2000.

Part 3A of the Environmental Planning Instruments (EPLs) (other than State environmental planning policies) do not apply to a “State Significant Development” as delineated in section 89J. A discussion of the State Environmental Planning Policies (SEPPs) applicable to the proposed development follows.

Pursuant to section 89J of EP&A Act, Junee Ethanol Refinery does not require authorisations under:

- ❖ Part 3 of the Coastal Protection Act 1979;
- ❖ Section 201, 205 or 219 of the Fisheries Management Act 1994;
- ❖ Part 4, or an excavation permit under section 139, of the Heritage Act 1977;
- ❖ Section 87 or section 90 National Parks and Wildlife Act 1974;
- ❖ Section 12 of the Native Vegetation Act 2003;
- ❖ Section 100B of the Rural Fires Act 1997; or
- ❖ Section 89, 90 or 91 of the Water Management Act 2000.

In addition the Junee Ethanol Refinery does not require authorisation of as follows:

- ❖ Agriculture permits under section 144 of the Fisheries Management Act 1994;
- ❖ Approval under section 15 of the Mine Subsidence Compensation Act 1961;
- ❖ Mining lease under the Mining Act 1992;
- ❖ Petroleum production lease under the Petroleum (Onshore) Act 1991; or
- ❖ Pipelines Act 1967.

9.3 An environment protection licence under Chapter 3 of the *Protection of the Environment Operation Act (1997) NSW*

The protection of the *Environment Operation Act (1997) NSW* (“POEO Act”) provides an integrated system of licensing for polluting industries. Schedule 1 of the POEO Act identifies types of development that require an environment protection licence (“EPL”).

Schedule 1 of the POEO Act includes activities involving “*agricultural produce (including dairy products, seeds, fruit, vegetables or other plant material) that crush, juice, grind, gin, mill or separate more than 30,000 tons of produce per year*” and “*that store or package chemical substances in containers, bulk storage facilities, stockpiles or dumps with a total storage capacity exceeding: (3) 2,000 tonnes of any chemical substances*”.

As the proposed facility will mill more than 650,000 tonnes of grain per year, an EPL will be sought from the DEC.

9.4 Consent under section 138 of the *Roads Act (1993) NSW*

Under section 138 of *The Roads Act 1993* consent from the RTA is required to erect a structure or carry out a work in, on or over a public road or connect a road (whether public or private) to a classified road. Consent may not be given with respect to a classified road except with the concurrence of the RTA.

The entrance to the site from the Olympic Highway will require upgrading to a standard that can accommodate truck turning movements and works will be required to locate the pipeline under the road. Minor works will also be required to the Olympic Highway intersection.

9.5 Water Management Act (2000) NSW

The *Water Management Act 2000 NSW* (WM Act) incorporates the provision of various acts relating to the management of surface and ground water in NSW, and provides a single statute for the regulation of water use and works that affect surface and ground water, both marine and fresh.

The Junee Ethanol Refinery will use Junee water supply facility to take raw water together with limited irrigation water. After treatment of wastewater, this will be stored in a lagoon for providing the water to nearby farm land and or recycling to the plant.

The Junee Ethanol Refinery will not cause any harmful impacts on surface water and ground water.

9.6 Threatened Species Conservation Act (1995) NSW

The site has historically been used for grain and livestock production. No threatened flora or fauna species or endangered ecological communities were recorded on-site or along the proposed pipeline route during the desktop assessment or field investigation.

10. STAKEHOLDER CONSULTATION

Biofuel Innovations Australia Pty Ltd (under the name of Marinna Energy) has instigated and participated in community consultations during the six (6) years the project has been in development.

Included for consideration are letters of support from:

- ❖ Mr Greg Campbell of Junee Shire Council;
- ❖ Mr Michael McCormack MP (Riverina);
- ❖ Mr Adrian Piccoli MP, (Murrumbidgee) ;
- ❖ Mr John Little (Aboriginal land Council).

Michael McCormack MP

FEDERAL MEMBER FOR RIVERINA

Mr Barney Hughes
Director
Marinna Energy
242 Summer Hill Road
Tamora NSW 2666

29 June 2011


Dear Mr Hughes

I write to support the Marina Energy's ethanol project at Junee.

This project will have significant benefits for the local community. There will be 55 permanent staff on the project which will see \$5 million in wages each year added into the local economy which will increase to \$8 million when the site is fully developed through ethanol expansion and associated industries coming on site.

The plant will require ongoing servicing which will see \$1.5 million going to local trades people each year as well as \$150 million boost to the local grain market with 850,000 tonnes of grain to be purchased. The plant will have a positive effect on approximately 1,250 jobs

In addition to economic benefits the plant will also contribute environmental benefits.

The project at Junee will introduce to the Riverina the greenest renewable ethanol in Australia that will achieve emissions savings in production in excess of 50% compared to that of crude oil.

Further the second phase of development will see additional green developments, including the commission of a nutrient recycling plant and the development of the carbon dioxide market.

This project will be a great addition not only to the Riverina but to wider Australia also.

Yours sincerely



Michael McCormack MP
Federal Member for Riverina

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Adrian Piccoli MP

Member for Murrumbidgee

Deputy Minister for Education | Minister for Education

TO WHOM IT MAY CONCERN

It is with pleasure that I acknowledge my support for Marina Energy Limited's proposal to construct an Ethanol Refinery at Junee, which is located in the heart of my State Electorate of Murrumbidgee.

This refinery will be a 250 million litre per annum ethanol plant, which will use waste starch from locally grown grain. The plant will also produce 250,000 tonnes of high protein Dried Distillers Grains for the local feedlot market, with the total capital investment in the initial stage being \$235 million.

I understand that Marina Energy have carried out considerable community liaison and consultation within the Junee community regarding this proposal. I also understand the proposal has the strong support of the Local Council (Junee Shire) and also the local community.

I am very happy to support this project as it will provide 55 permanent jobs for the area and will inject millions of dollars into the Junee and Wagga communities. It will also source grain from local growers – wheat, barley and corn. As you can appreciate, this is a huge opportunity for the area, and is something that has the potential to grow into an even larger contributor to the economy of the area.

The construction phase of the project will provide in the vicinity of 500 jobs and ongoing work opportunities for many trades people. On commencement of operations the facility will require, I believe, 650,000 tonnes of grain per year, which will be an injection of \$150 million into the local grain market.

Obviously, these figures alone illustrate the potential of this project. I have had meetings and telephone conversations with Director of Marina Energy, Mr Barney Hughes and am very excited about what he and his colleagues are developing.

It is therefore without hesitation that I give this project my full support as it is an opportunity to facilitate many, many new jobs in the Junee area through a development that is sustainable and economically and environmentally beneficial.

Please do not hesitate to contact me if you would like to discuss this letter in any further detail, as I would be happy to do so.

Yours sincerely,



Adrian Piccoli, MP

Member for Murrumbidgee

Deputy Leader of the Nationals

Minister for Education

23 June 2011



THE NATIONALS for Regional NSW

Our Ref: (1.4.4)GFSC-SML
21 June 2011



Junee Shire Council
Belmore Street Junee
NSW 2663 (PO Box 93)
Ph: 02 6924 8100
Fax: 02 6924 2497
jpc@junee.nsw.gov.au

The Directors
Marinna Energy Ltd
PO Box 482
RIVERWOOD NSW 2210

Dear Sirs

MARINNA ENERGY PROJECT

Council would like to express its wholehearted support for the *Marinna Energy Project*. We have kept informed at all stages of planning for the project and are satisfied that detailed consideration has been given to all factors. We believe it will be good for the cause of bioenergy, for South-West New South Wales and for the Shire of Junee in particular.

Marinna Energy has a site which is well chosen strategically and for its access to local infrastructure. The community will be tremendously supportive and local industries will rise to the challenges of support to the project during both its building and production phases. Junee Shire Council is an activist, progressive local government body and you may be assured that its maximum efforts will go into the facilitation of the project so far as it is able.

Please let me know if I can provide further information or assistance.

Yours sincerely



Greg Campbell
General Manager



WAGGA WAGGA LOCAL ABORIGINAL LAND COUNCIL

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Site Survey Report

Survey Name Establishment of Ethanol refinery at Marina
Conducted by: John Little
Contact No: 04120 49457
Date of Survey: Saturday 10 February 2007

Report

The proposed development is located at Marina NSW, 7 km north east of Junee. The site comprises 80 hectares, encompassing capacity lots of 1500 tonnes: Lot 1 DP533779 and Lot 1 DP533779. The existing Rail Siding is part of the proposed site.

There were no findings of Aboriginal artifacts or evidence of Aboriginal Sites or stone tools.

John Little 
Cultural Heritage Site Monitor
Wagga Wagga Local Aboriginal Land Council

11. ADDITIONAL ENVIRONMENTAL CONSIDERATIONS

What follows is indicative assessment of the key environmental issues identified as arising from construction and operation of the proposed ethanol production plant and sets out measures to avoid, minimise, mitigate, offset and manage the impacts.

Key environmental considerations identified in the preliminary assessment for the proposed facility are surface and ground water quality, traffic and transport, noise and air quality impacts and Aboriginal heritage. Additional issues considered include waste, ecological, visual amenity, social-economic considerations and hazards and risks.

11.1 Air Emission Management - Dust Plan in Construction Phase

There is potential for air emissions during construction, namely from construction vehicles and dust generation from earthworks. To mitigate the potential emission sources during construction, all vehicles will be maintained to an acceptable standard, vehicle speeds will be restricted to 15 km/h on unsealed roads, and where required dust will be managed by a combination of managing work schedules such that exposed areas are only stripped as construction progresses and/or wetting of bare earth surfaces and internal roads as appropriate.

During construction, every effort will be made to minimise the discharge of visible dust beyond the property line that will interfere with land use or violate air quality standards. The project management team will be responsible for dust control within the fence-line where such control is practicable within the prevailing climatic condition at the time control is required.

Source reduction and source improvements will take place to provide emission control through improved stockpile management; the project will focus on improved work practices related to the plants loading and load-out operations.

The project management team will carry out qualitative inspections of dust throughout the construction and pre-commissioning phases of a project site. Dust accumulators will be positioned at strategic locations on the site in order for this dust monitoring to be undertaken.

Examples of measures to be undertaken include:

- ❖ Reduction in the amount of material being handled and minimise the frequency of any stockpile surface disturbance;
- ❖ Reductions in material drop height when loading out to any stockpile;
- ❖ Covering any stockpile when practical with tarpaulin and securing the cover;
- ❖ Fugitive dust control for material handling operations and stockpiles will be through reduced handling, reduced time of stockpiling, when possible, and dust suppressants (e.g. water) under prolonged dry and windy weather conditions;
- ❖ Trucks shall not be overloaded while carrying earth, sand, gravel, stone or other aggregates while moving on/off site or temporary site.
- ❖ Bulk storage of waste sand shall be limited as far as is practicable and care shall be taken during handling to reduce dust generation.
- ❖ Drop height between excavators and transporters shall be minimised and double handling of earth in storage areas will be eliminated where possible.
- ❖ Reduce the handling of stockpile materials during prolonged windy weather.
- ❖ Speed limit shall be strictly applied in order to limit the disturbance of dust and all drivers shall be instructed to stay on approved routes to minimise off-road traffic.
- ❖ Water spray trucks or similar will be used to control dust on the site in the area of competence.
- ❖ Mud and dirt accidentally transported onto public roads via construction traffic shall be cleaned up immediately by the subcontractor responsible.

The project will ensure at all times the appropriate health, safety and environment management protocols are utilised.

11.2 Existing energy use and Greenhouse Gas Emissions in operation stages

During operation, the plant will use Compressed National Gas (CNG) as follow:

(TJ/year) or Process step	Type of energy use or greenhouse gas	Amount of tCO ₂ e/year
Fermentation (pre Fermentation + Fermentation)	CO ₂	181,440 tCO ₂ e/year
CNG combustion in boiler (fermentation)	CO ₂	5,610,164 tCO ₂ e/year
CNG combustion in drying (DDGS)	CO ₂	5,610,164 tCO ₂ e/year
CNG combustion in thermal oxidation (DDGS)	CO ₂	39,944,365 tCO ₂ e/year
Total		51,164,693 tCO ₂ e/year

The above numbers are calculated based on the follow figures

1. Total beer 203 ~ 196 t/hr				
CO ₂ gas 21.4 ~ 20.6 t/hr. average 21.1 t/hr				
CO ₂ gas : 21.1 t/hr				
2. Liquefied natural gas emission factor				
Fuel combusted	Compressed gas emission factor			Energy content factor (Gj/kl)
	N ₂ O	Gj/kl		
51.2	0.1	0.03	25.3	

11.3 Existing (future) Air Emissions

Major sources of air emissions are Intake and Unloading, Fermentation and DDGS Drying process as follow:

During the Intake and Unloading process, the dust will be generated in wheat transportation, assortment and selection processes. During the fermentation process, when producing ethanol production, odours will be generated. During the DDGS Drying Process, when water contained in DDGS evaporates during drying WDG stillage, odours will be generated. The eestimated amount of dust and odours in the processes are as follow:

Process step	Type of air emission*	Amount (grams per minute)
hopper truck unloading	Dust	21.01
Cleaning	Dust	45.02
De-bran handling	Wheat powder	10.20
Hammer milling	Wheat powder	7.20
Mixing(Fermentation)	Wheat powder	13.18
Fermentation	Odours(VOCs)	18394.69
Mixing	Wheat powder	6.3
	Odours(VOCs) Wheat powder	5037.38
	CO	1472.63
	NOx	753.38
Cooling	Wheat powder	4.99
Packing	Wheat powder	4.46

* Identify any class 3 indicator emissions

The above numbers are calculated based on the following figures:

- Hopper truck unloading: EPA Emission factor/AP- 42(9.9.1) PM 0.035lbs/grain ton
- Cleaning: EPA Emission factor/AP- 42(9.9.1) PM 0.075lbs/grain ton;
- Bran handling: EPA Emission factor/AP- 42(9.9.1) PM 0.017lbs/grain ton;
- Hammer milling: EPA Emission factor/AP- 42(9.9.1) PM 0.012lbs/grain ton;
- Fermentation as follow:

Pollution	Uncontrolled Emission Factor	Remark
Odour(VOCs)	0.35	

- Mixing: EPA Emission factor/AP- 42(9.9.1) PM 2.87lbs/DDGS ton
- Drying: Prevention of significant deterioration PSD),

Pollution	Uncontrolled Emission Factor	Remark
CO	2.87	
PM10	5.61	
PM	5.61	
Odour(VOCs)	19.19	
Acetaldehyde	0.75	
Acrolein	0.0098	
Formaldehyde	0.34	
Methanol	0.18	

- Cooling: EPA Emission factor/AP- 42(13.44) PM 0.019lbs/DDGS ton
- Packing: EPA Emission factor/AP- 42(9.9.1) PM 0.017lbs/DDGS ton

11.4 Outlining the Steps Taken for Air Emissions

Dust generated in Wheat Intake and Unloading will be collected by Vent Scrubber and treated bag-filter for exhausting to the atmosphere. Odour and CO₂ which generated in Fermentation Process will be collected and treated by Vent Scrubbers.

Mixed for stillage, bran and syrup is operated within a continuous operation mode with dust (powder) and odour generated to be vented and collected by bag-filter and exhausted as clean air to the atmosphere. The remainder dust (powder) and odour will be combusted in order to remove any harmful factors before exhausting to the atmosphere.

CNG which is clean energy will be used in DDGS process as drying heat sources. The dust (powder) and odours generated in DDGS process will be collected firstly by dust collector located in rear of drying equipment and cleaned for exhausting to the atmosphere. Also, the odours will be combusted with Thermal Oxidation unit in seizing furnace of exhaust gas.

The gas which exhausted in thermal oxidation unit has high temperature. To lower the temperature, the boiler will be equipped in rear part. And after passing through bag filter, there are possible white steams due to humid air. Therefore, white steams preventing system will be provided. After lowering THE density of exhaust gas, the gas will be vented to the atmosphere.

Cooling, transportation, storage and packing processes of DDGS will be operated in close-loop systems. Dust generated in the loading process will be collected and treated by bag-filter.

In fermentation process, odours and CO₂ will be generated in Pre-Fermentation and Main Fermentation processes. But these odours and CO₂ will be removed at over 98% of total using Vent Scrubbers

During the drying DDGS process, odours will be generated when moisture evaporates due to over 300°C of DDGS. Dust will be generated due to dried DDGS depending on ventilation speed in inside of dryer. But with the use of a thermal oxidation unit, all odours will be combusted. Bag-filter will be provided in the rear of boiler to collect any scattering dust.

11.5 Surface Water Quality, Erosion & Sediment Management

A suite of measures are available to minimise on-site erosion, reduce and limit sediment discharged from the site and limit any adverse off-site impacts to receiving water. These include stockpiles of large areas of bare soil to have sediment controls placed on the down slope side, stockpiling of excavated soils during construction will be limited to designated locations, no go areas will be established for construction vehicles, sediment fences and low flow diversion bunds will be installed on contours where practicable to control sheet erosion, sediment barriers will be placed around storm water inlets, where practical work schedules will be arranged such that exposed areas are only stripped as construction progresses and establishment of a temporary sediment pond at the site to collect run-off from construction activities.

Ground water resources are of prime importance, therefore protection of the resource shall be the focus of any protective measures adopted for site drainage and run-off.

Storm water shall be allowed to run-off to land at both site and temporary site, however run-off of storm water can cause erosion of slopes, accumulation in excavations and slippery hazardous conditions on paved and unpaved roads. The project management team will take the necessary control measures to prevent hazards from run-off through a site and temporary site survey prior to the wet season commencement. Control measures such as sedimentation pits, channelled drainage, access barriers and designated roads may be utilised.

11.6 Water Pollution Prevention and Site Drainage in Construction Stages

Storm Water /Drainage

Ground water resources are of prime importance, therefore protection of the resource shall be the focus of any protective measures for on-site drainage and run-off. Storm-water shall be allowed to run-off to land at both site and temporary site, however run-off of storm water can cause erosion of slopes, accumulation in excavations and slippery hazardous conditions on paved and unpaved roads. The project management team will take the necessary control measures to prevent hazards from run-off through a site and temporary site survey prior to the wet season commencement. Control measures such as sedimentation pits, channelled drainage, access barriers and designated roads may be utilised.

Hydro test water

Hydro test water shall come from 1 of 3 options:

1. Desalination
2. External sourcing and tanker transport or
3. Municipal tie-in.

Discharge of hydro test water may be into the drainage system, the sewer system, utilised by other contractors on the project or sent to absorption and evaporation ponds. The selected method shall be determined in due course.

Sewage Water

Septic tank facilities shall not be permitted on the site and temporary site. Single containment holding tanks providing storage of the sewage shall be installed at all ablution and washing facilities at site and temporary site. At regular and as required intervals, a “honey wagon” or sewage recovery pump truck shall remove the contained sewage where it shall be taken to a municipal sewage works for treatment and discharge. Should separation of grey water and sewage water be achieved, the grey water as non-hazardous shall be utilised for dust control.

Chemical Cleaning/Testing

Chemicals and water containing chemicals determined to be hazardous to the environment, and produced as a result of the construction and pre-commissioning processes shall be contained during use, retrieved after use and disposed of appropriately in accordance with the CECP and WMP.

11.7 The Amount of Existing Water Usage

The raw water for the plant is supplied by Golden Fields Water.

The following table describes the amount/type and process steps of water use.

Process step	Type of water use	Amount (ton/h)
1. Mixing stage (raw water)	For Processing water	129 tons/h
2. Cooling Tower Make-up	For Cooling water	55 tons/h
3. Boiler Make-up	For steam generation	30 tons/h
4. Re-used water		78 tons/h
Total (1+2+3-4)		136 tons/h

* Note: Total water needed the plant is 214tons/h. But the re-used water (treated water) from wastewater treatment system will be supplied to the applicable process. Therefore actual water needed as raw water will be 136 tons/h.

11.8 Steps Taken for Discharge of Water

Liquefaction Process:

- ❖ Hot water: Hot water coming out from the liquefaction is collected in the hot water collection tank and reused in the system.
- ❖ Hot water: Hot water used for cooling of liquefied wheat slurry is transferred into storage tank and from reused in Liquefaction section as mixing water.
- ❖ Hot stillage: this is used as thin slop after decantation process to reduce fresh water consumption in the process tower. Condensate coming out from the flash condenser after cooking of slurry is recycled in the system, i.e. sent to the pre-masher where it is used for the slurry preparation.

Fermentation Process:

- ❖ Sealing water: Pump sealing water is recycled back to the system.
- ❖ Removal of washing form fermentation: The equipment washings are sent to ETP plant for further treatment with biological process and treated water is used for process reuse or floor washings.

Distillation process:

- ❖ Pump sealing water: Pump sealing water coming is recycled back into the system.
- ❖ Vacuum sealing water: Vacuum pump sealing water coming is reused in the distillation section itself.
- ❖ Steam condensate: Sent to the steam condensate collection tank and then to boiler for steam generation.
- ❖ Hot water: Hot water coming out from the cooler is sent to the cooling tower.
- ❖ Anhydrous ethanol section:
- ❖ Effluent generated from this section is pure water and sent to polishing unit for further treatment and reuse. Equipment washing generated are separately collected and sent to effluent treatment plant for biological treatment and same stream is either reused or recycled in to main process of the plant and utilities.

Evaporation section:

- ❖ Process of evaporation is designed to take care of extra effluent generated in the process of manufacture of Hydrous Ethanol. Optimised heat transfer area and good heat transfer coefficients at all temperature gradients is considered while designing the system. System operates under vacuum and is at low temperature, hence does not require more downtime for cleaning. Thereby reducing the plant downtime required for equipment cleaning.
- ❖ Cleaning for equipment is done with close loop system i.e. CIP and effluent generated during cleaning is separately collected and sent to effluent treatment plants. Evaporated water from this system is collected in the form of condensate in a separate tank and it is transferred to condensate polishing unit for biological treatment. Treated water is used in the system thereby reducing fresh water consumption.

11.9 Zero Discharge and Wastewater Recycle / Reuse Technology

In most of the conventional ethanol production technologies, the treated effluent also yields very high BOD, COD, TSS and TDS level with colour and odour.

Based on the above mentioned fact, a treatment by which it will be possible to overcome all the problems has been developed specifically for this plant. The concept and the treatment are based on the belief that all BOD requirements should be reduced and the treated effluent coming out of the plant will meet all of the specifications applicable as per local and state level norms.

An intrinsic and critical part of any distillery/ethanol plant operation is the management of generated effluent, especially in view of growing ecological and environmental concerns

11.10 Ground Water Management

It is not anticipated that ground water will be impacted during construction. Excavation and foundation design will be undertaken upon the completion of a pre-construction geotechnical survey of the site, which will include consideration of the intersection of ground water.

If shallow ground water is detected, the likely result will be modification of engineering design to avoid the need for ground water management by raising design depths.

Existing discharge or deposits to land are as follow:

Process step	Type of discharge	Flow rate (L/day)
* Treated water from Wastewater treatment	* Treated water: (BOD 10~50mg/L)	*Water to be treated:
* Liquid sludge from Lagoon and wastewater treatment system	* Liquid sludge	2, 467m ³ /d * Liquid sludge : 50m ³ /d

11.11 Noise Management

Biofuel Innovations Australia Pty Ltd recognises that noise induced hearing loss through exposure to noise generated during the construction and pre-commissioning activities, is a consideration which must be mediated.

In general, noise may be minimised by several methods, including proper specification and purchasing of equipment with regard to noise minimisation. If equipment or process produces noise in excess of industrial standards exists, from sources such as compressors, generators, heavy equipment and others, they may be recommended for insulation, deflection, reflection or other preparation in order to minimise the noise.

Speed limitation and use of designated route by heavy machinery shall also guard against noise production. The project management team will conduct regular maintenance inspections in order to identify faulty apparatus. During site preparation, construction and commissioning activities, subcontractors shall be required to perform work in a manner that minimises the effects of noise generated.

Where noise levels above industry standard becomes unavoidable, this shall be identified by a risk assessment performed on the works.

11.12 Vibration

It is recognised that vibration can be an environmental hazard during the construction process. Primarily the sources of vibration are from hand tools using compressed air or electrically operated equipment such as jack hammers and scabble guns used in concrete breaking or chipping. Vibration is present in grinding activities, particularly in large diameter machines. Vibration is also present from plate and roller compaction machines either walk behind or ride on, used in foundation preparation.

As far as reasonably practicable, inspections and audits will be undertaken to use JHA and specific risk and health assessments, and mandatory PPE such as protective hand gloves, shall minimise or prevent risk of injury through vibration impact utilised.

11.13 Buffer Distance

Separation distances from the plant to related facilities, residents and others are as follow:

Proposed buffer distances	Recommended buffer distance
<p>Existing buffer distances include</p> <ul style="list-style-type: none"> 1.3 kilometres to areas zoned rural living; 1.8 kilometres to areas zoned multiple use; and 2.3 kilometres to areas zoned low density residential and residential 1. <p>Single residences currently located in:</p> <ul style="list-style-type: none"> - IN1Z (600 metres to NE and 800 metres to SW), - FZ (1000 metres to SE and 500 metres to ESE) 	<p>AQ286 states that the buffer distance required for industry including the Treatment of Organic Waste is 500 metres.</p>

<p>Note that there is a residence on-site immediately south of the proposed facility that is currently leased as a residential property on a month by month basis. This residence will be utilised as a site office during construction and for office type activities during operation.</p> <p>No change in buffer distance proposed.</p>	
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Proposed sound power level (dBA) and source/type of emission in each process are as follow:

Process step	Source/type of emission	Sound power level (dBA)	
		Factory Inside	Near the residence
Intake & Loading Process	Intake & Loading process area	52.2	
	Cleaning Part Room	54.2	
	De-braning room	72.8	
DDGS Drying Process	Grinding part room	72.6	
	DDGS Drying room	56.6	
	Decanter room	45.4	
Ethanol plant	indoor	103.8	
	Outdoor	78.8	

11.14 Liquid & Dangerous Goods Management

During construction, the management of fuel, lubricants and other chemicals will be in accordance with the relevant standards and legislative requirements. Storage and handling procedures will be developed.

The Construction Environmental Management Plan (CEMP) will document the nature of these dangerous goods in detail. Material Safety and Data Sheets (MSDSs) for all dangerous goods will be maintained on-site at all times. Emergency procedures will be documented and emergency equipment will be available in all storage areas.

Spill management will be documented and spill management equipment will be available in all areas where hazardous substances and dangerous goods are stored. All dangerous goods will be stored in appropriate containers in designated areas. Containers will be clearly and correctly labelled so the contents are easily identified.

11.15 Solid Waste

No solid waste will be generated from the plant.

11.16 Prescribed Industrial Waste

No industrial waste will be generated from the plant.

11.17 Greenhouse Gas Management

During construction of the proposed development, GHG emissions will be minimal, including construction machinery, associated transport to and from the site, and energy use during construction. W.E.S. will ensure that machinery and equipment is maintained in good working order, unnecessary transport is minimised and energy is utilised efficiently, in order to limit GHG emissions.

The Australian Government is adopting the European Union EEC Directive 2009/28/EC as the standard for its biofuels framework. This Directive has mandated a 35% reduction in GHG emission by 2012 for biofuel production facilities (measured against production of crude oil). Currently operating ethanol plants in Australia will struggle to achieve this. All facilities using our technology around the world, are already achieving reductions of over 50% of GHG emissions, a target not required until 2018. Biofuel Innovations Australia reduction of GHG emissions could be as much as 80%, once captured CO₂ can be commercially redeployed..

11.18 Waste Management

Resource NSW, a State Government agency created under the *Waste Avoidance and Resource Recovery Act* (2001) (WARR), produced the WARR Strategy in 2003. The operating principles of the Strategy emphasise a life cycle approach to waste prevention.

Two key areas identified by the Strategy are the avoidance and prevention of waste and the increased use of renewable and recovered materials. The State Government also recognises the need to reduce waste as a means of promoting ecological sustainability.

The proposed facility will incorporate waste reduction strategies in accordance with NSW Waste Management Hierarchy: avoid, reuse, recycle/ reprocess, dispose. The proposed facility requires an Environmental Protection Licence from DNR under POEO Act. It will involve the handling and production of waste from a limited number of sources:

- ❖ Co-products of the ethanol production process (DDGS);
- ❖ Surplus treated wastewater from the plant;
- ❖ Sewerage/wastewater from the plant and office amenity buildings;
- ❖ Used chemical drums and the like;
- ❖ Used oils, filters and machinery parts; and
- ❖ General office and administrative waste.

11.19 Co Products

Co-product in the plant is DDGS. DDGS is 90% solids and only 10% water and has a useful shelf life of over 12 months. Accordingly, it can be packaged and economically transported over long distances and may be marketed locally, nationally and/or internationally. DDGS will be preferentially sold to intensive agriculture facilities within the Junee region, though it may be marketed further afield if there is a reduction in local demand.

11.20 Ethanol Refinery Processed Wastewater

The proposed wastewater management system has been designed to maximise recycling and beneficial use of site water. All water used within the ethanol production process will be either recycled for further use within the plant following secondary treatment.

Chemicals, Oils and Filters

Plant chemical containers and routine maintenance consumables such as oil and grease for equipment and site vehicles will be stored in a bundled area and collected by a licensed water contractor as required. A portion of this waste stream would be classified as 'solid' or 'hazardous wastes' under DEC (1999) guidelines.

11.21 General Waste

A small amount of 'inert', general domestic waste, such as paper, cardboard and packaging, will be generated within the site office. It will be collected in appropriate bins and recycling containers for disposal by Council.

11.22 Flora and Fauna

Marinna Energy Pty Ltd conducted Preliminary Environmental & Planning Review for the site at 2007. In this report attached entitled *National Parks & Wildlife Atlas – Flora*, they mentioned a list of threatened flora sighted within the Junee LGA from 1891-2004.

Specifically the National Parks & Wildlife Atlas listing the 11 threatened species sighted within the Junee LGA over the period 1891-2004. It is of note that none of the identified species are within 5 kilometres of Junee Ethanol Refinery site,

11.23 Visual Amenity

The Junee Ethanol Refinery site will be located in a key wheat growing region of NSW with ideal rail access to further wheat growing markets interstate and to the north of NSW.

There are few visual receptors and none have elevated views of the site. Because of the 1.2 kilometres distance from the few residences (2 housing) from the site, viewpoints from the neighbouring occupied residences are beyond visibility range.

The proposed silos and grain storage bunkers will be similar to those on the adjoining properties and common throughout the nearby region. Subject to implementation of recommended mitigation measures, operation of the plant including lighting and the introduction of built form elements is not expected to adversely affect the visual amenity of the surrounding area.

11.24 Riverbank Stability, Riparian Management & Flooding

The proposed Junee Ethanol Refinery site, located at Lot 2 DP 970464 Warns Gate Lane Olympic Hwy Junee NSW 2663, is in a flat to slightly undulating field. This field has grown grains and pastures for livestock for decades.

Therefore, there are no rivers surrounding the site, and needs not to consider the Riverbank Stability, Riparian Management in this stage. But preventing any possible problem in the future, all relevant measures will be considered in the assessment of environment impacts.

12. CONCLUSION

Biofuel Innovations Australia seeks project approval for the development of an ethanol production plant at Junee. This facility is capable of producing 230 ML annually and will include several holding dams, a wastewater treatment system and lagoon. Due to our ZERO discharge system, the plant will contribute to eco-friendly system as well as the economic wellbeing of the community while fostering economic growth in the region.

13. APPENDICES

Included for consideration are the following supporting technical reports and information:

- 1) Noise Emission Calculations;
- 2) Gaussian Plume Equation;
- 3) Water Waste Treatment System;
- 4) Detailed Technical Drawings.