

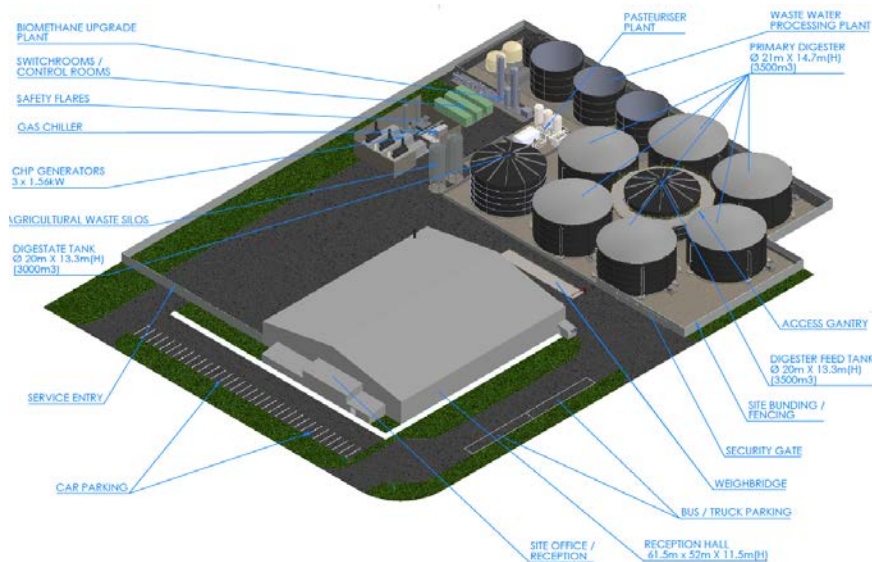
DeLorean Energy

Construction of a waste to energy anaerobic digestion plant. Removal of 7 regulated trees and 11 significant trees. Installation of signage.

1-2 Gidgie Court, Edinburgh Parks
361/L007/18

TABLE OF CONTENTS

	PAGE NO
AGENDA REPORT	1-40
ATTACHMENTS	
1: PLANS	41-53
2: APPLICATION DOCUMENTS	
a. Certificate of Title	54-56
b. DA Form	57
c. Planning Report	58-84
d. Arborist Report	85-138
e. Design Report	139-184
f. Environmental Report	185-254
g. Environment Management Plan	255-287
h. Stormwater Management Report	288-294
i. Traffic Turnpaths	295-298
j. Lighting Plan	299-301
k. Landscaping Plan	302
3: MAPS & PHOTOS	303-306
4: AGENCY COMMENTS	
a. Environment Protection Authority	307-337
5: CITY OF SALISBURY COMMENTS	338-343
6: REPRESENTATIONS	344-381
7: RESPONSE TO REPRESENTATIONS, COUNCIL AND AGENCY COMMENTS	382-391
8: ADDITIONAL INFORMATION	Separate Attachment
a. Responses to EPA	
9: DEVELOPMENT PLAN PROVISIONS	392-400
10: SUPERCEDED DOCUMENT	401-446
a. Design Report	



OVERVIEW

Application No	361/L007/18
Unique ID/KNET ID	2018/14874/01 & 02
Applicant	DeLorean Energy
Proposal	Construction of a waste to energy anaerobic digestion plant: organic waste reception, storage, treatment and disposal; and production of electrical energy, bio methane and thermal heat. Removal of 7 regulated trees, 11 significant trees. Installation of signage.
Subject Land	1-2 Gidgie Court, Edinburgh Parks
Zone/Policy Area	Urban Employment Zone
Relevant Authority	State Commission Assessment Panel (Sch 10, 1 - SAHT, LMC, Mining & Landfill development)
Lodgement Date	29 June 2018
Council	City of Salisbury
Development Plan	Salisbury Council Development Plan (Consolidated 15 December 2016)
Type of Development	Merit
Public Notification	Category 2
Representations	4 valid representations, 1 invalid representation
Referral Agencies	Environment Protection Authority
Report Author	Janine Philbey, Planning Officer
RECOMMENDATION	Development Plan Consent subject to conditions

EXECUTIVE SUMMARY

The applicant, DeLorean Energy (DeLorean) proposes the construction of an anaerobic digestion and waste to energy facility. The application includes tree damaging activities, signage, car parking and landscaping.

The facility comprises a receival shed and associated office with several digestive tanks.

The tanks will be connected to gas improvement systems which upgrade the quality to methane gas. A combined heat and power generator system is proposed to generate electricity to run the plant and export to the network.

The process is fuelled by organic materials and packaged materials with de-packaging undertaken on site within the receival shed.

The processing of materials will also generate waste water which will be treated on site and recirculated through the system or exported to Salisbury Water infrastructure. Solid waste materials will also be generated and provided to Jeffries Soil as a by-product.

The proposal was publicly notified as Category 2. The four representations received raised issues such as odour, noise, air quality and potential impacts on existing businesses. The applicant has responded to these issues in details in the body of this assessment report.

A referral was also made to the Environment Protection Authority (EPA). Several issues were raised by the EPA relating to the interface between land uses, air quality, waste management, water quality and the applicant has responded to these within the body of this assessment report. The facility will also require to be licenced by the EPA.

Subject to appropriate conditions, such a facility is appropriate in a zone that accommodates a range of industrial uses.

ASSESSMENT REPORT

1. DESCRIPTION OF PROPOSAL

The nature of the development was determined to be an undefined land use containing components of general industry, waste management and renewable energy generation.

The development comprises the following:

- a facility that converts waste to energy through anaerobic digestion,
- associated site works, landscaping and signage.

It was determined that the development does not constitute a form of special industry as defined in the *Development Regulations 2008* Schedule 1 as it does not emit odour which may be offensive or repugnant. This conclusion was reached following an assessment of the proposed design of the facility, mitigation measures and advice from relevant State Government agencies.

A summary of the proposal is as follows:

The applicant proposes construction of a waste to energy plant at Edinburgh Parks in northern Adelaide. It is expected the plant infrastructure would operate 24 hours a day, 7 days a week using approximately 125,000 tonnes per year of organic waste per year to produce 4.7 MW electricity and 21.7GJ/hr biomethane gas and 4.9MW of thermal heat.

The site consists of large areas of hard stand surrounding the receival shed to provide for the large vehicles accessing the site. There is some car parking to the south of the receival shed for staff and visitors.

The western aspect of the site is adjacent Northern Adelaide Waste Management Authority (NAWMA) and is landscaped with a mixture of regulated and significant trees which will be trimmed by an arborist to allow construction and operation.

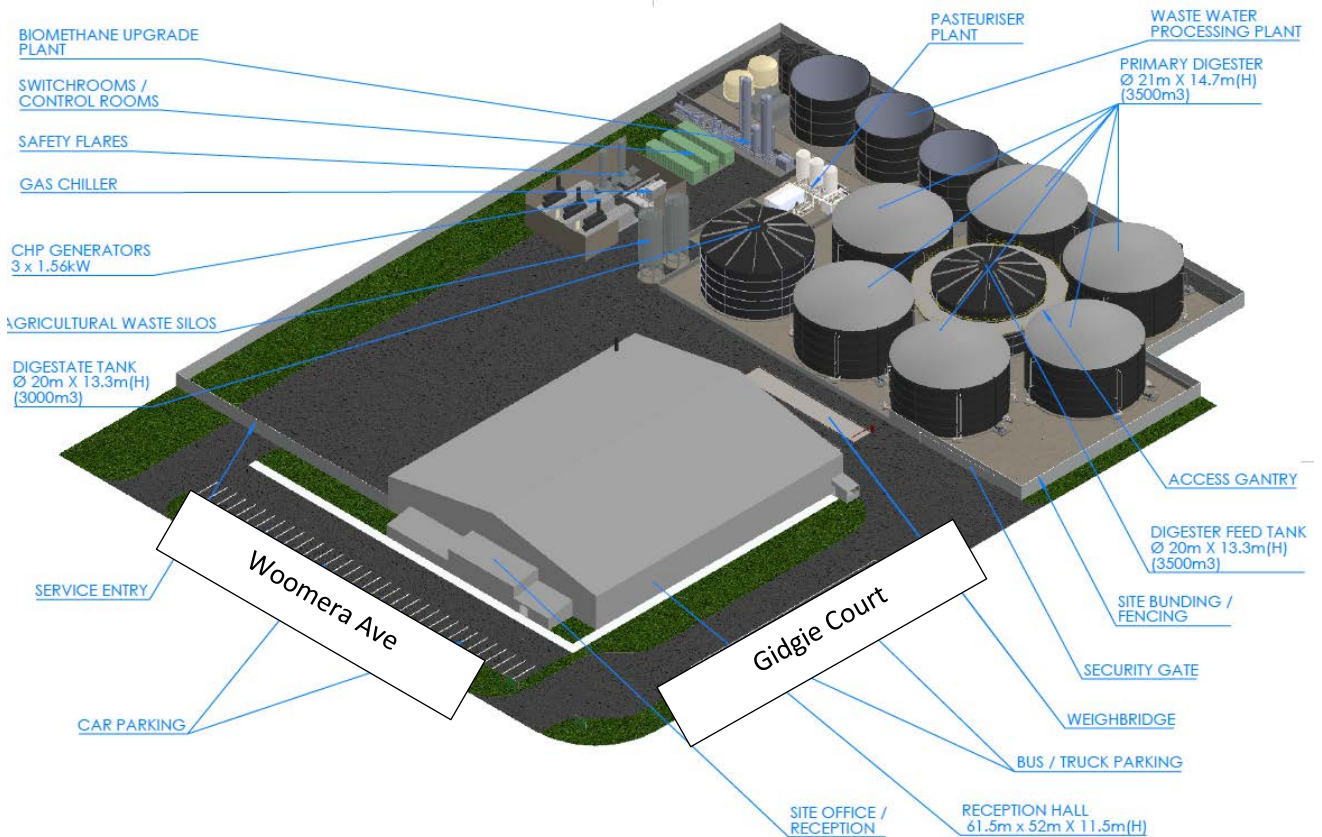
Building Height	Digester tanks – 14.7m tall Reception hall – 12.2m tall
Site Access	Via Woomera Avenue and Gidgie Court
Car and Bicycle Parking	33 car parks 2 truck/bus parks

Materials to be recycled within enclosed machinery include:

- Agricultural waste – damaged grain, fruit & vegetables;
- Industrial food manufacturing waste – peels, piths, pips, seeds, and other by-products, out of spec or damaged products from canneries, dairy manufacturers, abattoirs and other food manufacturers; and
- Out of date products from supermarkets, waste food, grease trap waste.

There are three main aspects of the built form to be assessed in this development application – being the receival shed where materials are delivered, the in-vessel anaerobic digestion process and lastly, the gas management and power utilities.

Site preparation works are expected to consist of foundations for equipment, tanks and shed as pad/strip footings, raft footings or ground slab with integrated thickenings.

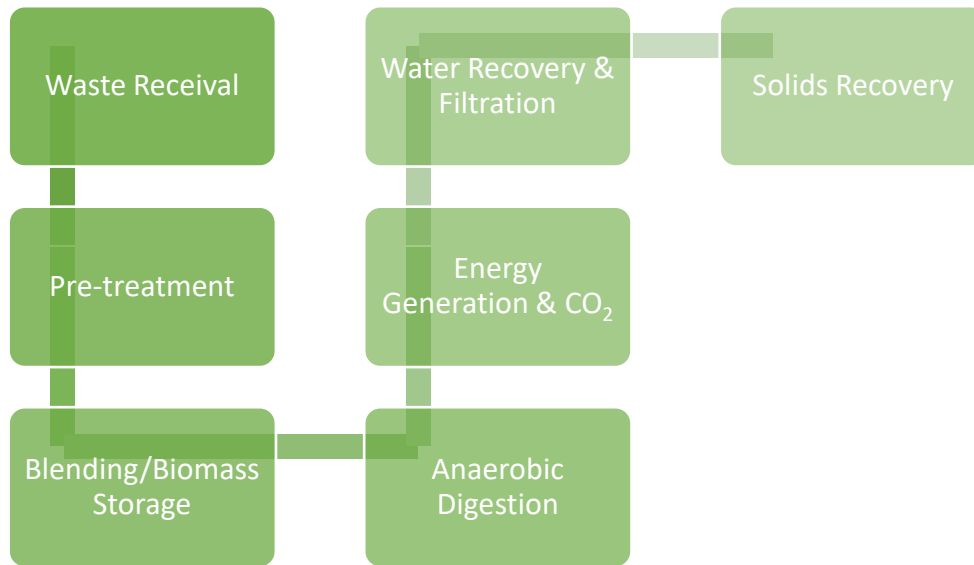


The shed structure is proposed to measure 61.5m long X 52m wide X 12.2m tall. In addition, the site will consist of the following:

- Site fencing & bunding
- 33 X light vehicle parks
- 2 X truck/bus parks
- 2 X weighbridges
- 2 X agricultural waste silos
- 6 X primary digesters – 21m diameter X 14.7m tall
- Wastewater processing plant
- Digestate tank – 20m diameter X 13.3m tall
- Pasteuriser plant
- Biomethane upgrade plant
- 2 X safety flares – 1.7m diameter X 8m tall
- 1 X gas chiller
- Associated switchrooms/control rooms
- 3 X 1.56kw combined heat and power generators (CHP)
- Associated acoustic fencing

The receival shed roof and site area will either be drained to sumps on site, to the wastewater treatment plant or to Salisbury Council's water supply.

In their application the proponent has detailed the anaerobic digestion process which is summarised as:



The section below describes the process and application details are contained in the ATTACHMENTS.

1.1 Delivery of waste

The proponent expects up to 125,000 tonnes of material to be delivered to the site, from commercial and agricultural businesses per year.

All materials will be weighed and inspected by relevant persons on site. The materials will be tested for physical and chemical properties on an as-needs basis to record the details for quality assurance. Non-conforming loads will not be accepted.



Figure 1 - image of delivery - liquid waste (supplied by applicant)

Trucks will access the facility via Woomera Ave and Gidgie Court through to a weighbridge to determine the weight of the onboard load.

The site has been designed to accommodate service vehicles (vans up to 8.8m long), semi-trailers (19m long) and B Doubles (26m long). Passenger vehicles are expected to use the carpark adjacent Woomera Avenue only.

The facility can take delivery of up to 5 trucks (within the shed) at any one time with a traffic light system managing on-site vehicle movements.

Doors on the facility will close within 30 seconds for tipping and pumping of materials, with weight sensors activating the doors.



Figure 2 – image of delivery of solid commercial organic waste (supplied by applicant)

The receival shed has a capacity to store approximately 770 tonnes/48 hours of material. Partitioning through curtains is proposed by the applicant in their design report to separate the odour producing areas from the rest of the shed.

Agricultural grain silos will have approximately 200 tonnes/48 hours of capacity, with materials transferred by enclosed blower system, while liquid waste will be delivered and pumped directly into a sump.

The applicant's environmental report details the bulk dry solids to consist of grains, whole fruits, vegetables and food processing wastes.

Potential odours would be controlled via a biofilter and humidifier unit with misting nozzles and fans inside the air extraction pipe – this would generate 4-5 complete air changes per hour. The biofilter is technically specified to deliver <math>< 500 \text{ OU/m}^3</math> (a measurement of levels of odour). The applicant states that the biofilter is a porous rock formed by fossilised sea sponge which is maintained in an enclosed, humid environment to create the ideal conditions for odour eating bacteria.

A standard operating procedure will be in place as well as a periodic maintenance regime. The regular and ongoing maintenance program provides the optimum level of bio filtration operation.

Extracted air is captured through internal ducting (as shown in figure 3) and passed through a biological air scrubber (spongolite) which 'eats' the odour bacteria.

The applicant has proposed cooling insulation through wall cladding and flooring of the building which is expected to prevent or slow down the premature decomposition and associated potential odours.

The applicant states that all solid materials will be loaded into the processing plant by the close of each business day and a wash-down process will be undertaken in order to prevent odours or accumulation of materials.

In order to prevent further odour or contamination outside of the subject site trucks will be washed before leaving the site.

1.2 Pre-treatment

Once the organic wastes have been delivered, these materials will be tipped into concrete receival bays for a front-end loader to transfer into feed hoppers to enable shredding and pulping.



Figure 3 - image of pre-processor & depackager (supplied by applicant)

The proposal indicates that four pre-processing units (shown above in Figure 3) have been allowed for in the design and layout which separates the packaging from organic waste. Each pre-processing unit has a capacity of up to 12-15 tonnes per hour. The resultant solid materials are recirculated with liquid to provide a pumpable organic sludge.

Packaging materials are removed and recycled as per agreements with clients.

1.3 Blending/Biomass Storage

The slurry resulting from the pre-treatment process is blended with other materials and pH levels are tested to maximise digestion and the resultant biogas yield.

1.4 Anaerobic Digestion

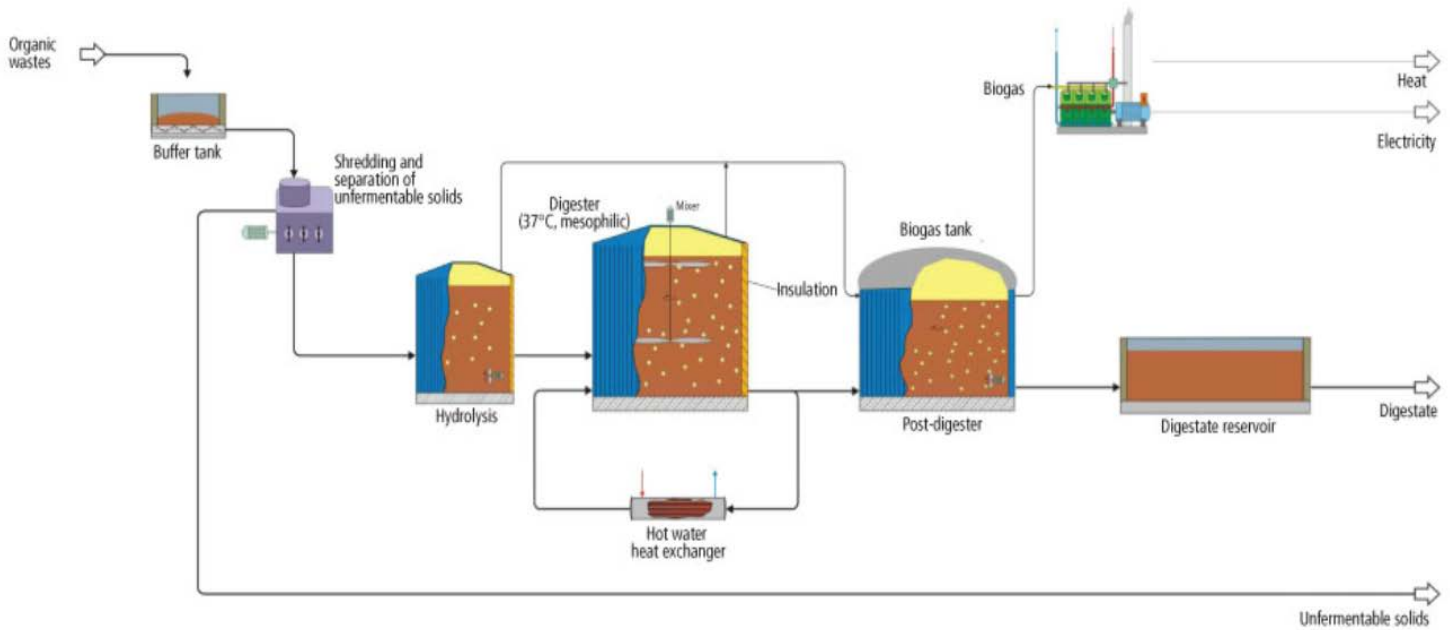


Figure 4 - anaerobic digestion process (supplied by applicant)

The central component of the development proposal is conversion of waste to energy through the anaerobic digestion process, with the materials delivered to site undergoing a series of biological breakdowns to produce biogas which is then upgraded through another biological process to LPG quality.

In order for the materials to be biologically broken down a series of pressurised and heated tanks are used in a closed system.

The hydrolysis tank will have capacity to store 3,500m³ of biomass and is enclosed and all gasses produced are captured and treated. The materials are mixed with water and agitated for approximately 5 days at 30-40 degrees Celsius to encourage the organic breakdown.

The materials are then moved to the six digester tanks which have capacity to store 3,500KL of biomass each (total 21,000KL) and is enclosed with all gasses produced captured and treated. The material will cycle between the tanks at high temperatures to enable pasteurisation.

The pasteuriser has a capacity of approximately 22T/hr and is enclosed, this is a modified pipework system through to the hydrolysis tank.

Through their design report, the proponent indicates that the mesophilic digesters would undertake the primary breakdown and digestion of materials at 38 degrees Celsius. Material will be contained within the digesters for up to 30 days, and with a high sugar content expected from the material, it is expected that 95% of the energy will be exhausted within 20 days from input. The applicant's Design Report states that the digesters will receive approximately 5m³ of material per hour.

Within the digesters are mixing nozzles which turn the contents and encourages digestion while drawing biogas from the roof space through a vacuum on the connection side. This improves yields and take-off through hydrolysis. A surface mixing nozzle breaks up caking or crusting of surface materials.

The pressure of the digester tanks is not expected by the applicant to reach more than that of a household gas stove; this will be monitored by systems on site.

A 3000m³ digester discharge tanks is proposed (post digester as shown in figure 5), with the waste hydrostatically pressured from the digester tanks. Any gas will be fed back to the digester tanks. The discharge tank actively mixes the dry and liquid materials before being spun in a centrifuge machine for 8 hours a day, 5 days a week.

Following this process, the materials are separated by the centrifuge with 30% expected to be dry solids and considered to be bio fertiliser.

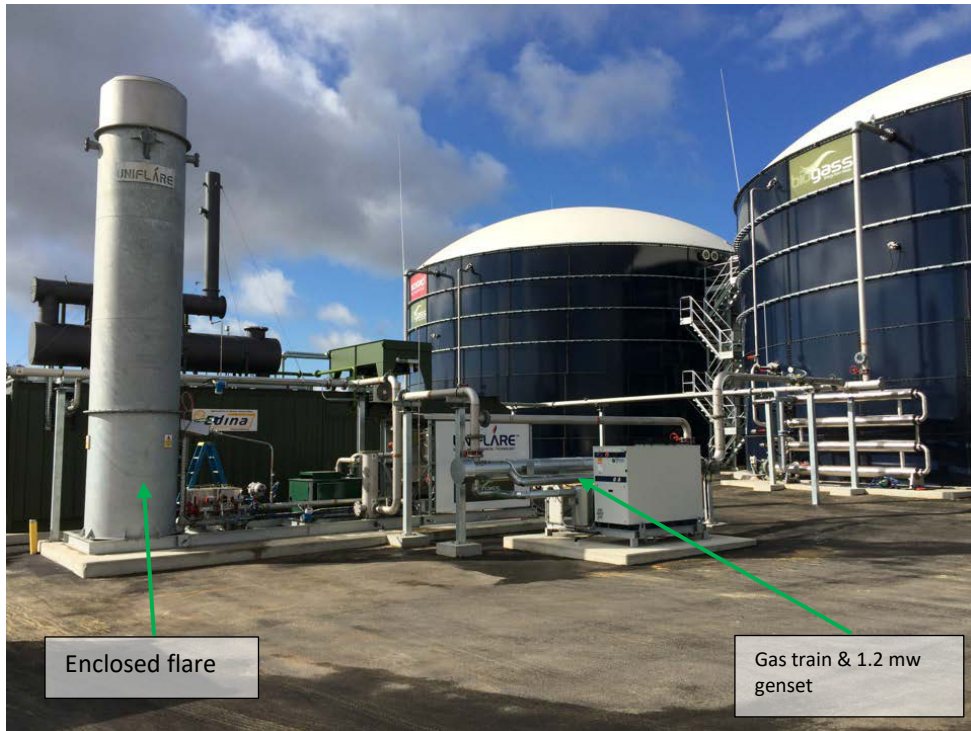


Figure 5 - image of digesters, gas train and first 1.2mw genset

1.5 Energy Generation & Co²

Extraction, Filtration and Processing

As stated by the applicant in their environmental report, the process is expected to generate 69,900m³ of biogas per day which will be cooled and purified through an activated carbon filtration system and burned through a Combined Heat & Power (CHP) unit. This process would generate approximately 4.9MW of thermal heat or 21.7GJ/hr of biomethane.

500m³ of material is expected to be collected through the digester as stated in the applicant's design report, with 60-65% being methane (CH₄) and 35-40% being carbon dioxide (CO₂) with a small amount of hydrogen sulphide (H₂S). The applicant has stated in a response to EPA queries that the H₂S is expected to be as low as possible (0.1ppm) at the 3 minute average to the nearest sensitive receptors.

The applicant revised their plans following feedback from the EPA to include a Schlumberger H₂S scrubber in the biogas upgrade process which is expected to reduce the detectable traces to <0.1ppm through capture of the H₂S in the gas through an iron oxide scrubber. The Schlumberger iron oxide scrubber is designed in the system upstream of the generation and flaring equipment to remove the chemical if it is present, which is determined by the monitoring systems for the proposal.

The electricity generated by the plant will make it self-sustainable with the additional generation of electricity being fed into the electricity grid.

As part of the gas generation process, the applicant expects to convert and upgrade the resultant gas from biogas (65% methane) to mains grade biomethane (97%) by removing CO₂, H₂S, water and other contaminants.

Flaring

A high temperature enclosed flare as an emergency fail safe mechanism for the plant is detailed in the applicant's design report. The flares would only be in use if the power generation engines are not in operation to combust the excess biogas at 1000 Degrees Celsius. The applicant's design report states that flaring may occur for an estimated 12 days a year for routine maintenance or a worst case scenario of 7 days if generators were to fail.

The flares are fully enclosed and operate automatically (shown above in figure 5).

The site plan indicates the safety flares are adjacent the combined heat and power gas coolers (3 X 1.56kw) on the western side of the site.

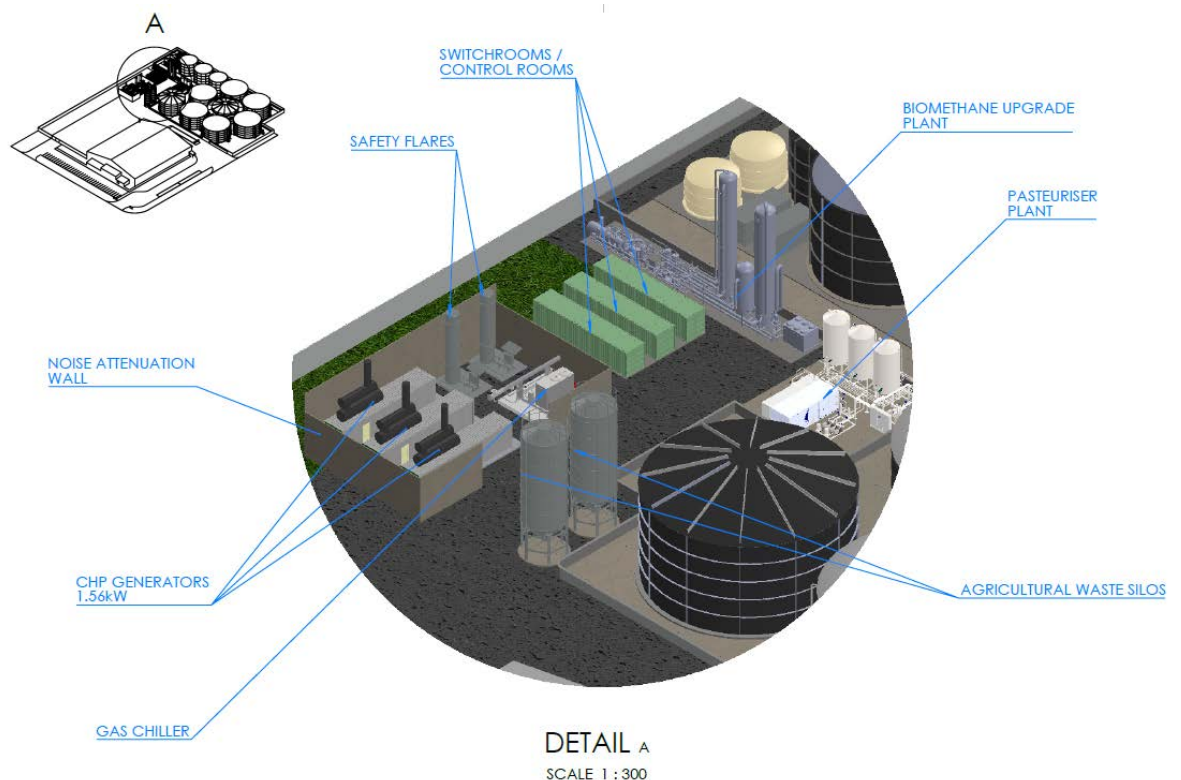


Figure 6 - detail of site layout (supplied by applicant)

1.6 Water Recovery & Filtration

The proponent's design report states that water will be treated in an anoxic reactor and through an aerobic reactor. Following this, the water will be passed through an ultrafiltration system which produces permeate to be processed through reverse osmosis and added back to the digestion process.

The proponent has stated that 128m³ litres of water will be supplied to Salisbury Water after bunding and treatment as part of other commercial agreements.

The proponent indicates through their environmental report that approximately 329m³ per day of liquid will be recirculated through the processing and digestive system.

It is expected the plant will generate a total of 456m³/day or 114 tonnes of water per day.

The applicant's design report details tank bunding, with a capacity of 120% or 4,200m³.

The bunding will provide a capture and divert process for any liquids to be disposed of through the drainage points.

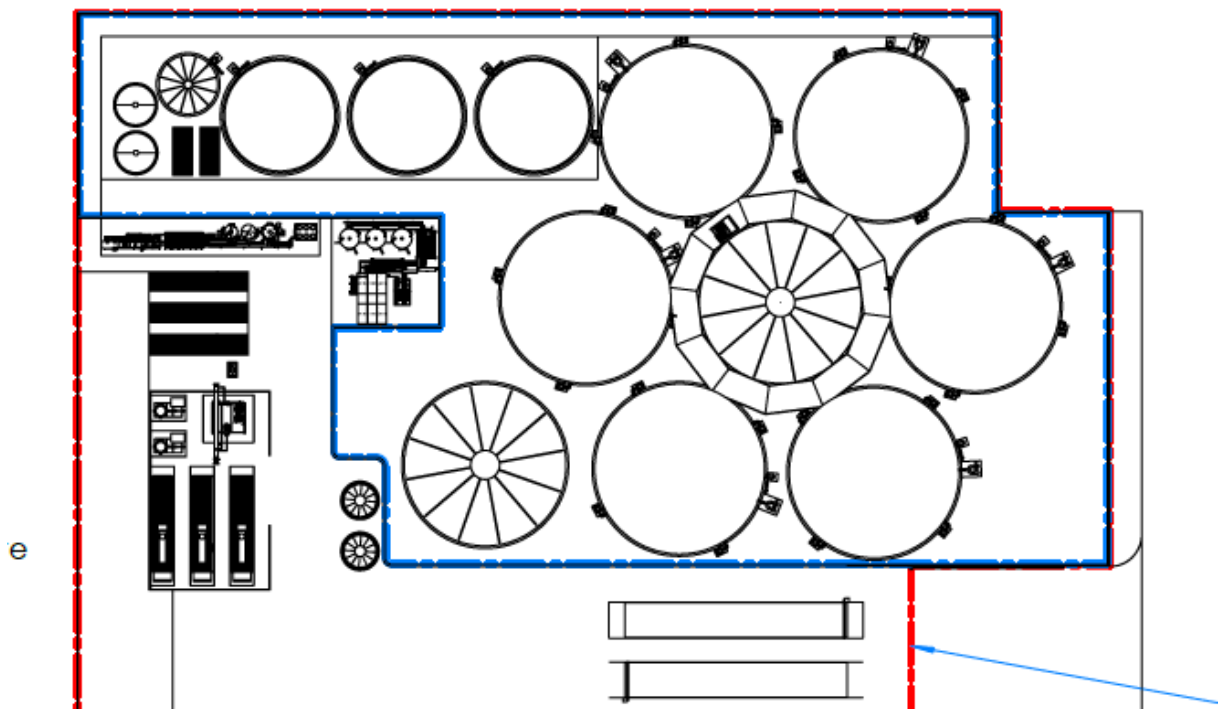


Figure 7 - site bunding shown by blue outline

1.7 Solids Recovery

The proponent's design report indicates that through the process of digestion some solids will be manufactured. The proponent estimates this will be 30% of the total product which will be outputted to a collection bay. It is envisaged these solids will be exported by truck as a bio fertilizer product.

2. Built form – office/shed

The site office is proposed for the southern frontage of the site to Woomera Avenue with 33 car parks facing the road. The site office consists of a reception area, meeting room, office, kitchen & staff amenities.

A second level within the structure would provide for an observation and education area.

The proponent has designed the site according with appropriate accessibility standards.

The 'reception' shed structure as shown below (Figure 7) has concrete bunkers, graded floor and drainage sump. The delivery doors open and close through a pressure switch and an alarm will sound if they are left open.

The applicant has indicated that the following materials and colours are proposed for the site, with white and cobalt blue representing the branding of the DeLorean site.

Site Material Schedule

Structure	Exterior Material	Coating (Indicative)
Site Office	Brickwork with exterior cladding	Painted - White
Reception Hall	Colourbond Steel	Painted - White
Digester Feed Tank	Glass fused steel/Stainless Steel	Painted - Cobalt Blue
Digester Tank - Walls	Glass fused steel/Stainless Steel	Painted - Cobalt Blue
Digester Tank - Roof	PVC coated polyester fabric	Painted - White
Digester Digestate Tank	Glass fused steel/Stainless Steel	Painted - Cobalt Blue
Waste Water Treatment Tanks	Glass fused steel/Stainless Steel	Painted - Cobalt Blue
CHP Co-generator	Steel	Painted - Beige
Emergency Flare	Galvanised Steel	Galvanised
Grain Silos	Steel	Painted - TBD
Control Rooms	Steel	Painted - Beige
Site Fencing	Colourbond Steel	Painted - White
Site bunding	Concrete	Concrete

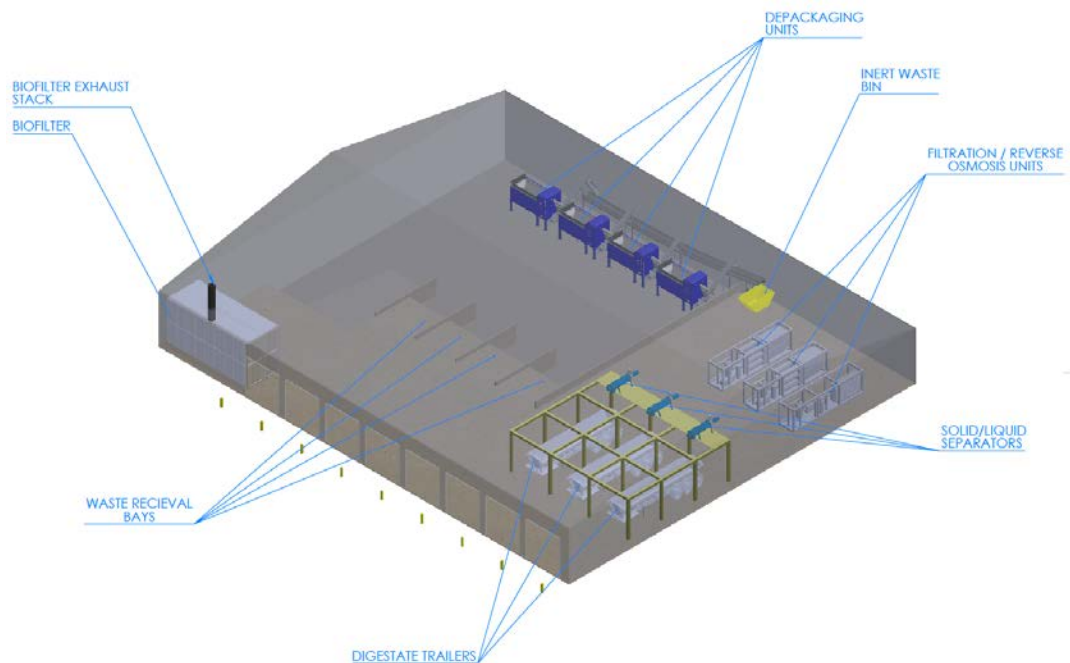


Figure 8 - 'reception' shed structure

2.1 Signage

Fascia mounted signage in the form of a corporate logo is also proposed.

The main building has two street frontages (Woomera Ave and Gidgie Court) and the façade signage is proposed for the Gidgie Court access point. The signage is integrated into the form through its installation onto the structure. A sign will also be installed to the rear of the shed facing towards the anaerobic digesters.



Figure 9 - proposed signage supplied by applicant

In addition the anaerobic digestion tanks at the rear of the allotment are proposed to display the DeLorean Logo.

2.2 Tree removal/Landscaping

The proponent proposes removal of 7 X Regulated and 11 X Significant trees in order to undertake construction of the anaerobic digestion plant.

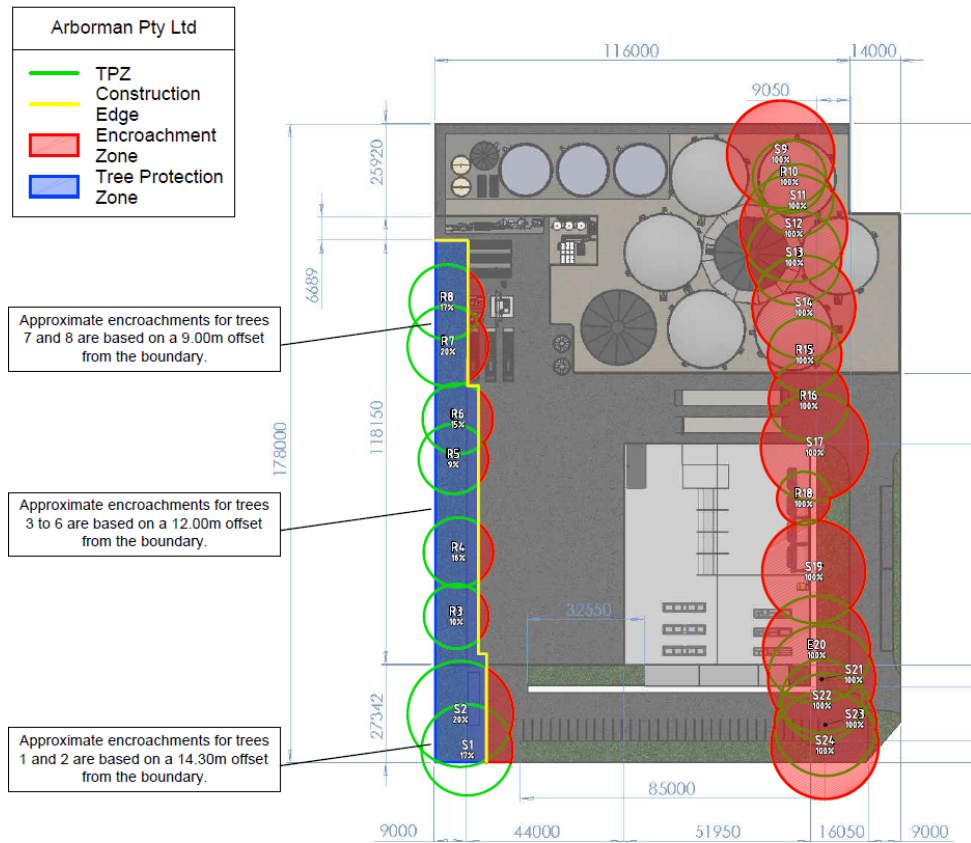


Figure 10 - the proposed removal of significant and regulated trees - eastern side of the allotment – arborist report

The sites Woomera Avenue frontage is expected to provide an identity and warmth to the site through the colours, textures and visual relief.

Further information regarding the tree removal is provided in the ATTACHMENTS.



Figure 11 - landscape design

2.3 Expected employment generation

As outlined in the design report, the proponent anticipates that approximately 14 staff will be employed consisting of a plant manager, four plant operators, receptionist, two office staff and others as required.

3. SITE AND LOCALITY

3.1 Site Description

The site consists of 1 allotment, described as follows:

Lot No	Section	Street	Suburb	Hundred	Title
A505	S68296	1-2 Gidgie	Edinburgh	Munno Para	CT5946/160

The subject site is located in the Edinburgh Parks light industry/food production precinct to the north of Adelaide's CBD.

The site is currently bordered by regulated and significant trees. The site does not contain any structures and is generally flat land, apart from a dip in the land, approximately half way between allotment boundaries running north-south.



Figure 12 - Site Aerial

The subject site is 120m wide on Woomera Ave and 167m deep along Gidgie Court. On the western side of the parcel the boundary is slightly longer in depth at 178m. The rear of the allotment is 116m wide.

The subject land does not contain any registered easements.

Gidgie Court is a 21m wide with a turning circle of 50m at the northern end of the court.

3.2 Locality

The locality is characterised by low intensity-built form with primarily industrial land uses. Large floor plate businesses such as Coates Hire, GTS Freight Management, Supashock Advanced Suspension, Ahrns Handling Equipment and Mayfield Industries are within the general vicinity of the proposed development.

The former Development Assessment Commission assessed an adjacent recycling facility (Northern Adelaide Waste Management Authority) immediately to the west of

the proposed development and gave Development Plan Consent (13 April 2016, Agenda item 2.2.1).



Figure 13- locality aerial

Renewal SA are major land holders within the Edinburgh Parks precinct and have been working with Primary Industries and Regions SA to develop a 'premier food manufacturing precinct' with access to transport through the Northern economic corridor and the SCT Direk Intermodal terminal.

The 'Northern Adelaide Food Park' is expected to create co-location to enable new and existing food, beverage, manufacturers, food packaging specialists and cold-chain suppliers to expand and grow. The precinct comprises 650 hectares with lots ranging from 2500m² to over 20 hectares.

A Coles distribution centre is located in close proximity to Inghams to the north west of the subject site.

Residential dwellings of Salisbury North are situated 500m to the south of the proposal, with the Edinburgh RAAF Base located approximately 600m to the north.

4. COUNCIL COMMENTS

4.1 City of Salisbury

Council has considered the proposal a form of development to be encouraged within the Urban Employment Zone to reduce reliance on the electricity grid and reduce waste.

Council has considered their referral response based on the proposal being a 'special industry' as per schedule 1 of the *Development Regulations 2008*.

The Council has indicated that noise and odour are concerns of representors and these potential issues are being assessed by the EPA. In addition, Council identifies that an EPA licence for operations will be required for the applicant to operate the facility.

Council indicates that if the potential issues are appropriately managed or mitigated that the 'activity would appear to be compatible with existing uses in the locality.'

Council states that the built form requires more detail if it is to be assessed against the Desired Character for the Zone which seeks innovative and high quality design.

The applicant is in discussion with Salisbury Water to provide 128m³ of water from the site and arrangements are being finalised – the network is sufficient to cater to this.

Council have indicated that a number of conditions should be applied. These conditions are summarised as follows:

- Low reflective, natural tones of all buildings and tanks
- Landscaping to be established prior to commencement of use
- Fencing to be in chain wire mesh in PVC coated black or similar
- All cranes be used in consultation with Edinburgh RAAF Airbase (contact details have been provided)
- Traffic management report to address:
 - Expected volumes of traffic and suitability of the road network to cater for these movements
 - Design of access points for Council sightlines and design requirements
 - Adequacy of on site car parking
 - Further detail in line with traffic management and Australian standards
- Civil plans
- Detailed access plans in relation to verge infrastructure and street trees and the proposed site landscaping

The City of Salisbury has indicated the proposal is worthy of development plan consent if the applicant provides the appropriate detail and are able to meet the standards required by the EPA.

4.2 Applicants Response to City of Salisbury Comments

The applicant acknowledges that final plans and details will be required to address several components of the development as raised by Council.

These include:

- Crane operations;
- Traffic management;
- Water offtake; and
- Street trees, landscaping and access plans in relation to Council assets.

In response to Council feedback regarding reduction in the sites tree canopy the applicant indicates that the site design and construction was predicated on reducing tree damaging activity. The applicant refers to the arborist report and the viability of the development if the proposal was restricted to retaining the mature trees.

The applicant has indicated a willingness to conform to the requirement to maintain ongoing contact with the adjacent RAAF Base during crane operation and usage. A condition has been applied to ensure this occurs.

The applicant has responded to Council regarding the water supply to Salisbury Water – with an agreement for outlet water to meet standards for acceptance by Salisbury Water to be used in aquifer recharge prior to construction.

As outlined above – the applicant will be required to provide final plans and details to address the Council’s requirements given the impacts of the proposal on associated Council infrastructure.

5. STATUTORY REFERRAL BODY COMMENTS

Referral responses are contained in the ATTACHMENTS.

The Environment Protection Authority is a mandatory referral in accordance with Schedule 8 of the *Development Regulations 2008, Item 11 – Activities of Environmental Significance*. If the State Commission Assessment Panel (SCAP) grant Development Plan consent conditions are directed by the EPA.

Schedules 21 and 22 are triggered by Schedule 8 of the *Development Regulations 2008* which states that activities of environmental significance are considered as the following:

7(1) Fuel Burning: the conduct of works or facilities involving the use of fuel burning equipment, including flaring (other than flaring at petroleum production, storage or processing works or facilities that do not have a total storage capacity or total production rate exceeding the levels respectively specified in clause 1(5) of Schedule 22) or incineration, where the equipment alone or in aggregate is capable of burning combustible matter—

(a) at a rate of heat release exceeding 0.5 but not exceeding 5 megawatts; or

(b) at a rate of heat release exceeding 50 but not exceeding 500 kilowatts and the products of combustion are used—

(i) to stove enamel; or

(ii) to bake or dry any substance that on heating releases dust or air impurities.

3(3) Waste or Recycling Depots: the conduct of a depot for the reception, storage, treatment or disposal of waste other than—

(a) temporary storage at the place at which the waste (not being tyres or tyre pieces) is produced while awaiting transport to another place; or

(b) storage, treatment or disposal of domestic waste at residential premises; or

(c) a depot that the Environment Protection Authority is satisfied will be conducted for such limited purposes that a referral is not necessary and has provided written confirmation of this to the relevant authority.

5.1 Environment Protection Authority (EPA)

In their response the EPA have addressed both items of the referral, with Schedule 22 taking precedence over Schedule 21; Schedule 22 provides direction and is an activity that requires licensing by the EPA.

During their assessment, the EPA sought further technical information from the applicant. The EPA considered the following:

<i>Issue</i>	<i>Response</i>
Interface between Land Uses	450m to nearest dwelling
Air Quality	Note on Development Plan Consent, conditions in licence
Noise	Noise mitigation met by proponent, condition applied to DPC.
Waste Management	Condition in licence.
Water Quality	Standard met by proponent, condition applied to DPC.

The assessment of this proposal required a thorough analysis of whether the design and operation would detrimentally impact surrounding land uses. Following the receipt

of additional information, the applicant was able to demonstrate that the proposed biofilter and H₂S scrubber would apply the appropriate mitigation techniques for the facility. The EPA stated that the proposal will be compliant with the *Environment Protection (Air Quality) Policy 2016* and is not likely to cause adverse impacts on either sensitive receivers or the surrounding environment subject to conditions applied through both Development Plan consent and the EPA licensing process.

All of the conditions and notes recommended by EPA have been included in the decision details below.

6. PUBLIC NOTIFICATION

The proposed development is listed as a Category 1 form of development in the Development Plan as the closest adjoining zone is greater than 60m from the subject site.

However, when considering the *Development Regulations 2008 (Part 6)*, a referral to EPA under Schedule 21 or 22 of the *Development Act 1993* does not enable the development to be considered as a Category 1 development. The proposal was therefore notified as Category 2 development.

Public notification was undertaken (by directly contacting adjoining owners and occupiers of the land) and 5 representations were received.

A total of 4 representors wish to be heard by the State Commission Assessment Panel. One representation was also received by the State Commission Assessment Panel, but was assessed as being invalid, given the allotment was not within the notified addresses (in accordance with the Development Regulations). The issues raised by this representor are somewhat covered by other representations.

6.1 Representations

The below table is a summary of the representations.

Representor ID	Issue
<i>R1</i>	<ul style="list-style-type: none"> • Emissions and odours from food waste • Desired character of Urban Employment Zone • Dust • Pollutants • Odours from digestion process • Wrong location/Zone referenced in the applicant's report • Sensitive receptors to air quality
<i>R2</i>	<ul style="list-style-type: none"> • Fire safety from excess biogas • Noise and odour from plant and heavy vehicles • Desired character of the Urban Employment Zone • Level of information provided • Interference and impacts with/on existing business operations • Airborne pollutants – damage to components • Increase in traffic movements – noise, vibration, dust • Escape of waste • Noise • Attraction of vermin • Lack of buffer area • Level of information provided for tree removal • Application should have been notified as Special Industry
<i>R3</i>	<ul style="list-style-type: none"> • As R2

Representor ID	Issue
R4	<ul style="list-style-type: none"> • Potential of raw waste spillage • Airborne pollution and impact on food quality standards for styrene packaging products



Figure 14 - representation map

6.2 Applicants Response to Representors

The applicant engaged Botten Levinson Lawyers to provide a response to representations.

The response indicates there are a number of matters which are not considered to be relevant to the planning assessment required.

In response to representors concerns regarding the appropriateness of the proposal within the Urban Employment Zone, the applicant references OBJs 1, 3, 6, 7 and the Desired Character statement of the Zone.

The applicant indicates the proposal has a significant floor plate and transport needs to satisfy OBJ 3 and is clustered with the adjacent NAWMA facility.

The applicant states that food and beverage production businesses within the local area will reduce waste impacts and future energy costs.

The applicant states that in their planning opinion the proposal is not significantly at variance with the Development Plan given 'it is not an important or grave departure in either quantity or degree with matters of fact and degree to determine its planning merits as established by the Supreme Court.'

Land use definition

The applicant states that in their planning opinion the proposal is not a 'special industry' as defined by the *Development Regulations 2008*, stating that:

The emissions report clearly shows that any emissions from the proposed development will not endanger, injure or detrimentally affect the life, health or

property of any person, and will not produce conditions that are offensive or repugnant to the occupiers or users of the land in the locality.

The assertion made overlooks the modelling showing emission levels well below the standards set by the EPA, and appears to be based on a misunderstanding of the proposal.

The proposal uses a combination of top tier generation equipment, filtration systems, and closed loop in-vessel digestion processes, to ensure that there are no emission impacts. It incorporates the best available technology to avoid the need for buffer or separation areas and is associated with food and beverage production, as a provider of decreased food waste disposal costs and energy fees.

Odour and Emissions

As outlined earlier in this report – the technical specifications the applicant has used in management of the site and potential odour is envisaged to meet the levels set by the *Environment Protection (Air Quality) Policy 2016*.

Representors 2 & 3 indicate the current level of air quality should be maintained and that the proposed development will detrimentally impact this. In response the applicant states that some development may impact the current air quality but this should be as low as reasonably possible.

In addition, the applicant states that the risk of tank rupture is extremely low and highly unlikely; if this did occur, bunding would capture all liquids which would be diverted to a sump.

All representors raised concerns regarding the potential for wastes and particulates to 'escape' the facility and the applicant has indicated that this is not possible given the enclosed nature of the development. It is expected that delivery of materials will be in trucks with waterproof and solid proof vessels; should this occur the applicant will ensure the materials are contained appropriately.

Noise

Representors considered noise from the proposal to be unacceptable. The applicant has subsequently updated plans with associated technical reports demonstrating that the generators will be serviced by a 7m tall noise attenuation barrier, with an additional 3m fence on the boundary and a 2.4m tall fence adjacent the truck access area.

Vermin

The applicant does not consider vermin to pose a problem given the contained nature of the development.

Tree Removal

The applicant indicates that other design solutions were investigated and that tree removal has been reduced following the arborist report which seeks to retain 6 trees with some trimming to accommodate fire risks around the enclosed flares etc.

'Public Space'

The applicant asserts that public space is not the adjoining road or surrounds of the proposed development; rather this refers to open space of parks and the like. The notion of the impact on public open space is rejected.

A copy of each representation and the applicant's response is contained in the ATTACHMENTS.

7. POLICY OVERVIEW

The subject site is within the Urban Employment Zone as described within the Salisbury Council Development Plan (Consolidated 15 December 2016).

Relevant planning policies are contained in the attachments and summarised below.

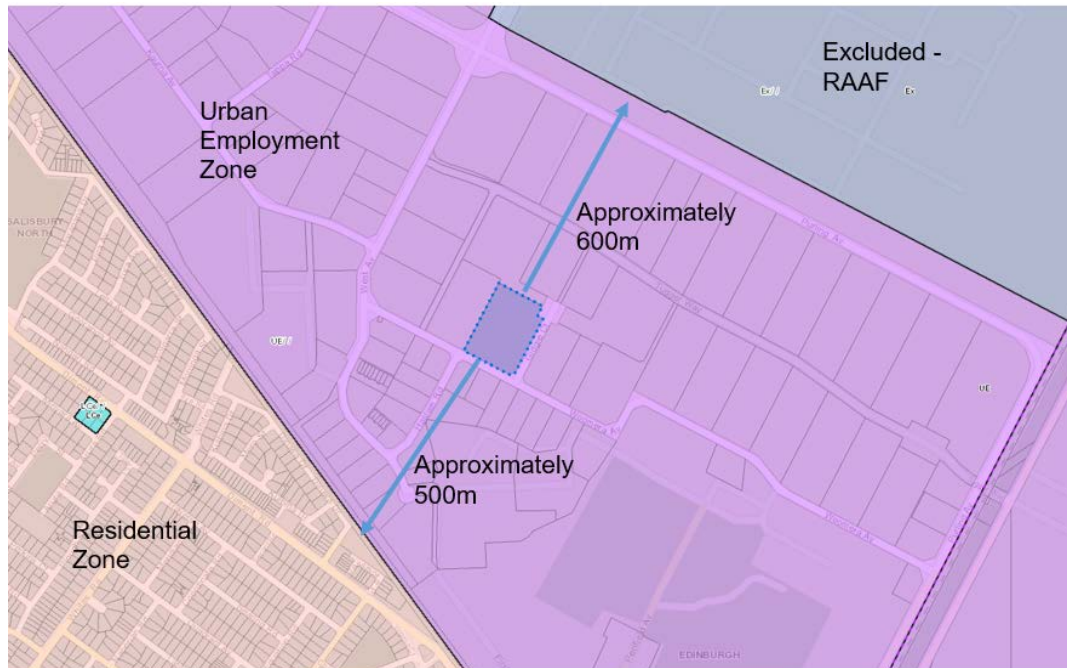


Figure 15 - zoning map

7.1 Urban Employment Zone

The Urban Employment Zone seek to accommodate a mix and range of industrial land uses which generate wealth and employment for the State. High technology and large floor plate enterprises are expected with the interface managed when adjacent to sensitive receivers.

Objective 6 seeks development which provides economic and environmental benefits, which is supported by Objective 7 (b) with improvement of economic conditions of adjoining communities where appropriate.

The Desired Character of the Zone expects business clusters and opportunities for innovation through new businesses. In addition, indoor, 24 hour/7 day a week operation is expected for technology based businesses.

The Urban Employment Zone also anticipates special industry but only in association with food and beverage production, using the best available technology to minimise land use impacts and reduce the need for large buffer or separation areas.

Business clusters are encouraged by the Desired Character statement with opportunities for innovation, start up and growth of new businesses. The intention of the Desired Character is to provide for a wide range of activities associated with industrialised horticulture, processing and packaging.

Clustering of industrial activities is encouraged to share resources, reduce waste and energy needs within the Zone. A high level of compatibility between land uses in the Zone is envisaged to ensure a quality and attractive business environment is maintained.

The proposed development is not listed in the Procedural Matters section of the Zone and is therefore categorised as Merit.

7.2 Council Wide

The Council Wide provisions relevant to the application provide direction with regard to Waste Management Facilities.

Objective 1 states that human and environmental health impacts are to be minimised through location and operation with PDC 1 providing further detail in this regard through consideration of the generation of surface water and groundwater pollution, traffic, noise, odours, dust, vermin, weeds, litter, gas and visual impact.

PDC 4 provides direction on the separation distance from the property boundary, with the bulk of the building to be centred in the middle of the allotment.

The section continues to state that the operations should be screened from public view and a chain wire or pre-coated painted metal fence to a minimum of 2m in height should surround the development (PDC 7, 11).

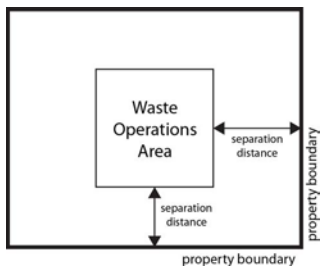
In addition, soil and groundwater should be addressed through a leachate barrier to prevent pollution (PDC 17).

The Council Wide Section addresses Renewable Energy Facilities stating that the development of renewable energy facilities, such as biomass energy facilities should be in appropriate locations to avoid or minimise adverse impacts and maximise positive impacts on the environment, the local community and the State (Objectives 1 & 2).

8. PLANNING ASSESSMENT

The application has been assessed against the relevant provisions of the Salisbury Council Development Plan, which are contained in Appendix One.

8.1 Quantitative Provisions

	Development Plan Guideline	Proposed	Guideline Achieved
Site Area General Section - Waste Management Facilities - PDC 4		Landscaped area 2830m ² Bunded area 6,540m ² Concreted area 9,790 m ² Office area 311.7m ² <i>Total site area 22,700m²</i> <i>Equates to 16% site coverage</i>	YES <input type="checkbox"/> NO <input type="checkbox"/> PARTIAL <input checked="" type="checkbox"/>
Building Height	Structures higher than 15m require approval (Concept Plan Map Sal/1, Edinburgh Defence Airfield (Area Control Regulations)).	Receival hall 12.2m Digestion tanks 14.7m tall	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> PARTIAL <input type="checkbox"/>
Land Use In Zone	Generally the Urban Employment Zone has a wide ambit of land uses under the expected forms of development, with combinations of these land uses allowing for local workforces and businesses to work together. High technology / food manufacturing is envisaged in zone.	Waste to energy bio digestion plant consisting of biogas to biomethane plant, 3 cogeneration combined heat and power engines, 2 emergency flares and 1 biofilter exhaust.	YES <input type="checkbox"/> NO <input type="checkbox"/> PARTIAL <input checked="" type="checkbox"/>
Car Parking – PDC 19 in Zone	3.3 per 100 m ² for office 0.67 per m ² for industrial building greater than 2000 m ²	33 car parks 2 truck/bus parks	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> PARTIAL <input type="checkbox"/>
Front Setback – PDC 11 in Zone	4 metres	10m from Woomera Avenue	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> PARTIAL <input type="checkbox"/>
Side Setback	N/A	4m from Gidgie Court	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> PARTIAL <input type="checkbox"/>
Fencing – General Section - Waste Management Facilities PDC 11	Wire mesh, colour coated of at least 2.1m tall	Wire mesh, colour coated of at least 2.1m tall	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> PARTIAL <input type="checkbox"/>

Planning Comment

1. Operations are largely restricted to the internal building and rear of the site.
2. Security fencing and acoustic treatments have been integrated into the design.
3. Building heights are consistent with planning policies.
4. The processing of waste is contained within structures.
5. A waste recovery and recycling facility has been established on adjacent land.
6. Front and side setbacks are consistent with planning policies
7. Grade level carparking, manoeuvring areas and landscaping assist in providing a physical buffer.

8.2 Definition of land use

In order to appropriately consider the proposal, the sensitivity of the locality was considered with relation to odour given the perishable nature of materials being delivered and processed through conversion to gas and electricity.

Representations sought to characterise the land use as 'Special Industry'.

The *Development Regulations 2008* defines special industry as (underline added) an industry where the processes carried on, the methods of manufacture adopted or the particular materials or goods used, produced or stored, are likely—

(a) to cause or create dust, fumes, vapours, smells or gases; or

(b) to discharge foul liquid or blood or other substance or impurities liable to become foul,

and thereby—

(c) to endanger, injure or detrimentally affect the life, health or property of any person (other than any person employed or engaged in the industry); or

(d) to produce conditions which are, or may become, offensive or repugnant to the occupiers or users of land in the locality of or within the vicinity of the locality of the land on which (whether wholly or partly) the industry is conducted.

In comparison to the above special industry definition the *Development Regulations 2008* define industry as the carrying on, in the course of a trade or business, of any process (other than a process in the course of farming or mining) for, or incidental to—

(a) the making of any article, ship or vessel, or of part of any article, ship or vessel; or

(b) the altering, repairing, ornamenting, finishing, assembling, cleaning, washing, packing, bottling, canning or adapting for sale, or the breaking up or demolition, of any article, ship or vessel; or

(c) the getting, dressing or treatment of materials (and industrial will be construed accordingly).

The proposal satisfies the definition of industry and is considered to be a facility that converts waste to energy through anaerobic digestion.

A third party appeal was lodged through the Environment Resources and Development Court regarding the nature of the development and the subsequent perceived impacts upon the surrounding land uses.

In considering the definition of the proposed land use, the applicant has provided a number of mitigation measures which are to be managed through the Environment Protection Authority licencing process.

Previous proposals considered by the Environment Resources Development Court have considered controls on the operation and maintenance of facilities in determining whether a proposal may cause offensive or repugnant conditions.

In this matter, the advice of the EPA (as the state regulator) has reviewed the air quality technical report which predicts there would be adequate dispersion of odour to meet the ground level concentrations as specified within the *Environment Protection (Air Quality) Policy 2016*. The advice goes on to state that the proposed development is unlikely to result in adverse air quality impacts to sensitive receivers.

Representors have indicated that their primary issue with the referral response from the EPA discounts them as relevant receivers, which the Special Industry definition (above) does not.

Following further technical advice from the EPA, the applicant (in their opinion) provided modelling to SCAP which was conservative in its nature – with the output of 1.89 odour units at the site boundary based on 60 parts per million (PPM) within the digestive vessels. This level is not expected to be reached by this proposal given the mitigation measures in place; such as the biofilter, negative pressure receipt shed and the hydrogen sulphide (H₂S) scrubber being upstream of the biogas conversion rather than after the fact.

8.3 Land Use and Character

The Urban Employment Zone is expected to accommodate a range of employment generating land uses. The State has been gradually transitioning away from heavy industry to technology based development. Following the closure of major employers (Holden and supporting businesses) in northern Adelaide the Zone allows this to occur.

The proposed land use, while not explicitly anticipated by the Urban Employment Zone, is not precluded. High technology and food manufacturing land uses are expected within the Zone. These land uses would also generate odour given the manufacturing process and disposal of waste.

When considered in conjunction with Schedule 22 and 21 of the *Development Regulations 2008* the proposed development may be defined as a multi-use site as the technology which supports each part of the operations provides a contemporary and leading edge demonstration of waste management techniques rather than the historic approach of landfill or open air waste management.

The proposed land use and supporting functions are expected to align with the Objectives of the Urban Employment Zone.

It is expected that the large floor plate would accommodate the reception of materials for recycling and the office on the southern aspect of the site with the anaerobic digestion and energy production to be contained to the northern aspect of the site.

The applicant expects supermarket and fresh produce suppliers and the like to provide materials; and some of these businesses are located within the business park. The site is bordered to the west by the Northern Adelaide Waste Management Authority a land use that is similar in nature to the proposed development. The co-location of these similar businesses is expected to provide for a clustering as anticipated by the Desired Character statement.

The location of the proposal is expected to satisfy the diversion of organic materials from landfill (OBJ 7), as the waste will not be travelling large distances to be recycled.

While the staffed/delivery hours will be 7am-5pm Monday to Friday and 7am-1pm Saturday, the anaerobic digestion process is expected to run day and night. This is consistent with the 24/7 nature of the Urban Employment Zone.

The applicant has indicated through their response to representations that up to 14 jobs are expected to be created following construction and operation of the anaerobic digestion plant. While this is not a substantial in number, there is potential for education, training and skills to be garnered from employment within the emerging industry. The secondary impacts of the proposed development could also be considered as a positive for the local area through additional work for existing roles such as transport and logistics. This is consistent with the intention of the Urban Employment Zone to provide for a number of industries which generates employment.

On the matter of land use and character, the proposal is consistent with the objectives and Desired Character of the Urban Employment Zone.

8.4 Interface with Land Uses

In addition to the above – representors raised concerns regarding the interface between existing businesses and the proposed development. Representations state that the proposed development is incompatible with their business given the food safety requirements and clean environment expected for businesses, employees and customers.

As identified above in 8.1 the General Section - Waste Management Facilities - PDC 4 provides a diagram of setbacks for proposals dealing with waste. While the proposal may be identified as a waste management facility it is not a facility that deals with exposed waste. Rather –the pressurised nature of the receival shed is expected to draw in air rather than expel it when roller doors are open for truck deliveries.

Objectives 1-3 of the General Section - Interface between Land Uses seeks to reduce conflict between land uses, protect the community from adverse development impacts and incompatible development.

PDC 1 provides further detail, stating that development should not detrimentally affect the amenity of the locality or cause unreasonable interference through any of the following:

- (a) the emission of effluent, odour, smoke, fumes, dust or other airborne pollutants
- (b) noise
- (c) vibration
- (d) electrical interference
- (e) light spill
- (f) glare
- (g) hours of operation
- (h) traffic impacts.

While the surrounding land uses are similar in their industrial/light industrial nature PDC 4 of the Urban Employment Zone states that their management should be appropriate between the locations of activities with an interface of land uses that are sensitive to these operations. It is not expected that the proposed land use will be detrimental, given the environmental management features proposed by the applicant as described below in 8.5.

Representations

A number of representors raised land use and character incompatibility as a concern, stating that the proposed development would detract from the desired character of the Edinburgh Parks Precinct. This view was associated with the issues of emissions and odours detracting from the current environment and negatively impacting upon existing businesses, employees and customers. Odours and emissions are discussed in sections below.

The applicant has confirmed through correspondence with the EPA that there should be no expected interface impact to the nearest sensitive receivers (dwellings) as the technology employed to mitigate these issues will reduce the likelihood of this occurring. In addition the separation distances and modelling has indicated this is not likely to occur.

8.5 Environmental Factors

8.5.1 Dust, Air Quality & Odour

The Development Plan seeks control measures for the potential harm or nuisance generation of air pollution (General Section – Interface between Land Uses, PDC 11).

During construction, the applicant indicates through their environmental report that the focus will be on reducing nuisance from dust through applying best practices and minimising exposed soil. A Construction Environment Management Plan will be required by a condition of Development Plan consent.

During operation, the applicant has stated that odour concentrations are expected to remain below the criteria specified by the *Environment Protection (Air Quality) Policy 2016*. However potential emissions could include dust and odour, hydrogen sulphide (H₂S) and biogas combustion particulates.

The applicant states within their environmental report that the 'receiving' shed is expected to be the most likely source of odour.

The potential for odour is high given the perishables delivered to the site – however the proposed approach as outlined in 1.1 is envisaged to mitigate the risks associated with potential off-site impacts.

In addition, through their response to EPA technical requests, the hydrogen sulphide (H₂S) generated in the gas conversion process was addressed to the satisfaction of the EPA (refer to correspondence included in Attachments).

The applicant undertook emissions modelling which predicted that odour levels would meet the criteria required by the *Environment Protection (Air Quality) Policy 2016* at the nearest residential and other receptor locations. This has been confirmed by the EPA referral response which states the proposed development is unlikely to result in adverse air quality impacts to sensitive receivers.

An Operational Environmental Management Plan (as a note for enforcement purposes) and required conditions by the EPA will be required by a condition of Development Plan Consent.

It is expected that licensing agreements with the EPA will further address operational concerns, given the ability for any compliance issues to be notified and investigated (and remedial measures undertaken if required).

The EPA direction states ongoing management of the site would likely be managed via conditions of an EPA licence. These conditions may include:

- Post commissioning monitoring to validate the inputs used in the model for all identified pollutants of concern
- undertake on-going H₂S monitoring of pre-scrubber and post scrubber biomethane
- preparation of a contingency plan to outline measures that would be actioned in the event that roller doors and/or bio-filters/scrubber fail or in the event that H₂S is detected at sensitive receivers.

In addition, the applicant will monitor the system and process for issues and will add a further odour removal system as/if required. As per Figure 16 below, the applicant has undertaken an assessment of the sensitive receivers with distances ranging from 7m (adjacent NAWMA) to 460m (residential dwellings).

As outlined in the applicant's air quality documentation a replacement standard electric motor which can be connected immediately will be on site at all times to be installed in case of failure.



Figure 16 - sensitive receiver map - applicant's environmental report

It is not expected that the proposed land use will detrimentally impact the locality through dust, air quality or odour given that mechanisms are built into the operations and management of the high technology plant.

No.	Distance from Property / Activity Boundary	Sensitive Receptor
0	0m	Proposed Site Location (Lot 505)
1	7m	Northern Adelaide Waste Management Authority
2	18m	GTS Freight Management
3	18m	Mayfield
4	18m	Coats Hire
5	15m	Ahms Handling Equipment
6	15m	DSA SA
7	68m	Commercial / Industrial
8	75m	Edinburgh Parks Nursery
9	115m	Commercial / Industrial
10	175m	Commercial / Industrial
11	205m	Commercial / Industrial
12	175m	Print Lord
13	260m	Commercial / Industrial
14	280m	ZF Lemforder
15	290m	Commercial / Industrial
16	410m	Cape
17	460m	Residential Housing

Note: Closest residential sensitive receptor is 460m from proposed site location

Figure 17 - table from applicant's environmental report

The above table states that receptors are 15-18m from the generation of gas and electricity.

Given the treatment of H₂S by the applicant, the EPA does not envisage detrimental impacts on the surrounding land uses.

8.5.2 Noise Emissions

PDC 8 (General Section – Interface between Land Uses – Noise Generating Activity) states that development with the potential to emit significant noise (e.g. industry) should incorporate noise attenuation measures that prevent noise from causing unreasonable interference with the amenity of noise sensitive premises.

The applicant states in their Environmental Report (10 – Noise Emissions) that the proposed development will conform to the *Environment Protection (Noise) Policy 2017* under the *Environment Protection Act 1993* through consideration of activities which may cause disturbance to adjacent land users.

Operational vehicle movements are expected to be within the enclosed building or during operational hours, with ‘smart reversing’ alarms to minimise disturbance. It is expected that unloading and moving of materials will be restricted to operation hours of 7am-6pm on weekdays and 7am -1pm on Saturdays.

Machinery located in the main building is expected to be used on weekdays only, with closed doors.

The applicant has stated that the combined heat and power unit will be fitted with a muffler to reduce the sound output and will be housed in a soundproofing enclosure to minimise noise.

The applicant has provided an acoustic report as part of their response to EPA queries (shown below in Figure 18), which identifies the 3.7m acoustic wall designed to dampen noise if any is generated from the combined heat and power unit despite the muffler and soundproofing.

Sensitive noise receivers such as residential dwellings are approximately 500m away which is considered to be ‘out of range.’



Figure 18 - barrier wall and fence on boundary – supplied through response to EPA by applicant

A condition will be applied to provide certainty and the applicant will be required to meet the *Environment Protection (Noise) Policy 2017* as outlined above.

8.5.3 Vermin

PDC 1 (General Section - Waste Management Facilities) states that waste management facilities should be designed and located to minimise adverse impacts on the site and surrounding areas from the generation of vermin among other issues.

The applicant proposes the construction of a site fence which may reduce the likelihood of small animals/vermin accessing the site. In addition, the enclosed nature of the operations is not expected to attract pests who may be attracted to food scraps and the like. The end of day wash down procedure also reduces likelihood of vermin attraction.

8.5.4 Litter

As per above 7.2, PDC 1 (General Section - Waste Management Facilities) states that litter should be minimised through location and design of any proposed development.

The applicant has indicated that machinery will depackage products to allow for baling and recycling off site. In addition, to prevent litter from blowing away from/around the site the quick close doors with pressure sensor will reduce the time for wind to move litter around and possibility of this occurring.

The applicant's approach is expected to be appropriate for managing litter on the site.

8.5.5 Light Spill

The applicant has provided details of the proposed lighting for the site, which focuses on safety, security and access.

It is not expected that the proposed light plan will detrimentally impact the surrounding sites, nor are they sensitive to it.

The below figure demonstrates the lighting scheme looking north over the site from Woomera Avenue.

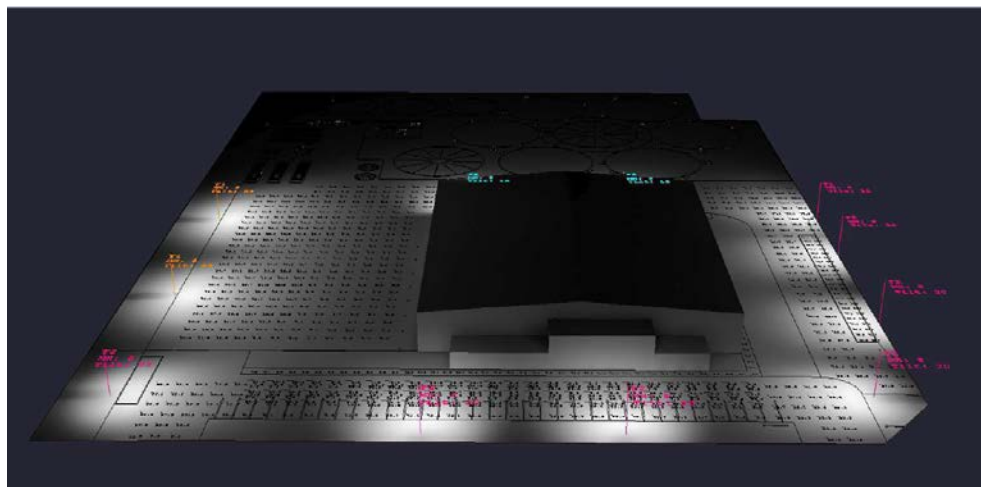


Figure 19 - demonstration of lighting scheme, looking north from Woomera Ave

A condition will be applied to reflect the appropriate lighting for the site.

8.5.6 Hours of Operation

While the plant and site infrastructure is expected to operate 24 hours a day 7 days a week to generate the best return on investment for the applicant, the staffed hours will be as follows:

- 7 am to 5pm weekdays;
- 7am to 1pm Saturday.

Applying a condition to the Development Plan consent is not expected to be appropriate given the 24 hour nature of the precinct and distance from sensitive land uses.

The development will be directed in its operation by the appropriate guidelines from the Environment Protection Authority licence.

8.5.7 Gas and electricity generation

Within the emissions assessment report, the applicant addresses risks relating to gas and electricity generation.

The applicant does not expect the generation of either gas or electricity to be a fire risk to the site or surrounding area. The site is appropriately fenced to prevent vandalism and the biogas is collected under a fire-resistant double membrane dome on each of the six digesters.

The two emergency flares (8m tall X 1.7m in diameter) are only expected to be used on an emergency basis, or if generators are being serviced.

The enclosed flares are designed to automatically adjust the appropriate amount of air inflow at the base of the stack through dampers. The control panels on site provide staff with measurements of the materials and gas within the system for appropriate monitoring.

8.5.8 Surface water and groundwater pollution

Through the Environmental Report the applicant states that the proposed development will recycle, treat and reuse the surface water collected. The 1.5m tall bunding that surrounds the tanks on the northern part of the site will direct stormwater to sumps areas for cleaning or the aquifer operated by Salisbury Water.

The applicant does not expect groundwater to be polluted as all products will be processed using enclosed machinery on bunded concrete stands.

The proposal is not expected to unduly impact groundwater or stormwater on the site. Given the substantial hardstand being constructed, the appropriate water recycling is in place to avoid overloading the street infrastructure.

The EPA was satisfied the proposed bunding would ensure stormwater is not contaminated and no spills are released to the environment. A condition has been applied as per EPA direction.

8.6 Design and Appearance

8.6.1 Visual impact

The Urban Employment Zone seeks a high standard of development which promotes distinctive building, landscape and streetscape design, with high visual and environmental amenity, particularly along arterial roads and the boundaries of adjoining zones through PDC 5.

Adjacent buildings are similar in their construction, with large floor plate buildings predominate in the locality.

The proposed shed and associated digestion tanks are expected to integrate well visually, given the current development pattern.

Landscaping is expected to provide some visual relief from the bulk of the built form, with street trees to Woomera Avenue and the western boundary providing texture and colour difference.

The site materials and colours are proposed to reflect the DeLorean Energy corporate branding, with the shed and associated office to be white with cobalt blue for the rear digestive tanks.

The proposed landscaping design is integrated into the proponent's response to the locality and site. With several regulated or significant trees removed it is anticipated that the proposed garden beds and landscaping treatments in conjunction with the remaining native trees will soften the industrial appearance of the development.

The combined heat and power generator is expected to be painted beige, with emergency flares to be left as galvanised stainless steel.

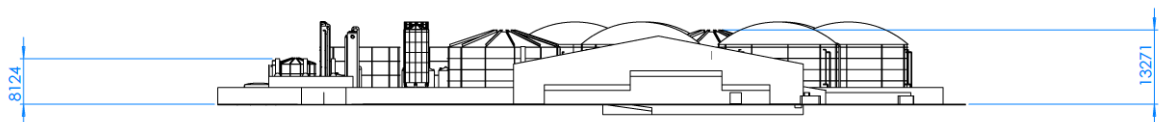


Figure 20 - north view of the proposal from the design report & site elevations

The proponent states that the site fencing would be Colorbond white which blends with the sites colour scheme and is relatively neutral in appearance.

The appropriate conditions will be applied to visually integrate the site to the locality. Generally, the proposed materials and colours are expected to be an appropriate visual representation of the policies contained within the Development Plan.

In their referral response – Council sought further detail on the visual impacts of the proposed development. However, site visits indicate that the supplied plans and design are consistent with the pattern of built form within the precinct and the addition of the development is not expected to detrimentally impact the general nature of the built form. The landscaping to the street frontage will soften the built form to the roadway and adjacent businesses.

A condition will be applied relating to final materials and colours.

8.6.2 Signage

The proposed signage is not expected to dominate or distract from the operations on site and will provide the appropriate wayfinding for the associated business for those delivering to the site.

The signage is predominantly the DeLorean branding on each structure across the site in cobalt blue with a white background.

The applicant's landscaping plan shows a structure that provides an entrance statement which is integrated with plantings.

8.6.3 Landscaping

The Desired Character statement of the Urban Employment Zone seeks to soften the external elements of the locality using landscaping and the applicant has supplied a plan which details a high quality external aspect to the site.

In addition, the landscaping serves to mitigate the impacts of removing some of the regulated/significant trees to provide a balance between the new development and the existing nature of the site.

The proposed plantings are low maintenance and native species to provide colour, texture and contrast.

Some of the existing taller trees are being retained for screening and will be trimmed, with additional trees proposed for the Eastern and Western edges. A small picnic table is proposed for the Western edge within the landscaping buffer.

The landscaping will provide complementary amenity plantings consistent with its streetscape context and to soften the visual appearance of industrial buildings.

8.7 Regulated and Significant Trees

The proponent proposes removal of 7 X Regulated and 11 X Significant trees in order to undertake construction of the anaerobic digestion plant.

It is unknown when the trees were planted and whether the allotment boundaries were different at that stage of development.

Figure 21 above demonstrates the locality and the age of the subject trees in relation to the proposed development looking south west from Gidgie Court. Further photos are provided in Attachment 1.

The applicant's arborist report states that the proposed development is in direct conflict with the built form and therefore require removal. It is worth noting that the lodged plans were amended to adjust the amount of trees removed and these plans were notified to the public as appropriate.

The General Section of the Salisbury Development Plan seeks conservation of regulated trees which provide important aesthetic or environmental benefit (OBJ 1) with preservation being subject to the contribution to character or visual amenity, rareness or habitat (OBJ 2). The regulated trees are less in number than the significant trees and although they provide some visual relief they cannot be retained for this reason alone.



Figure 21 - view of trees lining site - looking south west from Gidgie Court

Significant trees as referenced in the General Section of the Salisbury Development Plan should be conserved in balance with achieving appropriate development (OBJ 2). While the significant trees outnumber the regulated trees on the allotment, the design of the proposed facility has meant that the western trees are retained and therefore some landscaping will be mature. The proponent has nominated to landscape the site with replacement trees of at least 1m in height.

Both representors and the City of Salisbury have identified the removal of trees as a concern given the mature nature as a contributor to the amenity of area. In a land use planning sense the integrated landscaping, access and land use outcome for the site outweighs the loss of mature trees. Given the site is expected to be a self-sustaining operation the removal of mature trees is somewhat negated by the overall environmental benefits.

The proposed landscaping also provides an integrated response to the reduction of mature trees, with replanting to be as directed by conditions, native to the locality and visually appealing.

8.8 Traffic Impact, Access and Parking

The proponent has outlined the expected traffic in their design report, with light vehicles to be used by staff and visitors and heavy vehicles (dump trucks, tankers and road trains) to deliver materials.

The proponent expects a maximum of 50 deliveries per day upon full operation, with approximately 5 trucks per hour.

The facility can process up to 9 trucks at a time through the traffic light controlled roller doors.

The traffic lights are integrated to the design of the site and are located adjacent to the bays to indicate free bays for material delivery.

Representors raised increased traffic from trucks as a negative impact on the locality with the potential for waste spillage on adjacent roads.

The applicant expects transport to use local roads to access the site and council have indicated that further details would be appropriate given the potential for impact on Council roads.

While details are required for Council, the traffic impacts and access to the site is not expected to be a serious detriment to the local area given the adjacent land uses are similar in nature and more intensive in their operational requirements.

Gidgie Court, Edinburgh Parks is also used by GTS Freight Management with large freight trains accessing the site; Coates Hire are immediately to the east of the subject site and oversize items such as demountable offices are available for lease from the site.

In terms of responding to representors comments regarding waste spillage – this is a matter not considered by the Development Plan or its policies; deliveries are expected to be secure loads in order to travel to the site.

9. CONCLUSION

The proposed anaerobic digestion facility is expected to divert approximately 120,000 tonnes of waste from landfill per year and generate 4.7MW of electricity and 21.7GJ/hr biomethane gas and 4.9MW of thermal heat through the anaerobic digestion process.

Representations raised a number of issues pertaining to air quality, dust, noise and waste spillage before delivery at the site.

The EPA provided referral advice with regard to the potential for interface impacts between land uses through the operation of the facility. The applicant has satisfied this agency in respect to meeting relevant air and noise quality standards required in South Australia for operation of the anaerobic digestion, electricity and gas plant.

Council have indicated in principle support of the proposal with details to be provided at the detailed design phase and prior to commencement of works – where appropriate these details have been conditioned.

The proposal is considered to be a 'next generation' energy provider and diversion of packed goods and perishables from landfill.

The above assessment has considered the proposal against the relevant Development Plan, referral responses from the EPA, the City of Salisbury and representations from the public.

The development of such a facility in a Suburban Employment Zone – subject to appropriate design and operational controls – is seen to be an appropriate one.

The proposal is recommended for Development Plan consent to be granted.

10. RECOMMENDATION

It is recommended that the State Commission Assessment Panel:

- 1) RESOLVE that the proposed development is NOT seriously at variance with the policies in the Development Plan.

- 2) RESOLVE that the State Commission Assessment Panel is satisfied that the proposal generally accords with the related Objectives and Principles of Development Control of the Salisbury Council Development Plan.
- 3) RESOLVE to grant Development Plan Consent to the proposal by DeLorean Energy for construction of an anaerobic digestion facility and associated works at 1-2 Gidgie Court, Edinburgh Parks subject to the following conditions of consent.

PLANNING CONDITIONS

1. The development granted Development Plan consent shall be undertaken and completed in accordance with the stamped plans and documentation, except where varied by conditions below (if any).

Reason: to ensure the development is undertaken in accordance with its approved plans.

2. Prior to the commencement of construction, a Traffic Management Plan (prepared in consultation with the local Council) shall be submitted to the reasonable satisfaction of the State Commission Assessment Panel.

Reason: to manage traffic impacts to the local and arterial road network.

3. Prior to the commencement of construction, a Civil Plan (prepared in consultation with the local Council) shall be submitted to the reasonable satisfaction of the State Commission Assessment Panel. This plan shall include relevant details in respect to finished floor and site levels, cut and fill levels, service infrastructure, pavement details, stormwater management, water quality systems and driveway crossover specification and verge alternations.

Reason: to provide adequate details to the local Council.

4. Prior to the commencement of construction, a final Landscaping plan (prepared in consultation with the local Council) shall be submitted to the reasonable satisfaction of the State Commission Assessment Panel. This plan shall include relevant details in respect to plant species selections, mature height levels, establishment and maintenance strategies.

Reason: to ensure appropriate landscaping measures are undertaken.

5. All external finishes shall have surfaces which are of a low light reflective nature.

Reason: to ensure the proposal blends into the local environment.

6. Materials likely to be windblown shall not be handled or stored outside of the building.

Reason: to ensure appropriate waste management procedures are followed.

7. All doors around the perimeter of the facility shall be kept closed during operations, except where otherwise required to facilitate the movement of materials by forklift/front end loader or during the entry and exit of trucks.

Reason: to ensure the development complies with the Environment Protection (Air Quality) Policy 2016.

8. Except where otherwise approved, no materials, goods or containers shall be stored in the designated car parking area or manoeuvring areas at any time.

Reason: to ensure the development complies with the Environment Protection (Air Quality) Policy 2016.

9. Stormwater systems shall be designed and constructed to cater for minor storm flows (Industrial/Commercial ARI = 10 years). The design of the stormwater system shall ensure that no stormwater is discharged onto any adjoining land. Surface stormwater is to be managed in a manner that ensures no ponding of water against buildings and structures, no creation of any insanitary condition, and no runoff into neighbouring property for the major storm event ARI = 100 years.

Reason: to ensure that stormwater is appropriately managed.

10. All driveways and parking areas shall be constructed with either brick paving, concrete or bitumen to a standard appropriate for the intended traffic volumes and vehicle types. Individual car parking bays shall be clearly line marked. Driveways and car parking areas shall be established prior to the approved use commencing and shall be maintained at all times.

Reason: to provide for adequate manoeuvring and site access.

11. Semi-mature native tree species (>1m in height) indigenous to the local area shall be planted on a 2 for 1 basis to compensate for the removal of each regulated tree and on a 3 for 1 basis for each significant tree. The replacement tree planting shall occur within six months of the commencement of site operations and be in a suitable position within the landscaped area on site.

Reason: to ensure that screen plantings are maintained and replaced where necessary.

12. All pruning work shall be undertaken by a qualified arborist and in accordance with *Australian Standard 4373-2007: Pruning of Amenity Trees*.

Reason: to ensure that existing plantings are maintained.

13. All works within the vicinity of the regulated/significant trees located on-site shall be undertaken in accordance with the recommendations made in the arborist report from Arborman Tree Solutions, dated Friday 14 September 2018 (document ID ATS5157-1-2GidCtDIR).

Reason: to ensure that existing plantings are maintained.

14. Landscaping shown on the approved plans shall be established prior to the operation of the development and shall be maintained and nurtured at all times with any diseased or dying plants being replaced.

Reason: to ensure that screen plantings are maintained and replaced where necessary.

15. Security fencing to be constructed using chain wire mesh in PVC coated black or similar.

Reason: to provide security with regard to the local environment.

16. All external lighting on the site shall be designed and constructed to conform to Australian Standard (AS 4282-1997).

Reason: to provide security with regard to the local environment.

Environment Protection Authority – directed conditions

17. Prior to commencement of operations, all noise mitigation measures must be installed as outlined in section 5 of the *Environmental Noise Assessment* prepared by Herring Storer Acoustics, dated February 2019 (document reference: 23621-5-18204).

Reason: to ensure the development complies with EPA noise requirements.

18. Prior to operation, all operational areas must be sealed with concrete (or other impervious material).

Reason: to ensure the potential for surface contamination is minimised.

19. Prior to the commencement of operations, bunding must be installed and all liquids and waste materials must be stored within the bunded area so as to contain any spillages that may occur. Note: Information on bunding is available in the *EPA Guidelines: Bunding and Spill Management* (2012) http://epa.sa.gov.au/files/47717_guide_bunding.pdf

Reason: to ensure the development complies with EPA contamination requirements.

20. Prior to commencement of operations, the Schlumberger Iron Oxide Scrubber must be installed and operational.

Reason: to ensure the development complies with the Environment Protection (Air Quality) Policy 2016.

ADVISORY NOTES

- a. This Development Plan Consent will expire after 12 months from the date of this Notification, unless final Development Approval from Council has been received within that period or this Consent has been extended by the State Commission Assessment Panel.
- b. The applicant is also advised that any act or work authorised or required by this Notification must be substantially commenced within 1 year of the final Development Approval issued by Council and substantially completed within 3 years of the date of final Development Approval issued by Council, unless that Development Approval is extended by the Council.
- c. The applicant has a right of appeal against the conditions which have been imposed on this Development Plan Consent. Such an appeal must be lodged at the Environment, Resources and Development Court within two months from the day of receiving this notice or such longer time as the Court may allow. The applicant is asked to contact the Court if wishing to appeal. The Court is located in the Sir Samuel Way Building, Victoria Square, Adelaide, (telephone number 8204 0289).
- d. A Construction Environment Management Plan (CEMP) shall be prepared and implemented in accordance with current industry standards in accordance with the Environment Protection Authority guideline 'Construction environmental management plans' 2016 (see http://www.epa.sa.gov.au/business_and_industry/environmental_planning/position-statements-and-guidelines) to minimise environmental harm and disturbance during construction.
- e. An Operational Environment Management Plan shall be prepared and implemented by the applicant in accordance with the Environment Protection Authority guidelines.
- f. In relation to Condition 12, replacement trees must not be a species listed in Regulation 6A(5)(b) of the *Development Regulations 2008*, or a tree belonging to a

class of plant declared by the Minister under Chapter 8 Part 1 of the *Natural Resources Management Act 2004*. The trees shall be maintained in good condition at all times and replaced if necessary.

- g. All cranes be used in consultation with Edinburgh RAAF Airbase by contacting:

Mr J Smith, Manager Technical Services
Department of Defence
Building EP2
PO Box 1500
Edinburgh SA 5111

Mr T Hogan
Estate and Infrastructure Group
Department of Defence
DSRGIDEP.executivesupport@defence.gov.au

Environment Protection Authority notes:

- h. The applicant is reminded of its general environmental duty, as required by section 25 of the *Environment Protection Act 1993*, to take all reasonable and practicable measures to ensure that the activities on the whole site, including during construction, do not pollute the environment in a way which causes or may cause environmental harm.
- i. An environmental authorisation in the form of a licence is required for the operation of this development. Conditions of licence may include requirements to:
- undertake post commissioning monitoring to validate the inputs used in the model for all identified pollutants of concern
 - undertake on-going H₂S monitoring of pre-scrubber and post scrubber biomethane
 - prepare a contingency plan to outline measures that would be actioned in the event that roller doors and/or bio-filters/scrubber fail or in the event that H₂S is detected at sensitive receivers.
- j. The applicant is required to contact the Environment Protection Authority before acting on this approval to ascertain licensing requirements. Information on applying for a licence (including licence application forms) can be accessed here: http://www.epa.sa.gov.au/business_and_industry/applying_for_a_licence
- A licence may be refused where the applicant has failed to comply with any conditions of development approval imposed at the direction of the Environment Protection Authority.
 - EPA information sheets, guidelines documents, codes of practice, technical bulletins etc can be accessed on the following web site: <http://www.epa.sa.gov.au>.
- k. The applicant is reminded that demolition and construction is required to be carried out so that it complies with the construction noise provisions of the *Environment Protection (Noise) Policy 2007*.
- l. Improvements to the adjacent public realm areas, including proposals to plant in the landscaped verge require the approval of the Salisbury Council and are not part of this planning consent.

Janine Philbey
PLANNING OFFICER
PLANNING AND LAND USE SERVICES
DEPARTMENT OF PLANNING, TRANSPORT and INFRASTRUCTURE



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2	THIRD REVISION	14/11/2018	MARTYN A.	JOSEPH O.	
1	SECOND REVISION	14/09/2018	MARTYN A.	JOSEPH O.	
0	ISSUED FOR REVIEW	22/05/2018	MARTYN A.	JOSEPH O.	

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 Email: info@biogass.com.au



CLIENT: DELOREAN GROUP
 PROJECT NO: J116
 ALL DIMENSIONS IN mm

TITLE: DELOREAN ENERGY SA ONE
 SITE ALLOTMENT BOUNDARY
 DWG NO. J116-002 SHEET NO. 13 OF 13 REV 2



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REVISION	REVISION DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED
2	THIRD REVISION	14/11/2018	MARTYN A.	JOSEPH O.	
1	SECOND REVISION	14/09/2018	MARTYN A.	JOSEPH O.	
0	ISSUED FOR REVIEW	22/05/2018	MARTYN A.	JOSEPH O.	

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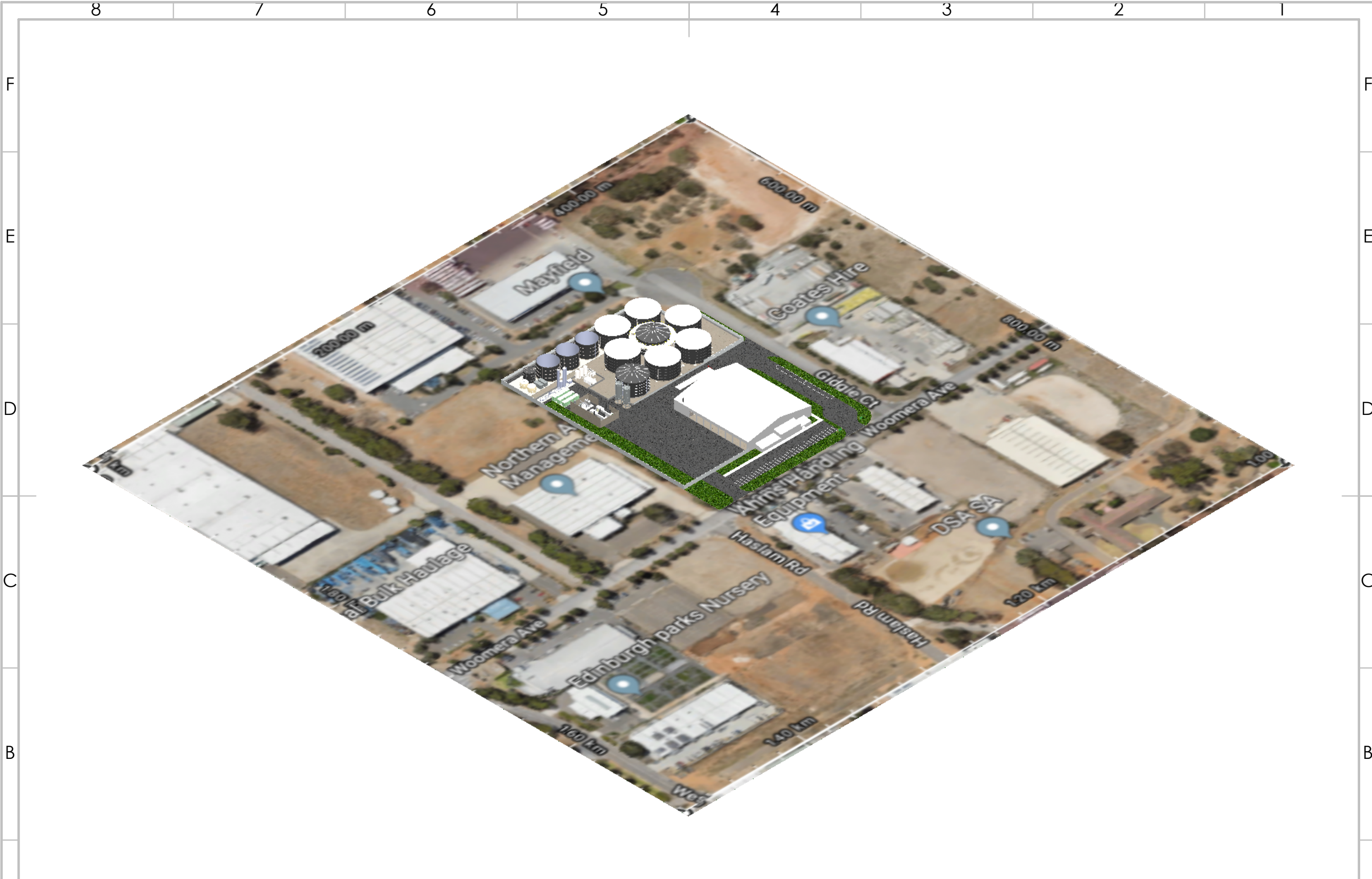
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CLIENT: DELOREAN GROUP
 PROJECT NO: J116
 ALL DIMENSIONS IN mm

TITLE: DELOREAN ENERGY SA ONE
 SITE OVERVIEW LAYOUT
 SCALE 1:2200
 DWG NO. J116-002 SHEET NO. 12 OF 13
 REV 2

8 7 6 5 4 3 2 1



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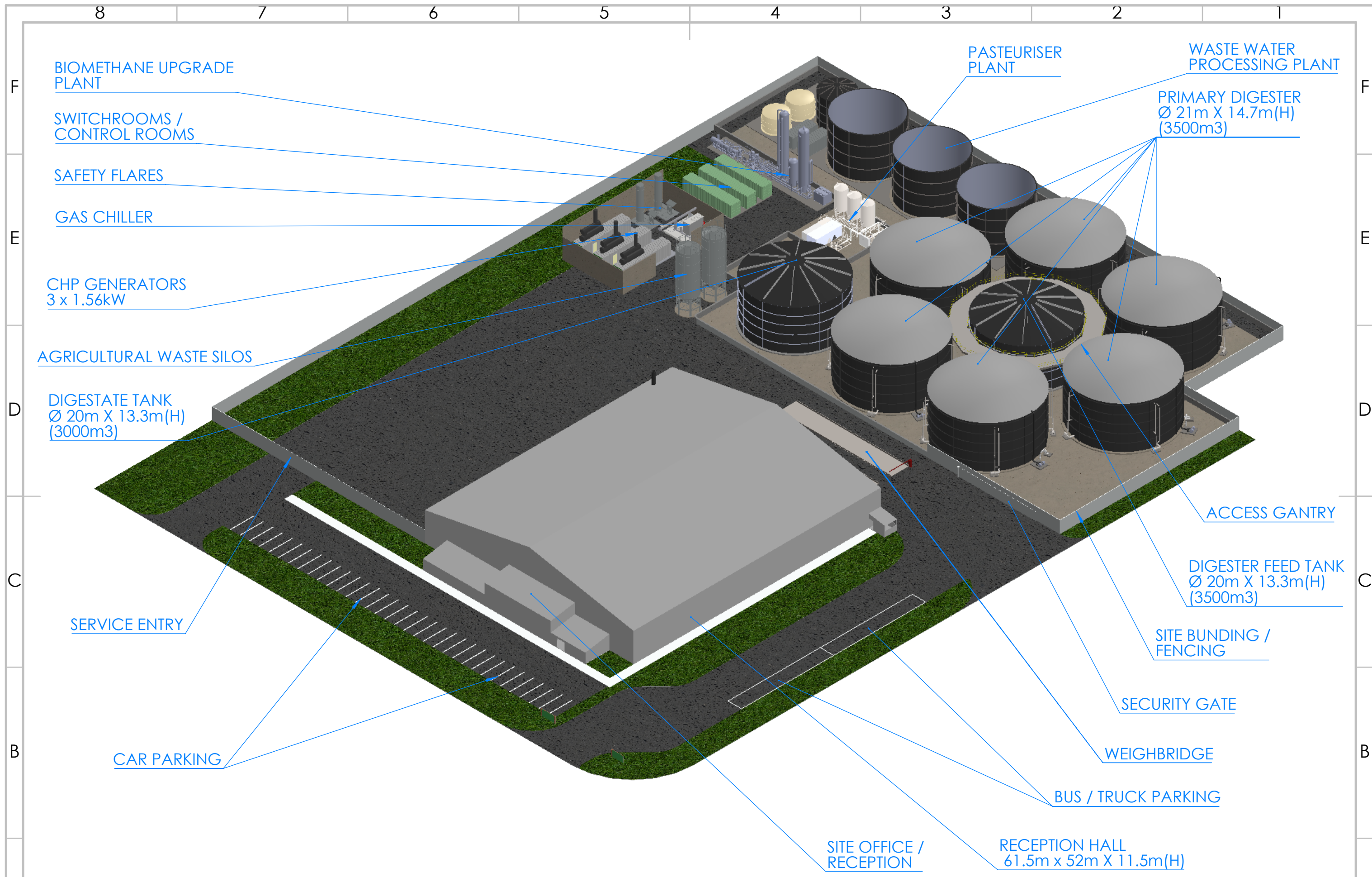
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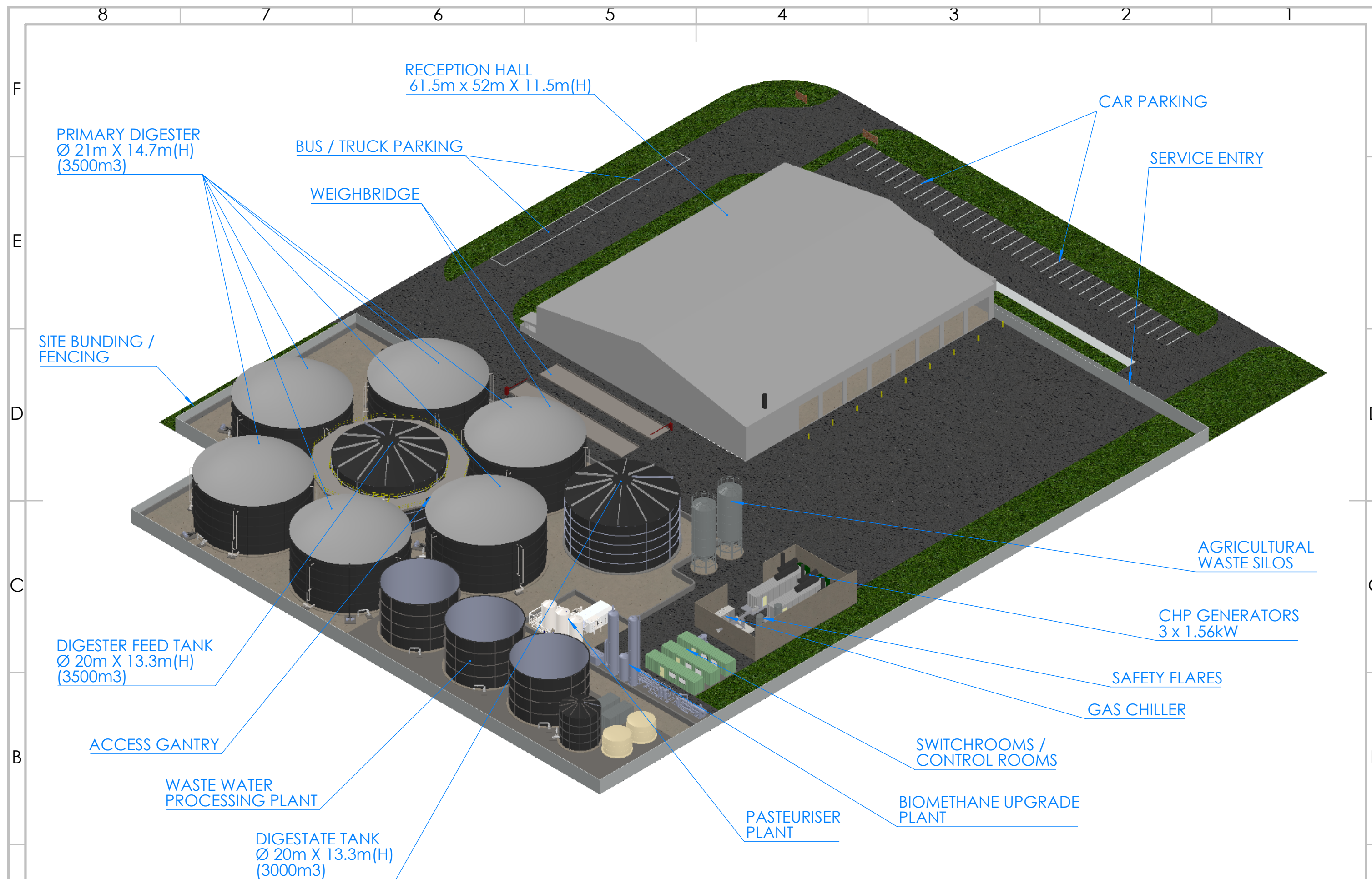


CLIENT: DELOREAN GROUP
 PROJECT NO: J116
 ALL DIMENSIONS IN mm

TITLE: DELOREAN ENERGY SA ONE
 SITE OVERVIEW LAYOUT
 SCALE 1:2000
 DWG NO. J116-002 SHEET NO. 11 OF 13 REV 2



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	1	SECOND REVISION	14/09/2018	MARTYN A.	JOSEPH O.				PROJECT NO: J116	PLANT CONCEPT LAYOUT		
	0	ISSUED FOR REVIEW	22/05/2018	MARTYN A.	JOSEPH O.				ALL DIMENSIONS IN mm	SCALE 1:600	DWG NO. J116-002 SHEET NO. 1 OF 13	REV 2
	REVISION	REVISION DESCRIPTION	DATE	DRAWN	CHECKED				APPROVED			



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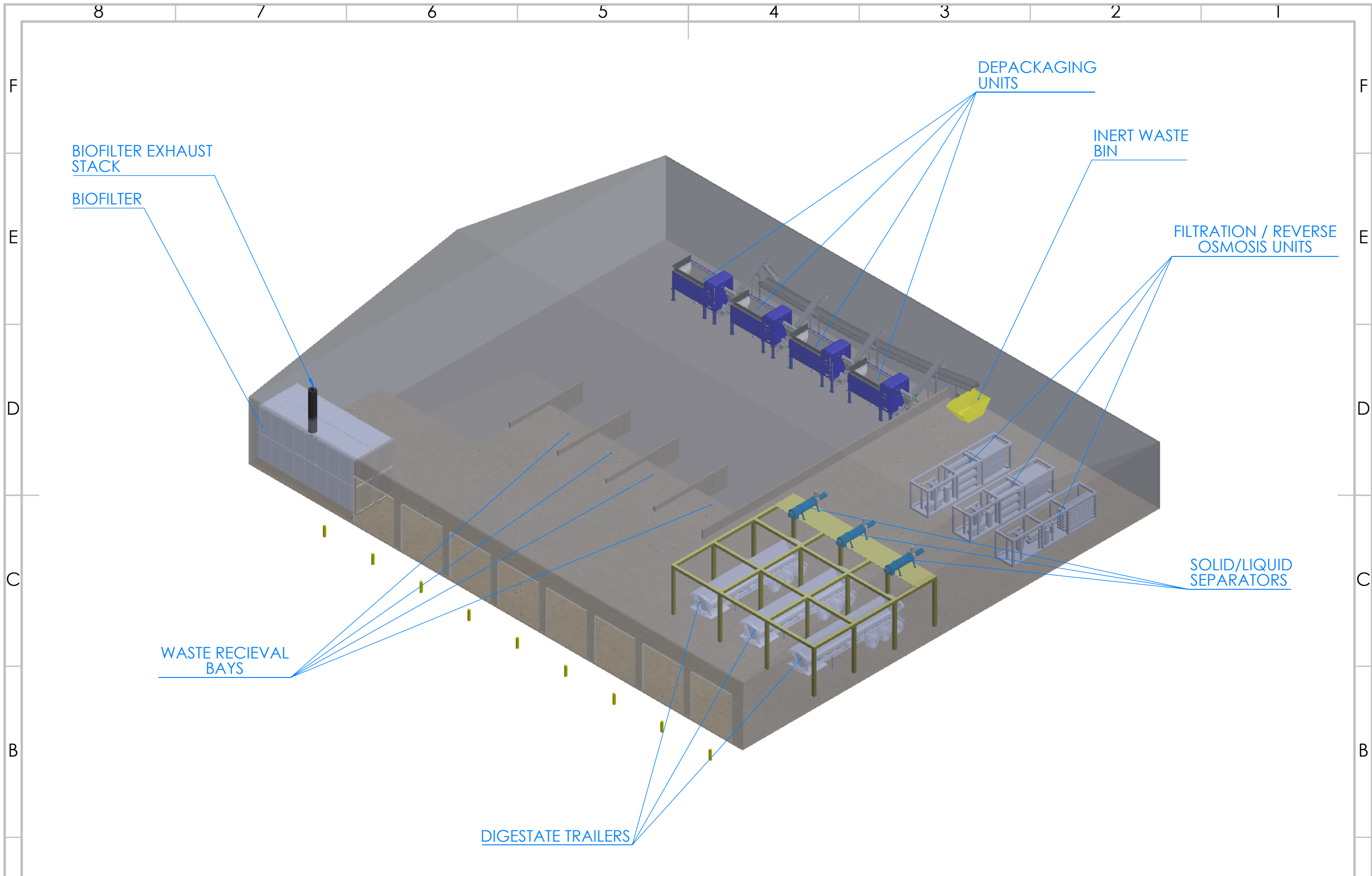


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PROJECT NO: J116

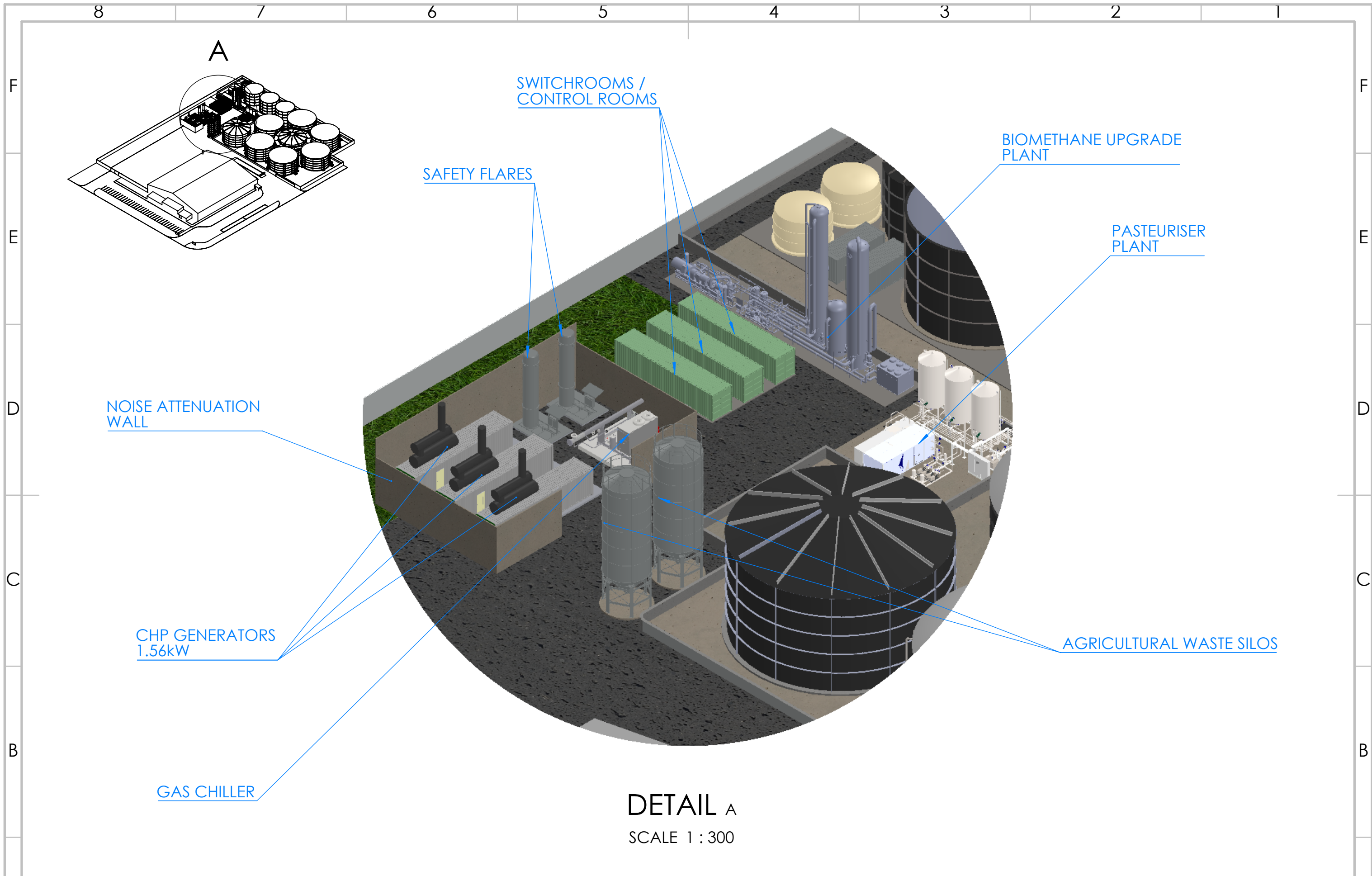
ALL DIMENSIONS IN mm SCALE 1:600

TITLE: DELOREAN ENERGY SA ONE
PLANT CONCEPT LAYOUT

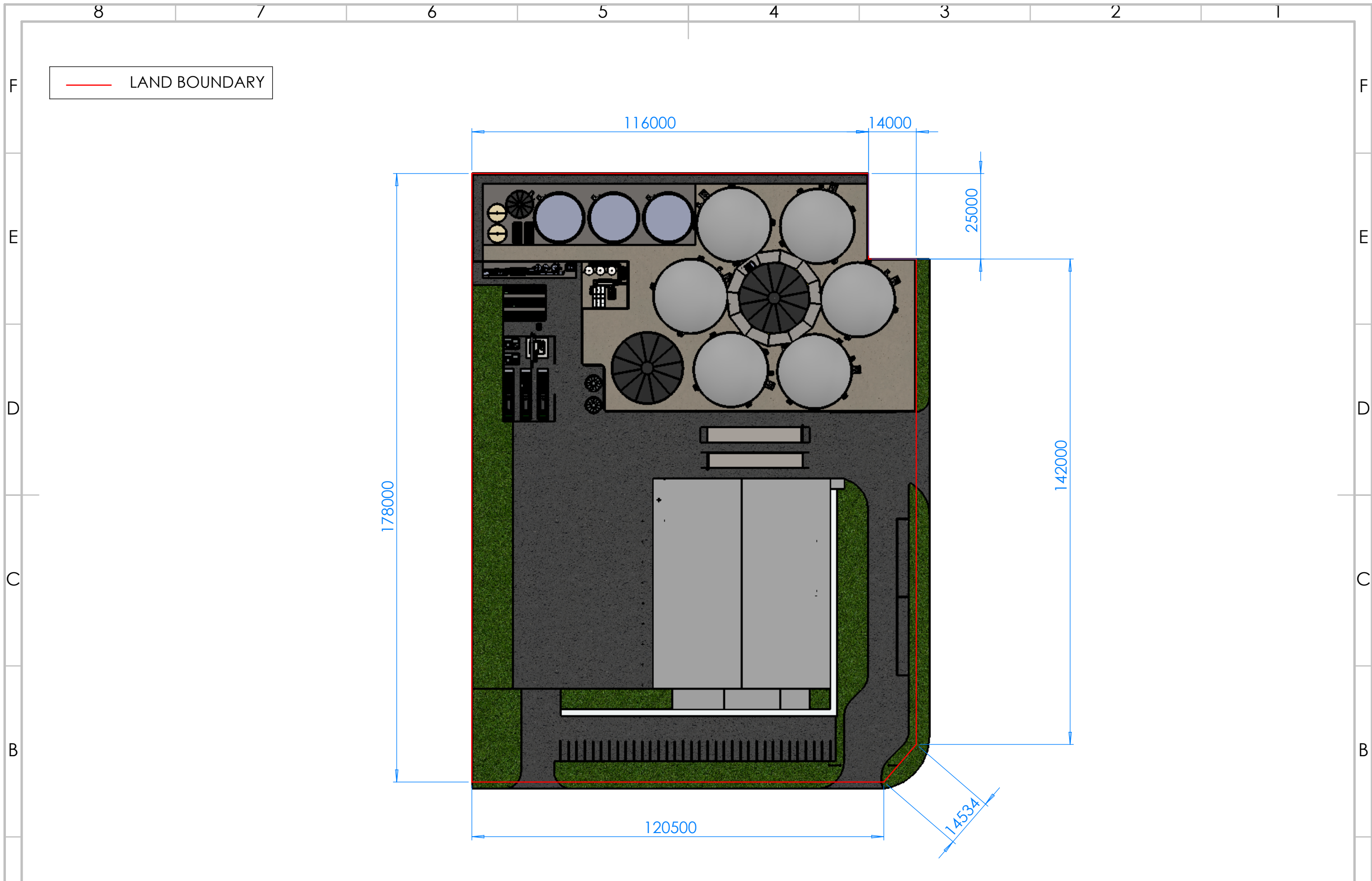
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	1	SECOND REVISION	14/09/2018	MARTYN A.	JOSEPH O.				PROJECT NO: J116	RECIEVAL HALL DETAIL			
	0	ISSUED FOR REVIEW	22/05/2018	MARTYN A.	JOSEPH O.				ALL DIMENSIONS IN mm	SCALE 1:300		DWG NO. J116-002 SHEET NO. 3 OF 13	REV 2
	REVISION	REVISION DESCRIPTION	DATE	DRAWN	CHECKED				APPROVED				



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	REVISION	REVISION DESCRIPTION	DATE	DRAWN	CHECKED				APPROVED	ALL DIMENSIONS IN mm



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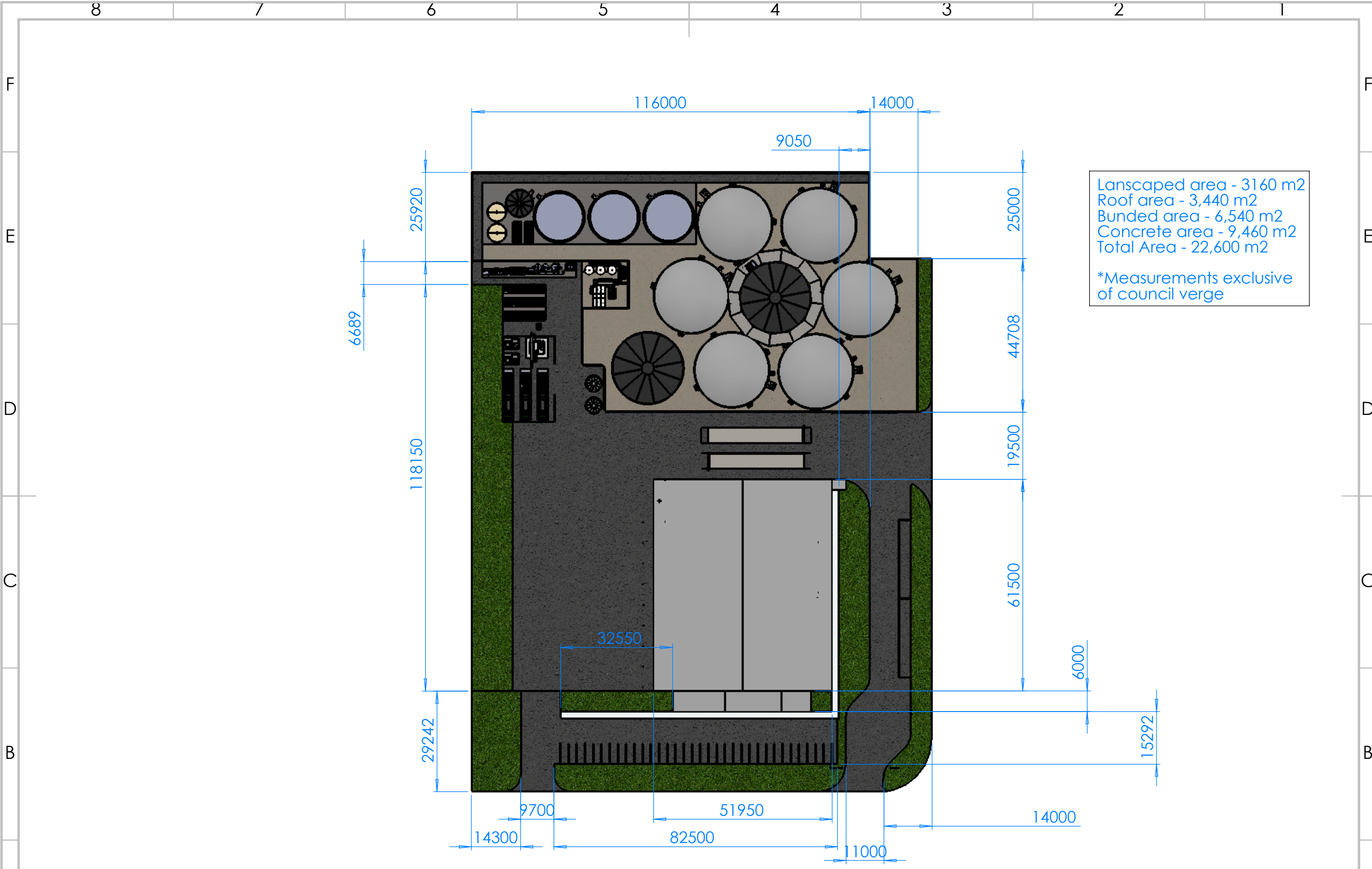
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CLIENT: DELOREAN GROUP
 PROJECT NO: J116

TITLE: DELOREAN ENERGY SA ONE
 SITE DIMENSIONS

DWG NO. J116-002 SHEET NO. 5 OF 13 REV 2



Lanscaped area - 3160 m2
 Roof area - 3,440 m2
 Bunded area - 6,540 m2
 Concrete area - 9,460 m2
 Total Area - 22,600 m2

*Measurements exclusive of council verge

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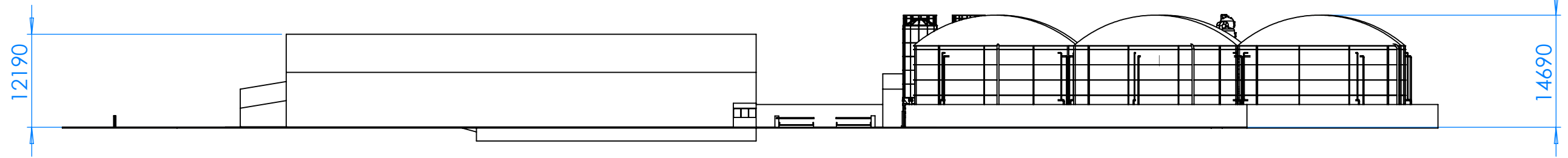
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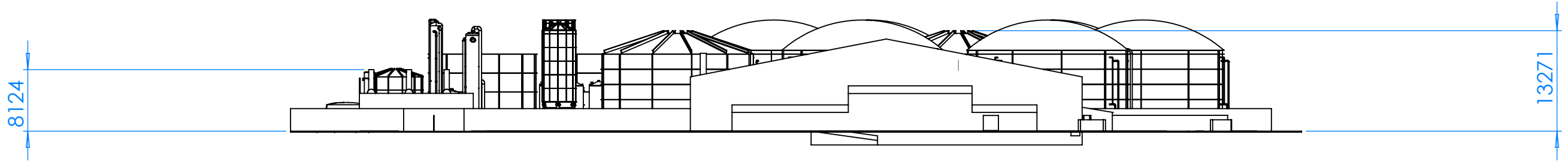
CLIENT: DELOREAN GROUP
 PROJECT NO: J116

TITLE: DELOREAN ENERGY SA ONE
 SITE DIMENSIONS

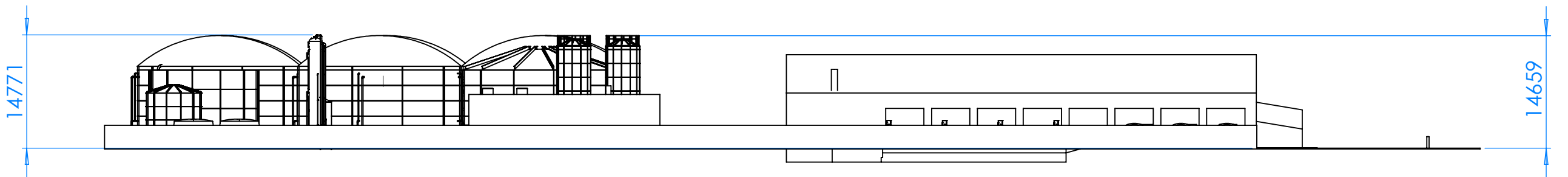
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 DWG NO. J116-002 SHEET NO. 6 OF 13 REV 2



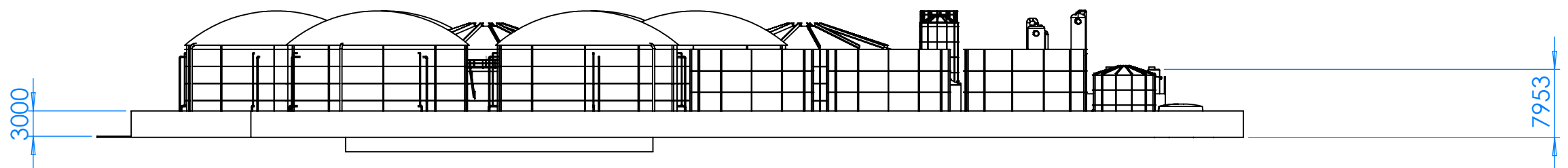
WEST VIEW



NORTH VIEW



EAST VIEW



SOUTH VIEW

REVISION	REVISION DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED
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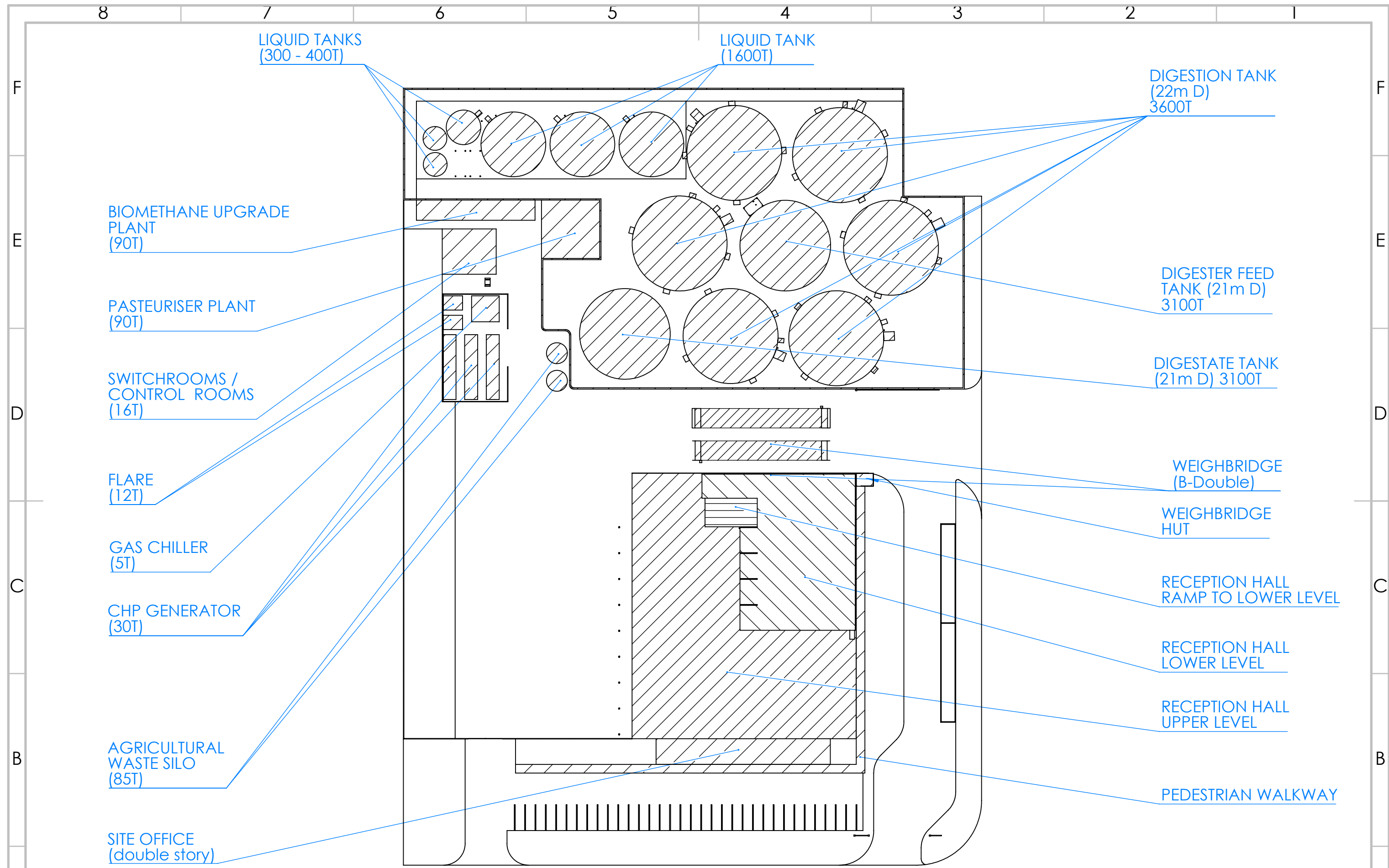
TITLE: DELOREAN ENERGY SA ONE
 SITE ELEVATIONS

ALL DIMENSIONS IN mm

SCALE 1:600

DWG NO. J116-002 SHEET NO. 7 OF 13

REV 2



LIQUID TANKS
(300 - 400T)

LIQUID TANK
(1600T)

DIGESTION TANK
(22m D)
3600T

BIOMETHANE UPGRADE
PLANT
(90T)

DIGESTER FEED
TANK (21m D)
3100T

PASTEURISER PLANT
(90T)

DIGESTATE TANK
(21m D) 3100T

SWITCHROOMS /
CONTROL ROOMS
(16T)

FLARE
(12T)

WEIGHBRIDGE
(B-Double)

GAS CHILLER
(5T)

WEIGHBRIDGE
HUT

CHP GENERATOR
(30T)

RECEPTION HALL
RAMP TO LOWER LEVEL

AGRICULTURAL
WASTE SILO
(85T)

RECEPTION HALL
LOWER LEVEL

SITE OFFICE
(double story)

RECEPTION HALL
UPPER LEVEL

PEDESTRIAN WALKWAY

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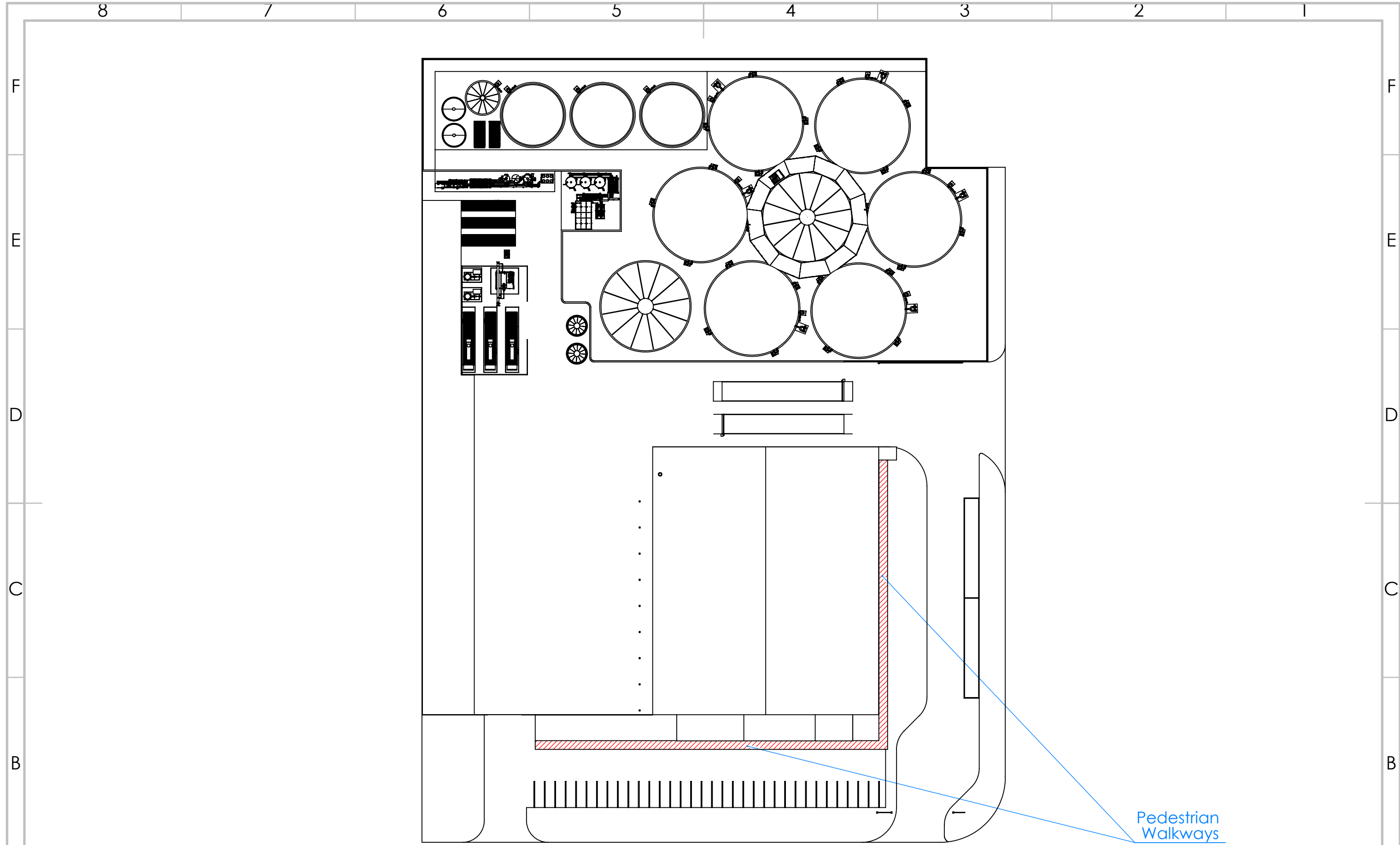
TITLE: DELOREAN ENERGY SA ONE
CIVILS LAYOUT

ALL DIMENSIONS IN mm

SCALE 1:800

DWG NO. J116-002 SHEET NO. 8 OF 13

REV 2



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0	ISSUED FOR REVIEW	22/05/2018	MARTYN A.	JOSEPH O.	

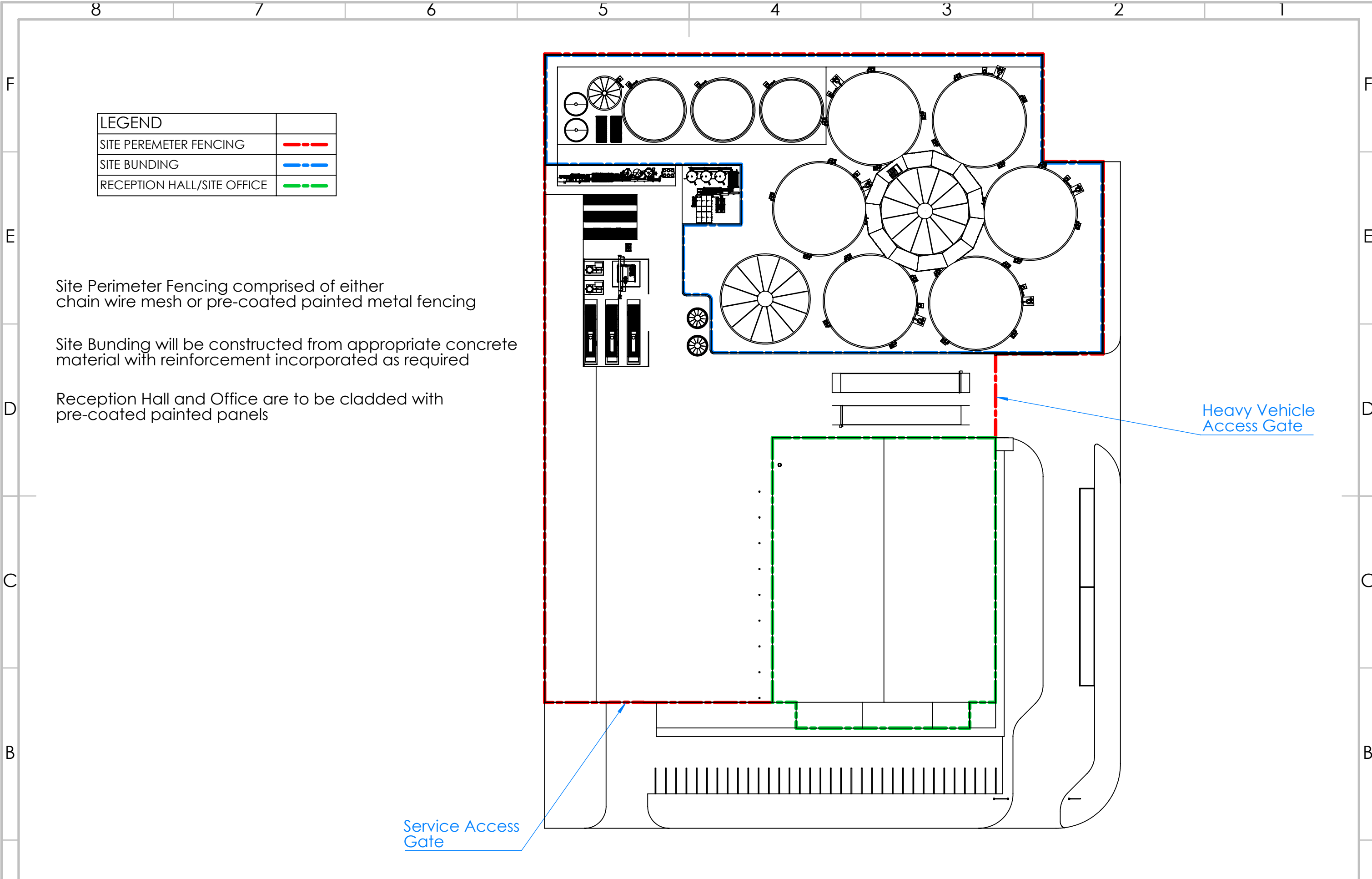
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CLIENT: DELOREAN GROUP
 PROJECT NO: J116
 ALL DIMENSIONS IN mm
 SCALE 1:800

TITLE: DELOREAN ENERGY SA ONE
 SITE ACCESS DIAGRAM
 DWG NO. J116-002 SHEET NO. 9 OF 13
 REV 2



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 PROJECT NO: J116

TITLE: DELOREAN ENERGY SA ONE
 CIRCULATION AND FENCING

ALL DIMENSIONS IN mm SCALE 1:800
 DWG NO. J116-002 SHEET NO. 10 OF 13 REV 2

Certificate of Title

Title Reference	CT 5946/160
Status	CURRENT
Easement	YES
Owner Number	9001259*
Address for Notices	L9 RIVERSIDE CENTRE NORTH TERRACE ADELAIDE SA 5000
Area	2.274HA (CALCULATED)

Estate Type

FEE SIMPLE

Registered Proprietor

URBAN RENEWAL AUTHORITY
OF LEVEL 9 (WEST) RIVERSIDE CENTRE NORTH TERRACE ADELAIDE SA 5000

Description of Land

ALLOTMENT 505 DEPOSITED PLAN 68296
IN THE AREA NAMED EDINBURGH
HUNDRED OF MUNNO PARA

Last Sale Details

There are no sales details recorded for this property

Constraints

Encumbrances

NIL

Stoppers

NIL

Valuation Numbers

Valuation Number	Status	Property Location Address
4425406709	CURRENT	1-2 GIDGIE COURT, EDINBURGH, SA 5111

Notations

Dealings Affecting Title

NIL

Notations on Plan

NIL

Registrar-General's Notes

NIL

Administrative Interests

NIL

REFERENCE MARKS				
Cnr	Bearing	From	Dist	PM Number
1	247°23'	PM FD	32.63	6628/55191
2	119°25'	PM FD	2.13	6628/56112
3	22°55'	PM FD	2.01	6628/56111
3	206°16'	MP FD	1.91	
6	296°15'30"	PM FD	1.08	6628/55192

PLAN NUMBER

DP 68296

THIS IS SHEET 1 OF 1 SHEETS

DEPOSITED 2 / 8 / 2005

ACCEPTED FOR FILING PRO REGISTRAR-GENERAL

MAP REF 6628-22-k & q DEV No 361/D011/04

TITLE SYSTEM REAL PROPERTY ACT

TITLE REFERENCE C'st 5878/134, 5878/135
5878/136 and 5878/138

OB / LAST PLAN REF FP 47214 TOTAL AREA 17.31 ha

DOCKET No

FIELD BOOK No

CLOSURE CHECKED J. E.	PLAN EXAMINED D.J.W.	PLAN APPROVED Dg. Williams 4.7.2005	PMS APPROVED 4.7.2005
--------------------------	-------------------------	---	--------------------------

IRRIGATION AREA DIVISION
HUNDRED MUNNO PARA
AREA EDINBURGH
COUNCIL CITY OF SALISBURY

PLAN OF DIVISION

ALLOTMENTS 122, 123, 124
and 126 in DP 57387

SCALE 0 50 100 150 200 METRES

STATEMENTS CONCERNING EASEMENTS ANNOTATIONS AND AMENDMENTS

PORTION OF ALLOTMENTS 503, 505, 506 AND 507 MARKED S ARE SUBJECT TO AN EASEMENT TO CKI UTILITIES DEVELOPMENT LTD, CKI UTILITIES HOLDINGS LTD, HEI UTILITIES DEVELOPMENT LTD, HEI UTILITIES HOLDINGS LTD AND CKI/HEI UTILITIES DISTRIBUTION LTD FOR ELECTRICITY PURPOSES VIDE RTC9330350

PORTION OF ALLOTMENT 506 MARKED A/B IS TO BE SUBJECT TO AN EASEMENT TO THE LAND MANAGEMENT CORPORATION FOR THE PURPOSE OF CONSTRUCTING, OPERATING AND MAINTAINING BORES AND TOGETHER WITH A RIGHT OF ACCESS OVER THE LAND MARKED B AS SET FORTH IN THE ACCOMPANYING APPLICATION

PORTION OF ALLOTMENT 500 MARKED T IS TO BE SUBJECT TO AN EASEMENT TO DISTRIBUTION LESSOR CORPORATION (SUBJECT TO L8890000) FOR ELECTRICITY SUPPLY PURPOSES AS SET FORTH IN THE ACCOMPANYING APPLICATION

AMENDMENT TO EASEMENT NOTE ~ VIDE DKT 69/2005 PRO R6 30.8.2005
31

ALL DISTANCES ARE GROUND DISTANCES

COMBINED SCALE FACTOR 1.00017 ZONE 54 MGA 94
BEARING DATUM 293°56'46" DISTANCE 682.00
DERIVED FROM PSM 6628/56111 - 6628/55191

I CHRISTOPHER JOHN MILLETT
licensed surveyor of South Australia do hereby certify -

(1) That this plan has been made from surveys carried out by me or under my personal supervision and in accordance with the Survey Act 1992

(2) That the field work was completed on the 27th day of MAY 20 05
excepting for the final placement of survey marks (strike out if not applicable)

Date 10/06/2005 Licensed Surveyor

PURLING AVENUE

ENLARGEMENT E2
NOT TO SCALE

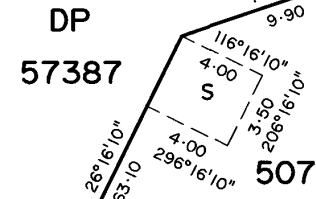
ENLARGEMENT E1
NOT TO SCALE

ENLARGEMENT E3
NOT TO SCALE

ENLARGEMENT E4
NOT TO SCALE

ENLARGEMENT E5
NOT TO SCALE

LEGEND	
NETWORK PSM	☐
NETWORK STATION	⊙
PERMANENT SURVEY MARK	☐
FOUND	☐ FD
GONE	☒ GONE
REFERENCE MARKS	●
FOUND	● MP OR RAM
GONE	● SPK FD
	● BT GONE
DRILL HOLE & WING	—
DIRECTION CHANGE	—
PART DISTANCES	(20.32)
CALCULATED DATA	20.85 CALC
COPIED DATA	100.85



DP 57387



FYFE PTY LTD
SURVEYORS and ENGINEERS
A.C.N. 062 592 465
143 FULLARTON ROAD ROSE PARK SA 5067
PHONE (08) 8364 1000 FAX (08) 8364 0904
Brisbane (07) 3208 6566
Reference 16501/1/9 Dwg No. 16501DC1-r2
QA REV 2 DATE 27/07/2005



DEVELOPMENT APPLICATION FORM

361/ /2018/

Please use BLOCK LETTERS and Black or Blue Ink

I wish to apply for (tick only one): <input checked="" type="checkbox"/> Development Plan Consent <input type="checkbox"/> Building Rules Consent	
<input type="checkbox"/> Full Development Approval (consists of both consents, which is required prior to any work commencing)	
APPLICANT: COMPANY / FIRST NAME DeLorean Energy	SURNAME
POSTAL ADDRESS: Level 1, 10 Ord Street, West Perth 6005	
EMAIL: INFO@DeLoreanenergy.com.au	
OWNER NAME: (This must be completed) Joseph Oliver	<input type="checkbox"/> as above
OWNER POSTAL ADDRESS:	<input type="checkbox"/> as above
OWNER PHONE NO: 08 6147 7577 0412 378 018	OWNER EMAIL: Joe.oliver@foodenergy.com.au
CONTACT PERSON FOR FURTHER INFORMATION <input type="checkbox"/> as above	
NAME: Hamish Jolly	TELEPHONE (W): 08 6147 7577 (M):
EMAIL: hamish.jolly@biogass.com.au	Information from Council will be given by electronic communication to the nominated email address.
BUILDER NAME: Biogass Renewables	BUILDERS EMAIL: info@biogass.com.au
BUILDER POSTAL ADDRESS: 1205 Hay Street, West Perth, WA 6005	CONTACT NO.: 08 6147 7577 LICENCE NO.:
CURRENT USE OF PROPERTY: Vacant	
DESCRIPTION OF PROPOSAL: Construction of Anaerobic Digestion facility	DEVELOPMENT COST \$ 33,000,000
LOCATION OF PROPOSAL	
Street No: 1-2 Street: Gidgie Court Suburb: Edinburgh	
Lot No: 505 Section: Plan: D68296 Volume: 5946 Folio: 160	
OFFICE USE ONLY	
Registration Date: / /2018 Zone: Ward:	
BUILDING RULES CLASSIFICATION	
Classification sought:	
If Class 5, 6, 7, or 9 classification is sought, state the proposed number of employees	Male: Female:
If Class 9a classification is sought, state the number of persons for whom accommodation is provided:	
If Class 9b classification is sought, state the proposed number of occupants of the various spaces at the premises:	

I acknowledge that copies of this application and supporting documentation may be provided to interested persons in accordance with the Development Regulations, 1993. Developments requiring public notification will be made available to the public for comment via Council's web site at www.salisbury.sa.gov.au

SIGNATURE: 

DATE: 08/06/2018



DELOREAN GROUP

Waste-to-Energy Anaerobic Digestion Planning Report

DELOREAN ENERGY SA ONE

125,000TPA Salisbury SA Facility - Phase 1

1-2 Gidgie Court, Edinburgh SA 5111

Date	Revision	Status	Prepared	Reviewed	Approved
07/06/2018	A	Final	MA	JO	HJ
19/09/2018	B	Final	MA	JO	HJ

Planning Report





PLANNING REPORT

Biogas Renewables

TABLE OF CONTENTS

Abbreviations and Acronyms	5
Units	5
1. Executive Summary.....	6
2. Building Near Airfields	6
2.1. Structure Heights.....	6
2.2. Noise	7
2.3. Lighting.....	7
2.4. Birds.....	7
2.5. Public Safety Risk	7
3. Crime Prevention.....	7
4. Hazards	8
5. Industrial Development	8
6. Infrastructure	9
7. Interface between Land uses	9
7.1. Emission of effluent, odour, smoke, fumes, dust or other pollutants.....	9
7.2. Noise	10
7.3. Vibration	10
7.4. Light spill	10
7.5. Glare.....	11
7.6. Traffic Impacts.....	11
8. Landscaping, Fences and Walls	11



9. Natural Resources	11
10. Regulated and significant Trees	12
11. Renewable Energy Facility	12
12. Transport and Access	12
13. Waste and Waste Management Facilities.....	13
13.1. Waste	13
13.2. Location.....	13
13.3. Management.....	14
14. Urban Employment Zone.....	14
14.1. Land Use	14
14.2. Form and Character	14
14.3. Land Division.....	16
14.4. Procedural matters.....	17
14.4.1. Complying Development.....	17
<i>Appendix 1: Arborist Tree Report.....</i>	Error! Bookmark not defined.
<i>Appendix 2: Arborist Impact Report</i>	23
<i>Appendix 3: Stormwater Management Plan</i>	24
<i>Appendix 4: Lighting Plan.....</i>	25



Abbreviations and Acronyms

AD	Anaerobic Digestion
ADF	Anaerobic Digestion Facility
BOD	Biological Oxygen Demand
CHP	Combined Heat & Power
COD	Chemical Oxygen Demand
DS	Dry solids
EI&C	Electrical Installation & Control
OS	Organic Solids
PLC	Programmable Logic Controller
PU	Packaged Unit
SS	Suspended Solids

Units

TPA	tons per annum
TPW	tons per week
TPD	ton per day
t/hr	ton per hour
dm ³	cubic decimeter (= 1 liter)
t/m ³	ton per cubic meter
kg VS/m ³ ·day	kg Volatile Solids per cubic meter reactor volume per day.
m ³ /hr	cubic meter per hour
Nm ³ /hr	normal cubic meter per hour
MW	megawatt
MWhr	megawatt hour
MW(th)	megawatt thermal energy
MW(e)	megawatt electrical energy
GJ	gigajoule
ppm	parts per million
kg/hr	kilograms per hour
mbar	millibar
m ³ /m ² *hr	cubic meter (air) per square meter surface area per hour



PLANNING REPORT

Biogass Renewables Pty Ltd

1. Executive Summary

The Delorean Energy SA One waste to energy bio digestion plant, herein referred to as "The Development", is required to adhere to the rules and restrictions outlined in the Salisbury Council Development plan.

Key items that require planning and acceptable design include the following:

- Building and structure height
- Emissions including noise, odour and light
- Landscaping including the quality and quantity of plants
- Land and building boundaries and distances from roads, properties and other zones.
- The treatment of significant and regulated trees on site.
- Appropriate use of land.

Biogass Renewables has completed a planning report for the Development relative to the Salisbury Development Plan and have incorporated smart and innovative design to satisfy the criteria of the Salisbury Development Plan.

This planning report aims to address all relevant criteria and conditions pertaining to the waste to energy biodigestion plant. The layout of the document follows the same order as the Salisbury Council Development Plan for ease of reference.

2. Building Near Airfields

2.1. Structure Heights

The Development is located within area C of the RAAF Airfield in Edinburgh, requiring special approval for any structures higher than 15m from the ground. The current design for The Development will ensure all buildings and structures have a height no higher than 15m from the ground.



2.2. Noise

The Development is not within any airfield Noise Affected Areas and hence no further action is required.

2.3. Lighting

The Development is located within the Controlled Light Installation Area (within 6km radius of the RAAF base). The Development will be in operation 24 hours a day however regular staffing is limited to normal working hours ranging from 7AM to 5PM. Through this there is no requirement for increased lighting requirements, meaning the Development will adhere to the Controlled Light Installation Area criteria. Refer to appendix 4 - Lighting Plan.

2.4. Birds

The Development will not attract birds to the area due to the process being entirely in-vessel. All waste is delivered and processed inside an enclosed Reveal Hall with no outdoor exposure of waste or waste products... In addition, the Development is located in excess of 3km from the nearby RAAF base, requiring no further action.

2.5. Public Safety Risk

The Development will take all possible safety precautions to eliminate risk to public safety and will not create unacceptable risks pertaining to:

- Lighting glare
- Smoke, dust and exhaust emissions
- Air turbulence
- Storage of flammable liquids
- Reflective surfaces
- Materials that affect aircraft navigational aids.

Construction materials and management plans will be used to control the above risks and ensure they do not become a risk to the public.

3. Crime Prevention

The Development has been designed for the following crime prevention measures:

- Maximise surveillance of public spaces
- Provide robust environment resistant to vandalism and graffiti

Job No: J116

Planning Report

Document No: J116-004

Date: 19/09/18

Rev: B



- Lighting utilised in frequently used public spaces (refer to Appendix 4 - Lighting Plan)
- Signage and lighting used to indicate paths and entries
- Landscaped to discourage crime
- Bunding, buildings and fences clearly differentiate public and private areas
- Discouraged and removed access between roofs
- Removal of any pedestrian entrapment points

4. Hazards

The Development has been designed to offtake any stormwater, flooding or tank rupture fluids and divert them to sump areas where they are either captured and stored or pumped directly into the on-site waste water processing facility

Biogas generated on site will comply with ICEX standards with a full HAZOP on site to uphold safety standards

The Development utilises co-generation units and self-enclosed flares to burn the produced biogas on site. The units are located away from any trees, with all combustion being internal with no exposed ignition sources.

The Development will be completely sealed at the ground level, resulting in the soil and ground water salinity not being affected

All waste delivered to The Development is contained either within Agricultural Silos or in specially built containment bunkers within the Reception Hall. The Reception Hall has a biofilter assembly which produces 4-5 air changes per hour and keeps the shed under constant negative pressure. The doors will be fast closing to eliminate any escaping odour or pollutants.

The bunkers in combination with the Reception hall and biofilter assembly eliminates the chance of:

- Discharge of polluted water from The Development
- Contamination of the land
- Airborne migration of pollutants.

5. Industrial Development

The site office will be located at the front of The Development facing the main road (Woomera Avenue) allowing direct pedestrian access from the main



carpark

The public vehicle entrances and exits are located to allow traffic to flow in both directions and allow forward direction for both access and exit.

The warehouse façade will consist of low reflection materials with a design that has an appealing appearance from public roads.

Fencing adjacent to the public road will be set back by a minimum of 10m from the main road (Woomera Avenue) and 4m from the secondary road (Gidgie Court). The area in front will be filled with landscaping and parking for employees and visitors.

6. Infrastructure

The Development will have a final designed to include provisions of the following utilities and services:

- Electricity supply
- Water supply
- Drainage and stormwater systems
- Waste disposal
- Effluent disposal systems
- Formed all-weather public roads
- Telecommunications services
- Social infrastructure, community services and facilities
- Gas services

Any development around electricity lines and other services will meet all clearances and safety restrictions required by the council and the state. New service infrastructure installed on site such as gas lines, electricity, water and telecommunications will be underground and concealed, adhering to any state and national requirements.

7. Interface between Land uses

The Development will be located and designed to minimise adverse impact and conflict to land users.

7.1. Emission of effluent, odour, smoke, fumes, dust or other pollutants

The waste receipt area is fully enclosed within the Reception Hall which is constantly under negative pressure through the use of a biofilter.

Job No: J116

Planning Report

Document No: J116-004

Date: 19/09/18

Rev: B



The ground is fully sealed from the soil, allowing no effluent or other pollutants into the ground. The Biofilter collects and absorbs the odour from the shed before dispersing the clean air into the atmosphere. As the waste operations are completed within the shed, there is no chance for dust or other pollutants to escape the confines.

Any water received on site from the Digester process will be processed through the waste water processing facility on site. This will clean the water to an acceptable level for either reintroduction into the AD process or export to Salisbury Water for compliant usage or disposal. Stormwater collected on site will either be reintroduced into the AD process or exported to Salisbury Water. Depending on the stormwater quality, the stormwater may or may not be processed in the waste water treatment plant prior to use. Refer to Appendix 3: Stormwater management plan for more information on the treatment of stormwater.

Emissions of the fumes from the CHP and emergency flare will be controlled and modelled to ensure adverse effects on both the environment and other land holders are not adversely affected.

7.2. Noise

Noise modelling will be completed on the Development to ensure acceptable noise restrictions are adhered to. The loudest component of the plant is likely to be the co-generation units, which currently emit 75dB from 1m away. Noise attenuation measures will be incorporated throughout the Development to meet the council and state requirements as well as the protection policy criteria.

Noise impacts from the equipment within the shed will be contained within the shed walls.

7.3. Vibration

The Development civils will be designed to minimise vibrations and the transfer of vibrations to neighbouring land users.

7.4. Light spill

As the Development will be manned mostly during daylight hours, lighting around the Development will be minimal with the exception of lighting for security and monitoring processes.

Most labour-intensive operations are conducted within the Reception Hall which will contain the shed lighting and eliminate light spillage.



The lighting will also adhere to the requirements set by the RAAF for maximum light emission past the horizontal. Refer to Appendix 4 - Lighting Plan.

7.5. Glare

The buildings and structures will be constructed with materials with low glare to reduce impacts on land holders, the public and the nearby RAAF base.

7.6. Traffic Impacts

The Development has been designed for separate entrances and exits for waste disposal trucks to use. The quantity of trucks entering the Development is estimated to be 50 trucks per day, which activity is consistent with the normal expectations for premises in this industrial/commercial precinct. Refer to the DeLorean Energy Traffic management Plan for more information.

8. Landscaping, Fences and Walls

The land will be enhanced with appropriate plants and other landscaping works including locally indigenous plant species where possible. Fences and walls installed around the premises will be functionally designed to enhance the attractiveness of The Development.

Perimeter fencing will be at minimum 2.1m high and will be constructed from council approved materials.

9. Natural Resources

The Development will retain and protect the natural resources and environment on the site. Water will be sourced from storm water and the south Australian water mains. Any water collected from natural resources will either be put back into the digestion process or exported to Salisbury Water depending on the site requirements at the time.

If water is to be exported to Salisbury Water, the water will be processed through the waste water treatment plant prior.

The waste receival areas will be bunded with specialised bunkers. This area will be sealed to stop any pollutants or salts from entering the soil below.



10. Regulated and significant Trees

Refer to Appendix 1: Arborist Tree report and Appendix 2: Arborist Impact Report for a detailed report and analysis of the planned treatment of regulated and significant trees on site.

11. Renewable Energy Facility

The Development will be located in the industrial area of Edinburgh Parks in the North of Adelaide. The local area has an abundance of commercial and industrial operations that can supply the Development with waste streams for processing.

The area is also suitable for power generation and transfer as the land has adequate infrastructure to install a grid connection on site. The Development is located in very close vicinity to the mains gas pipelines, allowing upgraded mains-grade biomethane to be injected into the gas mains.

The Development will be landscaped and will use appropriate materials for construction to minimise visual impact.

As stated in earlier sections, the area will be completely sealed to stop any leaching of pollutants or salts and will be within the safety guidelines for building near an airport.

12. Transport and Access

The Development will provide safe and efficient movement for all motorised and non-motorised transport modes. Access will be made to accommodate all vehicles including emergency services, public infrastructure services and commercial vehicles. The location supports and makes best use out of the existing transport facilities and networks due to the industrial area locality.

Off-street vehicle parking will be supplied on site to meet the demand in accordance with "Off street parking requirements". The parking area will be consistent with AS 2890 parking facilities. Under the "off street parking requirements" the following parking requirements are required:

Area type	Parking bays per 100m ²	Site Area	Total Bays required
Office	3.33	339.6	11.3
Warehouse greater than 2000m ²	0.67	3183	21.3

Job No: J116

Planning Report

Document No: J116-004

Date: 19/09/18

Rev: B



Total (rounded up)

33

The Development will meet the requirements of 33 parking bays on site, with extra Heavy vehicle and bus parking in addition, fulfilling The Development plan requirements.

13. Waste and Waste Management Facilities

13.1. Waste

The Development is designed to accept organic commercial and industrial food waste as well as dry agricultural waste from the outer region. All imported solid C&I waste is tipped into separated bunkers within the Reception Hall. Liquid waste is pumped into the Digester Feed tank from within the Reception Hall, resulting in all processing being conducted within the Reception hall negating any adverse effects for the public outside. The area is fully sealed with an impervious floor, eliminating any discharge to the ground. Agricultural waste will be transferred through a pneumatic conveyor system which keeps it sealed from spillage or blowing away.

The industrial and commercial food waste will be put through a separator to remove cardboard and plastics, which will then be captured and sent to a recycling facility via truck. Agricultural waste will be mixed with water before input into the Digester Feed Tank.

After the organics have been processed through the system, the resulting slurry is referred to as the "digestate". The digestate is separated from the water and transported away to local composting and farming operations. The separated water is cleaned through the waste water processing facility and is either pumped back into the system or exported to Salisbury Water.

A waste water management system will be in place to ensure all waste water and storm water is captured and processed adequately to either be pumped into the AD system or exported to Salisbury Water.

Ablution facilities will be connected to the local sewage network.

13.2. Location

The location of The Development is within the Urban Employment Zone, this being an appropriate use of the land. The Development will be separated from sensitive land uses and environmentally sensitive areas.

The Development satisfies the following criteria:

Job No: J116

Planning Report

Document No: J116-004

Date: 19/09/18

Rev: B



- 3km from airfield to minimise bird strikes
- 250m away from public open spaces
- 100m away from nearest surface water
- Land not subject to slipping

Sufficient area will be provided for the maximum expected volume and containment of potential water contaminants and diversion of clean storm water away from waste areas. The waste bunkers within the Reception hall are designed to hold 2 days' worth of organic materials.

The Development will be screened from public view, with the shed, fencing and landscaping providing a barrier to view.

13.3. Management

Noise attenuation will be utilised to ensure The Development does not interfere with the amenity of sensitive loads.

The access roads to The Development are appropriately sized and constructed for the expected traffic. The design of The Development infrastructure will have dimensions allowing the support and acceptance of all waste vehicles, and emergency vehicles in a forward motion for both entry and exit.

The Development will be able to accept up to 9 trucks at any one time, well over the average of 5 trucks every hour.

The Development will be fenced off with either chain wire mesh or pre-coated painted metal fencing, which will be at a height of 2.1m, higher than the minimum requirement of 2m.

14. Urban Employment Zone

14.1. Land Use

The anaerobic digestion development is classed under the industry form of development, making it an appropriate use of land.

The Development will not impede the operation of established land uses through encroachment, over development of sites or noise/emissions or any other harmful or nuisance-creating impact

14.2. Form and Character

The Development is consistent with the desired character of the zone as described under the section titled "DESIRED CHARACTER" Under the "Urban



Employment Zone" section of the Salisbury Council Development Plan.

Building setbacks will adhere to The Development plan guidelines. The Reception hall height is greater than 6m, resulting in the following minimum setbacks from the roads:

- 10 metres from the primary road frontage (Woomera Avenue)
- 4 metres from the secondary road frontage (Gidgie Court)

The building façade does not face any land zoned for residential purposes resulting in less restrictions for noise and light spillage, however the design will incorporate measures to reduce sound and light for land users in the area

The plant equipment with potential to cause an environmental nuisance include the following:

- 1 x Biogas to Biomethane upgrade
- 3 x Cogeneration CHP engines
- 2 x Emergency Flares
- 1 x Biofilter exhaust

The above-mentioned plant items are all located within the urban employment zone and are not situated near an allotment not zoned for employment. The Development will be designed to minimise the effect this plant has on the amenity of the locality

Noise will be attenuated to ensure noise emissions meet the acceptable criteria. As some sections of the plant will be in operation 24/7, the noise attenuation will be designed to create as little noise emissions as possible.

The Development location is in excess of 450m away from any residential areas, the hours of operation are not expected to detract from any nearby residential areas.

The Development design will be adaptable to changes over time should any changes be necessary. Components that can accommodate multiple uses designed within The Development are:

- Parking area
- Site office/meeting rooms
- Reception hall

The total area occupied by buildings is well below the threshold of 50%. The total ratio of building area to non-building area is:



Component	Total
Total Land Area	22700 m ²
Combined Office & Shed area	3523 m ²
Proportion of land occupied by buildings	15.51%

The Development is located outside of the “limited development area” as well as the “No structures and Development area” and hence is not required to fulfil the requirements of these area criteria's.

14.3. Land Division

As the land will not be divided, the rules regarding the creation of allotments does not apply.



14.4. Procedural matters

14.4.1. Complying Development

The below table outlines the complying criteria/conditions the proposed development will achieve:

Item	Complying Criteria / Conditions	Response
1	<p>The building, or any part, is not located within:</p> <p>(a) areas affected by aircraft noise shown on Concept Plan Map Sa/2 - Edinburgh Defence Airfield Aircraft Noise Exposure</p> <p>(b) an area shown on Concept Plan Map Sa/3 - Edinburgh Defence Airfield Lighting Constraints where restrictions on the amount of upward light apply.</p>	<p>(a) development is not located within the areas affected by aircraft noise</p> <p>(b) Development is within the Controlled Light Installation Area (6km radius). Lighting will be kept to a level which satisfies the criteria</p>
2	<p>The Development does not involve an activity of environmental significance or major environmental significance identified in Schedules 21 and 22 of The Development Regulations 2008.</p>	<p>The Development is not expected to involve any of the activities specified in schedules 21 and 22 of The Development Regulations 2008.</p> <p>Schedule 21</p> <ul style="list-style-type: none"> - Petroleum Production, storage or processing works or facilities – Biomethane will not be stored on site. - Fuel burning – Flaring will be used rarely and won't surpass a yearly average heat release of 0.5MW <p>Schedule 22</p> <ul style="list-style-type: none"> - Petroleum Production, storage or processing works or facilities – Biomethane will not be stored on site.

Job No: J116

Planning Report

Document No: J116-004

Date: 19/09/18

Rev: B

		<ul style="list-style-type: none"> - Waste or Recycling Depots – (a) waste is not stored while awaiting transport, (b) The Development is not located at a residential premise - Discharge of stormwater to underground aquifers – Stormwater to be recycled or exported to Salisbury Water - Fuel burning – Flaring will be used rarely and won't surpass a yearly average heat release of 0.5MW
3	The Development does not require referral pursuant to Section 37 of The Development Act 1993.	The Development will not require referral pursuant to section 37 of The Development act
4	The Development site is greater than 60 metres from the nearest residential zone boundary.	The Development Is over 450m away from the nearest residential boundary
5	The Development has direct access to a sealed roadway.	The Development has direct access to Woomera Avenue and Gidgie Court
6	All vehicles able to access/egress The Development in a forward direction.	The Development layout allows for entry and exit of the parking area and facility in a forward motion
7	A site coverage of less than 50 per cent.	The Development is covered by less than 16% by buildings
8	Building height does not exceed airport building heights shown on Concept Plan Map Sal/1 - Edinburgh Defence Airfield Defence (Area Control) Regulations and is no greater than 12 metres.	All structures will adhere to the Zone D airfield restrictions of under 15m height. Buildings (Reception hall and office) will adhere to a further height restriction of 12m.
9	Building setback in accordance with the following: (a) buildings up to a height of 6 metres sited at least 8 metres from	The Development buildings and fencing to be set back by 10m from the primary road (Woomera Avenue) and 4m from the Secondary road (Gidgie Court)

	<p>the primary street alignment</p> <p>(b) buildings exceeding a height of 6 metres sited at least 10 metres from the primary street alignment</p> <p>(c) 4 metres from the secondary street frontage.</p>	
10	<p>The Development is designed as follows:</p> <p>(a) buildings adjacent public streets are designed to overlook the street and have a maximum unarticulated length of 30 metres (15 metres for offices)</p> <p>(b) comprise low-reflective materials and pre-colour treatment if metal clad.</p>	<p>Buildings will be designed to a visually appealing standard by having articulated wall lengths no longer than 30m and constructed out of low reflective materials.</p>
11	<p>Landscaping comprises:</p> <p>(a) an area of not less than 10 per cent of the site</p> <p>(b) a landscaped setback area of more than 3 metres wide along any street boundary, except where a building is setback a lesser distance from any street boundary in which case the intervening setback is landscaped</p> <p>(c) a mix of species expected to grow to less than 0.5 metres in height and species expected to grow with clear stems to 2 metres height and with the canopy above.</p>	<p>(a) Landscaped areas will comprise of at least 10% of The Development</p> <p>(b) The landscaped area will be at least 3 metres wide along a street boundary</p> <p>(c) Landscaped areas will provide plant species expected to grow either no higher than 0.5m or more than 2m high.</p>
12	<p>A clearance of not less than 3 metres being provided for access purposes between any structure and one side boundary of the site.</p>	<p>Access ways 3m wide will be kept along all sides of non-street facing boundaries</p>

13	<p>Off-street vehicle parking and specifically marked disabled parking provided at the rate of not less than:</p> <p>(a) 2 per 100 square metres (industrial building area under 200 square metres)</p> <p>(b) 1.33 per 100 square metres (industrial building area 200-2000 square metres)</p> <p>(c) 0.67 per 100 square metres (industrial building area greater than 2000 square metres)</p> <p>(d) 3.3 spaces per 100 square metres (office building area)</p> <p>(e) 2 per 100 square metres (service trade premises building area).</p>	<p>Requirements for parking stand at 33 bays, The Development design incorporates room for 33 parking spaces total, not including heavy vehicle and bus bays</p>
14	<p>14 All buildings, including the associated filling of land - are sited, designed and constructed to prevent the entry of floodwaters in a 1-in-100 year average return interval flood event.</p>	<p>adequate drainage and site sloping will be installed to allow water from a 1-in-100 year flood event to be safely diverted away. Refer to Appendix 3: Stormwater management plan</p>
15	<p>Areas used for the loading or unloading of materials or for the storage of chemicals and materials used in industrial operations and processes are to incorporate bunding or containment facilities that:</p> <p>(a) prevent the entry of external stormwater</p> <p>(b) contain any spilt materials from entering the stormwater system.</p>	<p>The digestion tank area is bunded to allow the capture of 120% of the tank volume. The area is designed to capture any tank ruptures and storm water and divert them into the waste water processing plant on site.</p>
16	<p>All loading and/or unloading of vehicles to occur within the boundaries of the site.</p>	<p>All loading and unloading of solid and liquid C&I wastes will be completed on site within the Reception hall. Unloading of dry feedstock will be done next to the waste silos using a pneumatic</p>



		conveyor system.
17	All outside loading and unloading and goods storage areas should be screened by solid fencing or dense screen landscaping.	The Development is surrounded by fences, with the bulk of the unloading occurring within the Reception hall.
18	All stormwater drainage is retained and treated on-site or connected to an approved stormwater management scheme.	all storm water is collected and either exported to Salisbury Water if it is clean, or it is put through the waste water treatment facility if contaminated. The water leaving the waste water treatment facility is either put back into the digestion process or exported to Salisbury Water
19	Waste collection and storage areas provided which are: (a) screened and separated from adjoining areas (b) designed to ensure that wastes do not contaminate stormwater or enter the stormwater collection system.	The waste receival area is a set of specially built bunkers designed to contain the waste. The area is sealed with no chance of contaminating the storm water or soil below

20	<p>The Development comprises a maximum of two advertising displays, each of which does not encroach upon the public road reserve and accords with the following:</p> <p>(a) A maximum of one pylon sign per site that:</p> <p>(i) has a maximum height of 6 metres</p> <p>(ii) has a maximum area of 8 square metres</p> <p>(iii) is located between the building and the front property boundary.</p> <p>(b) A maximum of one freestanding directory sign per site that:</p> <p>(i) has a maximum height of 3 metres</p> <p>(ii) has a maximum length of 6 metres.</p> <p>(c) A maximum of one flush wall sign per site that:</p> <p>(i) has a maximum area of 8 square metres</p> <p>(ii) is erected on the building façade</p> <p>(iii) is located below the parapet of the building.</p>	<p>Advertisement signage will satisfy the conditions set out by the Salisbury Development Plan. Refer to Appendix 5: Preliminary Signage Template for an illustration of the desired street front signage</p>
21	<p>Fencing exceeding 2.1 metres in height (including colour –coated wire mesh fencing) adjacent to public roads should be set back in one of the following ways:</p> <p>(a) in-line with the building façade</p> <p>(b) behind the building line</p> <p>(c) behind a landscaped area that softens its visual impact.</p>	<p>Fencing around the perimeter of The Development will be at least 2.1m high and will be in line with the building face and setback regulations</p>



Appendix 1: Arborist Impact Report



Appendix 2: Stormwater Management Plan



Appendix 3: Lighting Plan



Appendix 4: Preliminary Signage Template





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PROFESSIONALS IN ARBORICULTURE

Arboricultural Impact Assessment and Development Impact Report

Site: 1-2 Gidgie Court, Edinburgh

Date: Friday, 14 September 2018
ATS5157-1-2GidCtDIR

Contents

Brief.....	1
Documents and Information Provided.....	1
Executive Summary	2
Site Location	3
Assessment.....	5
Recommendation	6
Glossary	7
References.....	7

Appendix A Tree Assessment Methodology

Appendix B Tree Assessment Findings

Appendix C Mapping

Appendix D Tree Findings Summary Table

Appendix E Tree Protection Zone Guidelines

Report Reference Number: ATS5157-1-2GidCtDIR

Report prepared for

Biogass Renewables Pty Ltd Attn: Martyn Anderson

Author

Marcus Lodge Consulting Arborist Arborman Tree Solutions Pty Ltd

Brief

Arborman Tree Solutions was engaged to undertake an Arboricultural Impact Assessment and provide a Development Impact Report for 1-2 Gidgie Court, Edinburgh. The purpose of the Arboricultural Impact Assessment and Development Impact Report is to identify potential impacts the proposed development will have on the trees within the site.

The proposed development includes the construction of a new Biogas plant and this report seeks to the impact the proposal will have on the trees within the site and to recommend impact mitigation strategies in accordance with Australian Standard AS4970-2009 *Protection of trees on development sites (AS4970-2009)* for trees to be retained.

In accordance with section 2.2 of the AS4970-2009 (2.2) the following information is provided:

- Assessment of the general condition and structure of the subject trees.
- Identification of the legislative status of trees on site as defined in the *Development Act 1993*.
- Identify and define the Tree Protection Zone for each tree and mark on the plan.
- Identify potential impacts the development may have on tree health and/or stability.
- Recommend impact mitigation strategies in accordance with AS4970-2009 for trees to be retained.
- Provide information in relation to the management of trees.

Documents and Information Provided

The following information was provided for the preparation of this assessment:

- Design Drawings 1-2 Gidgie Court (Lot 505) Site drawing 180828
- Preliminary Tree Assessment ATS5157-1-2GidCtPTA

Executive Summary

Arborman Tree Solutions has assessed the potential impacts to the 23 Regulated and/or Significant Trees from the proposed development and supporting infrastructure. The assessment has determined the impacts to the trees and recommended mitigations strategies where appropriate.

Note: the Preliminary Tree Assessment ATS5157-1-2GidCtPTA identified 24 trees with a trunk circumference greater than two metres at one metre above ground level. However, one of these trees, Tree 20, is dead and therefore exempt from regulation and has not been included in this report.

The encroachment within the Tree Protection Zone (TPZ) of 21 of the 23 trees is recognized as a Major Encroachment in that it is greater than 10% of the TPZ area. There are two trees, Trees 3 and 5 with an encroachment of 10% or less and this is considered to be a minor encroachment as defined in Australian Standard AS4970-2009 *Protection of trees on development sites* (AS4970-1993).

The encroachments result in various levels of impact ranging from None to Conflicted. The consequence of the impact is that six trees require protection and/or mitigation and seventeen trees require removal. Trees 1 to 6 are located adjacent to the property boundary and the proposal has been modified around these trees to minimise the impact of the encroachment; Tree 3 whilst not impacted by the development is in poor condition and has been recommended for removal. Trees 7 and 8 whilst in the same planting group are adjacent to the proposed generators and enclosed flares and there is a potential fire risk associated with the trees in this proximity and has therefore been recommended for removal. Trees 9-19 and 21-24 are located such that they are in direct conflict with the proposed development and their location does not allow for the site in a functional manner for this type of use.

The long-term health, structure and stability of the trees identified for retention is not expected to be compromised if the recommendations within this document and the guidelines of AS4970-2009 are adhered to.

Site Location

Figure 1: Site location - 1-2 Gidgie Court, Edinburgh



Methodology

The proposed design was reviewed in association with the information supplied in the Preliminary Tree Assessment ATS5157-1-2GidCtPTA and in the Design Drawings and CAD files as supplied by Biogass Renewables.

The potential impact of the proposed works on tree condition is considered in accordance with the guidelines in AS4970-2009 *Protection of trees on development sites* (AS4970-2009). When determining potential impacts of an encroachment in to a Tree Protection Zone (TPZ), the following should be considered as outlined in section 3.3.4 of AS4970-2009 section 3.3.4;

- a) Location of roots and root development.
- b) The potential loss of root mass from the encroachment.
- c) Tree species and tolerance to root disturbance.
- d) Age, vigour and size of the tree.
- e) Lean and stability of the tree.
- f) Soil characteristics and volume, topography and drainage.
- g) The presence of existing or past structures or obstacles affecting root growth.
- h) Design factors.

Impacts are classified into the following categories: -

- No Impact - no encroachment into the TPZ has been identified.
- Low <10% - the identified encroachment is less than 10% of the TPZ area.
- Low >10% - the identified encroachment is greater than 10% of the TPZ area however there are factors that indicate the proposed development will not negatively impact tree viability.
- High >10% - the identified encroachment is greater than 10% of the TPZ area but does not impact the Structural Root Zone (SRZ) or the trunk.
- Substantial - the identified encroachment is greater than 20% of the TPZ area but does not impact the SRZ or the trunk.
- Conflicted - the identified encroachment impacts the SRZ and/or the trunk.

Trees with calculated encroachments greater than 10% and with an Impact identified as 'Low' have features or considerations identified in clauses in AS4970-2009 3.3.4 which indicate these trees should be sustainable.

Trees with calculated encroachments greater than 10% and with an Impact identified as 'High' do not have any features or considerations identified in clauses in AS4970-2009 3.3.4 and therefore non-destructive excavation and/or tree sensitive construction is required to minimise potential impacts.

Trees with an Impact identified as 'Substantial' have calculated encroachments greater than 20% and therefore alternative design solutions, additional root investigations and/or tree sensitive construction measures are required, in some instances tree removal may be required to accommodate the development.

Trees with an Impact identified as 'Conflicted' directly impact upon the SRZ or the trunk of the tree, additional root investigations or tree sensitive construction measures are not available and the only option is alternative designs or tree removal.

Regulatory Status, Tree Protection Zones and Development Impacts are shown in Appendix B.

Assessment

The proposed development involves the construction of a new Biogas plant and associated infrastructure. This assessment aims to identify potential impacts and recommend mitigation strategies in accordance with Australian Standard AS4970-2009 *Protection of trees on development sites* (AS4970-2009) to ensure tree sustainability.

Note: the Preliminary Tree Assessment ATS5157-1-2GidCtPTA identified 24 trees with a trunk circumference greater than two metres at one metre above ground level. However, one of these trees, Tree 20, is dead and therefore exempt from regulation and has not been included in this report.

The encroachment within the Tree Protection Zone of 21 of the 23 trees has been calculated to be greater than 10% of the total TPZ area. This encroachment is recognised as a 'Major Encroachment' as defined by AS4970-2009. A Major encroachment may have a Low impact on the tree and therefore long-term health, structure and stability are not likely to be affected or it could be Conflicted with the development and requires removal.

There are four trees, Tree 1, 2, 4 and 6, where the impact is considered to be Low due to the site conditions and in the case of Trees 1 and 2 the species tolerance to activity in the root zone as a result of its specialised root system. Additionally, the landscaped area around these trees has been modified to increase the area around each tree and reduce the impact to a Low level.

The encroachment within the Tree Protection Zone of Trees 3 and 5 has been calculated to be equal to or less than 10% of the total TPZ area. This encroachment is recognised as a 'Minor Encroachment' as defined by AS4970-2009. A 'Minor Encroachment' has a Low impact on the tree and therefore long-term health, structure and stability are not likely to be affected. As above the landscaped area around these trees has been modified to increase the area around each tree and reduce the impact to a Low level. Tree 3 however is a poor-quality specimen and has been recommended for removal on these grounds only.

The trees are planted in a row and the area below the trees is relatively uncompacted and unmaintained and presents as a suitable environment for root growth. The area beyond the planting row is partially maintained and is relatively compacted open ground that is not considered to conducive to substantial root growth.

The species of Trees 1 and 2 (*Eucalyptus camaldulensis*) has a good tolerance to root disturbance as it has evolved along water courses throughout mainland Australia and has a dimorphic root system that is able to exploit water at great depths and has a relatively dynamic and replaceable surface root system. This root structure is therefore able to tolerate considerable soil disturbance which AS4970-2009 section 3.3.4 (c) allows consideration for.

Trees 7 and 8 are located in an area to be retained for landscaping and have root zone encroachments that whilst Major are still likely to result in a Low impact. However, due to the location and proximity of the generators and enclosed flares there is a potential fire risk associated with these trees. Due to the proximity of the generators and flares it is recommended these two trees are removed as part of this development. Tree 8 however is a poor-quality specimen and has been recommended for removal on these grounds as well as the potential conflict with the development.

The remaining trees, Trees 9-19 and 21-24, are in direct conflict with the proposal and will require removal for this development to proceed. Unlike Trees 1-8 this group of trees is not an edge planting rather it is wholly within the site and as such restricts opportunities for development. The site is located in an area identified for industrial development and as such this development appears to be otherwise reasonable and expected. Given the proposed use of this site and the requirements of the plant and equipment alternative designs that could still achieve the required outcomes are not available. Tree 19 is also a poor-quality specimen and has been recommended for removal on these grounds as well as the potential conflict with the development.

If the recommendations within this document and the guidelines of AS4970-2009 are closely adhered to, the structural integrity, stability and health of the trees identified for retention is not expected to be compromised by this development. Trees not identified for retention have impacts that indicate they cannot be protected and therefore they require removal for this development to proceed.

Recommendation

The following recommendations are presented based on the Arboricultural Impact Assessment:

1. Trees 1, 2 and 4-6 will not be substantially impacted and therefore only require the implementation of standard tree protection methodologies.
2. Trees 7 and 8 are in close proximity to the generators and enclosed flares there is a potential fire risk associated with these trees and therefore they are recommended for removal.
3. Trees 9-19 and 21-24 are in direct conflict with the proposed development and require removal for the development to be successful.
4. Tree 3 whilst not impacted by the development is recommended for removal due to its poor overall condition and short useful life expectancy.
5. Trees 8 and 19 have also been recommended for removal due to their poor overall condition and short useful life expectancy.
6. All trees to be retained require protection in accordance with AS4970-2009 and should be included within the Tree Protection Plan.
7. A Project Arborist should be appointed to assist in the compilation of the Tree Protection Plan and the installation of the tree protection measures.

Thank you for the opportunity to provide this report. Should you have any questions or require further information, please contact me and I will be happy to be of assistance.

Yours sincerely



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Glossary

Size:	approximate height and width of tree in metres.
Age:	identification of the maturity of the subject tree.
Useful Life Expectancy:	expected number of the years that the subject specimen will remain alive and sound in its current location and/or continues to achieve the relevant Principles of Development Control.
Health:	visual assessment of tree health.
Structure:	visual assessment of tree structure.
Circumference:	trunk circumference measured at one metre above ground level. This measurement is used to determine the status of the tree in relation to the <i>Development Act 1993</i> .
Diameter at Breast Height (DBH):	trunk diameter measured at 1.4 metres above ground level used to determine the Tree Protection Zone as described in Australian Standard AS4970-2009 <i>Protection of trees on development sites</i> .
Diameter at Root Buttress (DRB):	trunk diameter measured just above the root buttress as described in Australian Standard AS4970-2009 <i>Protection of trees on development sites</i> and is used to determine the Structural Root Zone.
Tree Damaging Activity	Tree damaging activity includes those activities described within the <i>Development Act 1993</i> such as removal, killing, lopping, ringbarking or topping or any other substantial damage such as mechanical or chemical damage, filling or cutting of soil within the TPZ. Can also include forms of pruning above and below the ground.
Tree Protection Zone:	area of root zone that should be protected to prevent substantial damage to the tree's health.
Structural Root Zone:	calculated area within the tree's root zone that is considered essential to maintain tree stability.
Project Arborist	A person with the responsibility for carrying out a tree assessment, report preparation, consultation with designers, specifying tree protection measures, monitoring and certification. The Project Arborist must be competent in arboriculture, having acquired through training, minimum Australian Qualification Framework (AQTF) Level 5, Diploma of Horticulture (Arboriculture) and/or equivalent experience, the knowledge and skills enabling that person to perform the tasks required by this standard.

References

Australian Standard AS4970–2009 *Protection of trees on development sites*: Standards Australia.

Matheny N. Clark J. 1998: *Trees and Development a Technical Guide to Preservation of Trees During Land Development*. International Society of Arboriculture, Champaign, Illinois, USA.

Appendix A - Tree Assessment Methodology

Tree Assessment Form (TAF©)

The Tree Assessment Form (TAF) summarises the findings of the tree assessment and provides a quick reference to the condition, legislative status and recommendations for each tree.

Record	Description
Tree	A perennial woody plant with a mature height of greater than 5 metres and life expectancy of more than 10 years.
Genus and Species	Trees are identified using normal field plant taxonomy techniques. Due to hybridisation and plant conditions available on the day of observation it may not always be possible to identify the tree to species level; where species cannot be ascertained <i>sp.</i> is used.
Height	Tree height is observed and recorded in the following ranges; 0-5m, 5-10m, 10-15m, 15-20m and >20m.
Spread	Crown width (diameter) is recorded using the following fields 0-5m, 5-10m, 10-15m, 15-20m and >20m.
Tree Health	Tree health is assessed using the Arborman Tree Solutions - Tree Health Assessment Method that is based on international best practice.
Tree Structure	Tree structure was assessed using Arborman Tree Solutions - Tree Structure Assessment Method that is based on international best practice.
Tree Risk Assessment	Trees were assessed using the International Society of Arboriculture Level 1 Tree Assessment method. The person conducting the assessment has acquired the International Society of Arboriculture Tree Risk Assessment Qualification (TRAQ).
Legislative Status	Legislation status was identified through the interpretation of the <i>Development Act 1993</i> , and the <i>Natural Resource Management Act 2004</i> as well as other relevant legislation, therefore determining regulatory status of the subject tree.
Mitigation	Measures to reduce tree risk may be recommended in the form of pruning and this listed in the Tree Assessment Findings (Appendix C). Tree pruning is recommended in accordance with AS4373-2007 <i>Pruning amenity trees</i> where practicable. Where measures to mitigate risk is not possible and the risk is unacceptable, then tree removal or further investigation is recommended.

Useful Life Expectancy (ULE)

Useful Life Expectancy (ULE) is a measure of the period for which the tree is expected to remain viable in the landscape.

ULE Rating	Definition
Surpassed	The tree has surpassed its Useful Life Expectancy.
<2 Years	The tree is considered to have a Useful Life Expectancy of less than two years.
<5 years	The tree is considered to have a Useful Life Expectancy of less than five years.
<10 years	The tree is considered to have a Useful Life Expectancy of less than ten years.
>10 years	The tree is considered to have a Useful Life Expectancy of more than ten years.

Maturity (Age)

The maturity of the tree is based on the stage of its live cycle.

Age Class	Definition
Senescent	The tree has surpassed its optimum growing period and is declining and/or reducing in size. May be considered as a veteran in relation to its ongoing management. Tree will have generally reached greater than 80% of its expected life expectancy.
Mature	A tree which has reached full maturity in terms of its predicted life expectancy and size, the tree is still active and experiencing cell division. Tree will have generally reached 20-80% of its expected life expectancy.
Semi Mature	A tree which has established, but has not yet reached maturity. Normally tree establishment practices such as watering will have ceased. Tree will generally not have reached 20% of its expected life expectancy.
Juvenile	A newly planted tree or one which is not yet established in the landscape. Tree establishment practices such as regular watering will still be in place. Tree will generally be a newly planted specimen up to five years old; this may be species dependent.

Tree Health Assessment (THA©)

Tree Health is assessed on a number of factors which are all considered to give an overall rating.

Category	Description
Good	Tree displays high vigour, uniform leaf colour, no or little dieback (<5%), crown density (>85%) and or healthy axillary buds and typical internode length. The tree has little to no pest and/or disease infestation.
Fair	Tree displays low vigour, dull leaf colour, little dieback (<15%), crown density (>70%) and/or reduced axillary buds and internode length. Minor pest and/or disease infestation potentially impacting on tree health.
Poor	Tree displays no vigour, chlorotic or dull leaf colour, moderate to high crown dieback (>15%), low crown density (<70%) and/or few or small axillary buds and shortened internode length. Pest and or disease infestation is evident and/or widespread.
Dead	The tree has died and has no opportunity for recovery.

Tree Structure Assessment (TSA©)

Tree Structure is assessed on a number of factors which are all considered to give an overall rating.

Category	Description
Good	Little to no branch failure observed within the crown, well-formed unions, no included bark, good branch and trunk taper present, root buttressing and root plate are typical.
Fair	History of minor branch failure observed in crown, well-formed unions, no included bark, acceptable branch and trunk taper present, root buttressing and root plate are typical.
Poor	History of significant branch failure observed in crown, poorly formed unions, included bark present, branch and trunk taper absent, root buttressing and root plate are atypical.
Failed	The structure of the tree has or is in the process of collapsing.

Tree Retention Rating (TRR)

The Tree Retention Rating is based on a number of factors that are identified as part of the standard tree assessment criteria including Condition, Size, Environmental, Amenity and Special Values. These factors are combined in a number of matrices to provide a Preliminary Tree Retention Rating and a Tree Retention Rating Modifier which combine to provide a Tree Retention Rating that is measurable, consistent and repeatable

Preliminary Tree Retention Rating

The Preliminary Tree Retention Rating is conducted assessing Tree Health and Structure to give an overall Condition Rating and Height and Spread to give an overall Size Rating. The following matrices identify how these are derived.

Condition Matrix				
Structure	Health			
	Good	Fair	Poor	Dead
Good	C1	C2	C3	C4
Fair	C2	C2	C3	C4
Poor	C3	C3	C4	C4
Failed	C4	C4	C4	C4

Size Matrix					
Spread	Height				
	>20	15-20	10-15	5-10	<5
>20	S1	S1	S1	S2	S3
15-20	S1	S1	S2	S3	S3
10-15	S1	S2	S2	S3	S4
5-10	S2	S3	S3	S4	S5
<5	S3	S3	S4	S5	S5

The results from the Condition and Size Matrices are then placed in the Preliminary Tree Retention Rating Matrix.

Preliminary Tree Retention Rating				
Size	Condition			
	C1	C2	C3	C4
S1	High	Moderate	Low	Low
S2	Moderate	Moderate	Low	Low
S3	Moderate	Moderate	Low	Low
S4	Moderate	Moderate	Low	Low
S5	Low	Low	Low	Low

The Preliminary Tree Retention Rating gives a base rating for all trees regardless of other environmental and/or amenity factors and any Special Value considerations. The Preliminary Tree Retention Rating can only be modified if these factors are considered to be of high or low enough importance to warrant increasing or, in a few cases, lowering the original rating.

Tree Retention Rating Modifier

The Preliminary Tree Retention Rating is then qualified against the recognised Environmental and Amenity benefits that trees present to the community thereby providing a quantitative measure to determine the overall Tree Retention Rating. Data is collected in relation to Environmental and Amenity attributes which are compared through a set of matrices to produce a Tree Retention Rating Modifier.

Environmental Matrix				
Origin	Habitat			
	Active	Inactive	Potential	No Habitat
Indigenous	E1	E1	E2	E3
Native	E1	E2	E3	E3
Exotic	E2	E3	E3	E4
Weed	E3	E3	E4	E4

Amenity Matrix				
Character	Aesthetics			
	High	Moderate	Low	None
Important	P1	P1	P2	P3
Moderate	P1	P2	P3	P3
Low	P2	P3	P3	P4
None	P3	P3	P4	P4

Tree Retention Rating Modifier				
Amenity	Environment			
	E1	E2	E3	E4
P1	High	High	Moderate	Moderate
P2	High	Moderate	Moderate	Moderate
P3	Moderate	Moderate	Moderate	Moderate
P4	Moderate	Moderate	Moderate	Low

Tree Retention Rating

The results of the Preliminary Tree Retention Rating and the Tree Retention Rating Modifier matrices are combined in a final matrix to give the actual Tree Retention Rating.

Tree Retention Rating Matrix			
Tree Retention Rating Modifier	Preliminary Tree Retention Rating		
	High	Moderate	Low
High	Important	High	Moderate
Moderate	High	Moderate	Low
Low	Moderate	Low	Low

Special Value Trees

There are potentially trees that have Special Value for reasons outside of normal Arboricultural assessment protocols and therefore would not have been considered in the assessment to this point; to allow for this a Special Value characteristic that can override the Tree Retention Rating can be selected. Special Value characteristics that could override the Tree Retention Rating would include factors such as the following:

Cultural Values

Memorial Trees, Avenue of Honour Trees, Aboriginal Heritage Trees, Trees planted by Dignitaries and various other potential categories.

Environmental Values

Rare or Endangered species, Remnant Vegetation, Important Habitat for rare or endangered wildlife, substantial habitat value in an important biodiversity area and various other potential categories.

Where a tree achieves one or more Special Value characteristics the Tree Retention Rating will automatically be overridden and assigned the value of Important.

Tree Retention Rating Definitions

- Important** These trees are considered to be important and will in almost all instances be required to be retained within any future development/redevelopment. It is highly unlikely that trees that achieve this rating would be approved for removal or any other tree damaging activity. Protection of these trees should as a minimum be consistent with Australian Standard AS4970-2009 *Protection of trees on development sites* however given the level of importance additional considerations may be required.
- High** These trees are considered to be important and will in most instances be required to be retained within any future development/redevelopment. It is unlikely that trees that achieve this rating would be approved for removal or any other tree damaging activity. Protection of these trees should be consistent with Australian Standard AS4970-2009 *Protection of trees on development sites*.
- Moderate** These trees are considered to be suitable for retention however they achieve less positive attributes than the trees rated as Important or High and as such their removal or other tree damaging activity is more likely to be considered to be acceptable in an otherwise reasonable and expected development. The design process should where possible look to retain trees with a Moderate Retention Rating. Protection of these trees, where they are identified to be retained, should be consistent with Australian Standard AS4970-2009 *Protection of trees on development sites*.
- Low** These trees are not considered to be suitable for retention in any future development/redevelopment; trees in this category do not warrant special works or design modifications to allow for their retention. Trees in this category are likely to be approved for removal and/or other tree damaging activity in an otherwise reasonable and expected development. Protection of these trees, where they are identified to be retained, should be consistent with Australian Standard AS4970-2009 *Protection of trees on development sites*.

Development Impact Assessment

Potential development impacts were determined in accordance with Australian Standard 4970-2009 *Protection of trees on development sites*. The identification of the impact of development considers a number of factors including the following:

- a. The extent of encroachment into a tree's Tree Protection Zone by the proposed development as a percentage of the area.
- b. Results of any non-destructive exploratory investigations that may have occurred to determine root activity.
- c. Any required pruning that may be needed to accommodate the proposed development.
- d. Tree species and tolerance to root disturbance.
- e. Age, vigour and size of the tree.
- f. Lean and stability of the tree.
- g. Soil characteristics and volume, topography and drainage.
- h. The presence of existing or past structures or obstacles potentially affecting root growth.
- i. Design factors incorporated into the proposed development to minimise impact.

Impacts were classified into the following categories:

- **None** - The proposed development does not impact on the tree.
- **Low** - The proposed development is unlikely to impact the health of the tree.
- **Moderate** - The proposed development is expected to impact the health of the tree however mitigation strategies are available to maintain tree condition.
- **High** - The proposed development is expected to substantially the health and potentially the stability of the tree.
- **Conflicted** - The proposed development substantially affects the tree including the Structural Root and/ the trunk.

Trees with an impact identified as 'Low' require general Tree Protection Zone management.

Trees with Low Retention Ratings and High or Conflicted impacts are recommended for removal as alternative designs or installation methods are not warranted.

Trees with a Moderate Retention Rating and High or Conflicted impacts are recommended for further investigation such as minor design alteration, other considerations or removal.

Trees with a High Retention Rating and High or Conflicted impacts are recommended for alternative installation methods, alternative designs or if these are not practicable or are unreasonable, tree removal may be recommended.

Appendix B - Tree Assessment Findings

River Red Gum

Inspected: Monday, 27 August 2018
Height: >20 metres
Spread: >15 metres
Health: Good
Structure: Good
Trunk Circumference: >3 metres
Useful Life Expectancy: >20 years
Tree Protection Zone (TPZ): 12.72 metres



Legislative Status

This tree is identified as a Significant Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than three metres and is not subject to any exemption from regulation.

Development Impact

The identified encroachment is greater than 10% of the TPZ area however this species is tolerant of changes to its root zone and as such this is not expected to have a long-term impact on tree viability.

Observations

This tree is in good overall condition.

Recommendation

This tree should be protected in accordance with AS4970-2009.

GPS Coords (MGA Zone 54)	283557 E, 6153362 N
Legislative Status	Significant
Development Impact	Low
Recommendation	Apply Tree Protection

River Red Gum

Inspected: Monday, 27 August 2018
Height: >20 metres
Spread: >15 metres
Health: Good
Structure: Fair

Trunk Circumference: >3 metres
Useful Life Expectancy: >10 years
Tree Protection Zone (TPZ): 14.76 metres



Legislative Status

This tree is identified as a Significant Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than three metres and is not subject to any exemption from regulation.

Development Impact

The identified encroachment is greater than 10% of the TPZ area however this species is tolerant of changes to its root zone and as such this is not expected to have a long-term impact on tree viability.

Observations

This tree is in fair overall condition.

Recommendation

This tree should be protected in accordance with AS4970-2009.

GPS Coords (MGA Zone 54)	283561 E, 6153366 N
Legislative Status	Significant
Development Impact	Low
Recommendation	Apply Tree Protection

Sugar Gum

Inspected: Monday, 27 August 2018
Height: >15 metres
Spread: >10 metres
Health: Fair
Structure: Poor

Trunk Circumference: >2 metres
Useful Life Expectancy: <10 years
Tree Protection Zone (TPZ): 9.00 metres



Legislative Status

This tree is identified as a Regulated Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than two metres and is not subject to any exemption from regulation.

Development Impact

The identified encroachment is 10% of the TPZ area and this species is tolerant of changes to its root zone and as such this is not expected to have a long-term impact on tree viability.

Observations

The tree has a history of branch failure. There is extensive decay within the primary structure.

Recommendation

Tree removal is recommended; this tree is not in conflict with the development however it is a poor quality specimen and is recommended for removal regardless of development.

GPS Coords (MGA Zone 54)	283582 E, 6153392 N
Legislative Status	Regulated
Development Impact	Low
Recommendation	Remove

Sugar Gum

Inspected: Monday, 27 August 2018
Height: >15 metres
Spread: >10 metres
Health: Fair
Structure: Fair

Trunk Circumference: >2 metres
Useful Life Expectancy: >10 years
Tree Protection Zone (TPZ): 9.72 metres



Legislative Status

This tree is identified as a Regulated Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than two metres and is not subject to any exemption from regulation.

Development Impact

The identified encroachment is greater than 10% of the TPZ area however this species is tolerant of changes to its root zone and as such this is not expected to have a long-term impact on tree viability.

Observations

This tree is in fair overall condition.

Recommendation

This tree should be protected in accordance with AS4970-2009.

GPS Coords (MGA Zone 54)	283581 E, 6153411 N
Legislative Status	Regulated
Development Impact	Low
Recommendation	Apply Tree Protection

River Red Gum

Inspected: Monday, 27 August 2018

Height: >15 metres

Spread: >10 metres

Health: Fair

Structure: Fair

Trunk Circumference: >2 metres

Useful Life Expectancy: >10 years

Tree Protection Zone (TPZ): 9.72 metres



Legislative Status

This tree is identified as a Regulated Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than two metres and is not subject to any exemption from regulation.

Development Impact

The identified encroachment is less than 10% of the TPZ area and the proposed development is not expected to have a noticeable impact on the viability of this tree.

Observations

This tree is in fair overall condition.

Recommendation

This tree should be protected in accordance with AS4970-2009.

GPS Coords (MGA Zone 54)	283591 E, 6153433 N
Legislative Status	Regulated
Development Impact	Low
Recommendation	Apply Tree Protection

Red Box

Inspected: Monday, 27 August 2018
Height: >10 metres
Spread: >10 metres
Health: Fair
Structure: Fair

Trunk Circumference: >2 metres
Useful Life Expectancy: >10 years
Tree Protection Zone (TPZ): 9.84 metres



Legislative Status

This tree is identified as a Regulated Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than two metres and is not subject to any exemption from regulation.

Development Impact

The identified encroachment is greater than 10% of the TPZ area however this species is tolerant of changes to its root zone and as such this is not expected to have a long-term impact on tree viability.

Observations

This tree is in fair overall condition.

Recommendation

This tree should be protected in accordance with AS4970-2009.

GPS Coords (MGA Zone 54)	283597 E, 6153444 N
Legislative Status	Regulated
Development Impact	Low
Recommendation	Apply Tree Protection

Sugar Gum

Inspected: Monday, 27 August 2018
Height: >20 metres
Spread: >10 metres
Health: Fair
Structure: Good

Trunk Circumference: >2 metres
Useful Life Expectancy: >10 years
Tree Protection Zone (TPZ): 11.28 metres



Legislative Status

This tree is identified as a Regulated Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than two metres and is not subject to any exemption from regulation.

Development Impact

The identified encroachment is greater than 10% and this tree is in close proximity to the generators and enclosed flares and there is a potential fire risk associated with this tree. Given this the impact on the tree is considered to be high and it will

Observations

This tree is in fair overall condition.

Recommendation

The level of impact on this tree is such that its removal is the most appropriate management option.

GPS Coords (MGA Zone 54)	283606 E, 6153459 N
Legislative Status	Regulated
Development Impact	High
Recommendation	Remove

Sugar Gum

Inspected: Monday, 27 August 2018
Height: >20 metres
Spread: >10 metres
Health: Fair
Structure: Poor

Trunk Circumference: >2 metres
Useful Life Expectancy: <10 years
Tree Protection Zone (TPZ): 10.44 metres



Legislative Status

This tree is identified as a Regulated Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than two metres and is not subject to any exemption from regulation.

Development Impact

The identified encroachment is greater than 10% and this tree is in close proximity to the generators and enclosed flares and there is a potential fire risk associated with this tree. Given this the impact on the tree is considered to be high and it will

Observations

There is extensive decay within the primary structure.

Recommendation

The level of impact on this tree is such that its removal is the most appropriate management option. Additionally this is a poor quality specimen that would be recommended for removal regardless of development.

GPS Coords (MGA Zone 54)	283612 E, 6153471 N
Legislative Status	Regulated
Development Impact	High
Recommendation	Remove

River Red Gum

Inspected: Monday, 27 August 2018
Height: >20 metres
Spread: >15 metres
Health: Good
Structure: Poor

Trunk Circumference: >3 metres
Useful Life Expectancy: <10 years
Tree Protection Zone (TPZ): 15.00 metres



Legislative Status

This tree is identified as a Significant Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than three metres and is not subject to any exemption from regulation.

Development Impact

The identified encroachment is greater than 10%. Given the level and type of encroachment this tree is not sustainable in this development.

Observations

The tree has a history of branch failure. There is extensive decay within the primary structure.

Recommendation

This tree is in direct conflict with the proposed development and its removal is required. Additionally this is a poor quality specimen that would be recommended for removal regardless of development.

GPS Coords (MGA Zone 54)	283712 E, 6153466 N
Legislative Status	Significant
Development Impact	Conflicted
Recommendation	Remove

River Red Gum

Inspected: Monday, 27 August 2018
Height: >15 metres
Spread: >10 metres
Health: Fair
Structure: Fair

Trunk Circumference: >2 metres
Useful Life Expectancy: >10 years
Tree Protection Zone (TPZ): 10.20 metres



Legislative Status

This tree is identified as a Regulated Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than two metres and is not subject to any exemption from regulation.

Development Impact

The identified encroachment is greater than 10%. Given the level and type of encroachment this tree is not sustainable in this development.

Observations

This tree is in fair overall condition.

Recommendation

This tree is in direct conflict with the proposed development and its removal is required.

GPS Coords (MGA Zone 54)	283712 E, 6153458 N
Legislative Status	Regulated
Development Impact	Conflicted
Recommendation	Remove

River Red Gum

Inspected: Monday, 27 August 2018
Height: >20 metres
Spread: >15 metres
Health: Fair
Structure: Good

Trunk Circumference: >3 metres
Useful Life Expectancy: >10 years
Tree Protection Zone (TPZ): 10.01 metres



Legislative Status

This tree is identified as a Significant Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than three metres and is not subject to any exemption from regulation.

Development Impact

The identified encroachment is greater than 10%. Given the level and type of encroachment this tree is not sustainable in this development.

Observations

This tree is in fair overall condition.

Recommendation

This tree is in direct conflict with the proposed development and its removal is required.

GPS Coords (MGA Zone 54)	283709 E, 6153454 N
Legislative Status	Significant
Development Impact	Conflicted
Recommendation	Remove

River Red Gum

Inspected: Monday, 27 August 2018
Height: >20 metres
Spread: >15 metres
Health: Fair
Structure: Good

Trunk Circumference: >3 metres
Useful Life Expectancy: >10 years
Tree Protection Zone (TPZ): 15.00 metres



Legislative Status

This tree is identified as a Significant Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than three metres and is not subject to any exemption from regulation.

Development Impact

The identified encroachment is greater than 10%. Given the level and type of encroachment this tree is not sustainable in this development.

Observations

This tree is in fair overall condition.

Recommendation

This tree is in direct conflict with the proposed development and its removal is required.

GPS Coords (MGA Zone 54)	283704 E, 6153447 N
Legislative Status	Significant
Development Impact	Conflicted
Recommendation	Remove

River Red Gum

Inspected: Monday, 27 August 2018
Height: >15 metres
Spread: >15 metres
Health: Good
Structure: Good

Trunk Circumference: >3 metres
Useful Life Expectancy: >20 years
Tree Protection Zone (TPZ): 13.20 metres



Legislative Status

This tree is identified as a Significant Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than three metres and is not subject to any exemption from regulation.

Development Impact

The identified encroachment is greater than 10%. Given the level and type of encroachment this tree is not sustainable in this development.

Observations

This tree is in good overall condition.

Recommendation

This tree is in direct conflict with the proposed development and its removal is required.

GPS Coords (MGA Zone 54)	283699 E, 6153427 N
Legislative Status	Significant
Development Impact	Conflicted
Recommendation	Remove

River Red Gum

Inspected: Monday, 27 August 2018
Height: >20 metres
Spread: >15 metres
Health: Good
Structure: Good

Trunk Circumference: >3 metres
Useful Life Expectancy: >20 years
Tree Protection Zone (TPZ): 14.40 metres



Legislative Status

This tree is identified as a Significant Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than three metres and is not subject to any exemption from regulation.

Development Impact

The identified encroachment is greater than 10%. Given the level and type of encroachment this tree is not sustainable in this development.

Observations

This tree is in good overall condition.

Recommendation

This tree is in direct conflict with the proposed development and its removal is required.

GPS Coords (MGA Zone 54)	283687 E, 6153415 N
Legislative Status	Significant
Development Impact	Conflicted
Recommendation	Remove

River Red Gum

Inspected: Monday, 27 August 2018
Height: >15 metres
Spread: >10 metres
Health: Good
Structure: Good

Trunk Circumference: >2 metres
Useful Life Expectancy: >20 years
Tree Protection Zone (TPZ): 10.32 metres



Legislative Status

This tree is identified as a Regulated Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than two metres and is not subject to any exemption from regulation.

Development Impact

The identified encroachment is greater than 10%. Given the level and type of encroachment this tree is not sustainable in this development.

Observations

This tree is in good overall condition.

Recommendation

This tree is in direct conflict with the proposed development and its removal is required.

GPS Coords (MGA Zone 54)	283682 E, 6153403 N
Legislative Status	Regulated
Development Impact	Conflicted
Recommendation	Remove

River Red Gum

Inspected: Monday, 27 August 2018
Height: >20 metres
Spread: >15 metres
Health: Good
Structure: Good

Trunk Circumference: >2 metres
Useful Life Expectancy: >20 years
Tree Protection Zone (TPZ): 11.16 metres



Legislative Status

This tree is identified as a Regulated Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than two metres and is not subject to any exemption from regulation.

Development Impact

The identified encroachment is greater than 10%. Given the level and type of encroachment this tree is not sustainable in this development.

Observations

This tree is in good overall condition.

Recommendation

This tree is in direct conflict with the proposed development and its removal is required.

GPS Coords (MGA Zone 54)	283680 E, 6153397 N
Legislative Status	Regulated
Development Impact	Conflicted
Recommendation	Remove

River Red Gum

Inspected: Monday, 27 August 2018
Height: >15 metres
Spread: >15 metres
Health: Fair
Structure: Good

Trunk Circumference: >3 metres
Useful Life Expectancy: >10 years
Tree Protection Zone (TPZ): 15.00 metres



Legislative Status

This tree is identified as a Significant Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than three metres and is not subject to any exemption from regulation.

Development Impact

The identified encroachment is greater than 10%. Given the level and type of encroachment this tree is not sustainable in this development.

Observations

This tree is in fair overall condition.

Recommendation

This tree is in direct conflict with the proposed development and its removal is required.

GPS Coords (MGA Zone 54)	283675 E, 6153383 N
Legislative Status	Significant
Development Impact	Conflicted
Recommendation	Remove

River Red Gum

Inspected: Monday, 27 August 2018
Height: >15 metres
Spread: >10 metres
Health: Fair
Structure: Fair

Trunk Circumference: >2 metres
Useful Life Expectancy: >10 years
Tree Protection Zone (TPZ): 7.44 metres



Legislative Status

This tree is identified as a Regulated Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than two metres and is not subject to any exemption from regulation.

Development Impact

The identified encroachment is greater than 10%. Given the level and type of encroachment this tree is not sustainable in this development.

Observations

This tree is in fair overall condition.

Recommendation

This tree is in direct conflict with the proposed development and its removal is required.

GPS Coords (MGA Zone 54)	283667 E, 6153371 N
Legislative Status	Regulated
Development Impact	Conflicted
Recommendation	Remove

River Red Gum

Inspected: Monday, 27 August 2018
Height: >15 metres
Spread: >15 metres
Health: Poor
Structure: Good

Trunk Circumference: >3 metres
Useful Life Expectancy: <10 years
Tree Protection Zone (TPZ): 14.40 metres



Legislative Status

This tree is identified as a Significant Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than three metres and is not subject to any exemption from regulation.

Development Impact

The identified encroachment is greater than 10%. Given the level and type of encroachment this tree is not sustainable in this development.

Observations

There is dieback of branch ends throughout the crown.

Recommendation

This tree is in direct conflict with the proposed development and its removal is required. Additionally this is a poor quality specimen that would be recommended for removal regardless of development.

GPS Coords (MGA Zone 54)	283665 E, 6153365 N
Legislative Status	Significant
Development Impact	Conflicted
Recommendation	Remove

River Red Gum

Inspected: Monday, 27 August 2018
Height: >20 metres
Spread: >15 metres
Health: Good
Structure: Good

Trunk Circumference: >3 metres
Useful Life Expectancy: >20 years
Tree Protection Zone (TPZ): 15.00 metres



Legislative Status

This tree is identified as a Significant Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than three metres and is not subject to any exemption from regulation.

Development Impact

The identified encroachment is greater than 10%. Given the level and type of encroachment this tree is not sustainable in this development.

Observations

This tree is in good overall condition.

Recommendation

This tree is in direct conflict with the proposed development and its removal is required.

GPS Coords (MGA Zone 54)	283650 E, 6153336 N
Legislative Status	Significant
Development Impact	Conflicted
Recommendation	Remove

River Red Gum

Inspected: Monday, 27 August 2018
Height: >20 metres
Spread: >15 metres
Health: Fair
Structure: Fair

Trunk Circumference: >3 metres
Useful Life Expectancy: >10 years
Tree Protection Zone (TPZ): 11.40 metres



Legislative Status

This tree is identified as a Significant Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than three metres and is not subject to any exemption from regulation.

Development Impact

The identified encroachment is greater than 10%. Given the level and type of encroachment this tree is not sustainable in this development.

Observations

This tree is in fair overall condition.

Recommendation

This tree is in direct conflict with the proposed development and its removal is required.

GPS Coords (MGA Zone 54)	283645 E, 6153328 N
Legislative Status	Significant
Development Impact	Conflicted
Recommendation	Remove

River Red Gum

Inspected: Monday, 27 August 2018
Height: >15 metres
Spread: >10 metres
Health: Fair
Structure: Fair

Trunk Circumference: >3 metres
Useful Life Expectancy: >10 years
Tree Protection Zone (TPZ): 14.28 metres



Legislative Status

This tree is identified as a Significant Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than three metres and is not subject to any exemption from regulation.

Development Impact

The identified encroachment is greater than 10%. Given the level and type of encroachment this tree is not sustainable in this development.

Observations

This tree is in fair overall condition.

Recommendation

This tree is in direct conflict with the proposed development and its removal is required.

GPS Coords (MGA Zone 54)	283643 E, 6153324 N
Legislative Status	Significant
Development Impact	Conflicted
Recommendation	Remove

River Red Gum

Inspected: Monday, 27 August 2018
Height: >20 metres
Spread: >15 metres
Health: Good
Structure: Good

Trunk Circumference: >3 metres
Useful Life Expectancy: >20 years
Tree Protection Zone (TPZ): 15.00 metres



Legislative Status

This tree is identified as a Significant Tree as defined in the Development Act 1993. This tree has a trunk circumference greater than three metres and is not subject to any exemption from regulation.

Development Impact

The identified encroachment is greater than 10%. Given the level and type of encroachment this tree is not sustainable in this development.

Observations

This tree is in good overall condition.

Recommendation

This tree is in direct conflict with the proposed development and its removal is required.

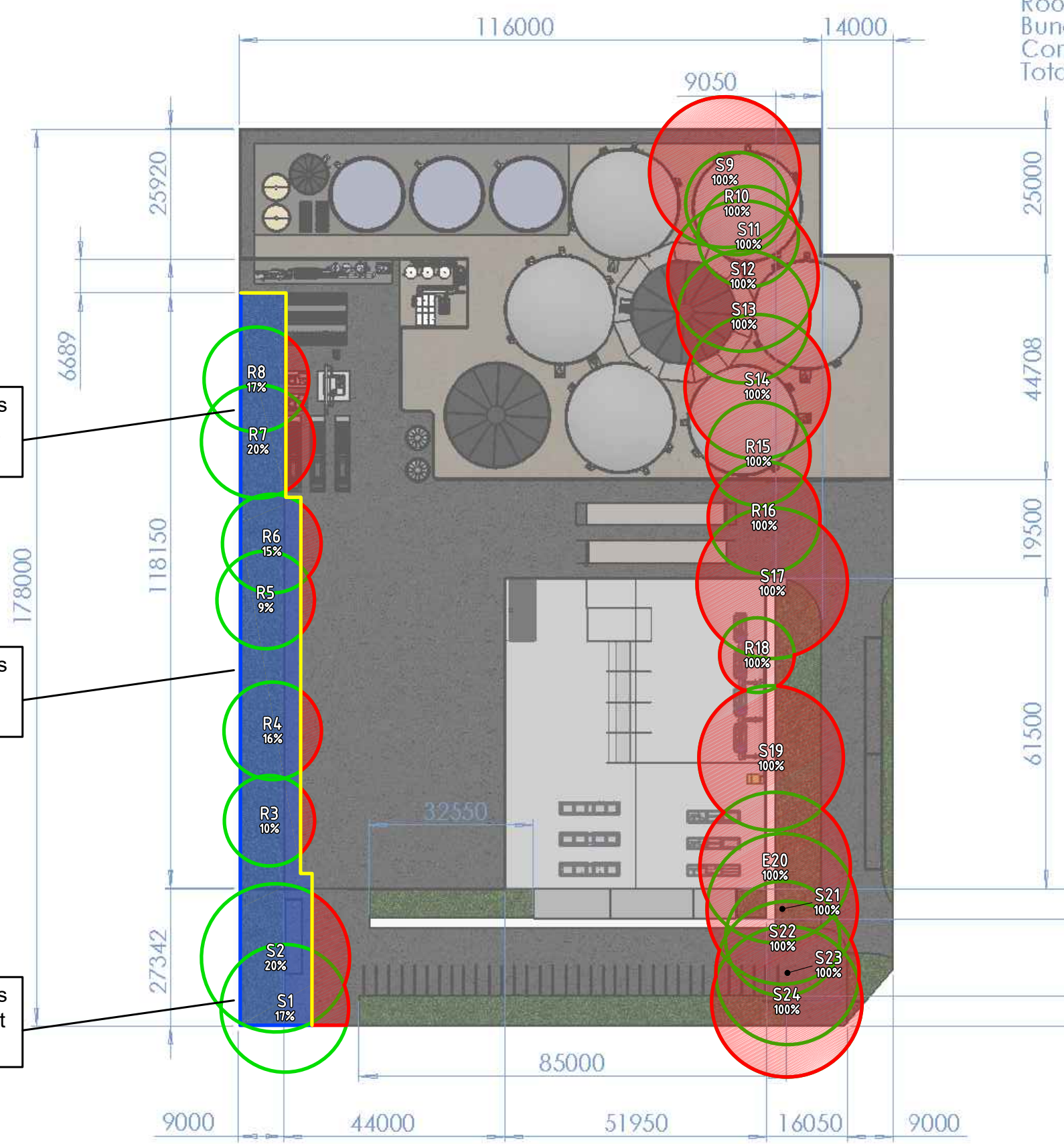
GPS Coords (MGA Zone 54)	283638 E, 6153317 N
Legislative Status	Significant
Development Impact	Conflicted
Recommendation	Remove

Appendix C - Mapping

Arforman Pt Ltd

- TP
- Construction Edge
- Encroachment
- Tree Protection

Lanscaped area - 2,830 m²
 Roof area - 3,440 m²
 Bunded area - 6,540 m²
 Concrete area - 9,790 m²
 Total Area - 22,600 m²



Approximate encroachments for trees 7 and 8 are based on a 9.00m offset from the boundary

Approximate encroachments for trees 3 to 6 are based on a 12.00m offset from the boundary

Approximate encroachments for trees 1 and 2 are based on a 14.30m offset from the boundary

REVISION	REVISION DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED
0	ISSUED FOR REVIEW	09/08/2018	MARTYN A.	JOSEPH O.	

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CLIENT: FOOD ENERGY
 PROJECT NO: J116

TITLE: SALISBURY AD PLANT
 CONCEPT LAYOUT

ALL DIMENSIONS IN mm SCALE 1:1000 DWG NO. J116-001 SHEET NO. 2 OF 4 REV 0

Appendix D - Tree Assessment Summary

Tree Assessment Summary

Tree No.	Botanic Name	Legislative Status	Development Impact	TPZ Radius	Observations	Recommendations
1	<i>Eucalyptus camaldulensis</i>	Significant	Low	12.72 metres	This tree is in good overall condition.	This tree should be protected in accordance with AS4970-2009.
2	<i>Eucalyptus camaldulensis</i>	Significant	Low	14.76 metres	This tree is in fair overall condition.	This tree should be protected in accordance with AS4970-2009.
3	<i>Eucalyptus cladocalyx</i>	Regulated	Low	9.00 metres	The tree has a history of branch failure. There is extensive decay within the primary structure.	Tree removal is recommended; this tree is not in conflict with the development however it is a poor quality specimen and is recommended for removal regardless of development.
4	<i>Eucalyptus cladocalyx</i>	Regulated	Low	9.72 metres	This tree is in fair overall condition.	This tree should be protected in accordance with AS4970-2009.
5	<i>Eucalyptus camaldulensis</i>	Regulated	Low	9.72 metres	This tree is in fair overall condition.	This tree should be protected in accordance with AS4970-2009.
6	<i>Eucalyptus polyanthemos</i>	Regulated	Low	9.84 metres	This tree is in fair overall condition.	This tree should be protected in accordance with AS4970-2009.
7	<i>Eucalyptus cladocalyx</i>	Regulated	High	11.28 metres	This tree is in fair overall condition.	The level of impact on this tree is such that its removal is the most appropriate management option.
8	<i>Eucalyptus cladocalyx</i>	Regulated	High	10.44 metres	There is extensive decay within the primary structure.	The level of impact on this tree is such that its removal is the most appropriate management option. Additionally this is a poor quality specimen that would be recommended for removal regardless of development.
9	<i>Eucalyptus camaldulensis</i>	Significant	Conflicted	15.00 metres	The tree has a history of branch failure. There is extensive decay within the primary structure.	This tree is in direct conflict with the proposed development and its removal is required. Additionally this is a poor quality specimen that would be recommended for removal regardless of development.

Tree Assessment Summary

Tree No.	Botanic Name	Legislative Status	Development Impact	TPZ Radius	Observations	Recommendations
10	<i>Eucalyptus camaldulensis</i>	Regulated	Conflicted	10.20 metres	This tree is in fair overall condition.	This tree is in direct conflict with the proposed development and its removal is required.
11	<i>Eucalyptus camaldulensis</i>	Significant	Conflicted	10.01 metres	This tree is in fair overall condition.	This tree is in direct conflict with the proposed development and its removal is required.
12	<i>Eucalyptus camaldulensis</i>	Significant	Conflicted	15.00 metres	This tree is in fair overall condition.	This tree is in direct conflict with the proposed development and its removal is required.
13	<i>Eucalyptus camaldulensis</i>	Significant	Conflicted	13.20 metres	This tree is in good overall condition.	This tree is in direct conflict with the proposed development and its removal is required.
14	<i>Eucalyptus camaldulensis</i>	Significant	Conflicted	14.40 metres	This tree is in good overall condition.	This tree is in direct conflict with the proposed development and its removal is required.
15	<i>Eucalyptus camaldulensis</i>	Regulated	Conflicted	10.32 metres	This tree is in good overall condition.	This tree is in direct conflict with the proposed development and its removal is required.
16	<i>Eucalyptus camaldulensis</i>	Regulated	Conflicted	11.16 metres	This tree is in good overall condition.	This tree is in direct conflict with the proposed development and its removal is required.
17	<i>Eucalyptus camaldulensis</i>	Significant	Conflicted	15.00 metres	This tree is in fair overall condition.	This tree is in direct conflict with the proposed development and its removal is required.
18	<i>Eucalyptus camaldulensis</i>	Regulated	Conflicted	7.44 metres	This tree is in fair overall condition.	This tree is in direct conflict with the proposed development and its removal is required.
19	<i>Eucalyptus camaldulensis</i>	Significant	Conflicted	14.40 metres	There is dieback of branch ends throughout the crown.	This tree is in direct conflict with the proposed development and its removal is required. Additionally this is a poor quality specimen that would be recommended for removal regardless of development.
21	<i>Eucalyptus camaldulensis</i>	Significant	Conflicted	15.00 metres	This tree is in good overall condition.	This tree is in direct conflict with the proposed development and its removal is required.

Tree Assessment Summary

Tree No.	Botanic Name	Legislative Status	Development Impact	TPZ Radius	Observations	Recommendations
22	<i>Eucalyptus camaldulensis</i>	Significant	Conflicted	11.40 metres	This tree is in fair overall condition.	This tree is in direct conflict with the proposed development and its removal is required.
23	<i>Eucalyptus camaldulensis</i>	Significant	Conflicted	14.28 metres	This tree is in fair overall condition.	This tree is in direct conflict with the proposed development and its removal is required.
24	<i>Eucalyptus camaldulensis</i>	Significant	Conflicted	15.00 metres	This tree is in good overall condition.	This tree is in direct conflict with the proposed development and its removal is required.

Appendix E - Tree Protection Zone Guidelines

Tree Protection Zone General Specifications and Guidelines

The Tree Protection Zone(s) is identified on the site plan. The TPZ is an area where construction activities are regulated for the purposes of protecting tree viability. The TPZ should be established so that it clearly identifies and precludes development/construction activities including personnel.

If development activities are required within the TPZ then these activities must be reviewed and approved by the Project Arborist. Prior to approval, the Project Arborist must be certain that the tree(s) will remain viable as a result of this activity.

Work Activities Excluded from the Tree Protection Zone:

- a) Machine excavation including trenching;
- b) Excavation for silt fencing;
- c) Cultivation;
- d) Storage;
- e) Preparation of chemicals, including preparation of cement products;
- f) Parking of vehicles and plant;
- g) Refuelling;
- h) Dumping of waste;
- i) Wash down and cleaning of equipment;
- j) Placement of fill;
- k) Lighting of fires;
- l) Soil level changes;
- m) Temporary or permanent installation of utilities and signs, and
- n) Physical damage to the tree.

Protective Fencing

Protective fencing must be installed around the identified Tree Protection Zone (See Figure1). The fencing should be chain wire panels and compliant with AS4687 - 2007 *Temporary fencing and hoardings*. Shade cloth or similar material should be attached around the fence to reduce dust, other particulates and liquids entering the protected area.

Temporary fencing on 28kg bases are recommended for use as this eliminates any excavation requirements to install fencing. Excavation increase the likelihood of root damage therefore should be avoided where possible throughout the project.

Existing perimeter fencing and other structures may be utilised as part of the protective fencing.

Any permanent fencing should be post and rail with the set out determined in consultation with the Project Arborist.

Where the erection of the fence is not practical the Project Arborist is to approve alternative measures.

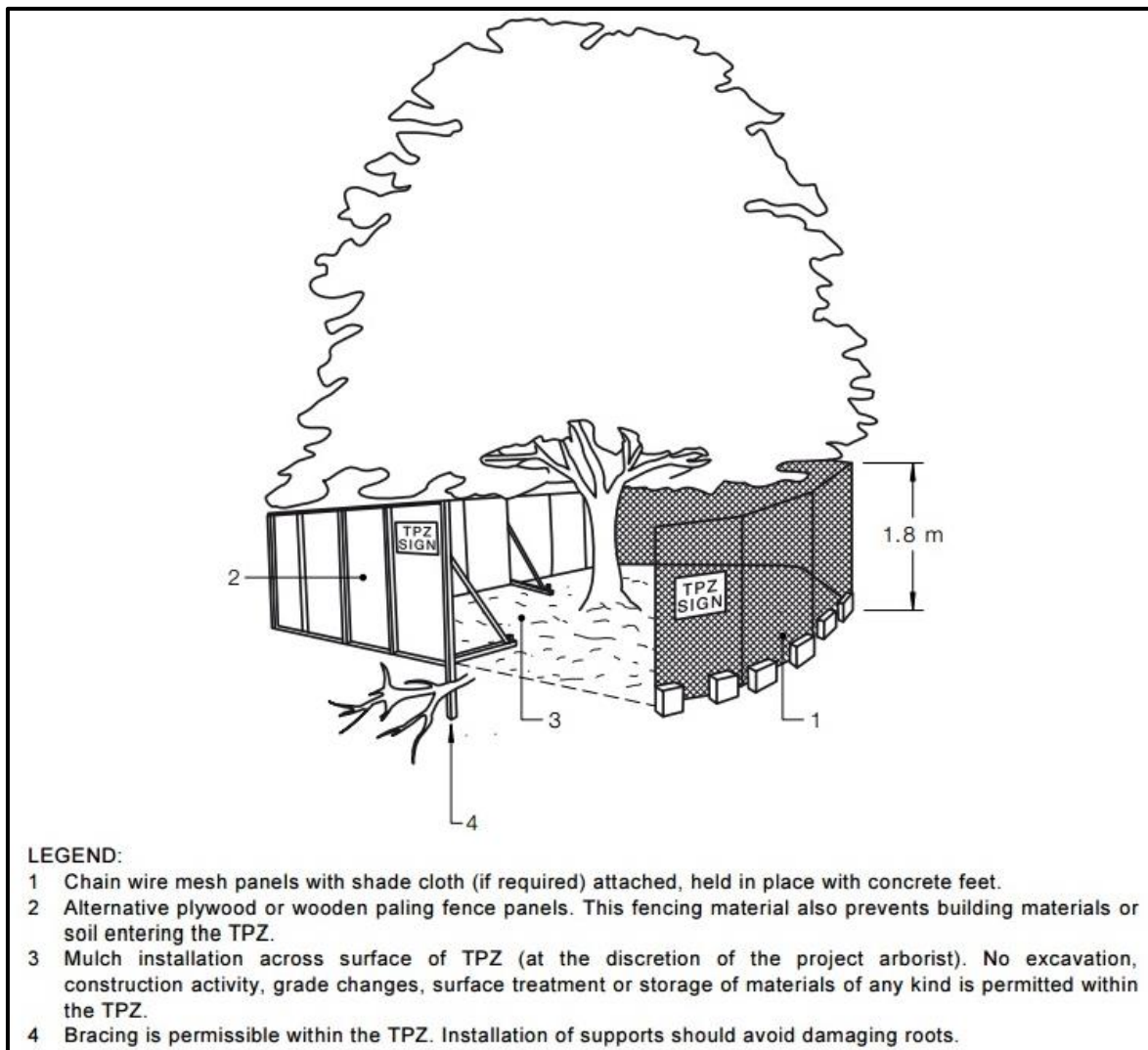


Figure 1 Showing example of protection fencing measures suitable.

Other Protection Measures

General

When a TPZ exclusion area cannot be established due to practical reasons or the area needs to be entered to undertake construction activities then additional tree protection measures may need to be adopted. Protection measures should be compliant with AS4970-2009 and approved by the Project Arborist

Installation of Scaffolding within Tree Protection Area.

Where scaffolding is required within the TPZ branch removal should be minimised. Any branch removal required should be approved by the Project Arborist and performed by a certified Arborist and performed in accordance with AS4373-2007. Approval to prune branches must be documented and maintained.

Ground below scaffold should be protected by boarding (e.g. scaffold board or plywood sheeting) as shown in Figure below. The boarding should be left in place until scaffolding is removed.

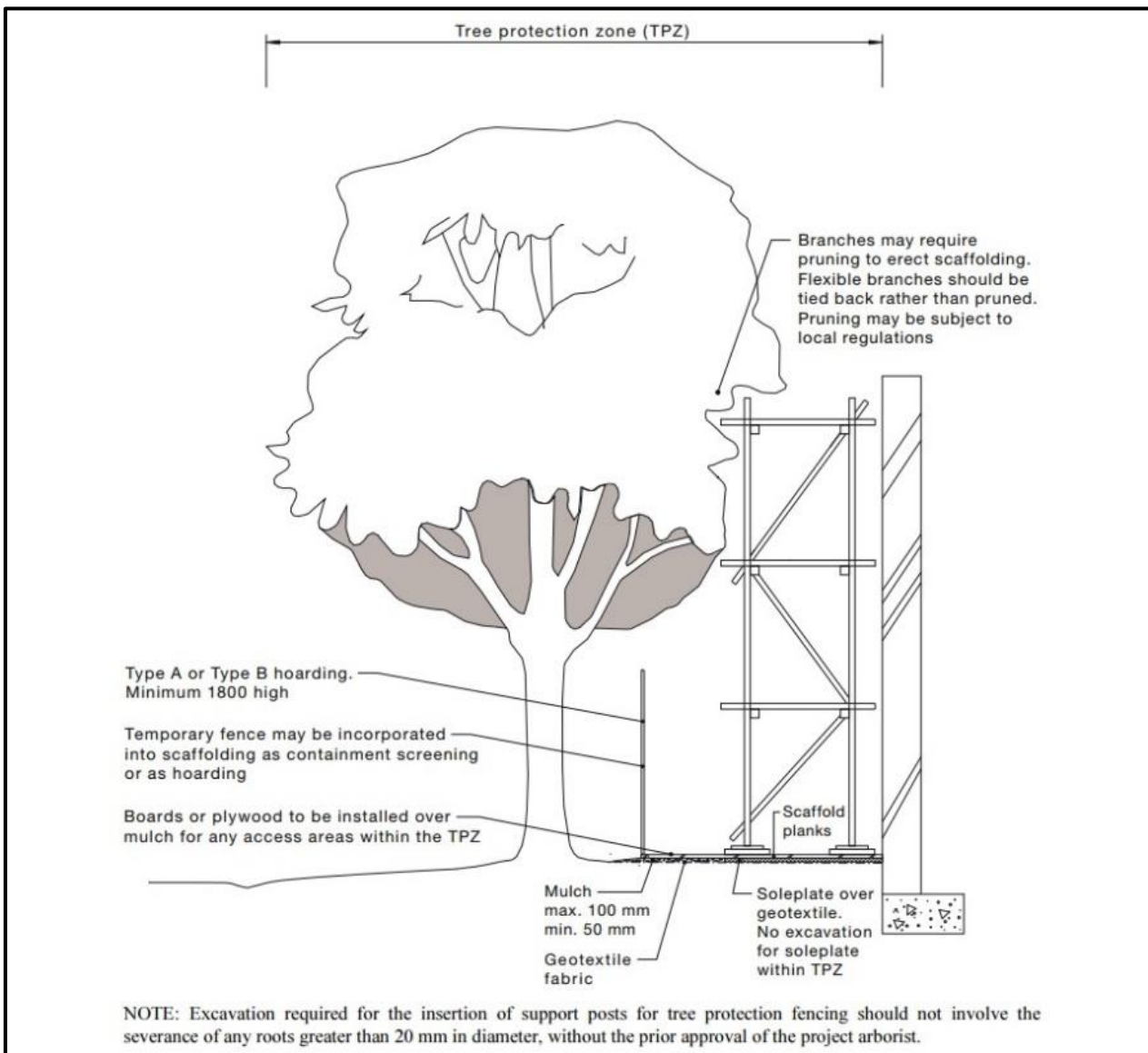


Figure 2 – Showing scaffolding constructed within TPZ.

Ground Protection

Where access is required within the TPZ ground protection measures are required. Ground protection is to be designed to prevent both damage to the roots and soil compaction.

Ground protection methods include the placement of a permeable membrane beneath a layer of non-compactable material such as mulch or a no fines gravel which is in turn covered with rumble boards or steel plates.

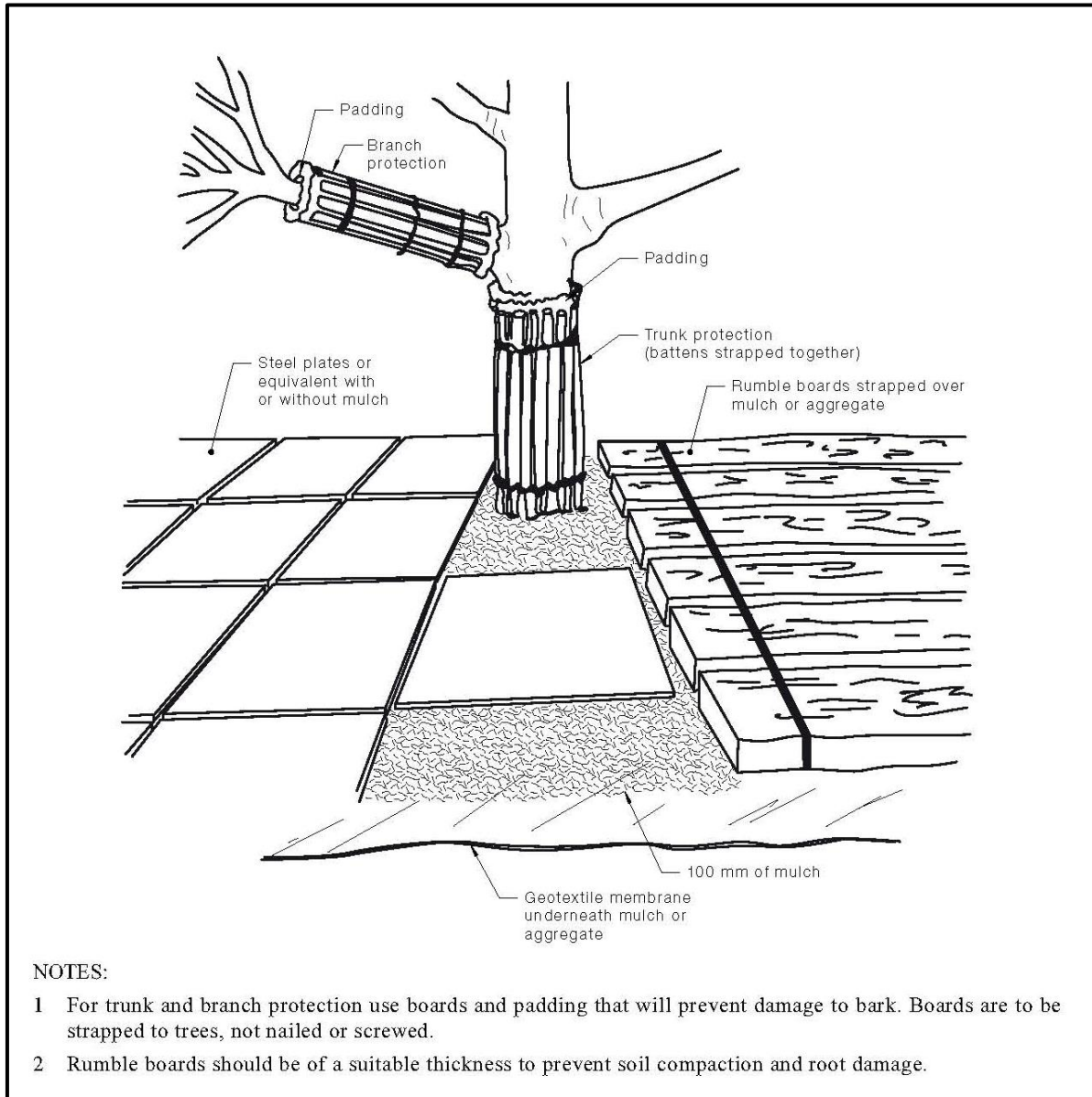


Figure 3 – Ground protection methods.

Document Source:

Diagrams in this document are sourced from AS4970-2009 Protection of trees on development sites. Further information and guidelines are available in within that document.

Paving Construction within a Tree Protection Zone

Paving within any Tree Protection Zone (TPZ) must be carried out above natural ground level unless it can be shown with non-destructive excavation (AirSpade® or similar) that no or insignificant root growth occupies the proposed construction area.

Due to the adverse effect filling over a Tree Protection Zone (TPZ) can have on tree health; alternative mediums other than soil must be used. Available alternative mediums include structural soils or the use of a cellular confinement system such as *Ecocell*®.

Ecocell®

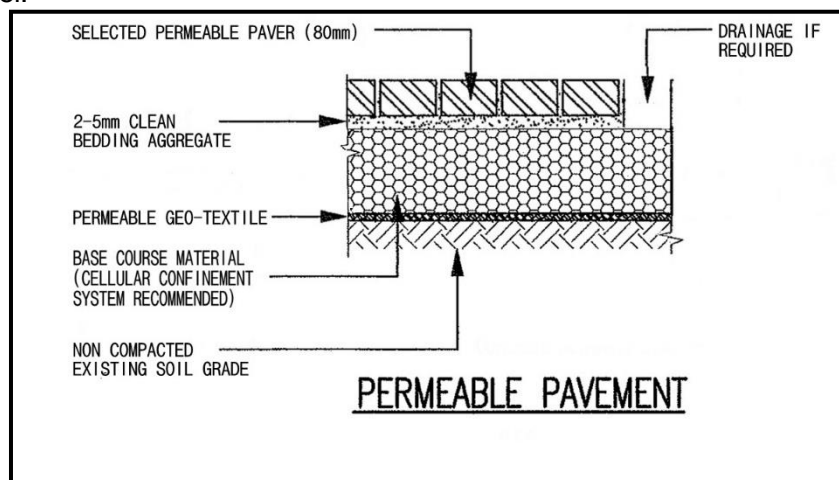
Ecocell® systems are a cellular confinement system that can be filled with large particle sized gravels as a sub-base for paving systems to reduce compaction to the existing grade.

Site preparation

- Clearly outline to all contracting staff entering the site the purpose of the TPZ's and the contractors' responsibilities. No fence is to be moved and no person or machinery is to access the TPZ's without consent from the City of Unley and/or the Project Arborist.
- Fence off the unaffected area of the TPZ with a temporary fence leaving a 1.5 metre gap between the work area and the fence; this will prevent machinery access to the remaining root zone.

Installation of Ecocell® and EcoTrihex Paving®

- Install a non-woven geotextile fabric for drainage and separation from sub base with a minimum of 600mm overlap on all fabric seams as required.
- Add Ecocell®, fill compartments with gravel and compact to desired compaction rate.
- If excessive groundwater is expected incorporate an appropriate drainage system within the bedding sand level.
- Add paving sand to required depth and compact to paving manufacturer's specifications.
- Lay EcoTrihex Paving® as per manufactures specifications and fill gaps between pavers with no fines gravel.
- Remove all debris, vegetation cover and unacceptable in-situ soils. No excavation or soil level change of the sub base is allowable for the installation of the paving.
- Where the finished soil level is uneven, gullies shall be filled with 20 millimetre coarse gravel to achieve the desired level.



This construction method if implemented correctly can significantly reduce and potentially eliminated the risk of tree decline and/or structural failure and effectively increase the size of the Tree Protection Zone to include the area of the paving.

Certificates of Control

Stage in development	Tree management process	
	Matters for consideration	Actions and certification
Development submission	Identify trees for retention through comprehensive arboricultural impact assessment of proposed construction. Determine tree protection measures Landscape design	Provide arboricultural impact assessment including tree protection plan (drawing) and specification
Development approval	Development controls Conditions of consent	Review consent conditions relating to trees
Pre-construction (Sections 4 and 5)		
Initial site preparation	State based OHS requirements for tree work Approved retention/removal Refer to AS 4373 for the requirements on the pruning of amenity trees Specifications for tree protection measures	Compliance with conditions of consent Tree removal/tree retention/transplanting Tree pruning Certification of tree removal and pruning Establish/delineate TPZ Install protective measures Certification of tree protection measures
Construction (Sections 4 and 5)		
Site establishment	Temporary infrastructure Demolition, bulk earthworks, hydrology	Locate temporary infrastructure to minimize impact on retained trees Maintain protective measures Certification of tree protection measures
Construction work	Liaison with site manager, compliance Deviation from approved plan	Maintain or amend protective measures Supervision and monitoring
Implement hard and soft landscape works	Installation of irrigation services Control of compaction work Installation of pavement and retaining walls	Remove selected protective measures as necessary Remedial tree works Supervision and monitoring
Practical completion	Tree vigour and structure	Remove all remaining tree protection measures Certification of tree protection
Post construction (Section 5)		
Defects liability/ maintenance period	Tree vigour and structure	Maintenance and monitoring Final remedial tree works Final certification of tree condition

Document Source:

This table has been sourced from AS4970-2009 Protection of trees on development sites. Further information and guidelines are available in within that document.

Tree Protection Zone



NO ACCESS

Contact: Arborman Tree Solutions

Ph. 8240 5555

m: 0418 812 967

e: arborman@arborman.com.au



27th March 2019

Dear Janine,

Log of Design Variations – J116 Delorean AD Project

As requested, a summary of changes to the design of the Delorean Anaerobic Digestion Project are detailed in the attached *Log of Design Variations* and I hereby confirm that all changes have been reflected in the latest design.

For your quick reference, summary of the key design variations to date is as follows:

- ***Addition of Noise Attenuation*** – Addition noise attenuation including a perimeter acoustic wall barriers (3m) on the adjacent common boundary to the generators, flares and truck access area with a secondary acoustic wall barrier (5m and 7m sections) surrounding the generators and flares to ensure compliance with EPA-SA noise criteria.
- ***Addition of Iron Oxide H2S Scrubber*** – Addition of an Iron Oxide H2S Scrubber upstream of all generation and flaring equipment to reduce biogas to <0.1ppms H2S to ensure compliance with EPA-SA air quality criteria.

I hope that this information adequately addresses your queries and if you have any further questions, please don't hesitate to get in touch.

Kind regards,



Joseph Oliver
General Manager
Biogass Renewables Pty Ltd



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Email: joseph.oliver@biogass.com.au
1205 Hay St, West Perth, Western Australia 6005

Log of Design Variations

This is a formal log of design variations to date from the initial design for the following proposed facility:

Details	
Developer	Delorean Energy SA One (in association with Biogass Renewables Pty Ltd)
Proposal	Construction of a new Anaerobic Digestion Bioenergy Plant
Location	A505 DP68296, Hundred Munno Para, 1-2 Gidgie Court, Edinburgh, SA 5111
Development Application Number	361 / L007 / 18

Design variations to date are recorded as follows:

No.	Date	Variation	Description	Reason for Variation	Status
1	17/10/18	Addition of Noise Attenuation	<p>Installation of the following additional attenuation measures:</p> <ul style="list-style-type: none"> Fan selection and attenuation of the Bio-filter blower outlets to achieve a combined sound power of no more than 89 dB(A) external. This assessment is based on three fans, being "Fans Direct: SWS1-D51B Size 365-100% CS90 Fans, 23 kW with fan speed of 1370 rpm". Each fan discharge outlet to be fitted with 2D cylindrical podded silencer, minimum 1m gap (duct), 1D unpodded silencer Section of 3m high acoustic barrier fence (0.48mm BMT or greater density) on the adjacent common boundary to the generators. Section of 3.0m high acoustic barrier fence (0.48mm BMT or greater density) on the adjacent common boundary to the truck access area. Generators to be fitted with acoustic attenuation package rated at 65 dB(A) at 1m. Acoustic barrier walls to be installed around the generators and flare units. The walls may be constructed metal framing with 	Recommendation by <i>Herring Storrer Acoustics</i> to ensure compliance with EPA-SA noise criteria as per <i>Environmental Noise Assessment</i> report dated 17/10/2018 (Doc 23621-2-18204).	Active



			<p>roof sheeting or cool room panel with a mass density of at least 10 Kg/m² for the combination. The wall on the western side of the generators and flare units should have a minimum mass density of 17 Kg/m² for the lower 5 meters, and if a lightweight construction, be a cavity wall type construction with minimum of 100mm between each side with 100mm acoustic insulation infill to assist in the control of lower frequency noise emissions (90mm sandwich panel one side, 100mm channel with roof sheeting on the other side with 100mm fiberglass insulation infill for example). Concrete tilt-up panel would also be suitable.</p> <ul style="list-style-type: none"> • Bio Methane Upgrade Plant to be fitted with manufacturers proprietary acoustic enclosure, sound power of Bio Methane Unit including blower not to exceed 91 dB(A). Section of 4.5m high acoustic barrier wall between electrical buildings and alone east side of Bio Methane Plant. 		
2	21/12/18	Addition of Iron Oxide H ₂ S Scrubber	<p>Addition of an Iron Oxide H₂S Scrubber to the Anaerobic Digestion process and located upstream of the generators, flares and biomethane upgrade equipment. The unit is performance guaranteed to scrub all biogas immediately after the digestion stage of the process to <0.1ppms H₂S. Further destruction of H₂S shall occur in generation and flaring equipment.</p>	<p>Incorporated in design to ensure compliance with EPA-SA air quality criteria and reflected in air dispersion modelling as per the <i>Salisbury Anaerobic Digestion Air Quality Assessment</i> report dated 2/5/19 (Doc 318000493) prepared by <i>Ramboll</i>.</p>	Active



BIOGASS RENEWABLES

Proposed In-Vessel Waste-to-Energy Anaerobic Digestion Design Report

DELOREAN ENERGY SA ONE

125,000TPA Salisbury SA Facility - Phase 1

1-2 Gidgie Court, Edinburgh SA 5111

Date	Revision	Status	Prepared	Reviewed	Approved
10/06/2018	A	Final	MA	JO	HJ
14/09/2018	B	Final	MA	JO	HJ
28/03/2019	C	Final Amendments	MA	JO	HJ

Design Report

Job No: J116
Document No: J116-001
Date: 10/06/18
Rev: A



DESIGN REPORT

Biogas Renewables

TABLE OF CONTENTS

Abbreviations and Acronyms	4
Units	4
1. BACKGROUND	5
2. KEY OBJECTIVES	7
3. DESIGN EXECUTION STRATEGY	8
3.1. LOCATION	8
3.2. DESIGN WORKS	8
3.2.1. Concrete	8
3.2.2. Structural	8
3.2.3. EI&C	8
3.3. REPORTING	8
3.4. DESIGN SCHEDULE	9
4. QUALITY CONTROL	9
5. PROCESS DESIGN	9
5.1.1. Waste Reception Hall	10
5.1.2. Digester Feed Tank	12
5.2.3 Pasteurisation Tanks	12
5.2.4 Anaerobic Digestion Process	13
5.2.5 Digestate Solid and Liquid Separation	14
5.2.5 Waste Water Treatment Plant	15



- 5.2.6 Gas Management and Power Utilities 15
- 5.2. SITE OFFICE AND FACILITY RECEPTION..... 18
- 6. BASIS OF DESIGN 18
 - 6.1. Appearance 18
 - 6.2. DESIGN LIFE..... 19
 - 6.2.1. Operational Design Life..... 19
 - 6.2.2. Structural Design Life 19
 - 6.3. PLANT PERSONNEL AND OPERATION SCHEDULE 19
 - 6.4. DESIGN REDUNDANCY 19
 - 6.5. SITE LAYOUT20
 - 6.5.1. Public and Pedestrian Access20
 - 6.5.2. Road Layout.....20
 - 6.5.3. Traffic Management.....21
 - 6.5.4. Signage.....22
 - 6.5.5. Tank Bunding.....22
 - 6.5.6. Drainage.....22
 - 6.6. BUILDINGS AND TECHNICAL.....22
 - 6.7. EARTHWORK AND GROUND CONDITIONS.....23
 - 6.7.1. Foundations.....23
 - 6.7.1. Landscaping23
 - 6.8. ORGANICS RECEPTION HALL23
 - 6.8.1. Concrete Slab.....25
 - 6.9. BOUNDARIES AND FENCING25
 - 6.10. FIRE PROTECTION25
 - 6.11. COMMUNICATIONS25
- 7. SAFETY IN DESIGN25



Abbreviations and Acronyms

AD	Anaerobic Digestion
ADF	Anaerobic Digestion Facility
BOD	Biological Oxygen Demand
CHP	Combined Heat & Power
COD	Chemical Oxygen Demand
DS	Dry solids
EI&C	Electrical Installation & Control
OS	Organic Solids
PLC	Programmable Logic Controller
PU	Packaged Unit
SS	Suspended Solids

Units

TPA	tons per annum
TPW	tons per week
TPD	ton per day
t/hr	ton per hour
dm ³	cubic decimeter (= 1 liter)
t/m ³	ton per cubic meter
kg VS/m ³ ·day	kg Volatile Solids per cubic meter reactor volume per day.
m ³ /hr	cubic meter per hour
Nm ³ /hr	normal cubic meter per hour
MW	megawatt
MWhr	megawatt hour
MW(th)	megawatt thermal energy
MW(e)	megawatt electrical energy
GJ	gigajoule
ppm	parts per million
kg/hr	kilograms per hour
mbar	millibar
m ³ /m ² *hr	cubic meter (air) per square meter surface area per hour



DESIGN REPORT

Biogass Renewables Pty Ltd

1. BACKGROUND

Biogass Renewables is an Australian energy company building mature-technology, site-specific anaerobic digestion facilities for the commercial, industrial, resources and government sectors in Australasia.

We integrate best-of-breed Australian, European and British componentry and design, delivered in the Australian context, using Australian know-how.

Biogass retains its own commercial, engineering and technical expertise in Australia, supported by a consortium of specialist European and British technology suppliers and technicians.

Biogass Renewables has successfully commissioned a 35,000-50,000 tonne per annum food waste capable of 2.4MW(e) 2.6MW(th) capacity bioenergy plant for Richgro at its principle metropolitan composting and manufacturing operations south of Perth in Western Australia.

Biogass Renewables operates a biogas potential testing laboratory enabling Biogass to sample and test prospective feedstocks to estimate biogas yields to assist in the design and feasibility for each new AD plant and also retains the in-house expertise to support the development of submissions for financial assistance.

Biogass Renewables is a member of the Australian Organics Recycling Association, Bioenergy Australia and the Waste Management Association of Australia.

The organic processing facility designed by Biogass Renewables, has been designed to meet bespoke design criteria, which will evolve through the design process.

The facility proposed is capable of processing up to 125,000TPA of expired industrial and commercial organic and agricultural waste, the facility utilises an option to include mechanical separation of contamination from the organic waste streams which has



been designed to process up to 10% of contamination at the front end, installed within an enclosed negative pressure reception hall to meet the EPA requirements.

The reception building is designed to output a clean organic waste stream as the feedstock for a mesophilic biological anaerobic digestion process. The process breaks down the volatile organic matter in the feed sludge through a process of hydrolysis, pasteurisation, and then in-vessel biodigestion in the presence of methanogen bacteria. The methane forming bacteria convert the organic acids to methane gas, carbon dioxide and water, producing biogas at around 60 – 65% methane.

Biogas is cleaned with in the headspace of the digester through a chemical conversion of H₂S and micro-dosing of air (O₂) to give sulphate (SO₄) and water (H₂O), filtered through an iron oxide scrubber and chilled through a biogas dryer and associated gas management equipment, before:

- 1) Upgrading to biomethane for a baseline of 22GJ/hr of gas energy; and
- 2) Boosting and combusting through three Combined Heat and Power Units (CHP) for up to 4.68MW electricity and 4.86MW thermal production. These are high-efficiency reciprocating engines for the production of electricity and heat to be utilised on site for the running of the plant before exporting surplus power into the local electricity grid.

The facility incorporates an enclosed compliant high-temperature flare which activates only if the generator is not operational, or excessive surplus biogas is generated.

In the biodigestion process, non-volatile solids (along with the few non-biodegradable organic solids) become digested sludge that is fed from the digester tanks into a digester outlet tank, ready to be separated into the solid and liquid fractions. The solid fraction is exported offsite by truck as a viable commercial biofertilizer product, whilst the liquid fraction is passed through an onsite wastewater treatment plant for clean-up to meet MAR standards. A proportion of the processed water is recirculated back into the anaerobic digestion system with the balance exported from the site to Salisbury Water for compliant usage or disposal within its network.



2. KEY OBJECTIVES

The objective of the design of this project is to build and operate a commercially viable anaerobic digestion facility in Salisbury, South Australia. This facility will be designed to:

- Accept and process up to 125,000TPA of trucked organic waste consisting of;
 - 100,000TPA of Commercial & Industrial (C&I) Organic Waste
 - 25,000TPA of Solid Agricultural Feedstock Waste
- Include an option for processing contaminated waste streams and pre-treating a broad range of wastes
- Be capable of producing a baseline of 291 1m³ of biogas per hour for use in generation of electricity and heat with the options to:
 - upgrade biogas to biomethane for injection into the gas mains.
 - Pipe biogas to nearby business customers in and adjacent to the Food Park to enable decentralised biogas-fuelled generation at various locations in the Food Park (each would require its own approval under this option)
- To supply the existing site operations with power and heat to meet the parasitic energy draw from the facility.
- Minimise odour
- Maximise re-use opportunities for digestate

The key design objectives for the project are:

- Achieving zero harm
- A facility with a high level of operability, maintainability and constructability
- Achieve and maintain noise and odour emission compliance; and
- No delays or additional cost on site due to design issues or errors;

The objectives of this Design Report are to:

- Detail how the design will be performed by the Contractor;
- Specify the policies and procedures applicable to the design which are to be used by the Project Design Team; and
- Assign responsibilities to key members of the Project Team.



3. DESIGN EXECUTION STRATEGY

The design will be completed in-house by Biogas, unless otherwise specified.

3.1. LOCATION

Lot 505,1-2 Gidgie Court, Edinburgh, South Australia 5111

3.2. DESIGN WORKS

3.2.1. Concrete

The design of all concrete works including footings, bunding, storm water capture and drainage and ground slabs will incorporate steel fibre reinforcement. The steel fibre reinforcing reduces construction time whilst assisting in minimising thickness and shrinkage cracks in ground slabs. Correct sealing methods will be used to seal the tanks and ensure tank integrity. Where applicable, Strand7 a Finite Element Analysis program will be used to design the concrete and will be designed with the local civils contractor.

3.2.2. Structural

All structural design will be completed on the structural analysis package Space Gass or similar as well as internal programs and spreadsheets. Design shall be in accordance with relevant Australian standards and building codes and shall incorporate elements for ease of construction.

3.2.3. EI&C

To accelerate the project schedule preliminary electrical calculations, modelling and earth grid design will be completed for input into the grid connection submission at the start of the project. The remainder of deliverables will be completed in accordance with the project schedule when mature primary electrical data, equipment lists, and General Arrangements are completed.

3.3. REPORTING

A weekly design progress report will be produced for the Project Report which shall include as a minimum work pack progress, earned hours, hold ups and outstanding technical queries.



3.4. DESIGN SCHEDULE

The design schedule is included as a sub-section of the full project schedule. Progress of deliverables and associated works packs will be updated weekly to allow correct tracking to baseline.

4. QUALITY CONTROL

Quality assurance and control shall be in accordance with Biogas - ISO 9001 compliant Design Procedure. The following processes are included in the procedure and will ensure compliance with ISO 9001 requirements.

- Design Project Commencement Process
- Safety in Design Process
- 3D Model Development and Review
- Design Drawing Development and Review Process
- Design Document Development and Review Process
- Vendor and Sub-contractor Document Review Process
- Design Hold Process
- Design Change Process
- TQ/RFI Process
- Non-conformance Process
- Corrective Action Process
- Preventive Action Process
- Design Project Completion Process

5. PROCESS DESIGN

The process design has been broken out in to three sections:

- Reception Hall



- In-Vessel Anaerobic Digestion Process
- Gas Management and Power Utilities

5.1.1.Waste Reception Hall

Receival of solid organic and liquid feed material into an insulated circa 70x52m negative-pressure Shed

Solid and liquid organic input material is imported to site by truck. Trucks will pass through a weighbridge at the entrance to the site before entering an insulated Reception Hall through fast-closing doors.

Once inside the Reception Hall, solid material will be tipped into storage bays (each allowing for up to 800m³ of volume or two days' tipping capacity). At this point plant operators will have first sight of the input material and will be able to remove any large or problematic waste materials, before the materials are loaded into the process.

Liquid material is pumped directly into a 3,500m³ Digester Feed Tank from inside the Reception Hall, via two dedicated four-inch cam lock liquid inlet connection points. The liquid waste stream is piped through a filter system into the Feed Tank. The liquid connection area houses a bunded area which captures any spills from the truck pump-out process and pumps back in to the feed tank for capture.

The Reception Hall allows for 5 waste trucks to back in at any one time, with the reception building housing traffic lights to indicate which bay is free for the following waste truck to pull in to.

The design has allowed for 4 pre-processing units for removal of inert and plastic waste streams. The pre-processing units separates inert material from the organic fraction. Inert material is captured in outlet skips for subsequent disposal to landfill. The pre-processing units will be capable of processing up to 12-15T/hour. The solid fraction is diluted with recirculated process liquor ensuring a pumpable organic sludge output as per the attached mass balance (Appendix 1).

Solid agricultural waste streams

Solid agricultural waste streams are imported to site via truck from agricultural and farming regions within South Australia. The dry agricultural waste is input directly into 2 grain Silos on site using a pneumatic conveyor system. The pneumatic conveyor system utilises moving air within a "blowline" to transfer or "blow" agricultural waste from the



delivery truck into the silos within fully contained pipework.

The Silos will have a total combined capacity of circa 200T of agricultural waste, allowing for at least 2 days storage on site. The Silos will be connected to a mixing system that will combine liquid and the agricultural waste into a pumpable slurry. The slurry is then pumped directly into the Digester Feed Tank.

Odour capture within the Reception Hall - Biofilter

The Reception Hall I is connected to an appropriately-sized biofilter and remains under a slight negative pressure to capture and extract all odours from within the building. Partitioning in the form of curtains will be incorporated into the design to separate the odour producing areas from the rest of the shed. The extraction and biofilter system is sized to deliver 4-5 air changes of the odour producing areas per hour. Extracted air is captured through an internal ducting system and passed through a biological air scrubber for removal and cleaning of odour. The biofilter medium is spongolite – a porous rock formed from fossilised sea sponge (similar to scoria medium which is widely used for biofiltration). The spongolite medium is maintained in an enclosed, humid environment allowing a habitat for odour-eating bacteria.

The biofilter will be located within the Reception Hall and will be designed with an exhaust stack, dispersing any exhaust into the air. The stack will extend upwards from the filter unit and penetrate through the Reception Hall roof into the open air. The exhaust stack will undergo emissions modelling where the final design will ensure compliance with emission and odour regulations.

Additionally, the Reception Hall will be fitted with fast-closing (30-second) doors so that tipping and pumping from trucks all takes place in a fully enclosed environment.

The Reception Hall construction includes cladding incorporating cool room-slab insulation to minimise the ambient temperature inside the Hall and to prevent premature decomposition before materials are processed.

Standing operating procedure is that all solid materials must be loaded into the plant process before close of business each day, with end of day washdown of the reception floor and bays to prevent potential for odorous materials laying overnight or accumulation on the floor.



5.1.2. Digester Feed Tank

The Digester Feed Tank (3,500m³) starts the first phase of digestion – the hydrolysis phase and is designed to hold the mechanically processed organic waste stream inputs at ambient temperature, allowing for storage of 5 days of accumulated input. The Digester Feed Tank is sized to dispense material into the process 7 days a week, allowing 365-day digester operation. This also allows for more storage capacity if the output process is not operational for a short period of time.

The digester feed tank is mixed by an in-tank agitator, ensuring a homogenous mix and keeping the solids in suspension ready for output to a pasteuriser - based on an input waste stream of up to 20% dry solid content.

All pumps are vortex centrifugal chopper pumps reducing particle size for greater surface area as well as processing a higher percentage of dry solids.

5.2.3 Pasteurisation Tanks

A volume of clean organic liquid feed is piped from the Digester Feed Tank on an hourly basis into a three-tank pasteurising system. The process is designed to meet PAS110 standards and can handle 22T/hour of wet feedstock. Heating of the pasteuriser is achieved by using surplus heat from the AD Plant co-generation units as per the attached mass balance (Appendix 1).

Within the three-tank pasteurisation process, the first operation is to fill and pre-heat up to 72°C, with the second phase holding at 70°C for a period of 1 hour. The third phase is emptying into the AD plant's main Digester Tanks. Each phase takes approximately 1 hour to complete, allowing for full pasteurisation to the European PAS110 standards within 3 hours. Holding each batch at over 72°C for 1 hour will ensure the pathogen log kill is reduced and stabilised before inputting into the Digester Tank.

In addition to pathogen kill, the pasteurisation process delivers efficiencies by enabling a shorter bioreactor retention time by thermal treating waste streams pre-digestion and can deliver a slightly higher breakdown and gas yield. This process will also assist in breaking down fats, grease and oils, by thermal treatment.

The process can be switched to pasteurise the outlet digestate instead of the input feedstock if required.



5.2.4 Anaerobic Digestion Process

The AD Plant is controlled from a Main Control Centre (MCC) located in a container next to the Reception Hall. Operation and control of the AD Plant process is provided by a programmable logic controller (PLC) in the MCC. Process status display and control parameters are monitored and adjusted via the MCC's human machine interface (HMI). The operation and adjustment of the HMI is by trained staff only. The MCC is connected to a SCADA system for remote system monitoring, operation, rectification and intervention if required.

Design of the 3500m³ Primary Digester Tanks

The primary anaerobic digestion process will take place inside six 3500m³ primary mesophilic 38°C digesters.

The Digesters are designed for a 30-day retention period, to maximise breakdown of different types of waste streams. Using a continuous feed process, proposed commercial and industrial organic waste streams which are generally low in fibre and high in sugars will break down in a mesophilic process within 15 days and is 95% exhausted of energy within 20 days from input.

The Digesters are designed to allow for removal of small floating plastics such as fruit labels, and other light floating organic fraction as well as any non-organic settled solids, such as small grit and glass, by way of a top and bottom capture exit point.

The Digesters process a set volume of blended feed every hour in a continuous diet feeding system. Based on a 30-day retention, each Digester will receive circa 5m³/hour.

The Digesters use an external mixing and heating / cooling system allowing for maintenance and repair of these systems from outside the tank without impacting Digester operation.

The external Digester mixing system has been designed to operate as follows:

- A directional mixing nozzle works by increasing the speed of the digestate at the bottom of the tank causing the contents to turn within the tank.
- A venturi mixing nozzle draws biogas from the roof space connection by creating a vacuum on the gas connection side, hydrolysing the digestate to improve gas yields and take off.

Job No: J116

Design Report

Document No: J116-001

Date: 10/06/18

Rev: A



- A top mixing nozzle which enables the mixing of the tank's digestate through an actuated valve is utilised to break up any caking or crusting of the surface material.

The external heating system on the Digesters has been designed to operate as follows:

- The Digester tank has a heat exchanger built into one mixing configuration, which is used to maintain and raise the temperature within the Digester.
- Three (3) temperature-measuring points are located on the tank which monitors the sludge temperature and hot water temperature.
- If the sludge temperature drops below a set value, the hot water from the CHP will be directed to flow through the heat exchanger.
- The heating system is operational during normal operating process to ensure a constant linear heat transfer through the material ensuring a homogenous mixture within the digestate.

Operation of the 3000m³ Digester Discharge Tank

Spent digestate is passed from the Digesters into a Digester Discharge Tank for buffering pending separation and post-processing of the digestate.

The Digester discharge tank is fed hydrostatically from the Digester tanks. The digestate in this tank contains active bacteria that will decline due to lack of feed, however will still produce methane gas that is fed back to the primary Digester tanks' gas space. The spent digestate is actively mixed to ensure a constant blend of dry solids and liquid product. The mixed product is outputted to a centrifuge located in the Reception Hall on an 8 hours/day, 5 days per week basis. The digester outlet tank has enough capacity to store digestate for a period of time if the centrifuge is not operational.

5.2.5 Digestate Solid and Liquid Separation

Mixed digestate product is output from the outlet tank and piped into the Reception Hall where it is mechanically separated by centrifuge into liquid and solid fractions. The solid fraction is outputted at 30% dry solids (a spadeable material suitable as a bio-fertiliser) into a collection bay, with the liquid fraction piped into an adjacent wastewater treatment plant.



5.2.5 Waste Water Treatment Plant

Separated liquid wastewater (and storm water as required) will be diverted to a purpose-built waste water treatment plant for processing. The objective of the wastewater treatment plant is to process the wastewater to MAR standard. The liquid will go through a homogenization phase before being diverted into an anoxic reactor. The liquids will then be channelled into one of 2 aerobic reactors.

The liquid will then go through an ultrafiltration phase which produces a UF permeate. The Permeate is processed in a reverse osmosis unit, after which it is put back into the digestion process.

The system also utilises a reverse osmosis unit for the treating of UF permeate from the ultrafiltration units.

Post processing, a proportion of the MAR-compliant wastewater will be recirculated back into the AD process, with the balance exported from site by connection to Salisbury Water's pipe infrastructure for use or complaint disposal by Salisbury Water.

5.2.6 Gas Management and Power Utilities

Biogas generated within the Digesters is collected in the biodome headspace collecting circa 500m³ of biogas per Digester. Biogas from agricultural and food waste organics has the following general characteristics:

- 60-65% CH₄
- 35-40% CO₂
- Typically, a minute amount of H₂S up to 500ppm.

Design of Gas Offtake Lines

Digester biogas offtake lines are fed automatically from the gas levels within the primary Digester Tanks and the Discharge Tank. The pressure within the Digester Tank (and Discharge Tank) are monitored by the PLC but would not exceed circa 8 mbar, similar to the gas pressure of a household stove.

The offtake lines on the Digester Tanks will be monitored by the MCC system to ensure that the gas flow is maintained at correct pressure and humidity content to either activate the Flare or CHP. From the offtake point, biogas is processed as follows:



- The Biogas is directed into a Schlumberger H₂S scrubber, reducing the H₂S down to 0.1 ppm. The scrubber utilises vessels containing Iron oxide which captures the H₂S from the gas, removing any detectable traces
- The offtake lines will direct the gas into a dehumidifier to reduce the liquid content of the gas. The recovered liquid is recirculated back into the digestion system.
- The flow of gas from the primary digester tank to the off-take lines is at a normal operating rate when the gas reaches a pressure of 7 to 8 mbar.

The offtake lines will direct the gas to a gas booster system, where the pressure of the gas will be increased from 8 mbar to 110 mbar to fuel the biogas CHP units, or for activation of the enclosed high-temperature Flare if required.

Biomethane Upgrade

The design incorporates a biomethane upgrade process to convert biogas (65% methane) to mains-grade biomethane (97% methane) equivalent to natural gas.

A gas upgrade system will remove carbon dioxide, hydrogen sulphide, water and other contaminants from the biogas. The purification process removes contaminants from the raw biogas stream - these being absorbed or scrubbed leaving more methane per unit volume of gas.

The biogas will be consumed at a maximum rate up to 2000m³/hr which can convert the gas to approximately 1020m³/hr of biomethane. During regular operation however, with the CHP units in use, the gas unit is expected to consume approximately 1,100m³/hr of biogas and produce 570m³/hr of biomethane. The expected energy potential from the biomethane produced will be approximately 22GJ/hr

The biomethane will be injected into the local gas mains where it will be used by businesses and dwellings in the area connected to the mains.

Design of the Combined Heat & Power Unit (CHP)

As described, the Digesters are under a small positive pressure to allow the biogas to flow out of the Digester to the gas management skid, with the dry biogas then boosted up to the operation pressure – 110mbar/10KPA for consumption within three 1.56MWe Combined Heat and Power (CHP) reciprocating units. At 60-65% CH₄ the generators will each combust a maximum of 600m³/hour of biogas producing 1,560kWe and 1,620kWh

Job No: J116

Design Report

Document No: J116-001

Date: 10/06/18

Rev: A



– 95 °C hot water, giving a maximum electrical efficiency of 43%, and a thermal efficiency of 44% capturing the exhaust gas hot water circuit for full thermal efficiency.

The CHP Unit is designed for biogas, allowing for a high tolerance of H₂S as required.

The CHP unit is operational when biogas is produced by the digesters. The engines are designed to run on biogas at between 50-100% capacity or 780-1,560kW.

The biodome gas bag levels within each Digester are measured to set the load rate of the engines. If the gas bag level is increasing in volume, the engine load signal is increased to match the gas production. Alternatively, the gas bags can be used as storage to meet the grid network peak loads to capitalise on the export of power during peak intervals.

Design of H₂S Removal and Gas Clean Up

H₂S clean up within the biogas is managed by a chemical conversion - adding a micro-dose of air in to the head space of each Digester to give $H_2S + O_2 = SO_4 + H_2O$, which enables the SO₄ – sulphate to drop out into the digestate for removal.

Iron Oxide Scrubber

The Iron oxide scrubber is set upstream of all generation and flaring equipment to reduce the H₂S content of the biogas to a level of 0.1 ppm or lower. The unit is performance guaranteed to scrub all biogas immediately after the digestion phase.

Design of High Temperature Enclosed Flare

Being a biological process continuously breaking down volatile matter, the process generates biogas at all times. If the AD plant's power generation engines are not in operation, two emergency High Temperature Enclosed flares will operate automatically to safely combust the surplus biogas.

The High Temperature Enclosed Flares are designed to burn at 1000 °C at a combined total flow rate up to 4000m³/hour to ensure a safe site can be maintained without any venting to the atmosphere. The Flare is designed to combust the excess biogas produced under a controlled safe system. At 1000 °C the Flare will eliminate any potential airborne pathogens from the biogas ensuring a 100% combusted biogas to carbon release to atmosphere.

The Flare activates automatically when Digester gas pressure reaches a defined level set just below the pressure relief valve set point.



The Flare will be monitored by the AD Supervisor to ensure that the automatic operation of flare ignition is maintained when the CHP unit is not operating.

5.2. SITE OFFICE AND FACILITY RECEPTION

The facility will be designed to show the site office and reception at the front of the site by the entry and exit ways to show an appealing “shop front” whilst shielding the operations and plant from public view.

The office layout will comprise of the following rooms:

- Ground Level
 - o Reception area
 - o Meeting room
 - o Office room
 - o Kitchen/Lunch room
 - o Restrooms – Male, Female and Disabled
- Second Level
 - o Observation/Education area

The Building will be constructed with full disabled access in mind, with ramps, large walkways and an elevator to travel between floors. A separate restroom will also be designed for the use of the disabled.

The office will be designed to Australian and council standards and will have all necessary features to deem it acceptable such as appropriate entries and exits (including emergency exits) and adequate exit signage.

6. BASIS OF DESIGN

6.1. Appearance

The facility will be designed to enhance the appearance of the localities and the wider area around Edinburgh. The design of the buildings will be consistent with buildings in the area and will be the first and foremost part of the site the public will view. The land



immediately adjacent to the roads will be landscaped and maintained in a presentable manner

Multiple driveways will provide access into the facility site from both Woomera Avenue and Gidgie Court. Commercial Vehicles will use separate entrances and exits to allow safe access for the public.

Signage promoting the facility will be placed by the entrances of the site depicting the company logo of "DeLorean Energy" along with the facility name. The signage will be consistent with signage by others in the area and will comply with Council requirements.

6.2. DESIGN LIFE

6.2.1. Operational Design Life

With regular routine maintenance, the Facility has a 25-year design life period.

6.2.2. Structural Design Life

The infrastructure and concrete elements within the facility have been designed for a design life of 50 years. The structure is designed to safely withstand a 1/100-year storm.

6.3. PLANT PERSONNEL AND OPERATION SCHEDULE

The Plant will have personnel comprising of operators and office workers working in both the plant facility and office. The site will comprise of the following personnel:

- 1 x Plant Manager
- 4 x Plant Operators
- 1 x Receptionist
- 2 x Office staff.

The plant has a proposed front-end processing operational schedule of 5 days a week, 7AM – 5PM, with all personnel working to these time requirements. The anaerobic and generation process is will be running 24 hours a day, 7 days a week.

6.4. DESIGN REDUNDANCY

The steel structures will offer design redundancy by providing multiple load paths, either



through bracing systems or utilising the steel-concrete interface. Utilising an integrated footing system in the shed means there is a larger distribution stress, which manifests as further design redundancy.

The facility process design offers redundancy to ensure the total volume of waste, facility design – 125,000TPA can be processed within the operational time for standard operations.

6.5. SITE LAYOUT

The facility will have multiple entry points for both public and commercial use. There will be multiple driveways into the facility from both Woomera Avenue and Gidgie Court for convenience and ease. Commercial Vehicles will use separate entrances and exits to the public to allow safe access for employees and the public alike.

The car park will span along Woomera Avenue and Gidgie Court, with space available for parking consistent with Council requirements and more than enough to service both employees and the public. The delineation of the parking and traffic direction will be applied to current Australian standards and will comply with council requirements.

6.5.1. Public and Pedestrian Access

From the car park, there is a designated path to a site office and welfare facilities. There is also a potential to install a viewing room to the reception Hall for educational purposes. Visitors will be able to see the operations with appropriate supervision in designated viewing areas on site. For safety and to prevent interference with the process, the viewing areas will be demarcated with guard railing, compliant to AS 1657. An elevated viewing platform will be included, also equipped with the appropriate safety apparatus to observe the facility operations.

6.5.2. Road Layout

Access roads will be sealed bitumen road with crushed rock base course and select fill sub-base. The road layout has been designed to allow for minimum interference between incoming and outgoing vehicles. The area in front of the shed provides adequate room to manoeuvre a truck or heavy vehicle. The car park is situated away from the loading point to eliminate the interface between visitors and loading vehicles. The waste will be delivered inside the Reception Hall directly into bunkers which can be used as an area for stockpiling two days of waste.



6.5.3. Traffic Management

Traffic is split into two categories:

- Light Vehicles (e.g. personnel and visitors)
- Heavy Vehicles (e.g. dump trucks, tankers, road trains).

Light Vehicles will enter the site through either of the two entrance ways provided on Woomera Avenue with parking located running along Woomera Avenue. Vehicles can then choose to exit from either of the same entrances on Woomera Avenue or, in the unlikely event of obstructions, the Heavy Vehicle entrance on Gidgie Court.

Heavy Vehicles will enter the site on the entrance way provided on Gidgie Court. Trucks will stop on the weighbridge before entering the industrial area of the site. From here, trucks will have ample room to manoeuvre and position themselves to offload material.

Once material has been offloaded, Vehicles will proceed to a second weighbridge prior to the exit on Gidgie Court. Once weighed in, the truck will exit onto Gidgie Court. The layout of the site has been designed to avoid collisions through the reduction of intersecting paths and separate entry and exit ways.

As many as 50 Trucks are expected to visit the facility every day once the site is in full operation, resulting in approximately 5 trucks every hour. The Facility has been designed to cope with the influx of vehicles with the following measures:

- 4 x commercial and industrial solid food waste receival bays
- 3 x digestate trailer bays
- 1 x Liquid feedstock receival bay
- 1 x Agricultural waste intake bay

This assures that the plant can accept up to 9 trucks at any one time.

As stated in section 5.1.1, The Reception Hall will have traffic lights installed to indicate which bays are free and which are in use.

Heavy Vehicle parking is also supplied on the Gidgie Court side of the site to allow large vehicles to stop on site without impeding other vehicles in the event the weighbridge is engaged. A bus waiting bay is also included, opening the opportunity for educational tours for large groups such as schools and universities.



All vehicles will be able to travel in a forward motion when entering, exiting and navigating around the site. Refer to the attached Traffic Management Plan for more information.

Refer to Traffic Management Plan for more information

6.5.4. Signage

Adequate signage will be provided as per the requirements in the relevant Acts and Standards. Areas will be clearly marked with the appropriate signage for visitors and operators alike.

6.5.5. Tank Bunding

The plant is required to have capture capacity of 120% of the largest tank at all times resulting in a required 4,200m³ of capture volume. Bunding will be installed around the perimeter of the tank area which will be designed to capture any liquids and divert them to drainage points scattered around the site.

The bunded area will be completely sealed, allowing no liquids captured within the area to leach into the ground or surrounding environment. Refer to *Appendix 2: Lot 505 Preliminary Design Drawings for an illustration of the site with the bunded area.*

6.5.6. Drainage

The stormwater from the shed roof and surrounding site area will be diverted into sump areas on site. Stormwater will either be diverted into the on-site waste water treatment plant for further processing or exported to Salisbury Water for compliant usage or disposal within its network depending on the site requirements at the time and the water quality.

6.6. BUILDINGS AND TECHNICAL

The buildings and structures will be designed to adhere to Australian building standards and council standards. Structural layouts, with details of connection methods will be issued once the design has been finalised.

The building specification for the materials and workmanship will comply with the Salisbury Council Development Plan and Australian standards. A full schedule of materials, finishes, plant and equipment details will be provided to the council upon design finalisation.



Essential fire safety provisions will be adhered to in the final design.

Refer to Appendix 3 - Material and Colour Schedules for more information on building/structural materials.

6.7. EARTHWORK AND GROUND CONDITIONS

It is assumed that ground conditions at the site will be capable of sustaining a bearing pressure of 200kPa and CBR of 7% by utilising standard static compaction methods (i.e. without ground improvement). The site has also been assumed as being able to be excavated utilising traditional earthmoving equipment without drilling or blasting.

Two copies of calculations based on the footing report with an accredited engineers' recommendations and supporting structural computations will be supplied to comply with the development act and regulations once the design has been finalised.

6.7.1. Foundations

With the requirements set out above, the foundations for equipment, tanks and shed are one of the following:

- Pad/strip footings
- Raft footing
- Ground slab with integrated thickenings

No allowance for concrete or screw piles have been made as it is assumed that the ground conditions can be met.

6.7.1. Landscaping

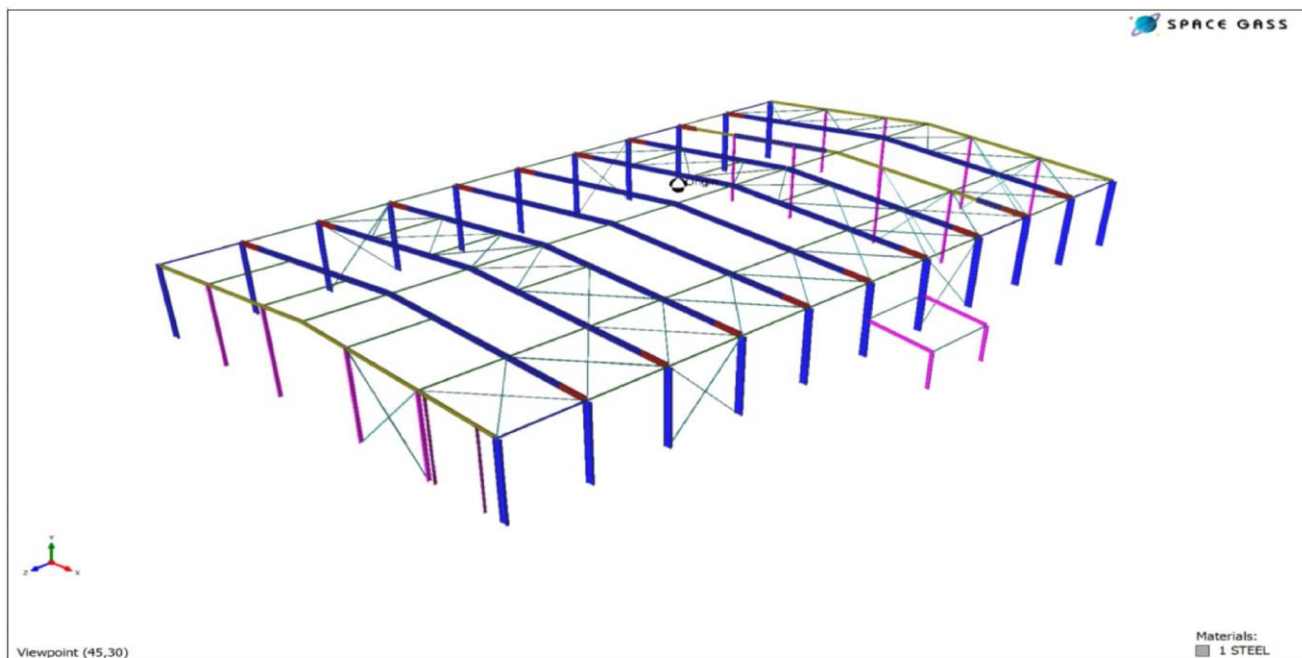
The Site will be landscaped to match the aesthetic of the surrounding land and businesses in the area. The front of the business will be landscaped to promote an appealing image from public view whilst adhering to council requirements.

6.8. ORGANICS RECEPTION HALL

The organics Reception Hall makes up majority of the structural work. The shed is a steel portal frame building with Colorbond cladding and insulation. The concept designed focused on providing ample space to carry out the required process whilst also satisfying the following codes and Australian standards:

- Building Code of Australia
- AS/NZS 1170 – Structural Design Actions
- AS 4100:1998 – Steel Structures
- AS/NZS 4859.1:2002 – Materials for the thermal insulation of buildings
- AS/NZS 3500.3:2015 – Plumbing and Drainage

The dimensions of the shed are circa 70 x 52m. With 3m high bunkers in the inside of the building, there is more than 800 m³ storage capacity (equivalent to two days of waste). The bunker walls are equipped with cast in steel to prevent damage from the loader





6.8.1. Concrete Slab

The concrete slab is reinforced with steel fibres to increase the spacing of joints and streamline the construction process by eliminating the need to tie traditional reinforcement (rebar or mesh).

6.9. BOUNDARIES AND FENCING

Internal fencing around the perimeter of the site will be constructed and made to match internal fencing of other businesses in the area whilst adhering to council requirements. The fencing will be made from suitable materials able to withstand environmental factors

6.10. FIRE PROTECTION

An adequate quantity of hydrants, booster pumps and street fire plugs (if deemed necessary) will be included in the final design. Locations and quantities will adhere to council and Australian Standards.

6.11. COMMUNICATIONS

Site communications for remote access and package plant access will be either hard wired from the existing telecommunications on site to meet the network requirements.

7. SAFETY IN DESIGN

Safety in design will be completed in accordance with the relevant acts and standards. A risk register will be maintained to mitigate and control any risks identified before and throughout the design and construction phases.



Appendix 1: Mass Balance

High Level Mass Balance

Project Name	Delorean Energy	Document No:	P210-P100
Project Number	J116	Revision:	A
Project Section	Feedstock Analysis As Tested	Date:	10/06/2018
		Compiled By:	J Oliver
		Checked By:	
		Approved By:	H Jolly



Design Basis

	Units	Grain Waste	C&I Organic Waste		ReCirc - Process Water
Annual Throughput	TPA	25,000	100,000		120,000
Weekly Throughput	TPW	480.77	1923.08		2,308
Daily Throughput	TPD	68	274		329
DM%	%	89%	28%		0.5%
VM%	%	93%	89%		90.0%
Density	Kg/m3	200	720		1000.0
Biogas Yield	m3/ tonne	420	150		0.5
Methane Content	%	60%	60%		60%
Volitile solids	vskg/T	828	179		4.50
Biogas Production /yr	m3 / year	10500000.00	15000000.00		60000.00
Biogas Production /hr	m3 / hour	1198.63	1712.33		6.85

Daily Load

Water input		273.97
Water recycled		328.77
Total water input		602.74
M3 Volume input / day	M3/day	671.23
Tonnes of feedstock	tds/day	342.47
Tonnes per hour - 8hours	tds/day	42.81

Blended Feed Characteristics

Dry Solids	20.8%
Contaminant	0% Assumed
Water	79%

Operation

Days Digestion 365 Days/yr

Phase 1

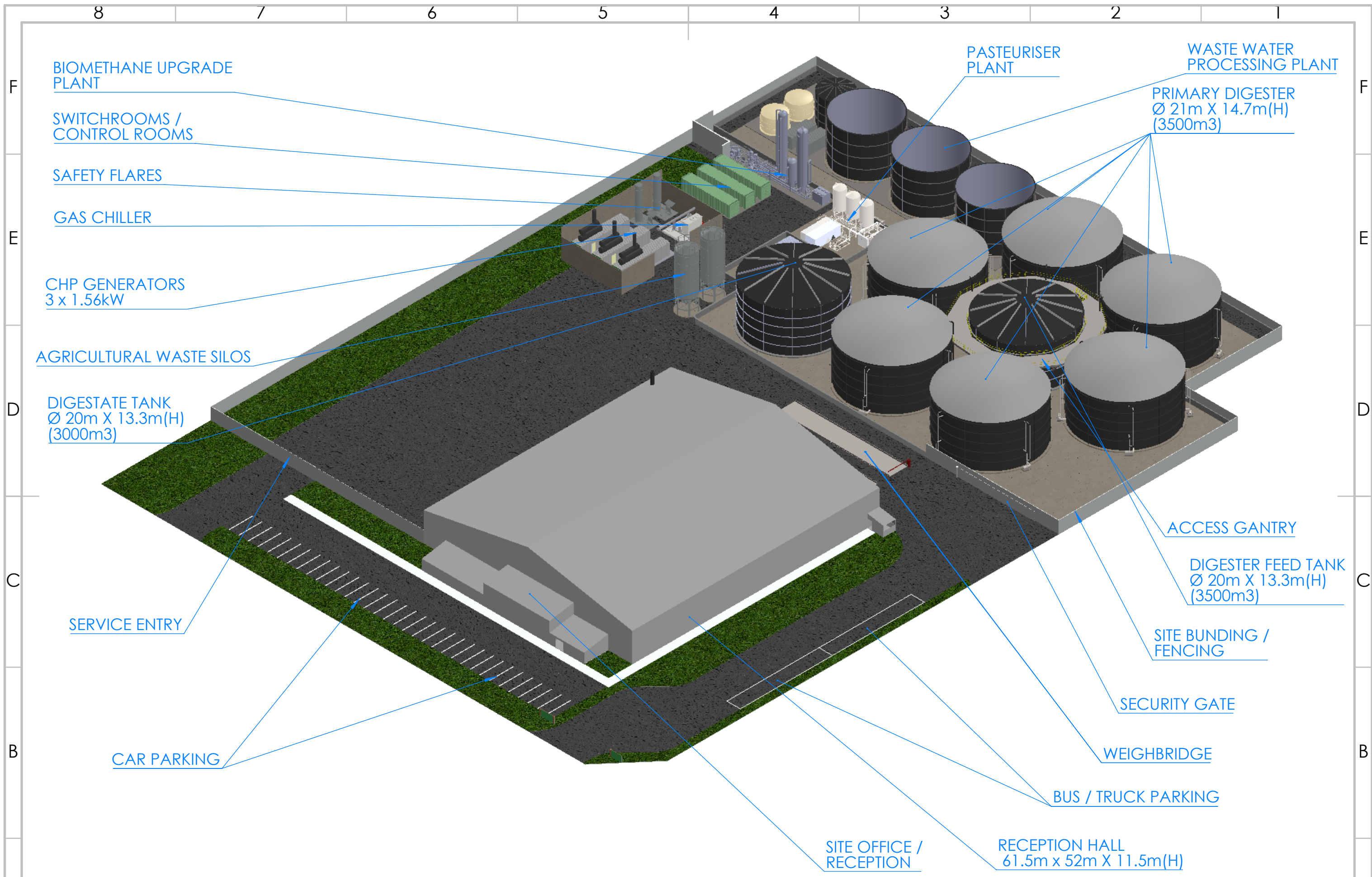
Total Annual Throughput	245,000
KGVS/M3 / day	5.37
Total Digestion volume	20,000
Digestion Retention	30
Total Digestion Capacity at 30 Days Retention	243,333
Digestion Spare Capacity at 30 Days Retention	-1%

Total Output @	7%	208,250
Solids seperated to	35% Tonnes / year	41,650
	Tonnes / day	114
Liquid fraction < 1% solids	m3 / year	166,600
	m3 / day	456
Liquid Recirculated	m3 / day	329
Liquid Output	m3 / day	128

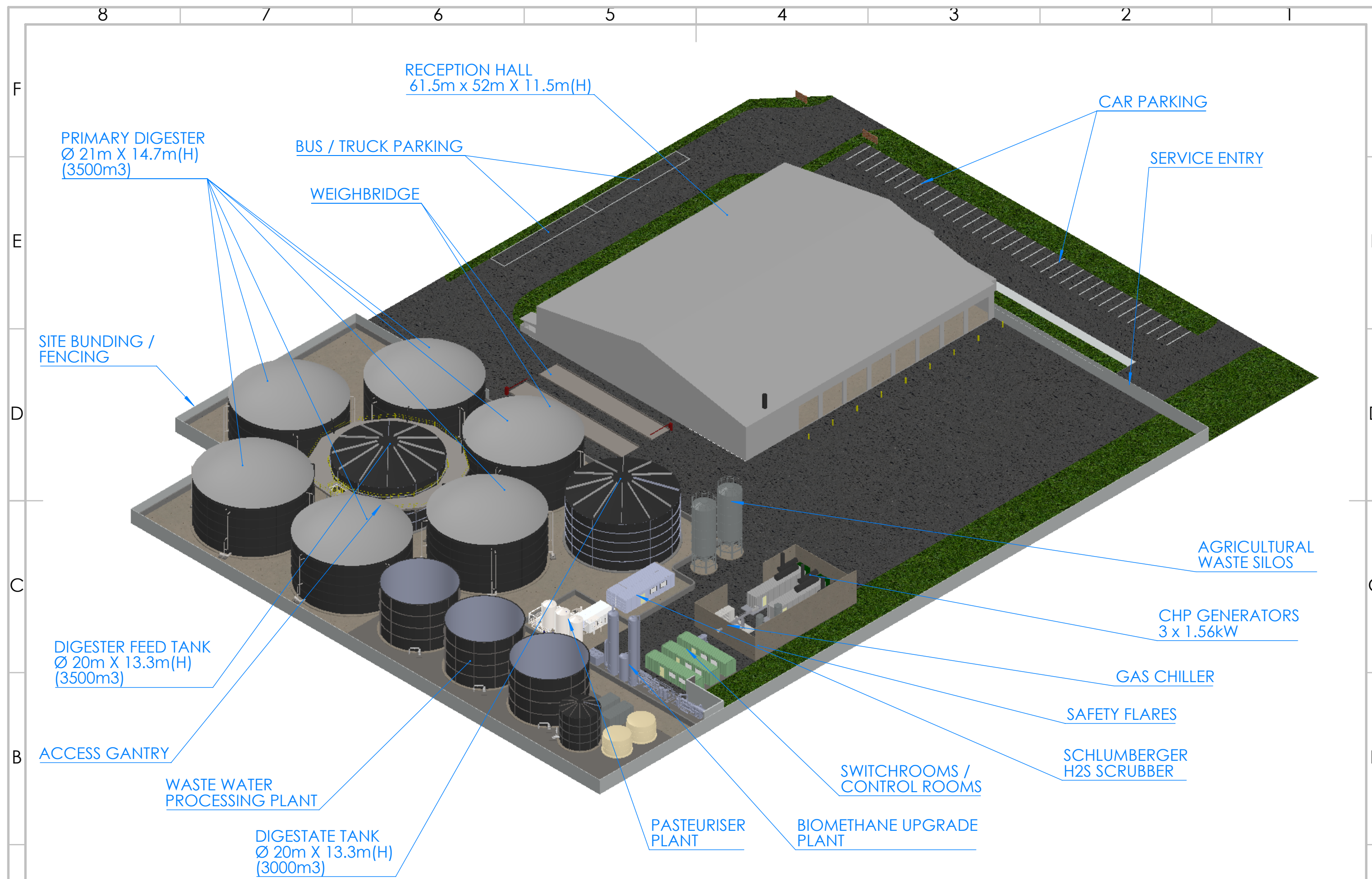
		m3 / hour	m3 / Day	m3 / Year
Total Biogas / Hour		2910.96	69863.01	25500000.00
Feedstock ave gas production / M3		104.08		
		KW / Hour	MW / Day	MW / Year
Biogas to Heat	KW thermal/hr	15282.53	366.78	133875.00
or			MW / Day	MW / Year
Biogas to CHP	KW thermal/hr	7859.59	188.63	68850.00
	KW Elec/hr	7568.49	181.64	66300.00
		Kg/Hour	Tonne / day	Tonne / Year
	CO2 output	2672.26	64.13	23409.00
or		m3 / hour	m3 / Day	m3 / Year
Biogas to biomethane	m3/hr-97%CH4	1484.59	35630.14	13005000.00
		GJ/day	GJ/day	GJ/Year
Total GJ produced	GJ/Hour	56.80	1363.21	497570.49



Appendix 2: Lot 505 Preliminary Design Drawings



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1	SECOND REVISION	14/09/2018	MARTYN A.	JOSEPH O.				ALL DIMENSIONS IN mm	SCALE 1:600	DWG NO. J116-002	SHEET NO. 1 OF 15	REV 1
0	ISSUED FOR REVIEW	22/05/2018	MARTYN A.	JOSEPH O.								
REVISION	REVISION DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED							



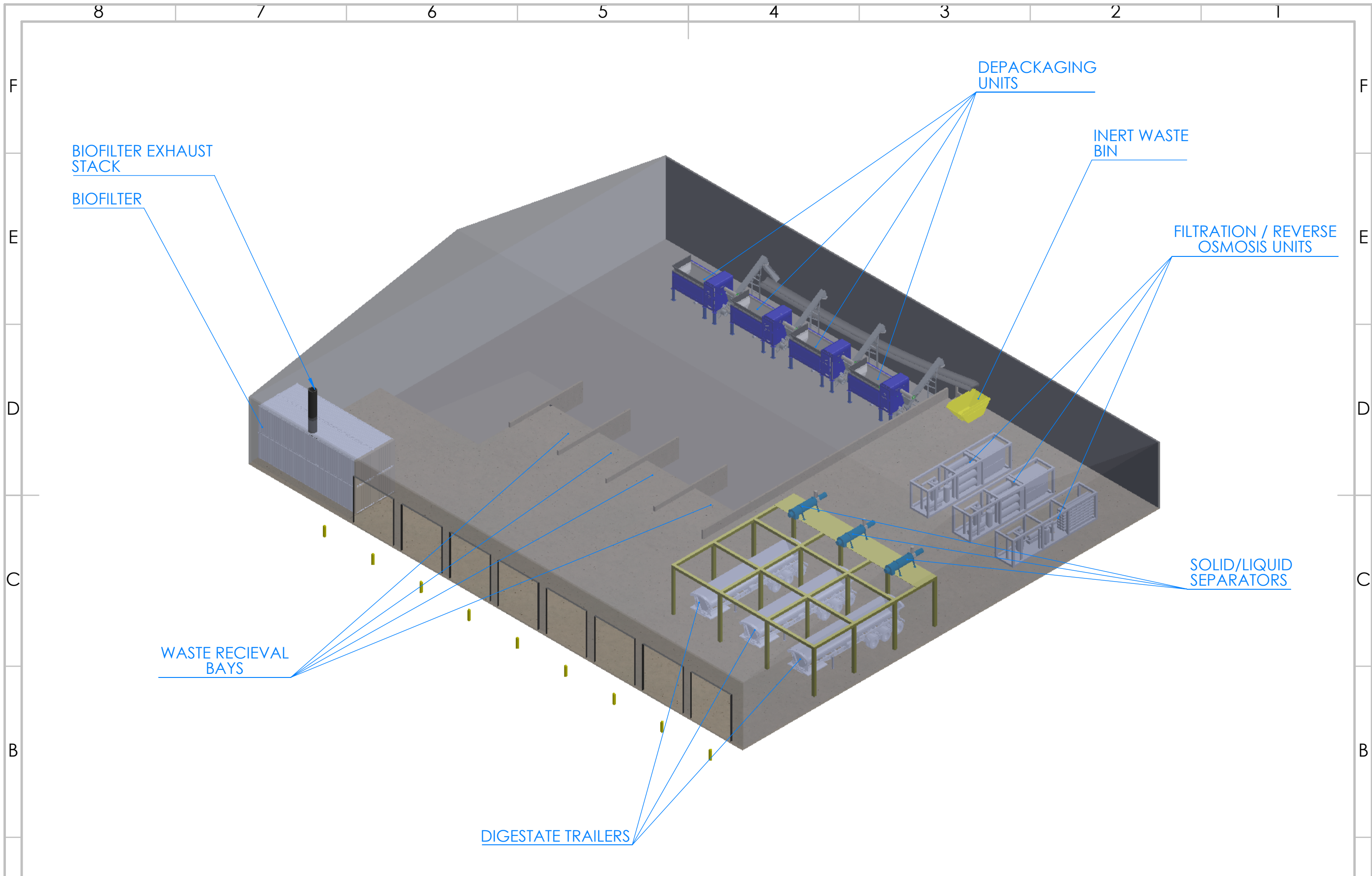
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0	ISSUED FOR REVIEW	22/05/2018	MARTYN A.	JOSEPH O.	

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PROJECT NO: J116	PLANT CONCEPT LAYOUT
ALL DIMENSIONS IN mm	SCALE 1:600
DWG NO. J116-002	SHEET NO. 2 OF 15
	REV 1



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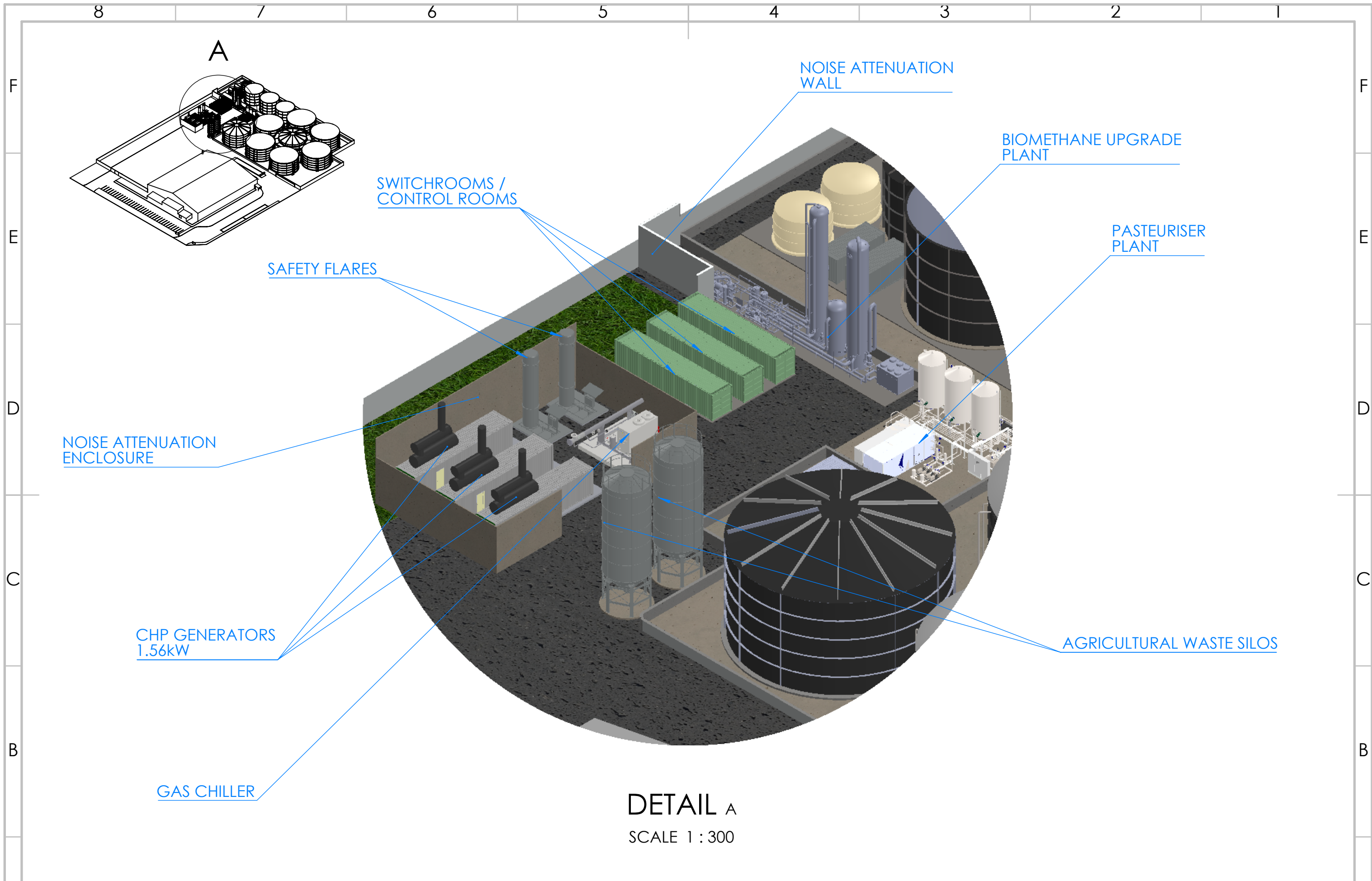
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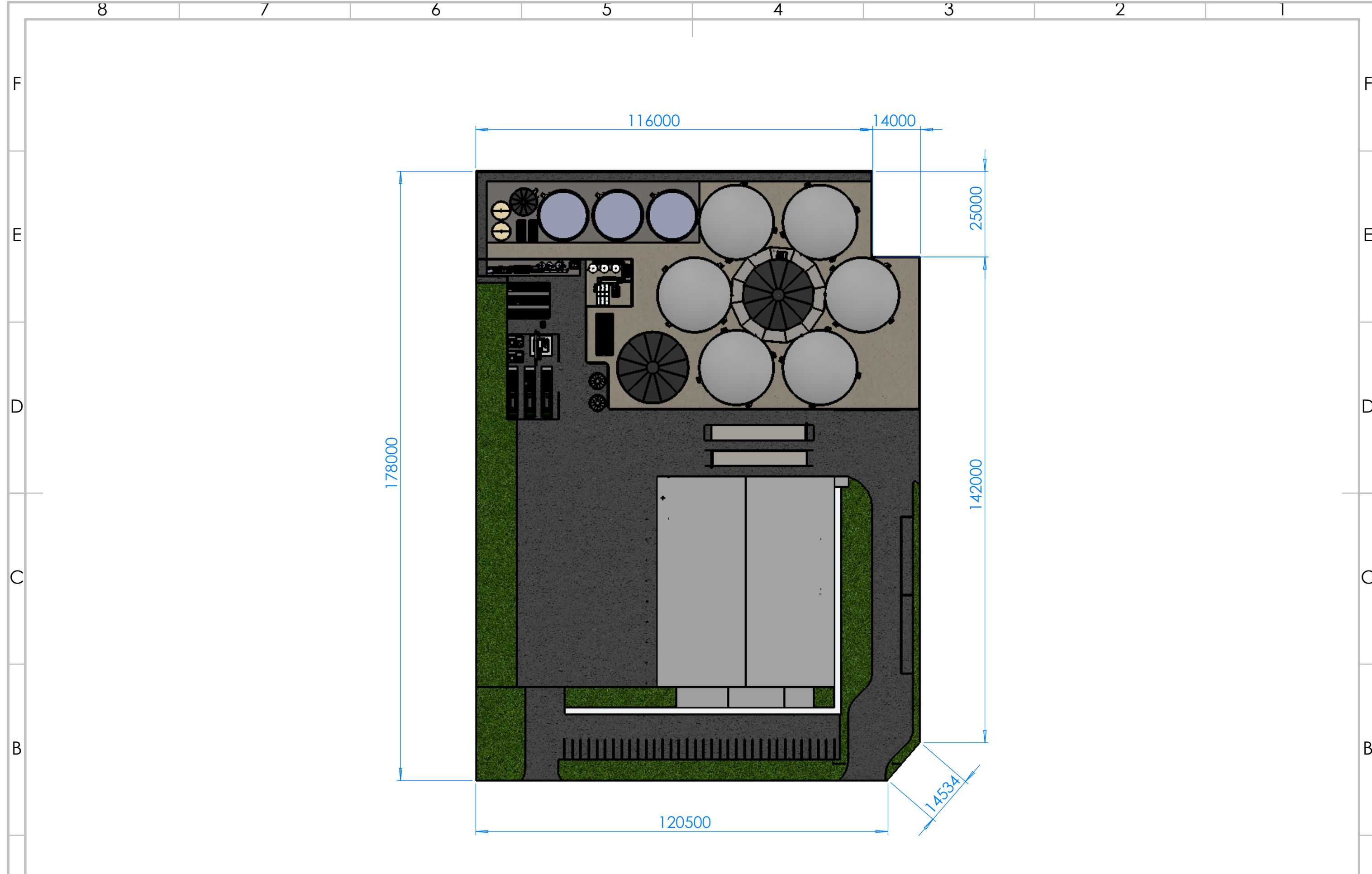
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 PROJECT NO: J116

TITLE: DELOREAN ENERGY SA ONE
 RECIEVAL HALL DETAIL

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0	ISSUED FOR REVIEW	22/05/2018	MARTYN A.	JOSEPH O.								
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0	ISSUED FOR REVIEW	22/05/2018	MARTYN A.	JOSEPH O.	

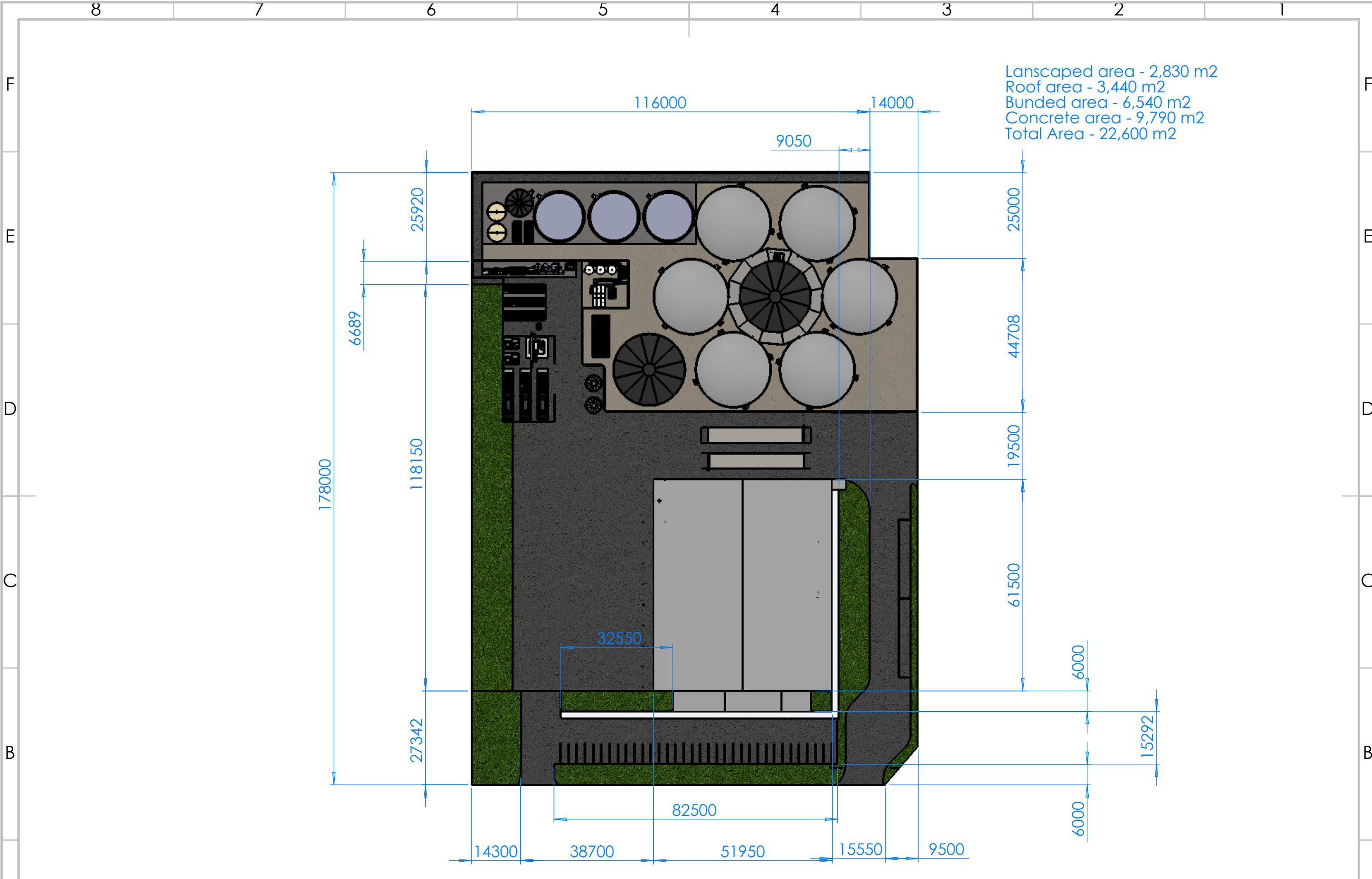
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CLIENT: DELOREAN GROUP
 PROJECT NO: J116
 ALL DIMENSIONS IN mm

TITLE: DELOREAN ENERGY SA ONE
 SITE DIMENSIONS
 SCALE 1:1000
 DWG NO. J116-002 SHEET NO. 5 OF 15
 REV 1



Lanscaped area - 2,830 m2
 Roof area - 3,440 m2
 Bunded area - 6,540 m2
 Concrete area - 9,790 m2
 Total Area - 22,600 m2

REVISION	REVISION DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED
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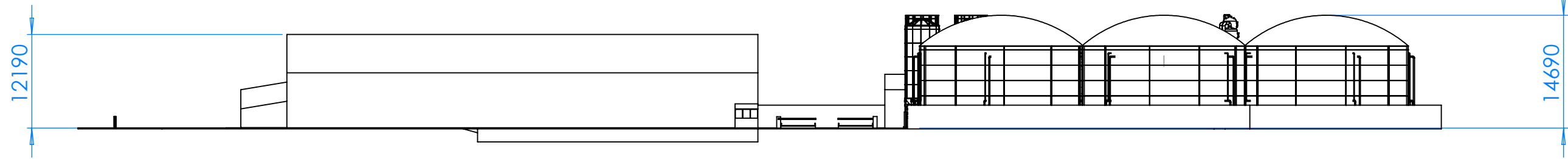
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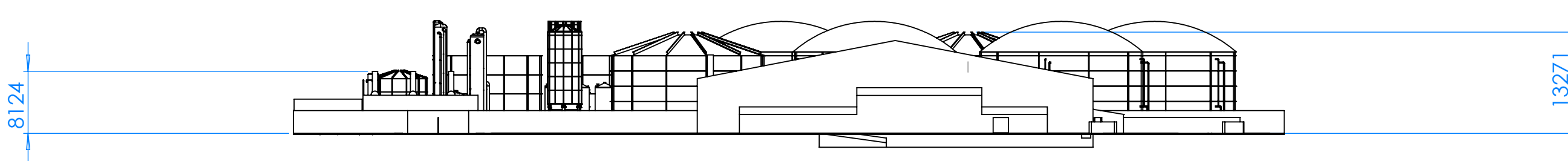
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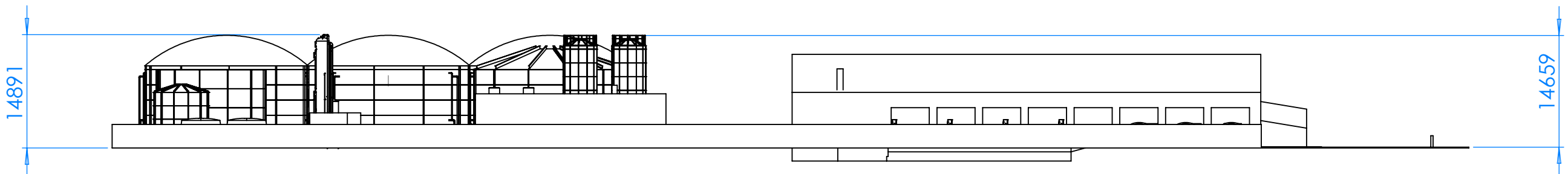
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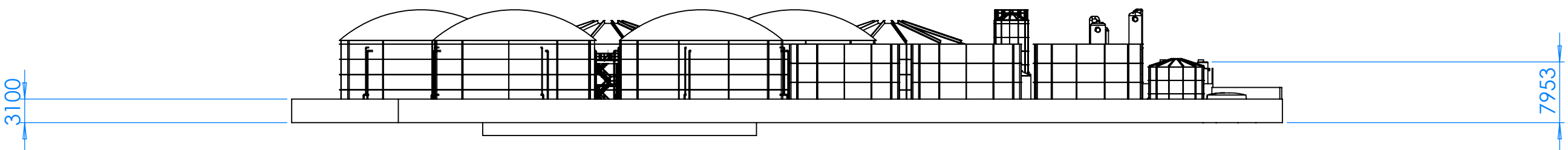
WEST VIEW



NORTH VIEW



EAST VIEW



SOUTH VIEW

REVISION	REVISION DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED
1	SECOND REVISION	14/09/2018	MARTYN A.	JOSEPH O.	
0	ISSUED FOR REVIEW	22/05/2018	MARTYN A.	JOSEPH O.	

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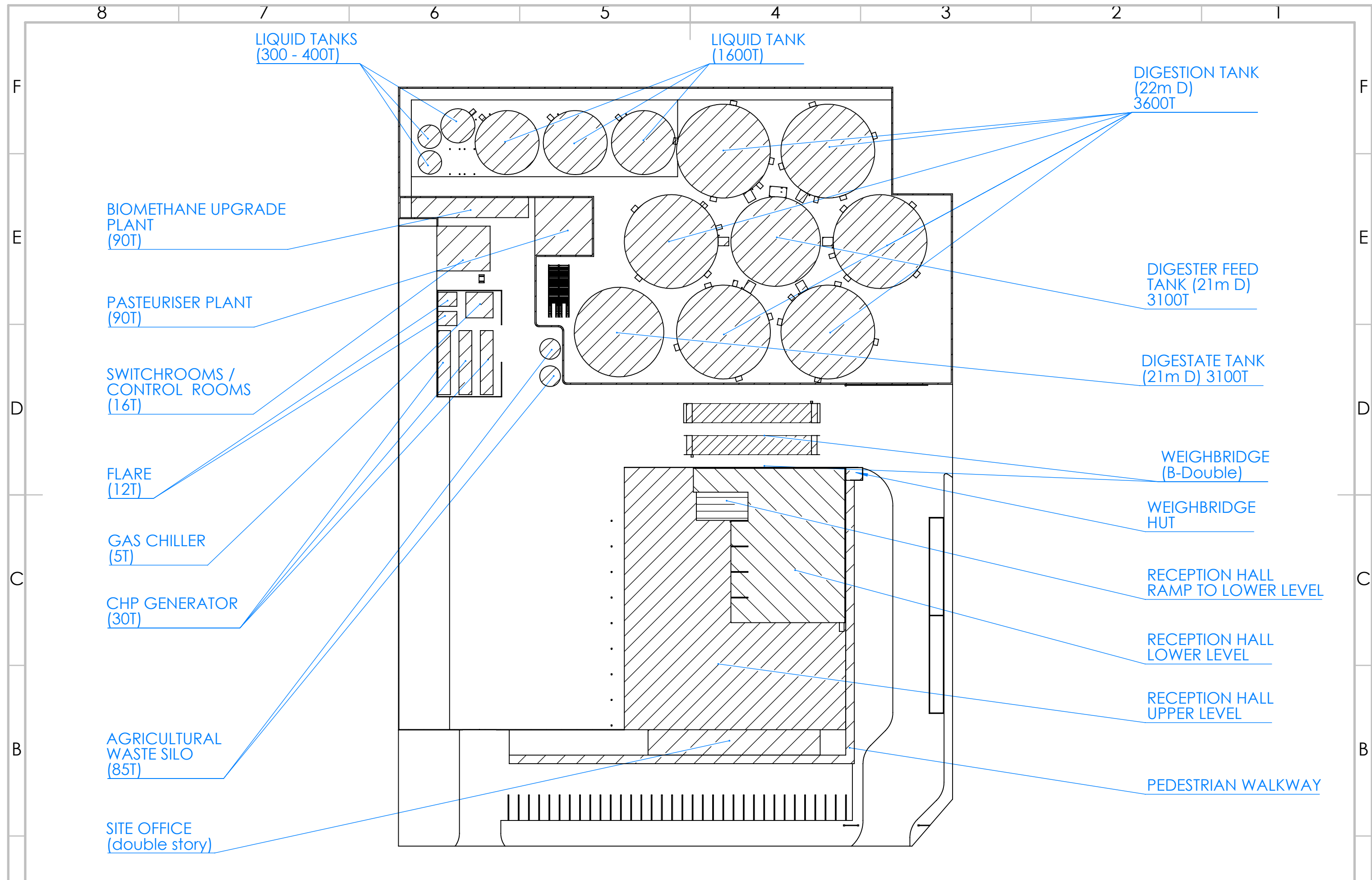
CLIENT: DELOREAN GROUP
 PROJECT NO: J116

TITLE: DELOREAN ENERGY SA ONE
 SITE ELEVATIONS

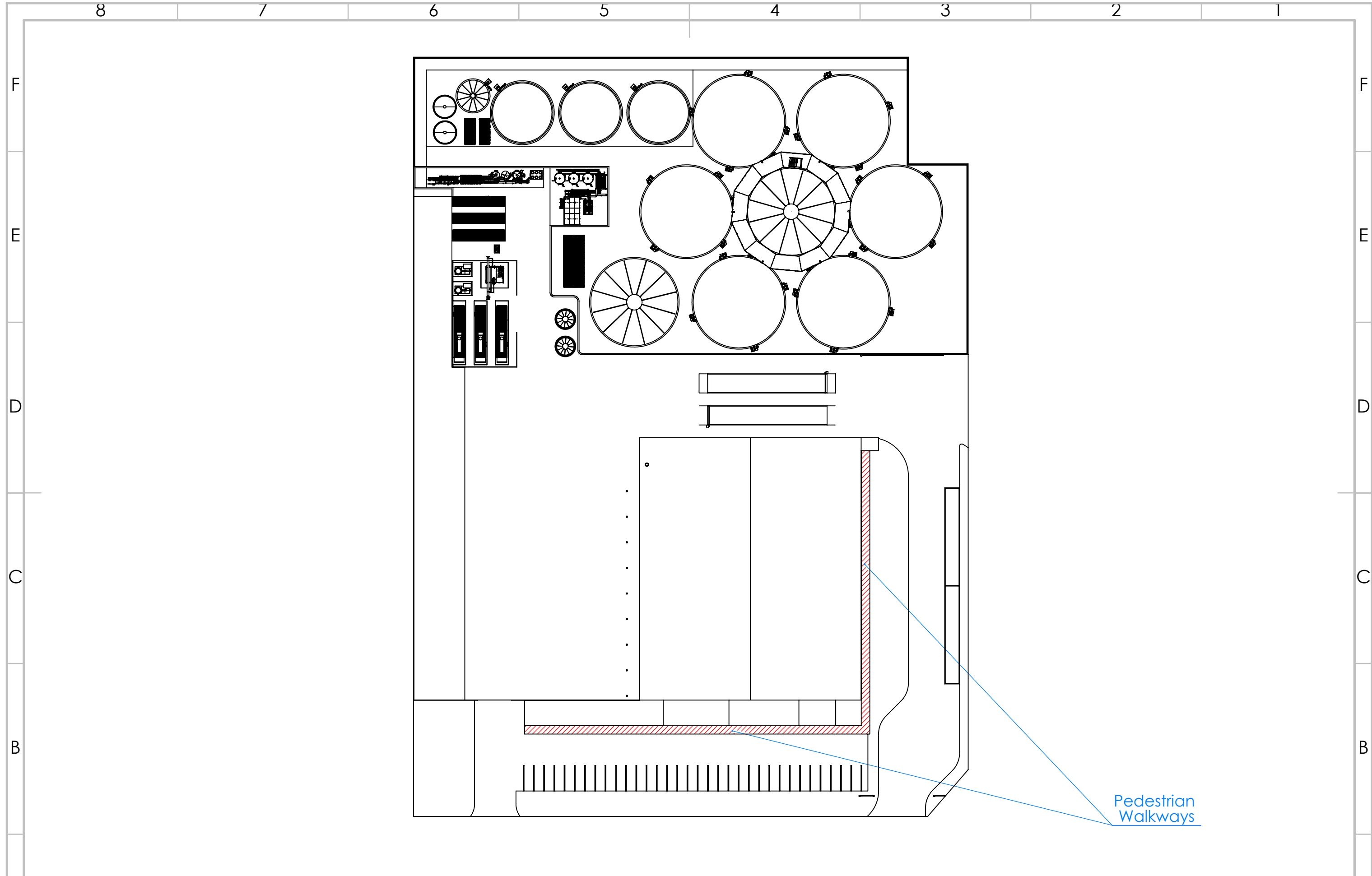
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1	SECOND REVISION	14/09/2018	MARTYN A.	JOSEPH O.		ALL DIMENSIONS IN mm	SCALE 1:800	DWG NO. J116-002	SHEET NO. 9 OF 15	REV 1	
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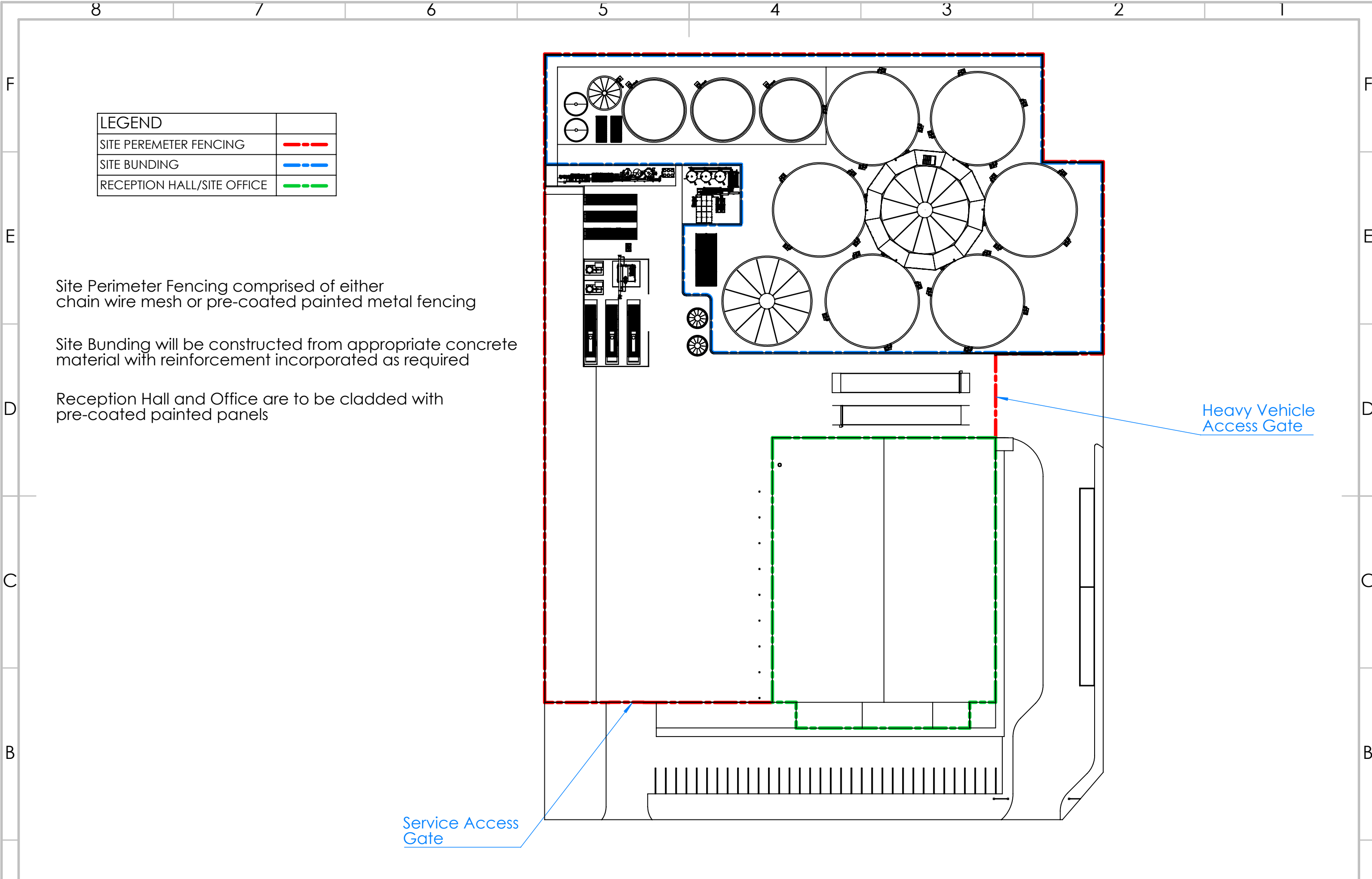
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 PROJECT NO: J116
 ALL DIMENSIONS IN mm

TITLE: DELOREAN ENERGY SA ONE
 SITE ACCESS DIAGRAM
 SCALE 1:800
 DWG NO. J116-002 SHEET NO. 11 OF 15
 REV 1



LEGEND	
SITE PEREMETER FENCING	
SITE BUNDING	
RECEPTION HALL/SITE OFFICE	

Site Perimeter Fencing comprised of either chain wire mesh or pre-coated painted metal fencing

Site Bunding will be constructed from appropriate concrete material with reinforcement incorporated as required

Reception Hall and Office are to be cladded with pre-coated painted panels

Heavy Vehicle Access Gate

Service Access Gate

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CLIENT: DELOREAN GROUP
 PROJECT NO: J116

TITLE: DELOREAN ENERGY SA ONE
 CIRCULATION AND FENCING

ALL DIMENSIONS IN mm SCALE 1:800 DWG NO. J116-002 SHEET NO. 12 OF 15 REV 1



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CLIENT: DELOREAN GROUP
 PROJECT NO: J116
 ALL DIMENSIONS IN mm

TITLE: DELOREAN ENERGY SA ONE
 SITE OVERVIEW LAYOUT
 SCALE 1:2000
 DWG NO. J116-002 SHEET NO. 13 OF 15 REV 1



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								PROJECT NO: J116		SITE OVERVIEW LAYOUT	
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CLIENT: DELOREAN GROUP
 PROJECT NO: J116
 ALL DIMENSIONS IN mm

TITLE: DELOREAN ENERGY SA ONE
 SITE ALLOTMENT BOUNDARY
 DWG NO. J116-002 SHEET NO. 15 OF 15 REV 1



Appendix 3: Material and Colour Schedules



Site Material Schedule

Structure	Exterior Material	Coating (Indicative)
Site Office	Brickwork with exterior cladding	Painted - White
Reception Hall	Colourbond Steel	Painted - White
Digester Feed Tank	Glass fused steel/Stainless Steel	Painted - Cobalt Blue
Digester Tank - Walls	Glass fused steel/Stainless Steel	Painted - Cobalt Blue
Digester Tank - Roof	PVC coated polyester fabric	Painted - White
Digester Digestate Tank	Glass fused steel/Stainless Steel	Painted - Cobalt Blue
Waste Water Treatment Tanks	Glass fused steel/Stainless Steel	Painted - Cobalt Blue
CHP Co-generator	Steel	Painted – Beige
Emergency Flare	Galvanised Steel	Galvanised
Grain Silos	Steel	Painted - TBD
Control Rooms	Steel	Painted - Beige
Site Fencing	Colourbond Steel	Painted - White
Site bunding	Concrete	Concrete

Material Schedule

Environmental Report

DeLorean Energy Pty Ltd

Waste-to-Energy Anaerobic Digestion Plant – Edinburgh,
South Australia

11 June 2018

ABSTRACT

This is an EPA works approval application by Delorean Energy Pty Ltd for the design, construct, commissioning and operation of a 125,000 TPA Anaerobic Digestion plant in Edinburgh, South Australia.

Contents

1.	Executive Summary	4
2.	Primary Information.....	4
2.1	Company and Contact Information	4
2.2	Company Legal Entities.....	4
2.3	Cost of works and application fee.....	5
3.	Land Use.....	5
3.1	Planning and Other Approvals.....	5
3.2	Site Location	5
4.	Track Record.....	6
4.1	Recent Track Record of Other Operations	6
5.	Stakeholder and Community Engagement	8
6.	Project Proposal.....	8
6.1	Project Overview.....	8
6.2	Construction Scope of Work	10
6.3	Process and Technology	11
6.3.1	Process Summary	11
6.3.2	Process Flow	11
6.3.3	Process Inputs, Outputs and Controls	12
6.3.4	Process Flow Details	13
6.4	Environmental Best Practice.....	17
7.	Integrated Environmental Assessment	19
7.1	Net Environmental Benefit.....	20
7.1.1	GHG Emissions Assessment.....	20
7.1.2	Best Practice Energy and GHG Management.....	21
7.2	Risk Assessment	21
8.	Water Resource Use.....	22
9.	Air Emissions	22
9.1	Air Emissions Assessment Overview	22
10.	Noise Emissions	24
10.1	Noise Impact Assessment Overview	24
11.	Water Management	25
11.1	Water Management and Run-off Discharges	25
12.	Waste Handling.....	27
12.1	Waste Handling and Treatment Premises.....	27
12.2	Hazardous Industrial Waste.....	27
12.3	Waste Feedstock.....	27
12.4	Waste Receival	28
12.5	Waste Disposal.....	29

13. Fire Risk	29
14. Other Site Precautions	31
14.1 Maintenance and Shutdown	31
14.2 Traffic Management.....	31
14.3 Pest and Vermin Management	32
14.4 Litter Management.....	32
14.5 Storage of Fuels, Chemical and Oils	33
15. Seeking other EPA approvals	33
15.1 Commissioning Plan	33
15.2 New License or License Amendment Subsequent to Works Approvals	33
16. List of Appendices.....	33

1. Executive Summary

This EPA works approval application relates to the proposed establishment of a waste-to-energy facility located in Edinburgh, South Australia receiving 125,000 TPA of organic waste and generating up to 8MW.

The proposed facility utilises proven Anaerobic Digestion (AD) technology designed and built Biogass Renewables Pty Ltd and currently in operation at their Richgro facility in Jandakot, Western Australia.

Under the works approval and license, the AD facility will receive a targeted 125,000TPA of Commercial & Industrial (C&I) waste and Agricultural Waste Feedstock. The facility will receive feedstock in the form of solids, semi-solids and liquids. Expected feedstocks include but are not limited to; fruits, vegetables, grain, dairy processing by-products, dissolved air filtration (DAF); fats, oils and grease and food processing wash waters.

Anticipated energy outputs will be 4.7MW of electrical energy, 21.7GJ/hr of biomethane and 4.9MW of thermal heat. Output digestate is separated into liquid and solid fractions to be reused, disposed or sold as compost.

This waste-to-energy project serves to create social, environmental and commercial benefit for governments, communities, businesses and other stakeholders. It is consistent with resource recovery initiatives as indicated by the waste hierarchy.

2. Primary Information

2.1 Company and Contact Information

Applicant business information

Business Name: DeLorean Energy Pty Ltd
Registered Address: Level 1, Ord St West Perth WA 6005

Contact person for enquiries relating to this application

Contact Person: Jonathan Luu
Company: Biogass Renewables Pty Ltd
Phone: +61 (0)410 227 362
Email: jonathan.luu@biogass.com.au

2.2 Company Legal Entities

The proposed AD facility is to be designed and built by the *Construction Entity*, developed by the *Developer Entity* and owned and operated by the *Project Owner Entity*. The company legal entities and relevant details are listed.

Entity	Company Name	Company Details	Key Responsibilities
--------	--------------	-----------------	----------------------

Construction Entity	Biogas Renewables Pty Ltd	ABN: 36 115 358 944 ACN: 115 358 944 Registered Address: Ground Floor, 1205 Hay St, West Perth, WA 6005	Engineering, Procurement and Construction (EPC).
Project Developer Entity	Food Energy Pty Ltd	ABN: 36 115 358 944 ACN: 115 358 944 Registered Address: Level 1, Ord St West Perth WA 6005	End-to-end accountability of project delivery and operation.
Project Owner Entity	DeLorean Energy Pty Ltd	ABN: 31 624 148 661 ACN: 624 148 661 Registered Address: Level 1, Ord St West Perth WA 6005	Delegated owner and operator of the project. Manages EPC and O&M contractors.

2.3 Cost of works and application fee

Cost of works: Estimated \$33M
Application fee: Refer to Development Application

3. Land Use

3.1 Planning and Other Approvals

Type of approval required	Approving authority	Status
Development Application	City of Salisbury	Submitted
Electrical Connection Application	South Australia Power Network (SAPN)	In Progress
Gas Grid Connection	Australian Gas Infrastructure Group (AGIG)	In Progress
Contractor Building License	Government of South Australia	In Progress

Table 1 – Current status of relevant planning and approval applications

3.2 Site Location

A site layout, location map and sensitive receptor map is attached as Appendices 1, 2 and 3 respectively. Details of the proposed site location is as follows:

Premise address: Lot 505, 1-2 Gidgie Court, Edinburgh SA 5111
Dimensions: Circa 130m x 190m
Size: Circa 2.27 ha
Municipality: Edinburgh, City of Salisbury

Zoning:	Industrial zone
Description:	The site is currently un-utilised vacant land. Surrounding roads are Woomera Avenue (main road) and Gidgie Court (side road). The closest neighbouring residents are commercial and industrial businesses including Coats Hire, Northern Adelaide Waste Management Authority, Mayfield Industries and Ahrns Handling Equipment.
Rationale:	The premise has been selected as the site for the proposed development due to its proximity to feedstock suppliers and the value that its current use represents from a financial, environmental and social perspective.
Site layout:	The site has been designed to provide adequate distance away from all nearby residences reducing disturbance from plant noise, odour and supporting logistics movements. Furthermore, design aims to minimise disturbance to remnant vegetation and the potential risk posed to operational irrigation channels.

4. Track Record

4.1 Recent Track Record of Other Operations


Biogass Renewables Pty Ltd (Biogass), has undertaken over 30 plant design and feasibility analyses for Australian bioenergy plants and has delivered and commissioned the successful bioenergy project in Western Australia (see below). Its key personnel have designed, and project managed over 10 plants in the UK.

Biogass has successfully commissioned a 35,000-50,000 tonne per annum food waste capable of 2.4MW (e) 2.6MW(th) capacity bioenergy plant for Richgro at its principle metropolitan composting and manufacturing operations south of Perth in Western Australia. The facility has been in operation since 2015 and has maintained an excellent environmental and social record throughout this time.

Biogass has handled the concept, scoping, feasibility analysis, grant application, finance and investment coordination, approvals, design, procurement, construction, commissioning, offtake agreements, and ongoing operations of the Jandakot Bioenergy Project at Richgro Garden Products in Western Australia.

The company currently has no notable relevant offences or enforcement actions to date.

JANDAKOT BIOENERGY PLANT		
Location	Jandakot, Perth, WA	
Start date	November 2013	

Completion date	January 2015	
Client	Richgro Garden Products	
Value	Phase 1 \$8 million, Phase 2 additional \$1.5 million	
Scope of works	<ul style="list-style-type: none"> • Biogas Renewables undertook the development, design, financing, construction, commissioning and operation of the Jandakot Bioenergy Plant – Processing Australian commercial and industrial organic waste/resource streams to power generation. Biogas Renewables handled all approvals from planning to DER (EPA) including grid connection and sale of the renewable power generated on site. 	
Inputs	<ul style="list-style-type: none"> • Phase 1: 35,000 tonnes – Phase 2: 50,000 tonnes per annum commercial and industrial food organics. 	
Outputs	<ul style="list-style-type: none"> • The type(s) of output produced by the facility and how this is managed – small amount of removed contamination - landfill, 1 t/day, recycled plastic (PET) 3 t/week, aluminium – 1 t/week, digestate – 80 KL/day – recirculated 15%, spread to onsite compost – 85% • The product(s) that are produced by the facility (energy/steam/heat) - hot water – 2.5 MWh, power up to 2.4 MW, 1.98 MW exported to grid 	
Outcomes	<ul style="list-style-type: none"> • Richgro garden products – A licenced waste receiver of organic waste streams – predominantly green organics from council collections • Previous electricity costs from the energy retailer of \$400,000+/annum • Enabling Richgro to take future higher revenue waste streams from contaminated organic material • Output a bio-fertiliser to blend with existing Richgro product improving nutritional and breakdown characteristics • To form a closed loop, with potential to utilise heat and CO₂ produced on site • Biogas Renewables is the project developer • Commissioned 2015 • Designed to produce over 2 MWe capacity electricity – 1.7 MWe to the grid • Sub – 4-year payback on capital (before grants etc.) 	

<p>Details of environmental challenges and non-compliances and how they were managed</p>	<p>Richgro Garden Products located on the Jandakot drinking water mound, with residential neighbours, within 200 m from the site posed a higher level of design considerations from noise, odour, emissions, and spillages, to ensure the site was compliant to the local Department of Environmental Regulation requirements, this was factored in to the design ensuring the supply of overseas packaged equipment met Australian Standards and to ensure the site limitations and considerations were met and adhered to, a full odour, noise and emissions report was completed with great success on the facility. This information can be made available if required.</p>
--	---

Table 2 – Jandakot Bioenergy Plant Overview

5. Stakeholder and Community Engagement

The entity has been in consultation with the relevant stakeholders and community groups regarding the proposed project for several months. During this time individual meetings have been held with members of the SA Government, councils and local community members including the Department of Primary Industries and Regions (PIRSA) and local businesses.

Throughout the consultation period the community response to the proposal has been positive, with stakeholder's keen to see the project go ahead as it is viewed as providing a sustainable and competitively priced outlet for food wastes and energy generation in the region. Local groups have also supported the employment generated from the project throughout construction and ongoing operation phases.

For a full list of stakeholder and community engagement, please refer to Appendix 4 – Stakeholder Engagement.

6. Project Proposal

6.1 Project Overview

The objective of this project is to design, build and operate a best practice organic waste treatment facility that will demonstrate how the technology can be integrated with food production to reduce the environmental footprint across the food supply chain.

The site will operate 24 hours a day, 7 days a week and will have a rated output of 8MW, of which approximately 4.7MW will be electrical energy, 21.7GJ/hr biomethane gas and the remainder thermal energy.

The facility will utilize an anaerobic digestion process to treat circa 125,000 tonnes per year of organic waste from the food processors in the surrounding region. The food wastes that will be accepted will vary seasonally however the plant has been designed to accept the following key feedstocks:

- **Agricultural Wastes** – Damaged grain, fruit and vegetables that are unsuitable for sale
- **Industrial food manufacturing wastes** – Peels, piths, pips, seeds, and other by-products, out of spec or damaged products from canneries, dairy manufacturers, abattoirs, and other food manufacturers; and
- **Post commercial food wastes** – Out of date and out of spec products from supermarkets, waste food, grease trap waste

The plant will be self-sufficient and will be capable to provide the energy to local businesses. The operation has been designed to be as close to zero-waste as possible and is consistent with the waste hierarchy.



Figure 1 – Waste Hierarchy

- **Prevention** – Prevention of waste from site is priority. All waste that is deemed unnecessary is not part of the AD process or facility operating procedure.
- **Reuse** – All materials are reused as much as reasonably possible. For example, all process water is captured and reused back into the process.
- **Recycling** – All material that can be recovered and recycled, will be recycled. Packaging waste is cleaned, segregated and baled to facilitate recycling.
- **Composting** - The anaerobic digestion process generates a digestate that is nutrient rich and is suitable for use as an organic fertiliser.
- **Recovery** – The proposed facility is a waste-to-energy project. It aims to recover energy from waste that would otherwise be sent to landfill.
- **Disposal** – Only unrecoverable and unrecyclable waste will be disposed, minimising waste sent to landfill.

6.2 Construction Scope of Work

The scope of work for construction will be conducted by the *Construction Entity* (Biogas Renewables Pty Ltd) for the design, construction, commissioning of the baseline AD bioenergy facility. The scope includes supply of the following:

- Civil engineering and construction, including detailed earthworks, and equipment bases
- Feeding and processing system for the bulk acceptance and processing of solid waste streams with a liquid waste stream input for blending the waste streams
- Negative pressure reception shed with biofilter
- Fully-automated, liquid pumping and receivable system servicing the digester buffer tank
- 4 x Tiger de-packager units
- Liquid inlet pipework
- Digester buffer tank
- Pasteurisation facility designed to process either the feedstock input or the digestate output at any one time.
- 6 x fully-automated primary biodigesters complete with pumps, mixing systems, bio-domes and instrumentation, delivering biogas (55-65% methane).
- Stainless steel gas pipework to ground level
- Underground Plastic liquids pipework to ground level
- Digestate tank
- Digestate centrifuge for removing and separating solids from the liquid stream
- Master process control system with remote SCADA interface
- Gas Analyser and micro air dosing system for managing the H₂S levels within the gas space of the digester
- 3 x 1.56MW packaged CHP generators including full heat recovery
- Biogas to biomethane upgrade package equipment
- Fully automated emissions-compliant high temperature enclosed safety flare for the combustion of surplus or waste biogas.
- Connection to the SAPN electricity grid
- Wet and dry commissioning of the facility
- Seeding the digester and process
- FOS TAC unit for digester health monitoring
- Full final design and compliance documentation including:
 - Detailed design drawings
 - General arrangement/site layout
 - Civils layout
 - Pipework layout
 - Conduit layout
 - System Mass Balance Calculation
 - Process Flow Diagram

- Process and Instrument Diagram
- EX Documentation
- HAZOP Documentation

6.3 Process and Technology

6.3.1 Process Summary

The bioenergy operation will process up to 100,000 TPA of Commercial & Industrial (C&I) organics waste and 25,000 tonnes of Agricultural Waste Feedstock including grainy waste material, totalling approximately 125,000 tonnes of input per year.

The facility is expected to generate in the order 4.7MW of electricity, 21.7GJ/hr of biomethane and 4.9MW of thermal heat. Approximately 166,600m³/year of AD water will be produced, with flow rates of up to 456m³/day when at full capacity. The plant is also designed to operate with a continuous process on 24 hours per day, 7 days per week.

6.3.2 Process Flow

The end-to-end process flow can be broadly simplified into the following process steps:

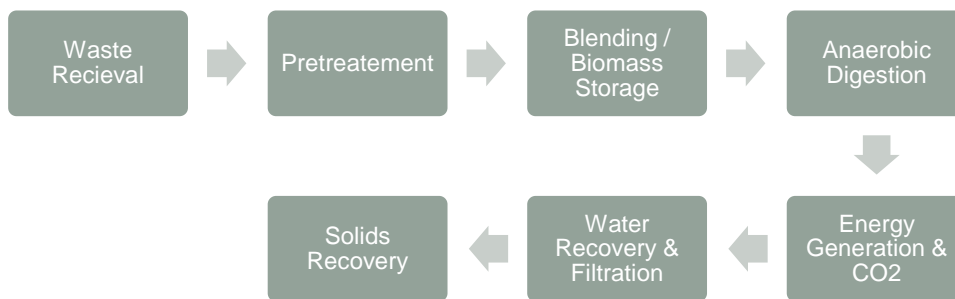


Figure 2 – Simplified Process Flow

1. **Waste Receival** – C&I Waste and Agricultural Waste Feedstock is received, classified and stored until required for the AD system.
2. **Pretreatment** – Waste is physically separated into organic feedstock for the AD system and inerts for disposal / recycling.
3. **Blending / Biomass Storage** – Feedstock is blended into a homogenous mixture and stored ready for the AD process.
4. **Anaerobic Digestion** – Feedstock undergoes a series of biological breakdown stages to produce usable biogas as an output.
5. **Energy & CO₂ Generation** – Electricity, heat, biomethane and carbon dioxide are produced as process outputs.
6. **Water Recovery & Filtration** – The output digestate sludge liquid fraction is separated and reused after entering a waste water treatment process.

7. **Solids Recovery** – The output digestate sludge solid fraction is separated and sold as organic compost.

6.3.3 Process Inputs, Outputs and Controls

Key anaerobic digestion process steps, inputs, outputs and control methods are detailed in the table below:

	Key Process step	Key Inputs	Key outputs	Key Controls
1	Waste Receival	100,000 tonnes/year C&I Organic Waste 25,000 tonnes/year Agricultural Waste Feedstock	Feedstock material ready for processing	<ul style="list-style-type: none"> Organic wastes will only be accepted in compliance with the EPA License and relevant agreement with the supplier Biofilter installed to treat all building exhaust air
2	Pre-treatment	Commercial and Industrial Organic Waste, Agricultural Waste Feedstock	Organic slurry Compacted packaging waste	<ul style="list-style-type: none"> High level sensors on vessels Sorting screens PLC control Biofilter installed to treat all building exhaust air
3	Blending / Biomass Storage	Organic slurry Ferric Chloride Electricity	Biomass suitable for anaerobic digestion or storage	<ul style="list-style-type: none"> pH controlled High level sensors PLC controlled Closed system
4	Anaerobic Digestion	Biomass Electricity Heat	Biogas Digestate	<ul style="list-style-type: none"> Temperature controlled Vessel level sensors Closed system Pressure controlled
5	Energy & CO2 Generation	Biogas	4.7MWh electricity 21.7GJ/hr biomethane gas 4.9MWh useable heat 64tonne/day CO2 generated from process	<ul style="list-style-type: none"> PLC controlled Catalytic converter Sound dampening Temperature and output monitored Emissions cooling/cleaning system Temperature and output monitored
6	Water Recovery & Filtration	Digestate liquid Electricity Water	329m3/day	<ul style="list-style-type: none"> Pressure sensors on all units Closed system

		treatment chemicals	Recirculated digestate liquid Recycled process water Liquid fertilizer Concentrated digestate liquid 128m3/day Liquid output	<ul style="list-style-type: none"> • Flow control on all systems • PLC control
7	Solids Recovery	Dewatered digestate Concentrated digestate liquid Biogas Electricity	114Tonnes/day Solid fertilizer product	<ul style="list-style-type: none"> • Feed rate controlled • Temperature controlled • Biofilter installed if required • PLC controlled

Table 3 – AD Key Process Inputs, Outputs and Controls

6.3.4 Process Flow Details

1. Waste Receiving

The AD plant will accept two main waste streams; Commercial and Industrial (C&I) organic waste and Agricultural Waste Feedstock.

Third party food wastes will be delivered to the site by truck. The inbound vehicle will be weighed at an onsite weighbridge, and the load will be inspected for non-conformity. Third party waste will only be received from clients who have booked delivery of a consignment of waste / resource and provided details of the materials' content. Non-conforming loads are not discharged or accepted at the site.

Waste is to be classified into the following categories (see Table 10 for full feedstock list):

- a) Packaged food wastes - Delivered on pallets or in pallets and will be unloaded into the receiving area by forklift. Storage of packaged food wastes will be kept to a minimum, with on-site storage limited to the materials that will be processed in the following 48 hours.
- b) Bulk dry / wet solids – Includes grains, whole fruits, vegetables and food processing wastes. Delivered in tipper trucks, with materials tipped into concrete receiving bays to facilitate subsequent handling by front-end loader. Storage of bulk food wastes will be kept to a minimum, with on-site storage limited to the materials that will be processed in the following 24 to 48 hours.
- c) Bulk liquids - Delivered by tanker truck and will be discharged directly into the fully enclosed feed system of the pre-treatment plant.
- d) Agricultural waste – Delivered by truck includes damaged, off-spec wheat, barley, grain etc. Agricultural waste will be transferred into holding silos by a fully enclosed blower system.

The facility will receive approximately 25,000 tonnes of Agricultural Waste Feedstock per year that will be loaded directly into the dry feed system and approximately 100,000 tonnes of C&I organic waste per year that will be transferred to the receival area by tractor and trailer and unloaded by front-end loader.

The receival hall will be located inside the bunded, concrete floored reception building, and has been designed to enable the safe and efficient unloading of a variety of organic wastes. Solid and semi-solid waste is deposited into graded bunkers and have been designed to hold 2 days of waste. Liquid waste is pumped directly into a sump, for subsequent pumping to a liquid storage tank or immediate processing.

Trucks are washed before departure with all wastewater draining to the sump for processing in the digestion system.

As the activities in this building have the potential to generate odour, this building will be fitted with a biofilter odour treatment system ensuring approximately 4-5 air changes per hour with blower rated at 525m³ per minute, 31,500m³ per hour. Receival building is also fitted with automatic 6 second fast-shutting doors. Floors will also be graded with a drainage sump. Washdown water is also reused in the AD system.

2. Pre-treatment

The pre-treatment system has been designed to accept a wide variety of organic wastes and incorporates feed hoppers, shredders, pulping units and liquid separation units.

Solid wastes will be loaded into the feed hoppers by front-end loader, before being shredded and transferred into the pulping unit via a conveyor. Liquid wastes and process water are pumped directly into the pulping unit, where digestible materials are blended and dissolved into a biomass slurry. The pulping process and all subsequent process steps take place in sealed vessels, minimising odour generation.

Non-digestible materials such as plastic and metal packaging materials, and sand/grit from vegetables are separated from the digestible biomass as it progresses through the plant. Heavy inert materials, consisting of metals and heavy plastic are removed in the de-packaging unit. Light inert materials such as plastic film is removed by manual labour prior to entering the system. The packaging materials will be segregated for recycling or be returned to the supplier under the terms of the supply contracts.

The pre-treatment plant will be located inside the bunded, concrete floored, pre-treatment plant building to minimise the risk of soil or water contamination. As the activities in this building have the potential to generate odour, this building will be fitted with an odour treatment system.

3. Blending / Biomass Storage

The biomass slurry from the pre-treatment plant is sent to the feeding tank where the day's inputs are blended and homogenised to ensure a consistent quality of feed to the anaerobic digestion process. The feedstock is also pH adjusted for optimum digestion and dosed with ferric chloride to chemically bind any free Sulphur and minimise the potential for Hydrogen Sulphide formation in the digestion process.

Feedstocks are blended and balanced to optimise composition for biological process stability and maximum biogas yield. Each blend is sampled for chemical analysis and balanced.

During blending, the biomass also undergoes hydrolysis to begin the anaerobic digestion process. The proposed plant has been designed to incorporate a biomass storage tank which will hold up to 5 days feedstock supply to smooth out peaks and troughs in the delivery of third party food wastes and to allow gradual transition between changing feedstocks, ensuring continuous operation of the plant at peak throughput.

The fully sealed glass-fused steel feeding tank will be completely sealed and will be located on a bunded concrete hardstand along with the anaerobic digestion tanks. This hardstand will be designed with bunding and the risk of fugitive odour emissions or land/groundwater contamination from this process is considered to be negligible. There are no potential emissions points.

4. Anaerobic Digestion

The anaerobic digestion system can be broadly separated into the following stages:

- a) Hydrolysis –During Hydrolysis complex organic molecules are mixed with water and agitated for approximately 5 days at between 30°C and 40°C to convert them to simple dissolved monomers and polymers.
- b) Pasteurisation - The clean digester feed is fed in to a two-tank pasteurisation operation, the first operation is to fill and pre-heating from 25-30degC up to 72degC for 50 minutes, with the second phase holding at 72degC for a period of 1 hour, before emptying. It is anticipated that it will empty within 5 minutes per operation. This allows for full pasteurisation to the European PAS110 standards and will ensure the pathogen log kill is reduced and stabilised before inputting into the digester feed tank. The process can also be changed to pasteurise the outlet digestate if required, ensuring a full robust process.
- c) Fermentation - During fermentation the dissolved monomers and polymers from the Hydrolysis tank are maintained under mesophilic conditions (between 35°C and 40°C) for a minimum of 20 days residence time to enable a series of fermentation/digestion steps to convert them into acetic acid, hydrogen and carbon dioxide.

Digestors are warmed using parasitic heat from the plant's biogas generators. All tanks and vessels in the anaerobic digestion process will be temperature controlled, insulated stainless steel tanks, with a galvanised iron cladding; the final post digestion tank fitted with a flexible roof to allow for variations in biogas generation.

The glass-fused steel tanks and vessels that make up the anaerobic digestion process will be completely sealed and will be located on a bunded concrete hardstand that will be designed in line with EPA bunding guidelines and the risk of fugitive odour emissions or land / groundwater contamination from this process is considered to be negligible.

Biogas, comprising approximately 65% methane/35% CO₂ v/v accumulates in the gas domes, and can be positively displaced by pumping air between the gas dome's two membranes.

Estimated residence of feedstock in digesters is between 25 and 30 days, during which a reduction in volume of 20% is expected. There are no potential emissions points.

5. Energy & CO2 Generation

The plant will generate 69,900m³ of biogas per day. The gaseous output from the process will be cooled and purified through an activated carbon filtration system, before being burned through a Combined Heat and Power (CHP) unit rated to produce approximately 4.7MW of electricity and 4.9MW of thermal heat or upgraded to 21.7GJ/hr of biomethane.

The electricity generated will be used to power the anaerobic digestion plant as well as being fed into the electricity grid. The heat generated will be used to maintain the anaerobic digestion tanks and vessels at optimal temperature.

Both the CHP unit and the water heater will be housed inside a noise insulated container and situated on a concrete floor.

An upgrade system is incorporated to convert the biogas (65% methane) to biomethane (97% methane) equivalent to natural gas to for input into the gas mains.

Overpressure in the system will be released though a high temperature flaring system. The flare operating temperature is approximately 1000 degrees Celsius to kill potential pathogens. Approximately 64tonne/day CO₂ is generated and managed with the emissions cooling/cleaning system. Temperature and output also monitored with the PLC system. The flare will only be operated on an emergency basis, or when one of the generators is not operating for routine maintenance (estimated 12 days per year) or in the unlikely event that the generators fail (worst case estimated 7 days).

6. Water Recovery and Filtration

The output digestate from the digestion process will be dewatered through a centrifuge. The liquid stream from the centrifuge will be treated though a waste water treatment system and membrane filtration system then directly recycled back into the system. Approximately 329m³/day of process liquid is recirculated.

The membrane filtration system will consist of a first pass Ultrafiltration (UF) unit where pathogens and any remaining solids will be directed to either the recycling circuit or the drier feed, while filtered water is then passed through a Reverse Osmosis (RO) unit. The concentrate from the RO filtration system will be bottled and sold as organic fertiliser, and the treated water will be recirculated for use as process water.

The water recovery and filtration system will be located inside the bunded, concrete floored reception building.

The bulk liquid fertiliser tank will be completely sealed and will be located on a bunded concrete hardstand along with the anaerobic digestion tanks. As a result, the risk of fugitive odour emissions or land/groundwater contamination from the Water recovery and filtration process is considered to be negligible.

Approximately 128m³/day of output process liquid is piped offsite into aquifer storage operated by Salisbury Water.

7. Solids Recovery

The solid fraction of the digestate is separated using the same process by dewatering through a centrifuge. Solids produced are a spade-able and nutrient rich material to be used as compost. The solid fraction output rate is expected to amount to 114Tonnes/day.

The complete solids recovery process occurs within the confines of the reception building. The collection point for transfer of the digestate will take place inside the negative pressure building so no digestate will be exposed to the external open air without a treatment in place.

Heavy vehicles are used to offtake the material on a daily basis as required inside the building prior to transporting offsite to compost facilities.

6.4 Environmental Best Practice

Biogas Renewables aims to exceed environmental performance expectations across all categories and wants to set a new standard for Australian best practice in the treatment of wastes from food production. The project has been designed from the outset to incorporate high level environmental performance into all processes and operations across the site.

Energy use and GHG emissions

- Methane emissions will be reduced as food waste is diverted from landfill and anticipated to reduce net GHG emissions.
- The CHP units are specified to provide both electricity and process heat.
- All pipes and vessels that are heated and/or cooled are insulated to minimise heat loss to atmosphere.
- Where possible, roofed work and storage areas incorporate transparent roofing panels to minimise the requirement for artificial lighting.
- New pumps and motors have been sized to ensure that they will operate at peak efficiency and energy efficient models have been selected.
- On larger pumps and motors, soft starters and Variable Speed Drives will be fitted to maximise operational efficiency and minimise load spikes.

Emissions to air

- The liquid wastes will be piped directly to the treatment plant significantly reducing odour generation.
- Waste deliveries and processing will be scheduled to minimise storage time on the site to minimise the generation of odour from putrescent feedstocks.
- Receipt of potentially odorous wastes, bulk waste handling and pre-treatment areas will be in an enclosed building which incorporates bio-filters to remove odour.
- All anaerobic digestion process vessels will be sealed to prevent fugitive emissions.
- Biomass will be dosed with Ferric Chloride to chemically fixate sulphur in the feedstock to minimise Hydrogen Sulphide generation.

- High efficiency CHP, water heater and flare units have been selected to maximise combustion efficiency and minimise the generation of unwanted gaseous by-products.

Noise emissions

- The CHP unit will be fitted with noise attenuators/silencers to ensure that sound output is below 75dB at 1m meeting the boundary requirements
- The CHP and water heater units will be located inside soundproofed buildings to ensure that noise emissions from the site are within guideline values.
- The plant has been located to ensure an adequate separation distance to the nearest residential sensitive receptors and from the nearest commercial / industrial receptors which will further reduce the likelihood of noise impacts. Refer to Appendix 3.

Water use and discharge

- Consumption of potable water across the site is minimised through reuse of process water wherever possible.
- Stormwater, flooding or tank rupture fluids will be diverted to sump areas where it is captured and either pumped into the aquifer or onsite waste water treatment plant for reuse in the AD process
- No waste water will be discharged from the site, with digestate liquid being concentrated to generate a liquid fertiliser product, and the remaining water being reused in the process.
- All site activities will be carried out on bunded concrete pads and under roofed areas to minimise the risk of contaminated water generation.

Land and Groundwater

- The operational site areas are completely sealed to ensure that pollutants cannot be discharged into the soil.
- All materials will be handled, stored, treated and transferred on bunded concrete areas to minimise the risk of a spill resulting in contamination of land or groundwater.
- All processes will be carried out either in bunded, concrete floored buildings, or in sealed vessels and/or tanks located on bunded concrete hardstands.
- All new bunds and hardstand areas will be designed and built to comply with or exceed EPA Guidelines and all relevant Australian Standards.
- Concrete hardstand areas and bunds will be routinely checked to ensure that their integrity is not compromised.

Waste Management

- The proposal will divert 125,000 tonnes of C&I waste and Agricultural Waste Feedstock per year from landfill.
- The process has been designed to produce the minimum possible waste requiring disposal – solid fraction of digestate is output for sale as an organic fertiliser.
- Spent activated carbon from the CHP biogas scrubber system will be processed through the AD plant.
- Packaging waste is segregated to maximise recycling potential.
- Scheduling waste delivery (where possible) to minimise the need for onsite storage.

- Pre-treatment of all non-packaged wastes within 2 days of receipt.
- Conduct all receipt, handling and processing activities in enclosed buildings or vessels with bunded concrete hardstand floors.
- Acceptance protocols to ensure only suitable wastes are used as feedstock.

7. Integrated Environmental Assessment

The proposed operation is a resource recovery and renewable energy project on an industrial site, with very favorable outcomes compared to the alternative of landfill disposal. The solution is designed to minimise environmental impact whilst ensuring energy security through renewable sources.

The plant has been conceived from the outset to serve as an example of best practice integrated waste processing. This following environmental assessment considers environmental impacts and benefits of the project and stipulates how risks will be mitigated.

Assessment	
Proposed Solution	<ul style="list-style-type: none"> • Large scale anaerobic digestion waste to energy plant to treat 3rd party organic waste, supply electricity to the National Electricity Market (NEM)
Advantages	<ul style="list-style-type: none"> • Significant net GHG emissions reduction • Significant reduction in waste to landfill • No solid or liquid waste requiring external treatment or disposal to landfill • Minimised odour • Constant and reliable biogas generation • Generates regional employment • Creation of an opportunity for a social enterprise assisting disabled people to gain skills and employment • Use of the organic material as digester feedstock • Generation of electricity for transfer to other manufacturers and/or export to the grid, • Increased recycling of packaging (plastics, cardboard, tin plate, aluminium etc.) • Creation of fertiliser products from the digestate • Secure and ethical management of clients' products and brands • A reliable consistent service to local manufacturers that also causes a net reduction of the environment footprint of their operation • Net operational profit
Disadvantages	<ul style="list-style-type: none"> • Capital cost • Operation and maintenance required • Cost of connecting to the NEM • Potential reluctance of incumbent generators/distributors to facilitate new connections to the NEM

The proposed operation will minimise emissions to air and water and will achieve very high rates of resource recovery. It will be a net generator of renewable energy, irrigation water and potentially organic fertiliser.

7.1 Net Environmental Benefit

The proposed facility will result in a net reduction of GHG emissions and a breakdown of the anticipated future energy use and GHG emissions are provided. Estimated greenhouse gas emissions were calculated using the National Greenhouse Accounts Factors July 2017. The detail of all calculations is provided in Appendix 5 – Emissions Calculations.

7.1.1 GHG Emissions Assessment

Baseline

Operation of the proposed facility will process an anticipated 125,000 tonnes per year of food waste as feedstock. As most of this food waste is currently disposed of in a variety of regional landfills, the equivalent greenhouse gas emissions avoided is estimated below.

Source	Production	Emissions Factor	CO2-e
	Tonnes/year	kg CO2-e/kg	Tonnes/year
Food Waste	125,000	1.9	237,500

Table 4 - Annual GHG emissions from existing food waste disposed to regional landfill

Source	Offset	Production	Emissions Factor	CO2-e	
		MW/h	MW/year	kg CO2-e/kWh	Tonnes/year
Electricity	Fossil Fuels	4.7	41,172	0.56	23,056

Table 5 - Annual GHG emissions from displaced electricity generation from fossil fuels

For the calculation, it is assumed that the biogas converted to biomethane will produce the same amount of greenhouse gas emissions as the natural gas that it offsets.

The anaerobic digestion process is designed as a totally enclosed system to maximise capture of biogas and therefore maximise energy generation. The system will also be carefully managed to maintain a consistent rate of biogas generation. In the event of excess pressure building up in any of the vessels, all pressure release valves discharge through the emergency flare. Therefore, it is assumed that fugitive methane emissions from the plant can be considered to be negligible.

As a result, the full 260,566 tonnes per year of GHGs currently released directly to atmosphere by existing food waste disposal practices will be avoided following the construction of the proposed waste to energy plant.

Proposed Plant Solution

The proposed facility will generate 25,500,000m³/year of biogas. This biogas will be consumed onsite through the operation of:

- 3 x 1.56 MWh Combined Heat and Power unit

In addition to combustion of biogas the plant will require a front-end loader and a forklift in the receival and dispatch areas of the plant. All electricity required to operate the waste-to-energy plant will be generated onsite through the CHP unit.

Source	Consumption	Energy Content Factor	Emissions Factor	CO2-e
	L/year	GJ/kL	kg CO2-e/GJ	Tonnes/year
Diesel Consumption	39,624	38.6	70.5	107,829
LPG Consumption	5,200	26.2	61.5	8,379

Table 6 - Annual GHG emissions produced from heavy site heavy machinery

Source	Consumption	Energy Content Factor	Emissions Factor	CO2-e
	m3/year	GJ/m3	kg CO2-e/GJ	Tonnes/year
Biogas for Electricity Combustion	15,769,737	0.0337	4.83	2,567

Table 7 - Annual GHG emissions from biogas for electricity generation

Net Greenhouse Gas Emissions

Overall, the proposal is anticipated to result in a net GHG emissions reduction of **140,198** tonnes of CO₂e per year.

7.1.2 Best Practice Energy and GHG Management

The proposed plant incorporates best practice at all levels of energy and GHG management. From the meta-level of conceptual project design where the initial scope of the project was expanded to include treatment of 3rd party food wastes down to the specification of pipe insulation, energy efficient lighting, pumps and motors, the proposal aims to set the Australian benchmark for best practice in a waste treatment project. As a result:

- Methane emissions from the food waste which will be diverted from landfill will reduce GHG emissions.
- A high efficiency CHP unit has been specified to provide both electricity and process heat for the plant itself
- All pipes, tanks and other vessels that are heated and/or cooled have been insulated to minimise heat loss to atmosphere.
- Where possible, roofed work and storage areas will incorporate transparent roofing panels to minimise the requirement for artificial lighting.
- New pumps and motors have been sized to ensure that they will operate at peak efficiency and energy efficient models have been selected.
- On larger pumps and motors, soft starters and Variable Speed Drives will be fitted to maximise operational efficiency and minimise load spikes.

7.2 Risk Assessment

The potential risks associated with the project are understood and will be managed as described in this application.

- Water resource use - See *Water Resource Use*.
- Odour and other air emissions from the site - See *Air Emissions*.
- Noise from the site - See *Noise Emissions*.
- Increase in traffic to and from the site - See *Traffic Management*.

8. Water Resource Use

The AD facility is a net generator of water and the site has been designed to be self-sustaining through the incorporation of a high level of water recycling. The facility it will require very little, if any, potable water input from mains other than for staff amenities and limited wash down of equipment.

Total liquid output from the site will be expected to be 456m³/day. Of this volume, 329m³/day is reused and recirculated to assist with the AD process. The remaining volume of 128m³/day is treated through a water treatment system and sent to the aquifer operated by Salisbury Water.

Stormwater will be diverted to sump areas and redirected to either the aquifer or onsite waste water treatment plant for reuse in the AD process.

Waste liquids from bottles and containers can be injected directly into the feeding systems and reused as a necessary liquid process component, avoiding the requirement for mains water.

The use of mains water for equipment will be minimised through the use of high pressure trigger nozzles. These will only be used at the end of depackaging runs and is necessary to reduce odour from old residues on equipment.

9. Air Emissions

The construction and operations of the AD facility will be compliant with the *Environment Protection (Air Quality) Policy 2016* under the *Environment Protection Act 1993*. The following section details the anticipated emissions and mitigation strategies relevant to air quality however a full emissions modelling assessment is currently being undertaken and will be provided in due course.

9.1 Air Emissions Assessment Overview

Air emissions from proposed facility

The proposed facility will generate emissions to air in both the construction phase and operations phase.

During construction, the primary focus will be managing nuisance dust to ensure that it does not cause issues for neighbouring properties.

During operations, potential emissions may include:

- Unclassified Indicators (both dust and odour) to be generated,
- Substances generated and emitted through the combustion of biogas; and
- Odorous emissions (Hydrogen Sulphide)

Dust Management

During the construction phase the risk of dust produced will be minimised through:

- Limiting the area of exposed soil at any time to the minimum required
- Applying best practice dust minimisation practices throughout the construction phase

Once the plant is operational dust generation will be minimised by surfacing all roads and car parks with non-dust generating materials such as gravel, sealing all operational areas with concrete and maintaining vegetation cover on all non-operational areas of the site.

Odour Management

It is recognised that there is a risk of odour generation from the proposed operation, particularly in the waste receipt, handling and pre-treatment stages of the process. This will be mitigated by conducting all materials receipt, handling and pre-processing activities within enclosed buildings, storing liquid wastes in closed tanks, maintaining a high level of housekeeping, and managing onsite storage of bulk solids so that materials are processed within 48 hours of their arrival.

An odour removal system will also be installed to treat any odours that are generated. Based on the currently available high-level designs it is expected that extraction points will be fitted near the entrance of the building to prevent odour escaping.

Should this arrangement prove to be insufficient once commissioning is underway, the proponent has allowed extra space adjacent to the installed units to expand the installed treatment capacity if required.

Experience has shown that the gas cleaning stage at the end of the drier unit is sufficient to control any odour generation and that subsequent odour treatment is not necessary. However, if this is found to be insufficient once commissioning is underway, a further odour removal system will be added.

Furthermore, the risk of adversely impacting upon sensitive receptors is also reduced by the proposed plant being situated as per Appendix 3.

Substances

The combustion of biogas through the CHP unit, rotary drier, water heater and emergency flare will generate Carbon Monoxide, Oxides of Nitrogen, Sulphur Dioxide, Volatile Organic Compounds and particulates. Based on expected combustion rates through each unit and using the emissions factors for combustion of landfill gas, the following emission rates have been estimated.

Hydrogen Sulphide generation during the anaerobic digestion process will be suppressed by the addition of Ferric Chloride. It is expected that very low levels of Hydrogen Sulphide may still be generated, but as all biogas will be combusted before release to atmosphere it is expected that emission rates will be within acceptable parameters. Where emission rates are found to be above acceptable limits during commissioning an additional biogas desulphurisation step will be put in place to prevent emissions exceeding the acceptable limits during operation.

Air quality best practice

The proponent of the project has sourced only technology that is considered EU best practice and is committed to ensuring that the project outperforms any other system that is currently available in Australia. To this end:

- Waste deliveries and processing will be scheduled to minimise storage time on the site to minimise the generation of odour from putrescent feedstocks.
- The Agricultural Waste Feedstock will be piped directly to the facility silos, minimising dust and odor generation.
- Receipt of potentially odorous wastes, bulk waste handling and pre-treatment areas will be in an enclosed building which incorporates bio-filters to remove odour.
- All process vessels, transfer lines and storage tanks will be sealed to prevent fugitive emissions.
- No process gases will be released to atmosphere without being burned to reduce their GHG potential.
- Biomass will be dosed with Ferric Chloride to chemically fixate sulphur in the feedstock to minimise Hydrogen Sulphide generation.
- High efficiency CHP, water heater and flare units have been selected to maximise combustion efficiency and minimise the generation of unwanted gaseous by-products.
- The CHP unit will have a catalytic converter fitted to the exhaust to minimise NOx emissions.
- All relief valves will vent to the emergency flare

Air quality impact assessment

Air emissions from the proposal are not at a level where they are expected to impact on local amenity or public health.

10. Noise Emissions

The construction and operations of the AD facility will be compliant with the *Environment Protection (Noise) Policy 2017* under the *Environment Protection Act 1993*. The following section details the anticipated emissions and mitigation strategies relevant to noise however a full noise modelling assessment is currently being undertaken and will be provided in due course.

10.1 Noise Impact Assessment Overview

The location of the facility has been selected and the layout of the plant arranged to ensure that all activity areas are sufficiently distanced to the nearest sensitive receptors as displayed in Appendix 3.

The table below shows the items of equipment and activities that have been identified as potentially causing noise disturbance and the mitigation measures that have been put in place to ensure that the proposal does not cause a significant increase in noise disturbance to neighboring properties.

Noise source	Activity	Mitigation
Vehicle movements on site	Delivery of 3 rd party waste feedstock to the facility	Facility to operate between 0700—1800 hours Monday—Friday 0700—1300 hours on Saturdays. Site vehicle movements will occur either inside buildings or on designated roads.
De-packaging and baling equipment	Pre-processing	Normal operating hours will be between 0700-1800 hours on weekdays. These units are all inside buildings and operate at levels consistent with OHS requirements.
Loaders and forklifts	Material transportation	Normal operating hours will be between 0700-1800 hours on weekdays. Transfer and materials handling activities will be conducted within enclosed buildings. External loader movements will be restricted to working hours. Smart reversing alarms to minimise potential disturbance.
Unloading pallets and materials	Material transportation	Normal operating hours will be between 0700-1800 hours on weekdays. Forklifts will move these (they will not be dropped heavily) and activity occurs in or to the north of buildings.
Moving and loading recyclables	Material transportation	Normal operating hours will be between 0700-1800 hours on weekdays. These will be moved using forklifts inside the reception building.
Combined Heat and Power Unit	AD plant operation	The CHP will be fitted with a muffler / silencer to reduce sound output. The unit will be housed in a soundproofed housing to minimise external noise.
AD flare	AD plant operation	The flare operates on demand and should not be is not anticipated to be noticeably audible to sensitive receptors.

Table 8 - Expected noise sources and mitigation measures

11. Water Management

11.1 Water Management and Run-off Discharges

The construction and operations of the AD facility will be compliant with the *Environment Protection (Water Quality) Policy 2015* under the *Environment Protection Act 1993*. The following section details the anticipated emissions and mitigation strategies relevant to water quality.

The proposal poses a minimal risk to surface water. The site has been designed to minimise the risk of generating contaminated surface water through containing all product transfer, handling, pre-processing and drying activities within enclosed buildings, and all other processes within sealed vessels located on bunded concrete hardstands.

All tanks are bunded to 120% of tank volume to safeguard against potential spillage from tank failure. Bunding will consist of approximately a 1.5m high wall completely enclosing the perimeter of all tank zones. Stormwater will be diverted to sump areas and redirected to either the aquifer or onsite waste water treatment plant for reuse in the AD process.

A detailed breakdown of key process steps, locations and safeguards related to water management are as follows:

Key Process step	Location and safeguards
Waste Receiving	<ul style="list-style-type: none"> Will take place inside the bunded, concrete floored Pre-treatment plant building, with sump pits to ensure that stormwater is not contaminated, and no spills are released to the environment
Pre-treatment	<ul style="list-style-type: none"> Will take place inside the bunded, concrete floored Pre-treatment plant building, with sump pits to ensure that stormwater is not contaminated, and no spills are released to the environment
Blending / Biomass Storage	<ul style="list-style-type: none"> Will take place inside sealed process tanks and vessels that will be located on a bunded, concrete hardstand area to minimise the risk that any stormwater will become contaminated, and to prevent the release of stormwater that does become contaminated or any spills to the environment.
Anaerobic Digestion	<ul style="list-style-type: none"> Will take place inside sealed process tanks and vessels that will be located on a bunded, concrete hardstand area to minimise the risk that any stormwater will become contaminated, and to prevent the release of stormwater that does become contaminated or any spills to the environment.
Water Recovery & Filtration	<ul style="list-style-type: none"> Will take place inside the bunded, concrete floored reception building, to ensure that stormwater is not contaminated, and no spills are released to the environment A wastewater treatment system, reverse osmosis unit and ultrafiltration unit treat process liquids generated
Solids Recovery	<ul style="list-style-type: none"> Will take place inside the bunded, concrete floored reception building, to ensure that stormwater is not contaminated, and no spills are released to the environment
Electricity & Heat Generation	<ul style="list-style-type: none"> Will take place inside the bunded, concrete floored CHP and water heater building, to ensure that stormwater is not contaminated, and no spills are released to the environment

Table 9 - Key process steps, their location and the safeguards in place to prevent the contamination of stormwater, groundwater or soils

12. Waste Handling

12.1 Waste Handling and Treatment Premises

The digestate sludge that remains at the completion of the anaerobic digestion is rich in Carbon, Nitrogen, Phosphorus and Potassium and as such is very suitable for use as an organic fertilizer. To avoid potentially needing to dispose of this valuable material, the wastes accepted into the plant will be carefully managed to avoid any contamination, and the process has been designed to ensure that it remains suitable for beneficial use.

The plant is designed to be able to accept packaged food waste and therefore the residual packaging materials will make up a component of the waste produced. Where packaged food wastes are accepted, the pre-treatment process generates a clean, shredded packaging residual that is pre-segregated into heavy and light fractions to enable easy recycling, and baled to facilitate easy transport. The proponent intends to structure food waste purchase agreements such that the supplier of the food waste retains ownership of, and responsibility for, the disposal of the residual packaging materials.

12.2 Hazardous Industrial Waste

The proposal is not expected to generate any hazardous industrial waste, as the residual packaging wastes is inert and digestate quality will be strictly controlled to ensure it is suitable for beneficial reuse.

12.3 Waste Feedstock

The plant will accept two main waste streams; C&I organic waste and Agricultural Waste Feedstock.

It is anticipated that there the plant will receive approximately 25,000 TPA of Agricultural Waste feedstock and 100,000 TPA of C&I organic waste. Agricultural Waste will be pumped directly into holding silos before entering the feed system. C&I organic waste will be unloaded in the receive shed and transported by front-end loader into the feed system.

The types of third party food wastes that will be received are summarised in the table below.

Waste Type	Examples	Solid / Liquid	Origin	Maximum storage quantity (tonnes)
Fruit & vegetables	Off-spec, damaged fruit & vegetables. Peels, seeds, other materials that do not contain free liquid content	Solid	Farms, Transporters, Processing plants, Supermarkets	50,000
Packaged "Dry" Food wastes	Powdered milk solids, damaged pizza, cheese, biscuits, dry pasta	Solid	Processing plants, Supermarkets	20,000

Animal processing wastes	Blood sludge, fats & oils	Liquid	Abattoirs	10,000
Milk processing by-products	Whey, bulk off-spec milk	Liquid	Dairies, milk processing plants	10,000
Pre-consumer fresh food wastes	Out of date mixed food wastes, bread, meat, fruit & vegetables	Liquid	Supermarkets	10,000
Agricultural Waste Feedstock	Damaged, off-spec wheat, barley etc	Solid	Farms, Transporters	25,000
Total				125,000

Table 10 - Types of wastes that will be received by the proposed plant

All delivery vehicles will enter and leave the site across a weighbridge to ensure that waste receipt is accurately tracked. All wastes will be inspected, sampled and tested in the onsite laboratory at the time of delivery to ensure that they are not contaminated with anything that may adversely affect processing or impact on digestate quality. Any contaminated materials will be rejected.

Packaged materials, or materials in small containers such as pallets, IBC's or fruit boxes will be counted, labelled and individually weighed before being emptied into the appropriate feed bay, or in the case of packaged materials, directly into the feed hopper as required. The number of units, type of food waste and the weight of each unit will be recorded to maintain records of feedstock available for blending into the plant, and to track against digestate quality.

12.4 Waste Receipt

The receipt area will be adjacent to the pre-treatment plant, and will be inside a bunded, concrete floored building, designed to enable the safe and efficient transfer of a variety of organic waste materials into the processing plant, enable easy cleaning, and meet or exceed all required design and environmental criteria. As the activities in this building have the potential to generate odour, it will be fitted with a Biofilter odour treatment system.

Third party food wastes will be delivered to the site by truck on a 'just in time' basis, and can be grouped into the following main categories:

- Packaged food wastes
- Bulk solids (such as grains, whole fruit and vegetables, and food processing wastes)
- Bulk liquids
- Agricultural Waste feedstocks (such as grain dust, GOMF)

Storage of packaged food wastes will be kept to a minimum, with on-site storage limited to the materials that will be processed in the following 48 hours.

Storage of bulk food wastes will be kept to a minimum, with on-site storage limited to the materials that will be processed in the following 24 to 48 hours.

Bulk liquids will be delivered by tanker truck and will be discharged directly into the feed system of the pre-treatment plant.

Control of contaminants and pathogens in the digestate will be managed through careful selection and management of feedstocks, rigorous process management and control, and a strict quality control regime including regular sampling and laboratory testing of the wastes received and of the final product. Strict application of this management and quality control framework will ensure that the digestate consistently meets acceptable standards for use as a fertiliser.

12.5 Waste Disposal

As outlined in previous sections, the process will generate minimal waste requiring offsite disposal. Material that is recyclable will be transported to designated recycling facilities and non-recyclables sent to designated traditional waste disposal facilities. Wastes that are generated will be tracked and recorded.

13. Fire Risk

The facility is an industrial site consisting of open land. The main buildings and sealed areas on the site are not included in a fire prone risk overlay due to the reduced risk for such areas, but open unsealed areas and the surrounding properties have a high fire risk overlay. However, fire risk for the site is low. The site and surrounding land have very few trees, and typically during hotter periods is either dry and bare or green and irrigated with little grass fire risk.

Any construction on the site will comply with South Australian fire code building standards determined through the building approvals process.

A CFA-approved fire management plan will be developed for the site.

The main sources of risk are:

- External fire source (grass fire or windblown embers)
- AD flare and exhaust
- Combustion of stored cardboard, paper, plastic and timber
- Sparks from vehicles and equipment on site
- Explosive risk from stored biogas

The main fire risks identified, and mitigation measures are shown below:

Risk	Mitigation	Likelihood with mitigation	Consequence	Residual risk with mitigation
External fire source (grass fire or windblown embers)	<ul style="list-style-type: none"> ▪ Maintenance of fire breaks at site perimeter and control of vegetation in open areas on the site ▪ Sprinkler system over AD tanks will be operated during any fire event ▪ Excess biogas from tanks will be purged and flared during 	Low	Low-moderate	Low

	<p>any imminent fire risk as part of an emergency response plan</p> <ul style="list-style-type: none"> ▪ Firefighting equipment and training to be maintained 			
AD flare and exhaust	<ul style="list-style-type: none"> ▪ Spark arresters fitted and maintained ▪ Control of vegetation on site 	Low	Low (any fires will be contained on site due to lack of vegetation and fire breaks)	Low
Combustion of materials stored on site	<ul style="list-style-type: none"> ▪ Flammable materials will be stored inside sheds where overhead sprinkler systems are fitted or on shipping containers on site ▪ No smoking permitted outside of designated staff areas, to be at least 20 m from stored flammable materials ▪ Quantities of flammable recovered packaging on site will be limited, with collections scheduled when a container load or semi-truck load of baled material is accumulated on site. 	Low	Low (any fires will be contained on site due to lack of vegetation and fire breaks)	Low
Sparks from vehicles and equipment on site	<ul style="list-style-type: none"> ▪ No use of likely spark sources (circular saws, mowers, forklifts) outside on days of total fire ban ▪ Control of vegetation on site ▪ Maintenance of fire-fighting equipment and training 	Low	Low (any fires will be contained on site due to lack of vegetation and maintenance of fire breaks)	Low
Explosive risk from stored biogas	<ul style="list-style-type: none"> ▪ Maintenance of fully enclosed AD system ▪ Limiting quantities of stored gas ▪ Fire sprinkler systems fitted to AD storage tanks ▪ Emergency purge and flare to allow controlled and rapid combustion of gas ▪ Emergency site evacuation procedures 	Low	Potentially moderate to high, but very unlikely	Low

Table 11 – Fire Risk Assessment

14. Other Site Precautions

14.1 Maintenance and Shutdown

All facility infrastructure, equipment and processes are designed to minimise the operational maintenance and shutdown requirements.

The buffer tank has capacity to store up to 5 days of feedstock material to providing flexibility for input variations. This accommodates for temporary isolated and shutdown maintenance activities while feedstock continues to enter the system.

The plant design accommodates for partial shutdown and isolation of various system components whilst allowing continued operation. Contingency equipment allows for breakdown maintenance such as 4 de-packaging units and 6 digester tanks.

During maintenance, relevant system will be fully isolated where necessary and potential hazards removed. During tank equipment changeout, the required tanks will be fully drained of material for up to 30 days so that the item can be isolated and serviced to limit potential hazardous consequences. This will be conducted with proper risk management procedure. Refer to Appendix 6 – HAZOP Risk Assessment.

Although the plant is designed to operate 24 / 7 without any planned shutdowns, in the instance of an unplanned shutdown while the plant is at full load capacity, feedstock material will not be accepted and will revert to existing waste receival arrangements i.e. landfill.

14.2 Traffic Management

Traffic is split into two categories, Light Vehicles (e.g. Personnel and visitors) and Heavy Vehicles (e.g. Dump Trucks, Tankers, Road trains).

Light Vehicles will enter the site through either of the two entrance ways provided on Woomera Avenue. From here, vehicles have a choice to park in parking areas running alongside Woomera Avenue or Gidgie Court. Vehicles can then choose to exit from either of the same entrances. On Woomera Avenue or, in the event of an obstruction, the heavy vehicle entrance on Gidgie Court.

Heavy Vehicles will enter the site on the entrance way provided on Gidge Court. Trucks will stop on the weighbridge before entering the industrial area of the site. From here, trucks will have ample room to manoeuvre and position themselves for offload.

Once material has been offloaded, Vehicles will proceed to the Weighbridge prior to the exit on Woomera Avenue. Once weighed in, the truck will exit onto Woomera Avenue. The layout of the site has been designed to reduce collisions as much as possible through the reduction of intersecting paths and separate entry and exit ways.

As many as 50 Trucks are expected to visit the facility every day once the site is in full operation, resulting in approximately 5 trucks every hour. The Facility has been designed to cope with the influx of vehicles with the following measures:

- 4 Commercial and industrial solid food waste receival bays
- 3 Digestate trailer bays
- 1 Liquid feedstock receival bay
- 1 Agricultural Waste intake bay

This assures the plant can accept up to 9 trucks at any one time.

The receival shed will have traffic lights installed to indicate which bays are free and which are in use.

Heavy Vehicle parking is also supplied on the Gidgie Court side of the site to allow buses and large vehicles to stop on site without impeding other vehicles. This opens the opportunity for educational tours for large groups such as schools and universities.

All vehicles will be able to travel in a forward motion when entering, exiting and navigating around the site.

14.3 Pest and Vermin Management

Risk of pests and vermin on site is mitigated through physical barriers and effective general site management. Mitigation measures include the following:

- Fast and same-day processing of waste streams reduces the risks to attract rodents and other pests.
- All tanks and connecting pipework are fully enclosed oxygen-free systems so that no organic process material is exposed.
- Electrical cabling and wires are contained in enclosed casing where possible.
- Doors on reception shed will be automatic fast closing doors to ensure that shed open time is minimised.
- The site will also be kept in good condition at all times through effective operational management best practice.

14.4 Litter Management

Litter on site will be managed through the following:

- Storing and depackaging materials inside buildings
- Baling recovered packaging types
- Storing baled materials so they are secure from crows and other birds (they will typically be stored inside the site buildings)
- Conducting weekly perimeter fence and site litter clean ups, including inspection and clean-up of stormwater pits
- Provision of staff litter, rubbish and recycling stations across the site, including cigarette litter bins in any designated outdoor smoking areas.

14.5 Storage of Fuels, Chemical and Oils

Fuels, oils and chemicals will be stored in secured and bunded areas. Spill kits will be located at each storage point, and staff instructed in correct use of these. Chemicals on site will include pH dosing and biogas cleaning/'scrubbing' chemicals (typically a Ca OH product that can strip out H₂S and CO₂).

15. Seeking other EPA approvals

15.1 Commissioning Plan

A commissioning approval will be sought for operation of the site following its construction. A commissioning plan will be provided to EPA once timeframes of works are better defined.

15.2 New License or License Amendment Subsequent to Works Approvals

The site will be required to be licensed as at the completion of construction and commissioning works.

16. List of Appendices

Appendix 1 – Site Plan

Appendix 2 – Location Map

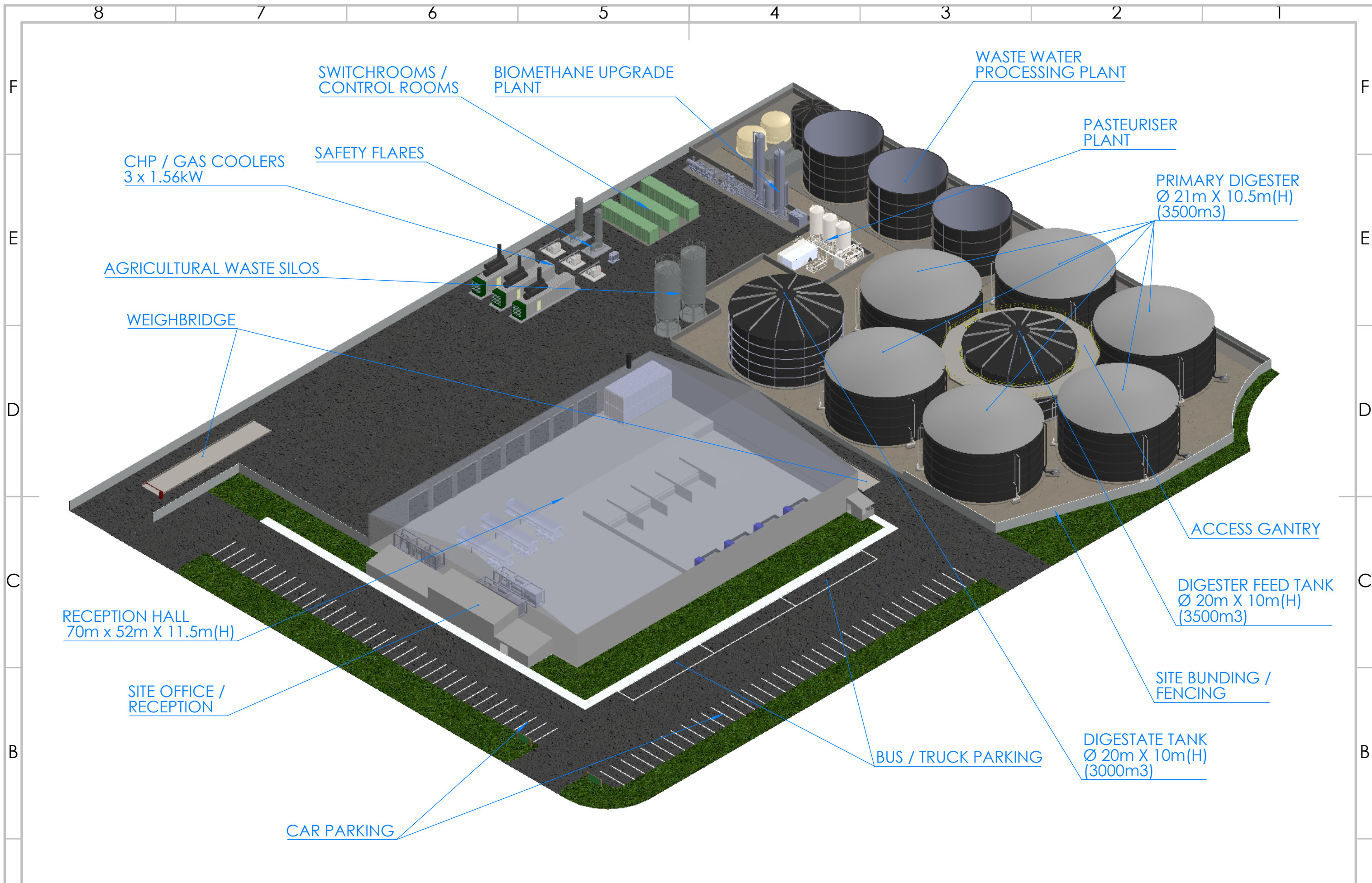
Appendix 3 – Sensitive Receptor Map

Appendix 4 – Stakeholder Engagement

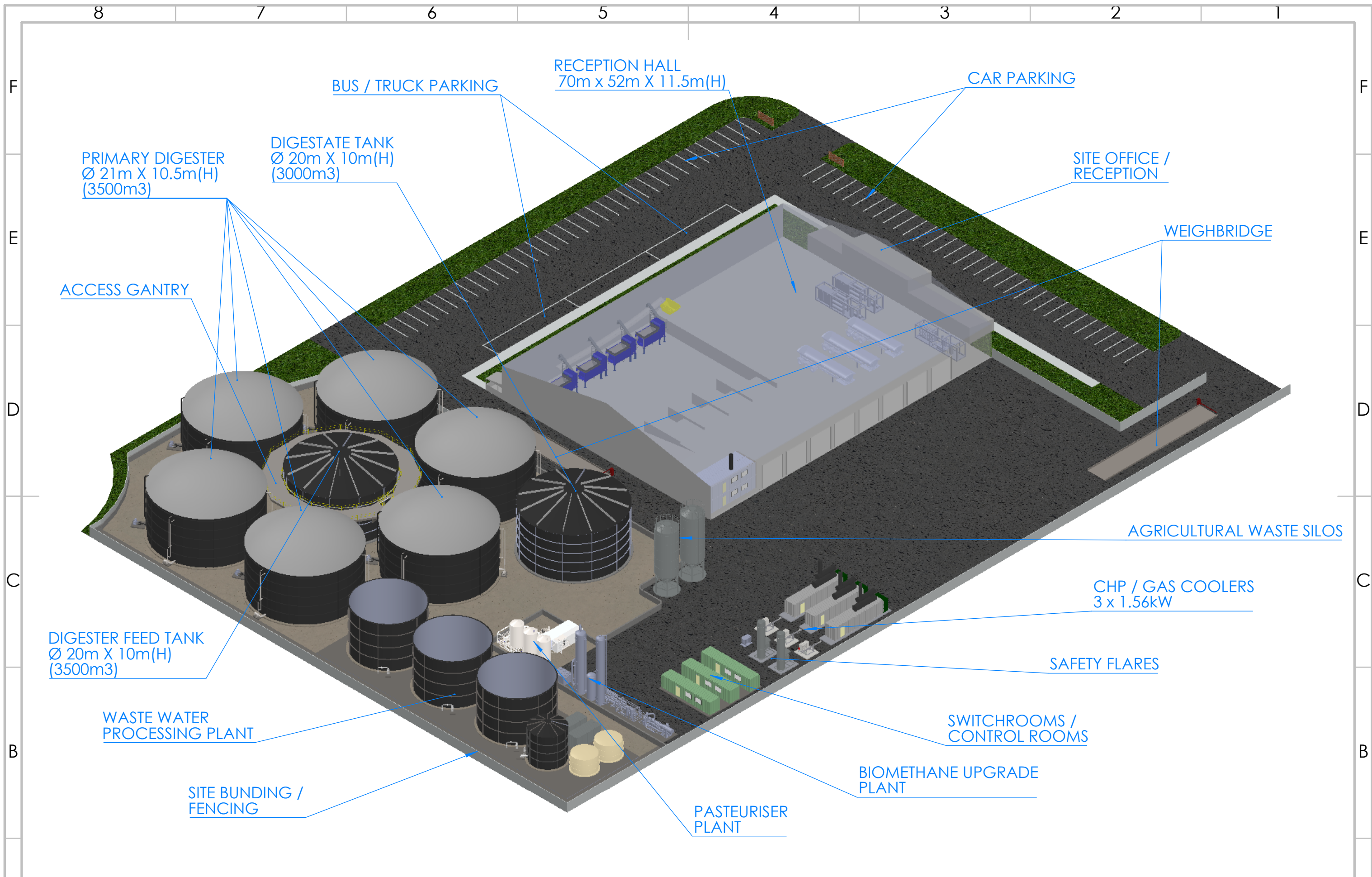
Appendix 5 – GHG Emissions Calculations

Appendix 6 – HAZOP Risk Assessment

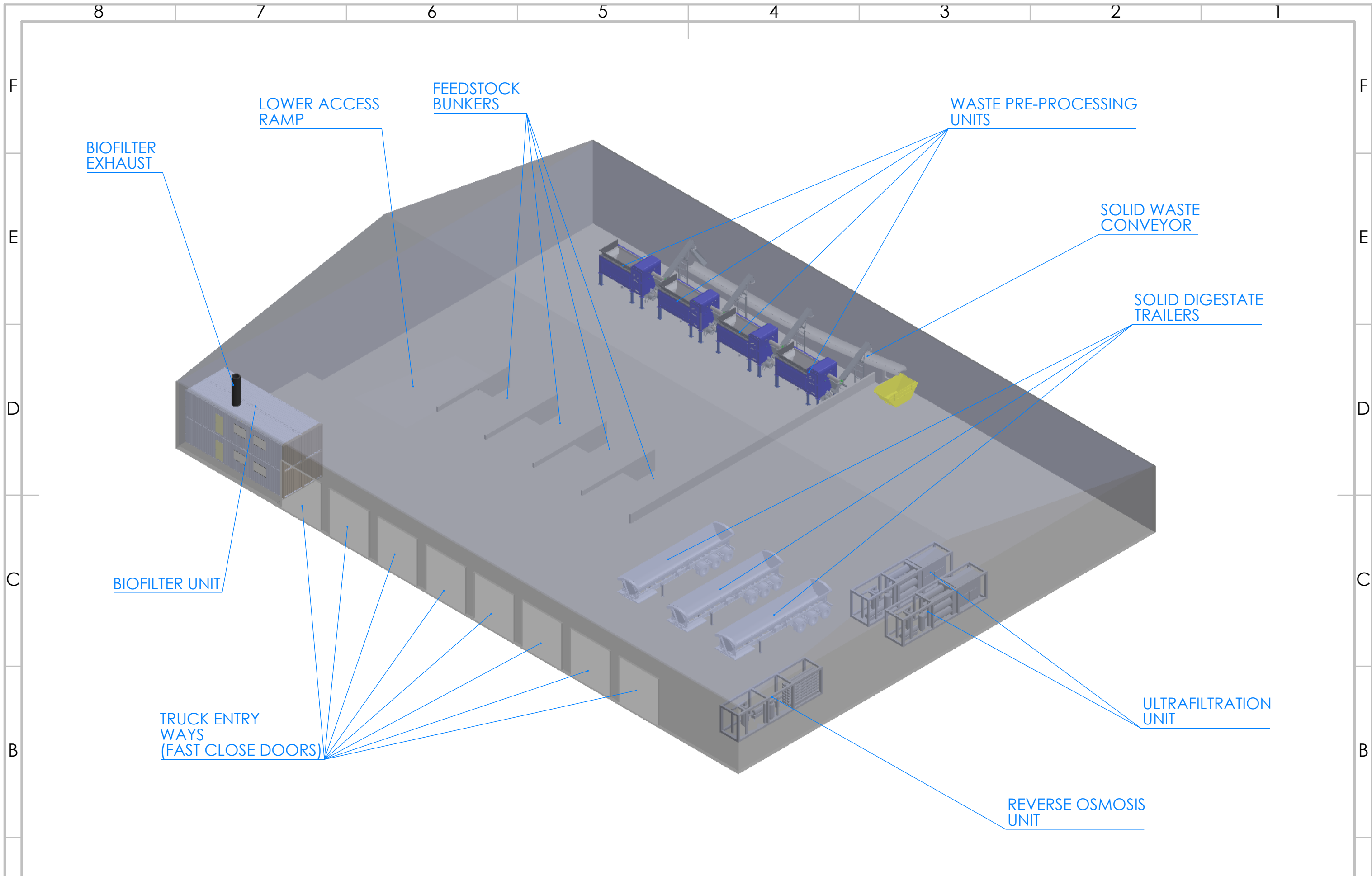
Appendix 1 – Site Plan



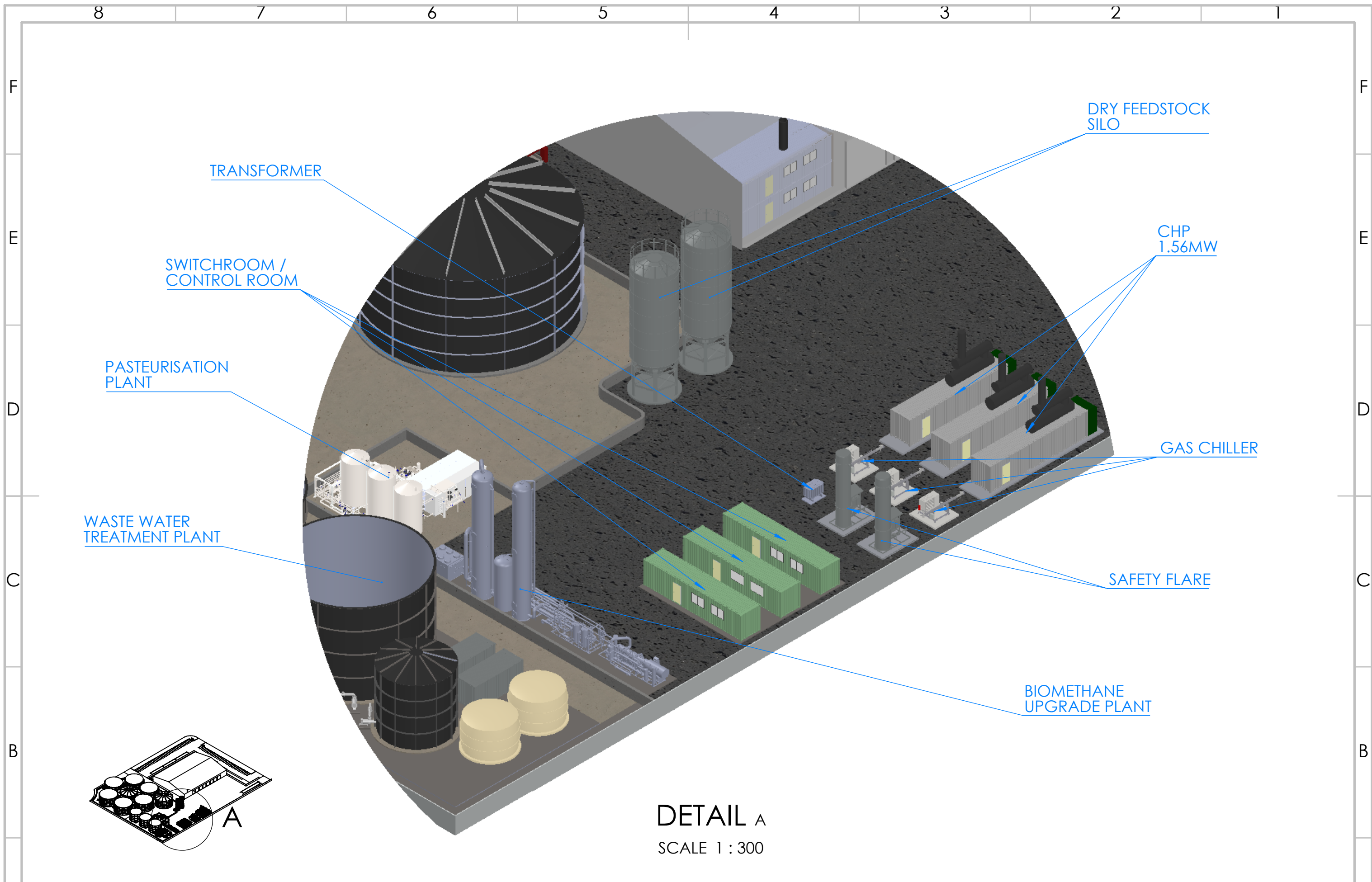
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REVISION	REVISION DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED	ALL DIMENSIONS IN mm	SCALE 1:600	DWG NO. J116-001	SHEET NO. 1 OF 8	REV 0			



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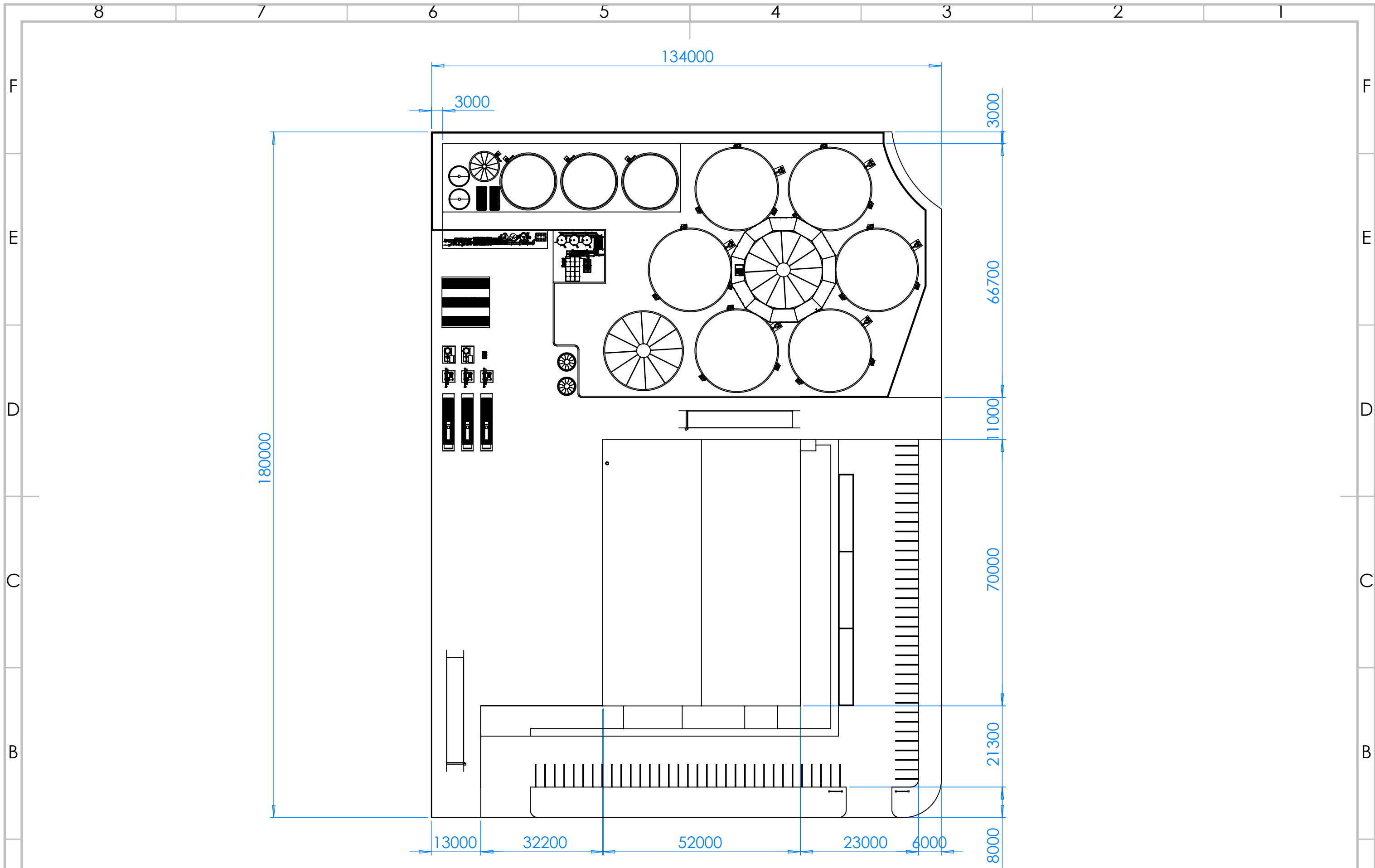


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DETAIL A
SCALE 1 : 300

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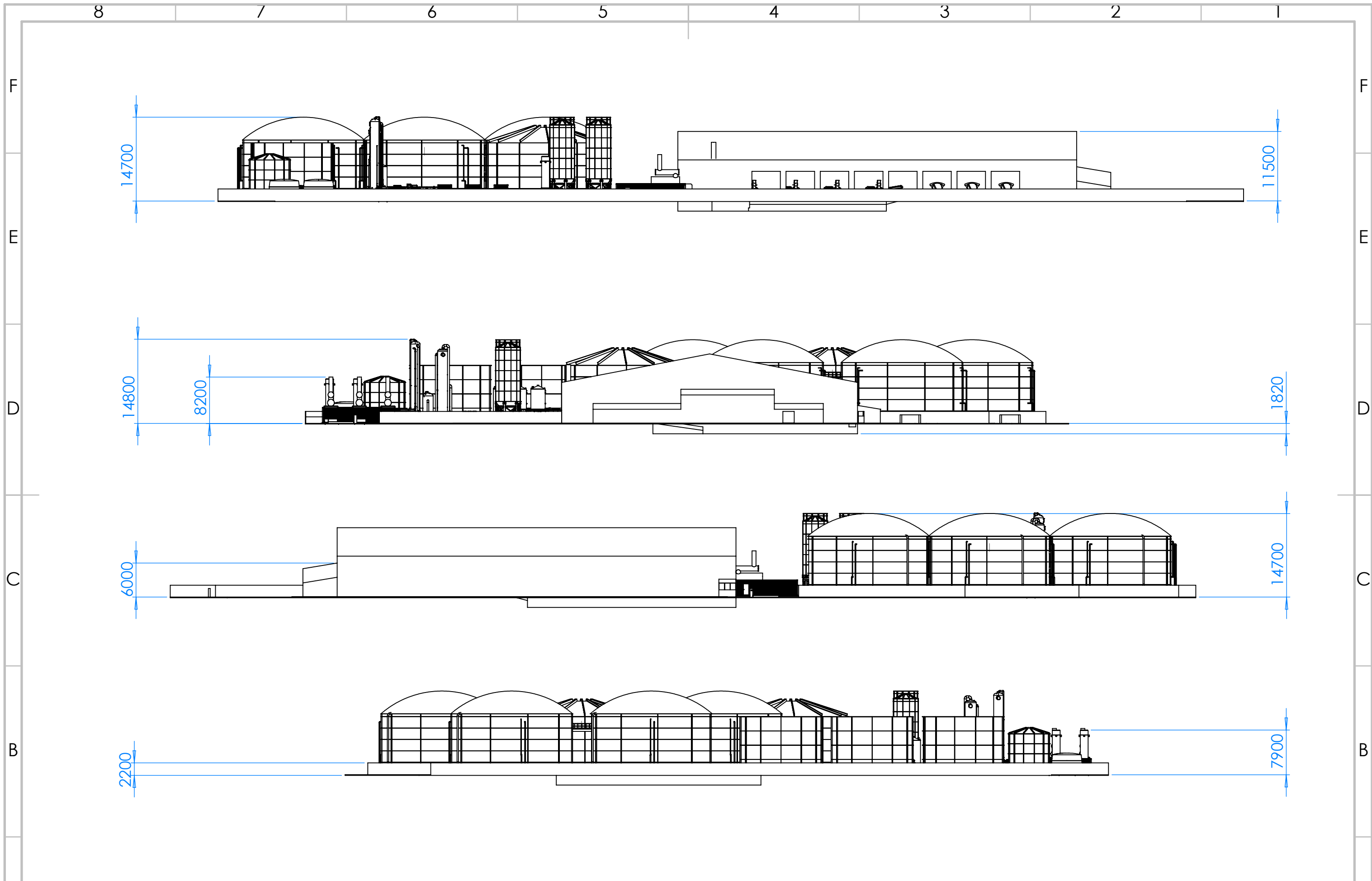
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 CONCEPT LAYOUT
 SCALE 1:900
 DWG NO. J116-001 SHEET NO. 5 OF 8
 REV 0



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 ALL DIMENSIONS IN mm

TITLE: SALISBURY AD PLANT
 CONCEPT LAYOUT
 SCALE 1:2000
 DWG NO. J116-001 SHEET NO. 7 OF 8
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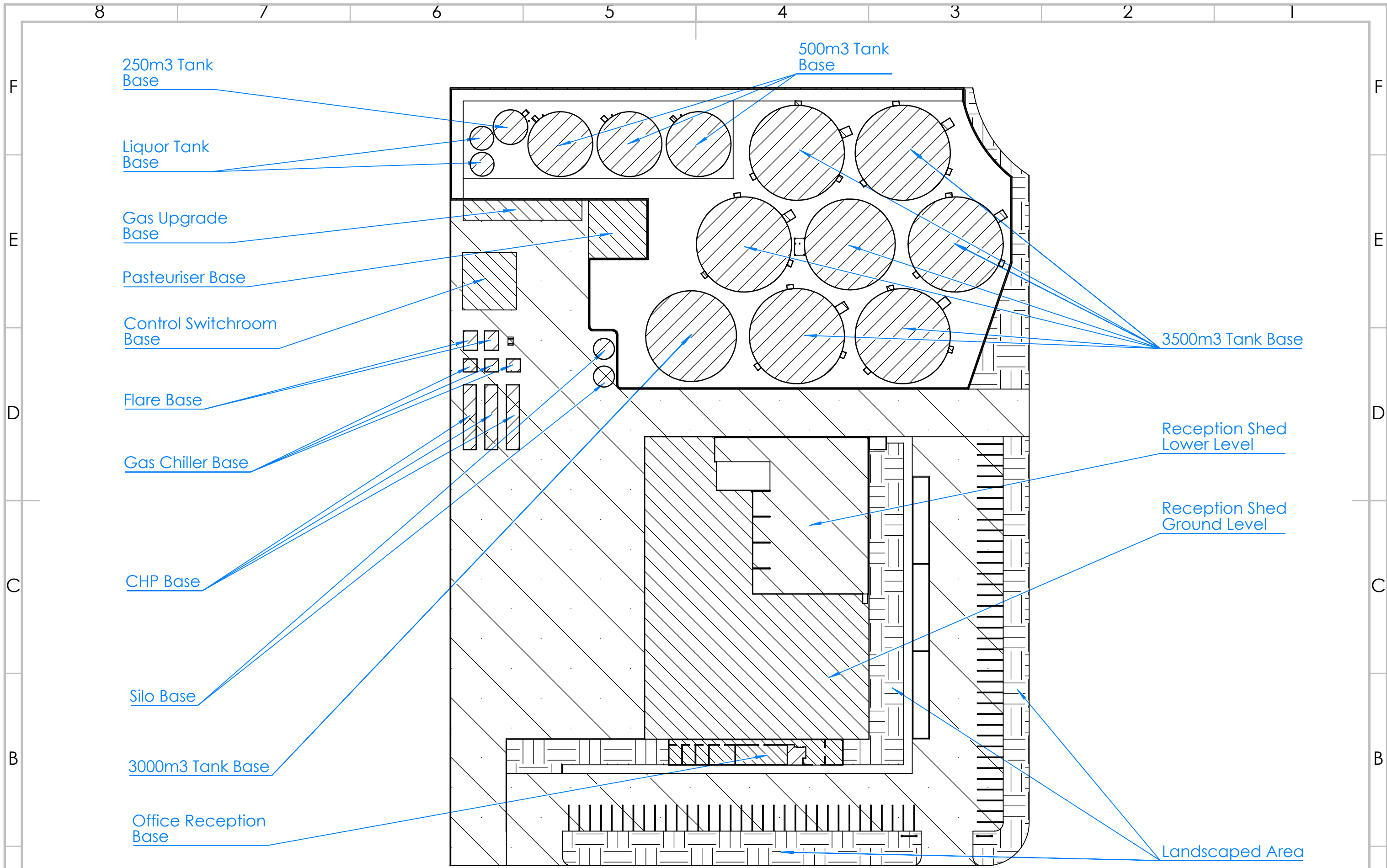
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CLIENT: FOOD ENERGY
 PROJECT NO: J116
 ALL DIMENSIONS IN mm
 SCALE 1:2200

TITLE: SALISBURY AD PLANT
 CONCEPT LAYOUT
 DWG NO. J116-001 SHEET NO. 8 OF 8
 REV 0

8 7 6 5 4 3 2 1



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CLIENT: FOOD ENERGY
 PROJECT NO: J116

ALL DIMENSIONS IN mm SCALE 1:800

TITLE: SALISBURY AD PLANT
 CONCEPT CIVILS LAYOUT

DWG NO. J116-002 SHEET NO. 1 OF 1 REV 0

Appendix 2 – Location Map – Lot 505

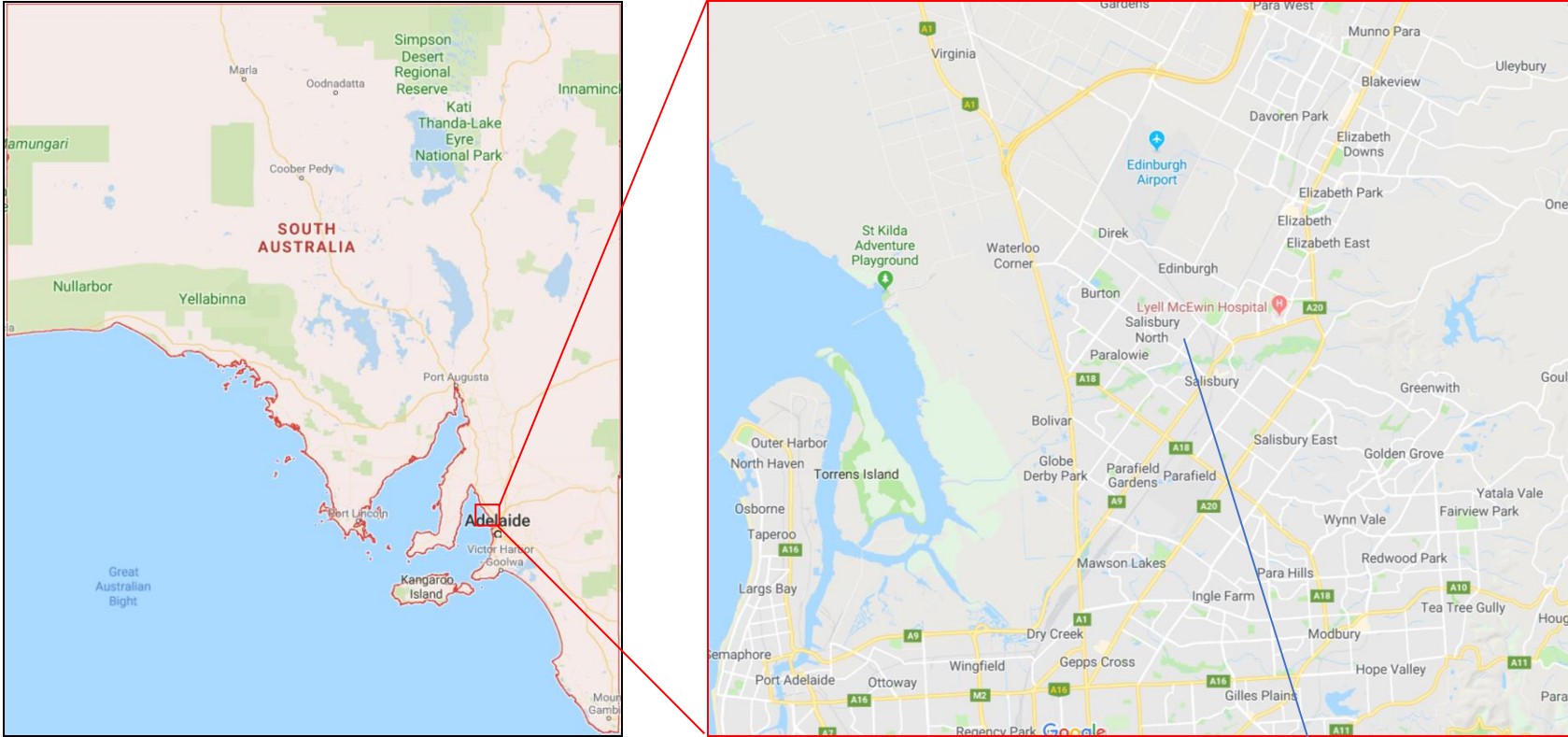


Figure 1 - Site Location Aerial

[Source: Google Maps]

1-2 Gidgie Ct,
Edinburgh SA 5111



Figure 2 - Aerial close-up of site location and surrounds

[Source: Google Maps]

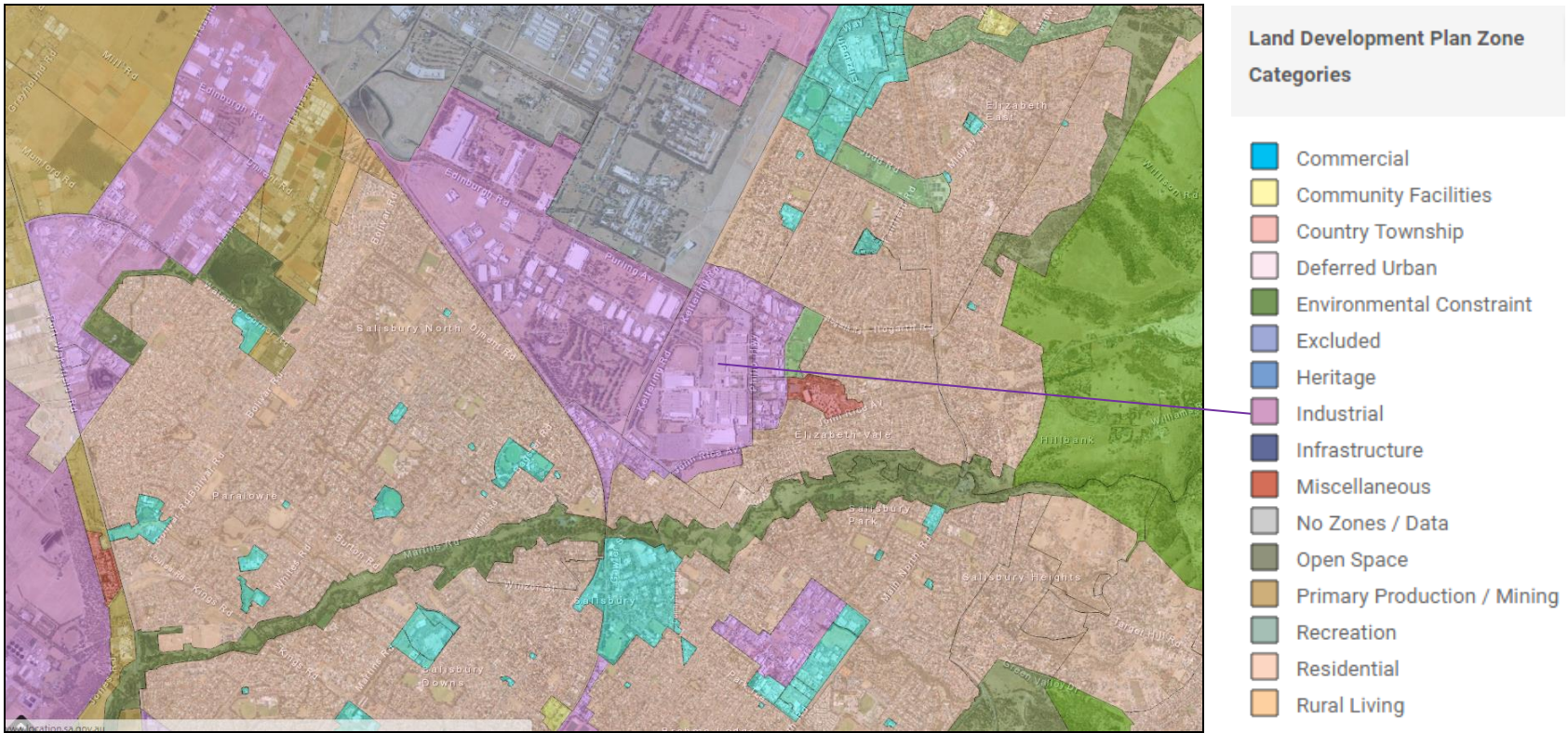


Figure 3 - Zoning Map for Site Location

[Source: location.sa.gov.au]

Appendix 3 – Sensitive Receptors Map – Lot 505



No.	Distance from Property / Activity Boundary	Sensitive Receptor
0	0m	Proposed Site Location (Lot 505)
1	7m	Northern Adelaide Waste Management Authority
2	18m	GTS Freight Management
3	18m	Mayfield
4	18m	Coats Hire
5	15m	Ahrns Handling Equipment
6	15m	DSA SA
7	68m	Commercial / Industrial
8	75m	Edinburgh Parks Nursery
9	115m	Commercial / Industrial
10	175m	Commercial / Industrial
11	205m	Commercial / Industrial
12	175m	Print Lord
13	260m	Commercial / Industrial
14	280m	ZF Lemforder
15	290m	Commercial / Industrial
16	410m	Cape
17	460m	Residential Housing

Note: Closest residential sensitive receptor is 460m from proposed site location

Appendix 4 – Stakeholder Engagement

Stakeholder Type	Stakeholder	Date	Attendees (Optional)	Comments
Councils	Salisbury Council SA Water	Wed 07-Mar-2018	-Hamish Jolly -CEO John Harry (CEO Salisbury Council) -Charles Mansueto (CEO Salisbury Water) -Nina -General Manager City Development - Terry Sutcliffe -Bruce Naumann	
	SA Water	Fri 16-Feb-2018	-Hamish Jolly -Darryn Pinto -Joe Oliver -Bruce Naumann	
	Council Solutions	Tue 27-Feb-2018	-Darryn Pinto -Bruce Wright -Paul Howlett -Oliver Barry -Taryn Alderdice	
	SRWRA	Wed 28-Mar-2018		
	Onkaparinga Council	Wed 14-Feb-2018	-Ben Calder -Darryn Pinto	Call to discuss council tender
	Playford Council	Wed 30-May-2018	-Darryn Pinto -Playford Council CEO	Northern Adelaide Recovery Centre
SA Government	PIRSA	Sun 25-Mar-2018	-Hamish Jolly -Darryn Pinto -Stephen Dubrich -Joe Oliver	
	PIRSA	Tue 27-Mar-2018	-Darryn Pinto -John Pitt	

DPC	Wed 28-Mar-2018	-Hamish Jolly -Darryn Pinto -Mary Lewitzka	Kick off monthly status update meeting
PIRSA	Thu 29-Mar-2018	-Darryn Pinto -John Pitt	Area visit - Virginia Park
PIRSA	Sat 24-Mar-2018	-Darryn Pinto -David Leach	Discuss Wine Industry Opportunities

Food Park Tennants	Food Park Tenants (Multiple)	Sat 26-May-2018	-Hamish Jolly -Olive Co -La Casa Del Formaggio -Auscold Logistics -Mary Lewitzka -Stephen Dubrich -Nina Parletta	Major/kickoff foodpark engagement meeting
	La Casa Del Formaggio	Sat 26-May-2018	-Darryn Pinto -Sean Pearce (CFO) -Claude (CEO/Owner)	
	Olive Co	Tue 17-Apr-2018	-Darryn Pinto -Steve (GM)	
	Coles	Tue 17-Apr-2018	-Darryn Pinto -Steve (GM)	
	Ingham's	Tue 17-Apr-2018	-Darryn Pinto -Steve (GM)	
	Adelaide Processors	Tue 17-Apr-2018	-Darryn Pinto -Dean (GM)	
	Barossa Fine Foods	Tue 17-Apr-2018	-Darryn Pinto -David Jones (Ops Manager)	

Organic Waste Producers	SA Produce Markets	Wed 14-Feb-2018	-Hamish Jolly -Darryn Pinto -Karen Butler (Facilities Manager)
	Peats Soils	Wed 14-Feb-2018	-Hamish Jolly -Peter Wadiwiz (CEO)
	Pendleton Fine Foods	Wed 14-Feb-2018	-Darryn Pinto -Nick Whiting (CEO)
	Gourmet Poultry	Tue 27-Mar-2018	-Darryn Pinto -Hamish Campbell
	Baiada Poultry	Wed 28-Mar-2018	-Darryn Pinto -Dada Hu (SA GM)
	SA Mushrooms	Thu 19-Apr-2018	-Darryn Pinto -Nick Fernia (CEO)
	SA Chamber of Produce	Tue 08-May-2018	-Darryn Pinto -George Giameos
	Tip Top	Tue 08-May-2018	-Darryn Pinto -Peter Thorpe
	Tuckers Natural	Wed 09-May-2018	-Darryn Pinto -Andrew Keil (GM Ops)

Appendix 4 - GHG Emissions Calculations

Baseline - Avoided emissions from landfill

Source	Production	Emissions Factor	CO2-e
	Tonnes/year	kg CO2-e/kg	Tonnes/year
Food Waste	125,000	1.9	237,500

Baseline - Avoided emissions from alternative fossil fuels

Source	Offset	Production		Emissions Factor	CO2-e
		MW/h	MW/year	kg CO2-e/kWh	Tonnes/year
Electricity	Fossil Fuels	4.7	41,172	0.56	23,056

TOTAL GHG Emissions Avoided	260,556	Tonnes/year
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AD Facility Emissions

Source	Consumption	Energy Content Factor	Emissions Factor	CO2-e
	L/year	GJ/kL	kg CO2-e/GJ	Tonnes/year
Diesel Consumption	39,624	38.6	70.5	107,829
LPG Consumption	5,200	26.2	61.5	8,379

Source	Consumption	Energy Content Factor	Emissions Factor	CO2-e
	m3/year	GJ/m3	kg CO2-e/GJ	Tonnes/year
Biogas for Electricity Combustion	15,768,000	0.0337	4.83	2,567

Total GHG Emissions Produced	118,774	Tonnes/year
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Net GHG Emissions Avoided	141,782	Tonnes/year
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972H Wheel Loader

Fuel Consumption	19.05	L/h
Operating Hours	2,080	h/year
Annual Fuel Consumption	39,624	L/year

RX70 Forklift

Fuel Consumption	2.5	L/h
Operating Hours	2,080	h/year
Annual Fuel Consumption	5,200	L/year

Biogas	25,500,000	m3/year
Electricity	15,768,000	m3/year
Biomethane	9,732,000	m3/year

Table 41: Waste mix methane conversion factors

Waste types	Default DOC proportion	Conversion factor CO ₂ -e (t=tonnes)
	A	B
Food	0.15	t x 1.9

State or Territory	Emission factor kg CO ₂ -e/kWh
New South Wales and Australian Capital Territory	0.84
Victoria	1.13
Queensland	0.79
South Australia	0.56
South West Interconnected System (SWIS) in Western Australia	0.76
North Western Interconnected System (NWIS) in Western Australia	0.66
Darwin Katherine Interconnected System (DKIS) in the Northern Territory	0.57
Tasmania	0.12
Northern Territory	0.67

Sources: National Greenhouse and Energy Reporting (Measurement) Determination 2008 (Schedule 1) and Department of the Environment.

Table 37: Scope 3 emission factors – natural gas for a product that is not ethane (inclusive of coal seam gas)

State or territory	Natural Gas EF for scope 3	
	Metro	Non-metro
	kg CO ₂ -e /GJ	kg CO ₂ -e /GJ
New South Wales and ACT	12.8	13.6
Victoria	3.9	3.9
Queensland	8.7	7.8
South Australia	10.4	10.3
Western Australia	4.0	3.9
Tasmania	NA	NA
Northern Territory	NA	NA

Source: Wilkenfeld and Associates (2012), derived from NGER data

Table 4: Fuel combustion emission factors - fuels used for transport energy purposes

Transport equipment type	Fuel combusted	Energy content factor (GJ/kL unless otherwise indicated)	Emission factor kg CO ₂ -e/GJ (relevant oxidation factors incorporated)		
			CO ₂	CH ₄	N ₂ O
General transport					
	Gasoline (other than for use as fuel in an aircraft)	34.2	67.4	0.5	1.8
	Diesel oil	38.6	69.9	0.1	0.5
	Gasoline for use as fuel in an aircraft	33.1	67.0	0.05	0.7
	Kerosene for use as fuel in an aircraft	36.8	69.6	0.01	0.6
	Fuel oil	39.7	73.6	0.07	0.6
	Liquefied petroleum gas	26.2	60.2	0.6	0.7

Table 2: Emission factors for the consumption of natural gas

Fuel combusted	Energy content factor (GJ/m ³ unless otherwise indicated)	Emission factor kg CO ₂ -e/GJ (relevant oxidation factors incorporated)		
		CO ₂	CH ₄	N ₂ O
Natural gas distributed in a pipeline	39.3 × 10 ⁻³	51.4	0.1	0.03
Coal seam methane that is captured for combustion	37.7 × 10 ⁻³	51.4	0.2	0.03
Coal mine waste gas that is captured for combustion	37.7 × 10 ⁻³	51.9	4.1	0.03
Compressed natural gas (reverting to standard conditions)	39.3 × 10 ⁻³	51.4	0.1	0.03
Unprocessed natural gas	39.3 × 10 ⁻³	51.4	0.1	0.03
Ethane	62.9 × 10 ⁻³	56.5	0.03	0.03
Coke oven gas	18.1 × 10 ⁻³	37.0	0.03	0.05
Blast furnace gas	4.0 × 10 ⁻³	234.0	0.0	0.03
Town gas	39.0 × 10 ⁻³	60.2	0.0	0.03
Liquefied natural gas	25.3 GJ/kL	51.4	0.1	0.03
Gaseous fossil fuels other than those mentioned in the items above	39.3 × 10 ⁻³	51.4	0.1	0.03
Landfill biogas that is captured for combustion (methane only)	37.7 × 10 ⁻³	0.0	4.8	0.03
Sludge biogas that is captured for combustion (methane only)	37.7 × 10 ⁻³	0.0	4.8	0.03
A biogas that is captured for combustion, other than those mentioned in the items above	37.7 × 10 ⁻³	0.0	4.8	0.03

Appendix 6 – HAZOP Risk Assessment

HAZOP/ RISK ASSESSMENT Study Record Sheet

HAZOP No: HAZ-J116-001

Meeting Held on: 1 June 2018

Meeting Held at:

1205 Hay St, West Perth WA 6005

Project: Edinburgh SA

Present:

Hamish Jolly

Joseph Oliver

Martyn Anderson

Jonathan Luu

Secretary: Joseph Oliver

Chairman: Hamish Jolly

GENERAL BACKGROUND

The following minutes summarise the HAZOP / Risk Assessment conducted for the proposed waste-to-energy facility.

The key objective of the workshop was to identify hazards and operability issues associated with the proposed installation of the plant.

WORK SCOPE ITEMS

Major items in the project scope are summarised below.

- Waste Receiving & Storage
- Pre-treatment & Mixing
- Hydrolysis & Anaerobic Digestion
- Water recovery & Filtration
- Solids Recovery
- Electricity, Heat and Gas Generation
- Flare System

LIST OF SYSTEMS

System: 1 – Waste Receiving & Storage

System: 2 – Pre-treatment & Mixing

System: 3 – Hydrolysis & Anaerobic Digestion

System: 4 – Water recovery & Filtration

System: 5 – Solids Recovery

System: 6 – Electricity, Heat & Gas Generation

System: 7 - Flare

No	Category	Cause	Consequence	Safeguards	Action Required	Action Cat	Action By	Decision/Status/ Document Reference	Completed Y/N	Date
System: 1 – Waste Reveal & Storage										
1.1	Inputs	Incorrect or excess material delivered to site	Operational issues Compliance Personnel health	Standard Operating Procedures (SOP) / Training Receival Procedures to check incoming materials. Fast and same day processing Quality Checks and Monitoring 2 days storage volume in receival bunkers	SOP / Training Create receival procedures manual					
1.2	Mechanical Equipment	Failure of tanks, pipework or mechanical instruments	Overfill of tanks, pipework and instrumentation Potential for leaks and spills Potential personnel hazard	Standard Operating Procedures (SOP) / Training Flow-meters / Pressure sensors with interlocks to pumps Tank gauges with high alarms Bunded areas Drainage sump	SOP / Training Install sensors and interlocks Install bunding Install drainage sump					

No	Category	Cause	Consequence	Safeguards	Action Required	Action Cat	Action By	Decision/Status/ Document Reference	Completed	
									Y/N	Date
1.3	Process Control	Electrical Failure	Loss of system control	Electrical Interlocks	Ensure equipment stops if process control system failure					
1.4	Environmental	Failure to contain odours	Potential localized odours	<p>Process occurs in enclosed waste receipt, storage and handling building</p> <p>Biofilter / ozone / odour treatment on exhaust</p> <p>Bunded areas</p> <p>Drainage sump</p> <p>Fast and same day processing</p>	<p>Install appropriate equipment</p> <p>Install bunding</p> <p>Install drainage sump</p>					
1.5	OHS	<p>Machinery Hazards</p> <p>Noxious Odours</p> <p>Bio Hazards</p>	Operator Safety	<p>Standard Operating Procedures (SOP) / Training</p> <p>PPE</p> <p>Guards and interlocks</p>	<p>SOP / Training</p> <p>Supply appropriate PPE</p> <p>Guards and interlocks installed</p>					

No	Category	Cause	Consequence	Safeguards	Action Required	Action Cat	Action By	Decision/Status/ Document Reference	Completed Y/N	Date
System: 2 – Pre-treatment & Mixing										
2.1	Inputs	Incorrect or excess material entering system	Operational issues Compliance	Standard Operating Procedures (SOP) / Training Quality Checks and Monitoring	SOP / Training					
2.2	Mechanical Equipment	Failure of tanks, pipework or mechanical instruments	Overfill of tanks, pipework and instrumentation Potential for leaks and spills Potential personnel hazard	Standard Operating Procedures (SOP) / Training Flow-meters / Pressure sensors with interlocks to pumps Tank gauges with high alarms Bunded areas Drainage sump	SOP / Training Install sensors and interlocks Install bunding Install drainage sump					
2.3	Process Control	Electrical Failure	Loss of system control	Electrical Interlocks	Ensure equipment stops if process control system failure					

No	Category	Cause	Consequence	Safeguards	Action Required	Action Cat	Action By	Decision/Status/ Document Reference	Completed	
									Y/N	Date
2.4	Environmental	Failure to contain odours	Potential localized odours	Fully enclosed system Bunded areas Drainage sump	Install appropriate equipment Install bunding Install drainage sump					
2.5	OHS	Machinery Hazards Noxious Odours Bio Hazards	Operator Safety	Standard Operating Procedures (SOP) / Training PPE Guards and interlocks Fully enclosed system	SOP / Training Supply appropriate PPE Guards and interlocks installed					
System: 3 – Hydrolysis & Anaerobic Digestion										
3.1	Inputs	Incorrect or excess material entering system	Operational issues Compliance	Standard Operating Procedures (SOP) / Training Quality Checks and Monitoring	SOP / Training					

No	Category	Cause	Consequence	Safeguards	Action Required	Action Cat	Action By	Decision/Status/ Document Reference	Completed	
									Y/N	Date
3.2	Mechanical Equipment	Failure of tanks, pipework or mechanical instruments	<p>Overfill of tanks, pipework and instrumentation</p> <p>Potential for leaks and spills</p> <p>Potential personnel hazard</p>	<p>Flow-meters / Pressure sensors with interlocks to pumps</p> <p>Tank gauges with high alarms</p> <p>Standard Operating Procedures (SOP) / Training</p> <p>Bunded areas</p> <p>Drainage sump</p>	<p>Install sensors and interlocks</p> <p>SOP / Training</p> <p>Install bunding</p> <p>Install drainage sump</p>					
3.3	Process Control	Electrical Failure	Loss of system control	Electrical Interlocks	Ensure equipment stops if process control system failure					
3.4	Environmental	Failure to contain odours	Potential localized odours	<p>Fully enclosed system</p> <p>Bunded areas</p> <p>Drainage sump</p>	<p>Install appropriate equipment</p> <p>Install bunding</p> <p>Install drainage sump</p>					

No	Category	Cause	Consequence	Safeguards	Action Required	Action Cat	Action By	Decision/Status/ Document Reference	Completed	
									Y/N	Date
3.5	OHS	Machinery Hazards Noxious Odours Bio Hazards	Operator safety	Standard Operating Procedures (SOP) / Training PPE Guards and interlocks Fully enclosed system	SOP / Training Supply appropriate PPE Guards and interlocks installed					
3.6	Gas Discharge	Blockage in gas line Excess gas pressure / production	Potential leaks to environment Pressure build-up and release Fire potential Potential release of H2S, GHG and odour	Oxygen micro-dosing to convert H2S into H2O and sulphates Release of gas through pressure relief valve Pressure / flow sensors with interlocks to relief valve Tank gauges with high alarms Flare system backup	H2S monitoring with alarms Installation of flame proof equipment Install sensors and interlocks with alarms Firefighting equipment Supply appropriate PPE					
System: 4 – Water Recovery & Filtration										
4.1	Inputs	Incorrect or excess material entering system	Operational issues Compliance	Standard Operating Procedures (SOP) / Training Quality Checks and Monitoring	SOP / Training					

No	Category	Cause	Consequence	Safeguards	Action Required	Action Cat	Action By	Decision/Status/ Document Reference	Completed	
									Y/N	Date
4.2	Mechanical Equipment	Failure of tanks, pipework or mechanical instruments	<p>Overfill of tanks, pipework and instrumentation</p> <p>Potential for leaks and spills</p> <p>Potential personnel hazard</p>	<p>Flow-meters / Pressure sensors with interlocks to pumps</p> <p>Tank gauges with high alarms</p> <p>Standard Operating Procedures (SOP) / Training</p> <p>Bunded areas</p> <p>Drainage sump</p>	<p>Install sensors and interlocks</p> <p>SOP / Training</p> <p>Install bunding</p> <p>Install drainage sump</p>					
4.3	Process Control	Electrical Failure	Loss of system control	Electrical Interlocks	Ensure equipment stops if process control system failure					
4.4	Environmental	Failure to contain odours	Potential localized odours	<p>Fully enclosed system</p> <p>Bunded areas</p> <p>Drainage sump</p>	<p>Install appropriate equipment</p> <p>Install bunding</p> <p>Install drainage sump</p>					

No	Category	Cause	Consequence	Safeguards	Action Required	Action Cat	Action By	Decision/Status/ Document Reference	Completed	
									Y/N	Date
4.5	OHS	Machinery Hazards Noxious Odours Bio Hazards	Operator safety	Standard Operating Procedures (SOP) / Training PPE Guards and interlocks Fully enclosed system	SOP / Training Supply appropriate PPE Guards and interlocks installed					
System 5: Solids Recovery										
5.1	Inputs	Incorrect or excess material entering system	Operational issues Compliance	Standard Operating Procedures (SOP) / Training Quality Checks and Monitoring	SOP / Training					
5.2	Mechanical Equipment	Failure of tanks, pipework or mechanical instruments	Overflow of tanks, pipework and instrumentation Potential for leaks and spills Potential personnel hazard	Flow-meters / Pressure sensors with interlocks to pumps Tank gauges with high alarms Standard Operating Procedures (SOP) / Training Bunded areas Drainage sump	Install sensors and interlocks SOP / Training Install bunding Install drainage sump					

No	Category	Cause	Consequence	Safeguards	Action Required	Action Cat	Action By	Decision/Status/ Document Reference	Completed	
									Y/N	Date
5.3	Process Control	Electrical Failure	Loss of system control	Electrical Interlocks	Ensure equipment stops if process control system failure					
5.4	Environmental	Failure to contain odours	Potential localized odours	<p>Process occurs in enclosed waste receipt, storage and handling building</p> <p>Biofilter / ozone / odour treatment on exhaust</p> <p>Fast and same day processing</p> <p>Bunded areas</p> <p>Drainage sump</p>	<p>Install appropriate equipment</p> <p>Install bunding</p> <p>Install drainage sump</p>					
5.5	OHS	<p>Machinery Hazards</p> <p>Noxious Odours</p> <p>Bio Hazards</p>	Operator safety	<p>Standard Operating Procedures (SOP) / Training</p> <p>PPE</p> <p>Guards and interlocks</p> <p>Fully enclosed system</p>	<p>SOP / Training</p> <p>Supply appropriate PPE</p> <p>Guards and interlocks installed</p>					
System: 6 – Electricity, Heat and Gas Generation										

No	Category	Cause	Consequence	Safeguards	Action Required	Action Cat	Action By	Decision/Status/ Document Reference	Completed	
									Y/N	Date
6.1	Inputs	Incorrect or excess material entering system	Operational issues Compliance	Standard Operating Procedures (SOP) / Training Quality Checks and Monitoring Flare system backup	SOP / Training					
6.2	Process Control	Electrical Failure	Loss of system control	Electrical Interlocks	Ensure equipment stops if process control system failure					
6.3	OHS	Machinery Hazards Noxious Odours	Operator safety	Standard Operating Procedures (SOP) / Training PPE Guards and interlocks	SOP / Training Supply appropriate PPE Guards and interlocks installed					
6.4	Gas Discharge	Leak in gas line Excess gas pressure / production	Potential leaks to environment Pressure build-up and release Fire potential	Pressure / flow sensors with interlocks Flare system backup	Install sensors and interlocks with alarms Firefighting equipment Supply appropriate PPE					

No	Category	Cause	Consequence	Safeguards	Action Required	Action Cat	Action By	Decision/Status/ Document Reference	Completed	
									Y/N	Date
6.5	Environmental	Noise barrier failure Catalytic converter failure	High noise level GHG Emissions	House generator in container to provide noise barrier Catalytic Converter on CHP exhaust stack	Install appropriate equipment					
6.6	Temperature	CHP unit failure	High temperature damage to unit Fire potential	Standard Operating Procedures (SOP) / Training Temperature sensors and interlocks / shutdown Fire protection Leak detectors PPE	SOP / Training Supply appropriate PPE Install fire protection					
System: 7 – Flare System										

No	Category	Cause	Consequence	Safeguards	Action Required	Action Cat	Action By	Decision/Status/ Document Reference	Completed	
									Y/N	Date
7.1	Inputs	Incorrect or excess material entering system	Incomplete burning Flame smoking Increased radiant heat Increase flame noise Operational issues Compliance	Standard Operating Procedures (SOP) / Training Quality Checks and Monitoring Barriers and “Hot” signs near flare	SOP / Training PPE Design to Australian Standards Install barriers and signs					
7.2	Process Control	Electrical Failure	Loss of system control	Electrical Interlocks System to shut in fail safe mode	Ensure equipment stops if process control system failure Install fail safe system					
7.3	OHS	Equipment hazards Noxious Odours	Operator safety	Standard Operating Procedures (SOP) / Training PPE Guards and interlocks	SOP / Training Supply appropriate PPE Guards and interlocks installed					

No	Category	Cause	Consequence	Safeguards	Action Required	Action Cat	Action By	Decision/Status/ Document Reference	Completed	
									Y/N	Date
7.4	Gas Discharge	Leak in gas line Excess gas pressure / production	Potential leaks to environment Pressure build-up and release Fire potential	Pressure / flow sensors with interlocks Flare system backup Leak detectors	Install sensors and interlocks with alarms Firefighting equipment PPE					
7.5	Environmental	Flaring failure / issues	Incorrect gas discharge Noise from operation	Standard Operating Procedures (SOP) / Training Equipment testing	SOP / Training Install appropriate equipment Design to Australian Standards Commissioning					
7.6	Flow	Blockage in flare	Build-up of gases in stack Potential for ignition in stack	Flow-meters / Pressure sensors with interlocks Design in check valve and liquid seal to prevent reverse flow Pressure relief valve to atmosphere	Install check valve and liquid seal					

No	Category	Cause	Consequence	Safeguards	Action Required	Action Cat	Action By	Decision/Status/ Document Reference	Completed	
									Y/N	Date
7.7	Temperature	Large volume of gas burning	Radiant Heat	Operator PPE Barriers and "Hot" signs near flare	Install sensors and alarms Supply appropriate PPE Install barriers and signs					



DELOREAN ENERGY



**ENVIRONMENT
MANAGEMENT PLAN**

Contents

Scope	3
Project Delivery Arrangements	4
Transition from Biogass to Delorean Energy	4
Environmental Obligations	5
EPA Requirements for Scheduled Premises	5
The Environmental Management Framework.	6
Risk Management	6
Procurement.....	7
Environmental Roles and Responsibilities	7
Control of Records	9
Competency, Training and Awareness.....	9
Induction and Awareness.....	9
Project Induction.....	10
Visitor Induction	10
Competency	10
Biogass Personnel	10
Subcontractors and Consultants.....	10
Training	11
Developing and Sourcing Appropriate Training Programmes.....	11
Scheduling and Delivering Training.....	11
Maintaining Qualifications/Skills and Records.....	11
Enquiries and Complaints Management.....	12
Construction Works.....	12
Incident and Emergency Preparedness.....	13
Attachment 1	15
Environmental Risk Register	15
Attachment 2	16
Environmental Obligations Register	16
Attachment 3	17
Risk Rating System.....	17
Attachment 4	18
Environmental Incident Response Plan.....	18

Scope

This Environmental Management Plan (EMP) describes the system for minimising and managing environmental risks associated with Project activities. The Project EMP has been prepared in accordance with Biogass' Environmental Management System. The key purposes of this Project EMP are to:

- ensure that project activities include measures to effectively manage potential and actual impacts to the environment and community
- ensure compliance with the contractual Project arrangements including the Project Scope and Project Requirements
- implement Biogass Environmental Policy
- provide certainty of delivery of the prescribed environmental outcomes for relevant project activities
- implement a system for legislative and contractual compliance
- establish mitigation and management measures to achieve the environmental requirements of the Project, having regard to the risks posed to the environment
- develop, implement and monitor management measures
- establish the environmental management requirements for subsidiary environmental management documentation including the Environmental Obligations Register, Environmental Risk Register and Environmental Monitoring Schedule.
- enable continual improvement

Project Delivery Arrangements

Food Energy in conjunction with Delorean Energy has contracted Biogass Renewables to Engineer, Procure and construct the Anaerobic Digestion facility to be located in Edinburgh, North of Adelaide.

Transition from Biogass to Delorean Energy

The Project states that the transfer of ownership of the constructed site commences following Preliminary Commercial Acceptance (PCA) and that the EMP governs all project activities and applies to any design and construction activities to the extent that they are carried out during the development and construction period.

A detailed environmental risk assessment of the Project activities will be applied. This environmental risk assessment involved rating:

- Pre-Site Construction – this risk rating recognises the future design, installation and verification of existing controls, such as engineered preventative and control measures
- Mid Construction phase – this risk rating recognises the additional controls, particularly the specifications from the relevant Manuals.

The purpose of the environmental risk assessment is to capture the risks related to project activities.

The inclusion of the existing controls associated with various phases within the design, construction and verification when considering the pre-site construction risk, recognises that the Project has sought to 'design-out' unacceptable impacts and risks to the environment, in accordance with the Performance Requirements.

Therefore, due to the project design, the overall environmental risk associated with activities is established.

The controls ensure the residual environmental risk associated with the operation and maintenance of the completed project is appropriately managed.

The operations are continuously monitored and controlled by the Supervisory Control and Data Acquisition (SCADA) system which provides the operator interface, including data trending and alarming.

When a parameter diverges from its set point, the control system automatically corrects the process to remain within the operating range. If the parameter still exceeds the operating range or if its trend is likely to do so, an alarm is automatically sent to the operator requesting a corrective action. If the corrective action is not effective or if no corrective action is taken by the operator, the control system will automatically shut down the system (or part of it) to prevent any negative effects on the process, asset or environment.

The process control and monitoring is complemented by the following:

- routine manual sampling and analysis program
- routine maintenance, checks and calibration of all instruments and equipment as specified by the Maintenance Management System (MMS)
- routine operation inspections and monitoring
- all systems and procedures are documented and specified in the associated Manuals.

All personnel receive continuous training to ensure their competency for all related activities is verified. The Operational and Maintenance controls, coupled with the Design and Construction verification, ensure the activities are delivered in accordance with the Performance Requirements, minimising the environmental impact of the Project.

Environmental Obligations

The Environmental Obligations Register (Attachment 2) identifies all Commonwealth and State environmental requirements (legislation, approvals, licences, permits and policies), and the Project requirements relevant to the Design & Construction activities and is used to track compliance with environmental obligations and requirements.

The Biogas Project Manager is responsible for managing the approvals process for these activities related to the Project and for regularly updating and maintaining the Environmental Obligations Register.

A working copy of the Obligations Register, which includes means to comply with each obligation, permit or approval, will be completed on a monthly basis to track progress against the requirements.

The Project Manager will use the Obligations Register to track ongoing performance against obligations, including being able to:

- describe the obligation's relevance to the activities
- identify the relevant approval holders
- refer to the document where the obligation was obtained
- reference the regulatory body which will govern regulatory compliance for the particular obligation
- describe how the obligations have and will be complied with by defining the document which details the compliance measure or the specific action that closes out the obligation
- define how compliance will be monitored.

The Project Manager will update this on a monthly basis, as part of the preparation of the monthly report. The current working version is available on the Project's document management system.

EPA Requirements for Scheduled Premises

In accordance with the Environment Protection Regulations the project will need to consider the relationship for

- prescribed premises activities
- controlled waste components

As a scheduled (prescribed) premises the project will be subject to a works approval and licensing provisions of the South Australia Environment Protection Act 1993.

As a result, the South Australian State requires a Works Approval and Commissioning Approvals and prior to the issuing of an operational Licence.

Biogass Renewables Project team complies with the requirements of the relevant Works Approval, Commissioning Approvals and Licence through implementation of this Environmental Management Plan.

As these are revised and issued, this Plan will be reviewed and updated accordingly.

The Project Manager will track ongoing performance against these requirements and provide detail in the monthly report.

The Environmental Management Framework.

This Environmental Management plan has been prepared in accordance with Biogass' Project Standard Operating Procedures 6.0.

Biogass' System describes the Project development and approval process. The Project will be subject to an Environmental Effects Statement (EES) in the Projects state, and to approval under other relevant legislation:

- ie: The Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

The fundamental output from the EES process will establish the Performance Requirements (PRs) for the Project. The PRs define the minimum environmental performance required for the Project to ensure that it will deliver on the environmental expectations of the community and key stakeholders.

Risk Management

The Environmental Effects Statement for the Project will enable the environmental risk assessment process to be applied. This considers the environmental risks for each activity across the project, the potential environmental hazard resulting from those activities and the potential environmental impacts. The likelihood and severity of the post design & construction raw risk is then determined (using the rating system in Attachment 3), recognising the design, installation and verification of existing design and construction phase controls, such as engineered preventative and control measures (e.g. deliberate modularisation of the pipework that allows for efficient transitioning between production rates). The risk register then identifies appropriate controls for Operational and Maintenance activities to manage this post design & construction raw risk, including reference to the relevant Operational and Maintenance Manuals and management plans. The likelihood and severity of the residual risk is then determined (using the rating system in Attachment 3).

The environmental risk assessment will be developed with input from relevant Project stakeholders and Biogass personnel.

The purpose of the environmental risk assessment is to capture the risks related to Operations and Maintenance activities. The inclusion of the existing controls associated with Design & Construction phase and verification when considering the raw risk recognises that the Project has sought to 'design-out' unacceptable impacts and risks to the environment, in accordance with the Performance Requirements.

The environmental risk assessment identifies the preventative measures required to minimise the risk of incidents and emergencies. Potential emergency situations are also identified. The risk register should be reviewed at least annually during the Operational and Maintenance phase or at other times such as when new aspects or impacts are identified or new activities proposed. This will take account of any new work or procedures, incorporate monitoring and investigation results, and any issues raised by stakeholders. Changes to the risk register will then be required.

Procurement

Procurement will be conducted in accordance with Biogass's procurement requirements, which requires the subcontract documentation and process to take account a number of considerations, including environment.

The subcontract and supplier documentation includes the relevant requirements of the project for environment.

Evaluation of tenders, subcontractors and suppliers includes evaluation of their environmental performance, environmental factors of supplies and history.

Biogass, the Project Manager or delegate will assist in the environmental evaluation required during procurement processes.

Environmental Roles and Responsibilities

The environmental roles and responsibilities are detailed below

Role	Responsibilities
Project Manager	<ul style="list-style-type: none"> - Overall responsibility for project construction, including for ensuring that all activities are carried out in an environmentally sound manner - Provide leadership, support and adequate resources for the achievement of environmental objectives, including that the requirements of the PRs and environmental laws and regulations are met - Responsible for discussions with various contractors and sub-contractors of the project and reporting to the Biogass Management Team. - Manage and comply with all state and federal legislation and regulations related to environment - Provide management and direction in relation to protecting the environment - Manage and actively participate in all site environmental initiatives - Ensure compliance to the project's environmental requirements by: <ul style="list-style-type: none"> o conducting regular audits and reviews of systems

	<ul style="list-style-type: none"> ○ developing procedures and managing training requirements when and if required - Ensure that environmental risks related to construction activities are properly managed - Facilitate an effective involvement of project personnel in the maintenance and development of the EMP.
Biogass Management	<ul style="list-style-type: none"> - Responsible for ensuring that Biogass satisfies all its contractual, legal and reporting requirements in accordance with the Project Contract - Assist the Project team to achieve compliance - Ensure third party certification for specific standards - Provide interface with Management Systems - Coordinate if required any community related activities - Provide advice and assistance in relation to any environmental issues that may occur on the project site. - Supervising the Project Manager
Health, Safety and Environment Officer	<ul style="list-style-type: none"> - Identify, administer and support environmental management for Project activities and assist the Biogass Management to: <ul style="list-style-type: none"> ○ Proactively and positively work with the regulators and authorities to ensure compliance with environmental standards ○ Provide support on environmental compliance and environmental monitoring - Manage the implementation of this EMP, including in relation to: <ul style="list-style-type: none"> ○ competency, training and awareness ○ measurement and evaluation, including monitoring, auditing, inspecting, reviewing, reporting on environmental performance and the operation of this EMP ○ management review and continual improvement - Liaise with Biogass Management to provide advice, monitoring and reporting on environmental matters (Project, Regulators and Community) - Assist the Biogass Management in managing the relationship between the Project, the regulators and authorities, particularly in relation to compliance with environmental standards. - Lead the provision of advice to the Project Manager in areas of environmental risk management and delivery - Assist in managing incidents, near-hits and complaints.
All other staff, employees and contractors	<ul style="list-style-type: none"> - Comply with environmental procedures and risk mitigation measures - Conduct regular environmental inspections in accordance with job responsibilities - If there is likelihood of damage occurring to the environment as a result of activities, notify their supervisor, and take appropriate corrective action including ceasing work activities, procedures or similar corrective actions - Ensure communication external to the Project regarding incidents occurs through the designated channels. - Share lessons and contribute to Project's knowledge

Control of Records

The following environmental records will be retained for the period specified in the Project Manual:

- legislative updates
- licences and permits
- approvals
- environmental training and induction activities
- monitoring results
- details of non-conformances and corrective/preventive actions/improvements
- incident or complaints reports □ results of environmental audits □ results of management reviews
- inspection, calibration and maintenance activities
- records of hazardous material waste sent for off-site disposal
- correspondence.

All records are to be:

- legible and clearly identifiable
- traceable via referencing to a specific requirement, procedure or this Environmental Management Plan.

The Project Manager is responsible for maintaining environmental records for the Project, except as nominated in other relevant management plans.

Competency, Training and Awareness

Induction and Awareness

All personnel, subcontractors, consultants and visitors will receive inductions into environmental obligations prior to commencing work on site.

All environmental inductions will be conducted as part of the site induction. The site induction will be reviewed regularly or in the event of a substantial change to an environmental procedure, to ensure it reflects current working practice.

Records will be maintained of all inductions conducted, including:

- names and signatures of personnel attending
- date of attendance
- name of trainer/facilitator.

Induction records will be generated, controlled and maintained within the document management system.

Where Project personnel have a specific role in developing or implementing the EMP, the Project Manager or delegate will induct personnel into the relevant requirements of this EMP. These personnel will not commence work on activities that could have an impact on the environment until this has been completed.

Project Induction

All personnel operating at Project-wide level will be required to attend a general Project induction. The Project Manager or delegate must conduct environmental inductions. These will communicate relevant Project-wide environmental requirements so that all personnel are aware of and understand the rules they are required to conform with and the impacts they are to avoid.

The topics addressed in the Project inductions shall include:

- duties under environmental legislation and contractual requirements
- specific environmental objectives and mitigation measures established in this plan
- responsibilities under this plan in relation to implementing mitigation measures, monitoring, reporting and implementing corrective actions
- definition, management and responsibilities in the event of an environmental incident
- the consequences of not implementing mitigation measures or departure from specified operating conditions
- internal and external communication processes and protocols
- community awareness and sensitivities, and cultural perspectives and expectations

Visitor Induction

All visitors going onto site must undergo a visitor's induction. Consultants and subcontractors are responsible for the actions and conduct of their visitors and must ensure that all visitors obey the site environmental requirements.

Visitor inductions may be provided for:

- personnel working short-term on the Project where they are not undertaking physical works and there is minimal potential for environmental harm

All visitors must be accompanied at all times. Under no circumstances may a visitor undertake any physical work onsite.

Competency

Biogas Personnel

Biogas will ensure that all personnel are suitably qualified or experienced to undertake their work in an environmentally responsible manner. Personnel are selected on the basis of skills, experience and cultural fit. Where a training need is identified, arrangements will be made for the appropriate training and development in line with the individual's needs.

Where necessary, assistance will be provided until the required competency level has been attained.

Subcontractors and Consultants

The competency of subcontractors and consultants to perform their environmental responsibilities will be specified and assessed as part of the procurement process. Following appointment, where a subcontractor or consultant proves not competent to perform their environmental responsibilities, the contract manager is responsible for taking remedial action which includes:

- communication and an agreed action plan with the subcontractor or consultant
- training by Biogass of the relevant personnel
- additional support to the subcontractor or consultant
- taking remedies under the contract.

Training

This section outlines environmental training requirements including:

- identifying training needs and skill gaps
- developing and sourcing appropriate training programmes scheduling and delivering training
- maintaining qualifications/skills and records.

The Project Manager, will monitor all contractors and where required coordinate training for relevant personnel and assess the effectiveness of the training.

The Project Manager, together with the Project contractors for each new starter, identify training needs and skill gaps relevant to the delivery of the project environmental requirements and the effective implementation of the EMP.

The training will include:

- familiarization with the environmental performance criteria, minimum procedural requirements and other environmental management measures to be met
- emergency and incident response training
- non-compliance and preventative action training
- monitoring, reporting and auditing obligations
- consortium member specific training (e.g. training on the Management System, non-compliances, monitoring, reporting and auditing)
- awareness programs providing case studies of relevant innovations and case studies demonstrated in the industry.

Developing and Sourcing Appropriate Training Programmes

The Project Manager will be responsible for ensuring the development of existing training programmes and will source materials from others, external providers or develop in-house material and programmes.

Scheduling and Delivering Training

The Project Manager is responsible for ensuring delivery of training and awareness programs to the relevant project teams.

Maintaining Qualifications/Skills and Records

Records and means to maintain competencies, skills and qualifications will be in accordance with the Biogass Standard Operating Procedures 4.0.

The following details must be included in environmental training records:

- name of personnel attending the training
- type of training attended
- date of attendance

- name of trainer
- name of the organisation providing the training
- refresher training requirements

Copies of environmental training records will be retained.

Enquiries and Complaints Management

Strict requirements will apply to the handling of complaints to ensure the cause of the complaint is rectified as soon as possible.

The means by which any enquiries or complaints received from regulatory authorities, interest groups or the general public will be managed in accordance with the Biogass Standard Operating Procedures. These procedures identify key communication mechanisms for enquiries and complaints.

For environmental complaints these include:

- Establishment of a 24-hour contact number
- Recording details of complaint received in respect to environmental Project activities
- Recordings details of actions taken, and response given
- Notification and reporting requirements, intended strategies to reduce complaints or incidents of a similar nature

Details of all complaints including summary of main areas and issues of complaint or the cause of the incident, action taken, response given and intended strategies to reduce complaints or incidents of a similar nature will be reported to Biogass on a monthly basis in the monthly Project Report.

The Project Manager must immediately notify Biogass if a complaint is received in respect to environmental Project activities (for example pollution or non-compliance). Biogass will immediately notify the appropriate State and regulatory bodies.

The complaints process including responses to complaints is detailed in the *Stakeholder Engagement Plan*.

Construction Works

All works conducted on the Project requires a permit to work approved and issued by Biogass. In order for a permit to be issued the work must be assessed and authorised by an appointed Biogass Representative, appropriately risk assessed (including environmental aspects), planned and controlled.

All personnel conducting the work must be inducted, appropriately trained for the task and understand the permit conditions. Environmental controls relevant to the works will be identified during the permit, risk assessment and planning processes and implemented using any of the following tools appropriate to the work:

- Job safety and environmental analysis
 - o a low to medium level, activity-specific risk assessment and planning tool which will identify the specific environmental management measures

- developed and implemented for the specific construction activity being undertaken.
- Pre-construction surveys will be completed as required.
- Work method statement
 - a high level, activity-specific risk assessment and step by step planning tool, which details all steps involved in a particular construction activity along with their respective risk control measures.
 - This will identify key environmental risks for construction activities and include a written methodology and current Site Environmental Plan to diagrammatically show appropriate controls and mitigation measures to ensure that Project objectives, targets and obligations are achieved
- Procedures – detailed task specific work instruction that are used to control specific activities. Environmental controls will be incorporated into specific procedures as part of the Work Pack development
- Site environmental plan
 - where there are significant environmental issues to be managed, a site environmental plan may be developed for the site.
 - This plan will detail practical environmental management measures to be implemented at specific worksites to minimise potential impacts of construction activity on the environment and community.
 - The preparation of a site environmental plan involves a detailed assessment of environmental and community risks for the proposed construction activities.
 - Most of the information contained will be presented in A3 and A1 formats to make them easy to use by all site personnel and subcontractors.
 - Site environmental plans are intended to be used at the site level and be displayed within the crib huts / lunch rooms.

If required by Biogass a Work Pack may be developed and will include an assessment of environmental obligations, including identifying all Commonwealth and State environmental requirements (legislation, approvals, licences, permits and policies) and the relevant Project Performance Requirements.

Relevant Manuals will be consulted for information on existing conditions.

The Project Manager is required to consult with contractors and review work permits with identified

high environmental risks prior to the permit being issued and works commencing.

The Project Manager or delegate will monitor and inspect any works in accordance with any relevant environmental requirements, including permit conditions, relevant Project Performance Requirements. All permits and associated documents will be maintained in accordance with the Biogass Project Standard Operating Procedures 6.0.

Incident and Emergency Preparedness

Incident and emergency preparedness, response and recovery Incident and emergency scenarios are identified in the Environmental Risk Register.

Environmental incidents and emergency preparedness and response will be managed in accordance with the Environmental Incident Response Plan (EIRP) (see Attachment 4).

The EIRP integrates with the Incident Management Plan and as such covers environmental incidents only. The EIRP provides a standard approach for the notification, recording, classification, investigation and reporting of all work related incidents, including those involving sub-contractors, other persons working on site, ensuring safe and effective handling of incident situations.

The EIRP also provides contact details and specific timeframes for relevant authorities that may need to be notified in the event of an environmental emergency.

The EIRP will be reviewed and, where applicable, updated after any major incident. For environmental incidents and emergencies, the EIRP:

- defines a procedure to manage incident situations
- ensures that the impact of an incident on the environment is minimised
- ensures that the continuity of operations is maintained through implementation of effective environmental incident management procedures and response plans
- ensures that appropriate internal reporting procedures are in place that include prompt notification to Biogass management and other required agencies
- ensures that communications protocols result in a coordinated public response, including any public reporting obligations
- ensures that results of all incidents are assessed, reported and corrective actions implemented.

As well as Biogass's responsibilities, the EIRP set out the responsibilities of the Contractors to participate in managing, responding to and investigating incidents.

The Project Manager has a key role to play in managing environmental incidents and reviewing the EMPs, procedures and tools following incidents, near-hits and complaints.

The Project Manager will be responsible for ensuring that environmental emergency procedures are available and to provide the means to ensure that relevant personnel are trained and equipped to deal with a range of situations, to include but not be limited to:

- fuel spills
- chemical spills
- ground contamination.

The induction will detail the relevant emergency response requirements. A master contacts list of incident / emergency response personnel will be kept in the EIRP (not distributed widely) and updated as regularly as required.

Attachment 1

Environmental Risk Register

Incident and emergency preparedness, response and recovery Incident and emergency scenarios for the Project site will be established. The completion of a site specific Environmental Risk Register Form prior to commencement of construction will be required. The Project Manager with support from delegated persons will assist in the completion of the form.

ENVIRONMENT Risk Assessment Register



No.	Activity/Task	Describe Hazard	Risk Assessment (before control measures)			Controls	Risk Ranking (after control measures)		
			Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
1.	DUST	Dust produced as a result of construction on site and associated project work							
2.	NOISE	Noise produced as a result of construction on site and associated project work							
3.	ODOUR	Odour emitted as a result of construction on site and associated project work							
4.	VERMIN	Vermin on project site as a result of construction work							
5.	LEACHATE	Leachate as a result of the construction on site and associated project work							
6.									
7.									
8.									
9.									
10.									

F 017

Upon completion the original form is to be filed within the Workplace Health and Safety master file

Attachment 2

Environmental Obligations Register

This Register identifies all Commonwealth and State environmental requirements (legislation, approvals, licences, permits and policies), and the Project requirements relevant to the Design & Construction activities.

ENVIRONMENT Risk Assessment Register



No.	Activity/Task	Describe Hazard	Risk Assessment (before control measures)			Controls	Risk Ranking (after control measures)		
			Likelihood	Consequence	Risk		Likelihood	Consequence	Risk

F 017

Upon completion the original form is to be filed within the Workplace Health and Safety master file

ENVIRONMENT Risk Assessment Register



No.	Activity/Task	Describe Hazard	Risk Assessment (before control measures)			Controls	Risk Ranking (after control measures)		
			Likelihood	Consequence	Risk		Likelihood	Consequence	Risk

Environment Obligations Register



#	Project Site Name: Delorean Energy	Action	Date
	General Environmental Duty – Environment Protection Act 1993	Not to contribute to or to unnecessarily pollute the environment in any way	
	General Environmental Duty – Environment Protection Regulations 2009	Not to contribute to or to unnecessarily pollute the environment in any way	
	General Environmental Duty – Environment Protection Policy	Not to contribute to or to unnecessarily pollute the environment in any way	
	General Environmental Duty – National Environment Protection Measures	Achieve agreed national objectives for protecting and managing particular aspects of the environment	

PS001

Upon completion the original form is to be filed within the Project Site Master File

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Page 1 of 2

Environment Obligations Register



PS001

Upon completion the original form is to be filed within the Project Site Master File

Attachment 3

Risk Rating System

The tabulated risk rating system is to assist in assessing the risk. When determining the risk rating of an identified environmental risk factor, consideration of the likelihood of the environmental incident occurring against the severity of the consequences if the incident occurs is required. Whilst taking into account the existing systems and controls at the Project Site.

Likelihood of injury or harm to Environment	Consequences of any incident or harm to Environment				Existing Systems
	Insignificant	Moderate	Major	Catastrophic	How do the existing controls and systems impact on the risk rating? (increase / decrease?)
Very Likely	High	Extreme	Extreme	Extreme	
Likely	Moderate	High	Extreme	Extreme	
Moderate	Low	High	Extreme	Extreme	
Unlikely	Low	Moderate	High	Extreme	
High Unlikely (rare)	Low	Moderate	High	High	



Attachment 4

Environmental Incident Response Plan

All environmental incidents and emergency preparedness and response will be managed in accordance with a project site specific Environmental Incident Response Plan (EIRP).

Delorean Energy

Environmental
Incident Response Plan
(EIRP)

Contents

Purpose	3
Scope.....	3
Regulatory, contractual and other requirements.....	Error! Bookmark not defined.
Preventative measures to minimise the risk of environmental incidents	4
Location of EIRP, information on hazardous substances and spill containment equipment	4
Environmental roles and responsibilities.....	5
Classification of Environmental Incidents.....	6
Environmental Incident Response	7
Environment incident notification	7
Environmental incident notification requirements	7
Emergency Services	7
Environment incident investigation.....	7

Purpose

The purpose of this Environmental Incident Response Plan (EIRP) is to provide project specific details for the identification of and response to potential environmental related incidents for Project activities of the Delorean Energy waste to energy facility.

This EIRP is a document for specific use by the Delorean Energy Team, to respond to management of potential and actual environmental incidents.

It provides guidance on potential environmental incidents, and the mitigation strategies to manage these potential incidents, as well as response to actual incidents, and follow-up and reporting requirements.

This EIRP is a key attachment to the Environment Management Plan (EMP).

It is also a relevant, but not limited to, the following EMP documents:

- Attachment 1 – Environmental Risk Register

Scope

This EIRP has been developed to comply with relevant regulatory requirements for the identified environmental risks, and the environmental incident response requirements of the Project.

For ease of reference, the specific Project are clearly identified in this document.

Emergency / Environmental Incident procedures must detail the actions to be followed in the event of an Incident. An Environmental Incident is defined as any event that causes, has caused or has the potential to cause an Environmental Hazard or Pollution.

The Project Emergency / Environmental Incident procedures must provide the following:

- a) an assessment of the types of Incidents and emergencies that might impact on the environment and their potential causes and consequences
- b) preventative measures required to minimise the risk of Incidents and emergencies which may be incorporated into the Environmental Management Plan
- c) names and contact details of key response authorities including Emergency Services
- d) names of key project response personnel and contact details (including after-hours telephone numbers)
- e) project personnel responsibilities
- f) location of on-site information on hazardous materials and dangerous substances, and spill containment equipment or structures
- g) a procedure for site personnel to follow to minimise/control the emergency/incident e.g. spill management
- h) procedures for notifying the on-site staff, contractors, regulatory agencies, and public, if required

Identification of types of potential incidents and emergencies that could impact on the environment

All activities are assessed as part of the risk assessment process undertaken as a requirement of the EMP, and presented in the Environmental Risk Register. Types of potential incidents associated with

activities that could impact on the environment, and their consequences, are identified and included in the Environmental Risk Register.

An assessment of the potential significance of these risks is included in the Register.

The Environmental Risk Register should be referred to for the identification and significance of potential environmental impacts associated with activities. The Environmental Risk Register also contains details on the control measures. The Environmental Risk Register will be reviewed at least annually during the construction phase or at other times such as when new aspects or impacts are identified or new activities proposed, to ensure that all activities and credible potential incident scenarios are identified.

Preventative measures to minimise the risk of environmental incidents

The likelihood of potentially significant environmental impacts can be reduced and/or the potential impacts mitigated by implementation of appropriate preventative measures. These preventative measures for identified potentially significant environmental issues are documented in the relevant procedures and management plans.

Refer to the Environmental Risk Register for references to relevant procedures and management plans respectively.

The Project Manager will be responsible for providing project personnel with guidance on the implementation of effective measures to appropriately manage the possible occurrence of these potentially significant environmental impacts identified through the risk assessment process. Responsibilities for implementing these measures are identified in the relevant procedures and management plans.

Location of EIRP, information on hazardous substances and spill containment equipment

Paper copies of this EIRP are kept in the project site Emergency Response Packs held by the Project Manager (Incident Coordinator). An inventory of hazardous substances and materials is provided and maintained, and will be available at all times. Copies of this inventory and the Safety Data Sheets (SDS) are accessed at the main project site entrance and at each First Aid Station. In the event of an emergency situation involving hazardous substances, the emergency procedures which include the SDS on hazardous substances or materials, and users with vital information on providing first aid, combating fires and managing spills. This information is accessed at the project site office and at each First Aid Station. The Health Safety & Environment Officer ensures that the current version of the procedures is available to all operation team members and issues controlled or uncontrolled copies to applicable external organisations where necessary.

Emergency management signage is deployed around the site to mark first aid facilities, emergency assembly areas and fire protection services (for further details refer to the Incident Management Plan).

Spill kits are always located near the First Aid Stations and in each active work area. Spill kits are checked as part of the monthly environmental inspection. Additional spill kits and replacement materials are kept onsite in the stores areas.

Environmental roles and responsibilities

Various members of the Delorean Energy Team have responsibilities for minimising the potential for and in responding to environmental incidents.

Table 1 outlines the key team members and levels of authority. Broader environmental management roles and responsibilities associated with Project activities are described in the EMP.

Project Manager	<ul style="list-style-type: none"> - Implements and ensures compliance with the requirements of the Environmental Incident Response Plan. - Ensures adequate funds, resources and allocates responsibilities to effectively develop, implement and maintain the Plan. - Manages all formal communication with external authorities and media as per the Stakeholder Engagement Plan. - Ensures that appropriate reporting to various authorities, EPA and other regulatory agencies is actioned as appropriate, in accordance with the severity and status of the incident (as defined in Attachment ____). - Reviews the outcome and close out of all major incidents with the Delorean Energy Management and Health Safety and Environment Officer. - The Project Manager will be informed in the event of a Class 1 or 2 events immediately or a Class 3 during the current shift. - Responsible for ensuring that all measures to contain, clean up and rectify the event have been completed and where necessary informing the Delorean Energy Management team and EPA and other appropriate regulatory authorities within the specified timeframes. - Reviews the outcome and close out of all major incidents with Delorean Energy Management team - Conduct audits and reviews of the EMS and EMP (including implementation - Ensure that all incidents including Class 3 environmental incidents are reported (as a minimum) on a monthly basis in the Monthly Project Report.
Delorean Energy Management	<ul style="list-style-type: none"> - Ensures Standard Operating Procedures and management plans are implemented to ensure environmental risks are correctly managed in accordance with identified best practices. - Reviews the outcome and close out of all major incidents with the Project Manager and Health Safety and Environment Officer.
Health, Safety, Environment Officer	<ul style="list-style-type: none"> - Participate and lead development of relevant Standard Operating Procedures and management plans to ensure environmental risks are correctly managed in accordance with identified best practices. - Ensure environmental systems are functioning correctly through training, awareness, audits and reviews. - Training includes Environmental Incident classification (Attachment ____) and the notification requirements (Attachment ____). - Advise Project Manager to cease work immediately if observed likely damage to environment. - Inform Project Manager and Delorean Energy Management of corrective actions. - Conduct reviews of the Risk Register during the project phase or at other times such as when new aspects or impacts are identified or new activities proposed

All Delorean Energy staff, employees and contractors	<ul style="list-style-type: none"> - Comply with the management plans and standard operating procedures, particularly environmental risk mitigation measures. - Conduct regular environmental inspections in accordance with job responsibilities. If a likelihood of damage occurring to the environment as a result of Project activities, notify their supervisor, and take appropriate corrective action including following the relevant emergency procedures, Incident Management Plan or similar corrective actions. - Ensure communication external to the project regarding incidents occurs through the designated channels. - All Staff, employees and contractors should inform the Project Manager immediately in the event of a Class 1 or 2 event, and during the current shift for a Class 3 event. - All staff will be made aware of the requirement to notify relevant supervisor and the Project Manager of potential and actual incidents. - All personnel working on the site will be made aware of the internal incident notification requirements through inductions and the procedures. - When on site, all visitors will be under the direction of a fully inducted escort, who will be responsible for that visitor/s at all times including during an emergency event. - Any personnel with incident/ complaint response or incident investigation responsibilities shall be appropriately trained. - The EIRP is principally a document for the Project Manager or delegate to use when responding to potential or actual incidents with environmental issues involved. However, all personnel affected by this EIRP have access to a copy via the Project Management System.

Classification of Environmental Incidents

For the purposes of response and reporting arrangements, environmental Incidents are classified into three classes, as summarised in Table 2.

Table 2. Classes of Environmental Incidents

Class One	Class Two	Class Three
<p>Class One Environmental Incidents create permanent or long-term damage to the environment.</p> <p>This damage will result in the environment taking 12 months or more to return to pre-existing conditions.</p> <p>Cost: > \$50,000 to clean up.</p>	<p>Class Two Environmental Incidents create short to medium term damage to the environment.</p> <p>This damage will result in the environment taking up to 12 months to return to pre-existing conditions.</p> <p>Cost: \$10,000 to \$50,000 to clean up.</p>	<p>Class Three Environmental Incidents typically cause short term or nuisance damage. The damage is easily rectified usually within one day.</p> <p>Class 3 incidents do not cause medium or long-term damage.</p> <p>Cost: < \$10,000 to clean up.</p>

The classifications, including sub-categories are explained in further detail in the Environmental Incident Classification Matrix.

Environmental Incident Response

All environmental incidents will be responded to in accordance with the following documents:

- relevant emergency procedures
- Incident Management Plan

Incidents will be responded to as outlined in the environmental incident response flow chart (Figure 1).

In summary:

1. STOP WORK and NOTIFY INTERNAL Supervisor and Project Environment Manager. (Duty Manager to be notified if the Environment Manager is not available).
2. PREVENT further environmental contamination/ spillage / pollution etc. (if safe to do so)
3. CONTAIN environmental contamination/ spill / pollution
4. CLEAN UP environmental contamination/ spill / pollution
5. Project Manager to NOTIFY EXTERNAL contacts (see section 10) (Duty Manager to provide external notifications if the Environment Manager is not available)

Environment incident notification

Environmental incident notification requirements

A master contacts list of incident / emergency response personnel will be kept in the EIRP (not distributed widely) and updated as regularly as required (Attachment ____).

This notification protocol must be strictly complied with for all Classes of Environmental Incidents. Notification and escalation to Delorean Energy and other stakeholders will follow the Environmental Incident Procedure (Attachment _____).

The Project Manager (or Site Manager if the Project Manager is not available) will report Class 1 and 2 environmental incidents to the Department for Environment and Water (DEW) and the Environmental Protection Authority (EPA) (as relevant) as soon as practicable within 30 minutes of the incident occurring.

Emergency Services

Refer to the Incident Management Plan for notification requirements for all types of incidents. The Emergency Services contact details will be displayed in the Project Site main office and at first aid facilities.

Additionally, site information will be produced to inform personnel of which personnel are primary responders' e.g. first aiders, wardens, site safety representatives.

The Project Manager and contractor management team will coordinate the review and updating of the contact listing details and ensure the current qualifications of the listed persons at a minimum of six monthly intervals.

Environment incident investigation

In the event of an environmental incident, and regardless of severity, the Project Manager will ensure that all incidents are thoroughly investigated with the findings and outcomes recorded and identifying corrective action implemented.

All incident investigations will be undertaken in a timely manner with investigations and reporting timeframes varying based on incident specifics.

All incident investigations will be undertaken in accordance with Incident Management Plan.

A properly planned, executed and followed up incident investigation will have some or all of the following benefits:

- reducing the probability of a repeat of the specific incident
- reducing the probability of related incidents
- reducing the probability of incidents that share some contributing factors with the specific incident
- identifying and initiating action on unrelated problems found as a by-product of the investigation
- providing the data required to detect developing trends that can be analysed to identify specific or recurring problems.

ATTACHMENT 5-A: ENVIRONMENTAL INCIDENT PROCEDURE

All Environmental Incidents (e.g. spills/pollution incidents) (class 1, 2 and 3)

<ol style="list-style-type: none"> 1. STOP WORK and NOTIFY INTERNAL Supervisor and Environment Manager (see 6) (Duty Manager to be notified if the Environment Manager is not available.) 2. PREVENT further environmental contamination/ spillage/ pollution etc. (if safe to do so) 3. CONTAIN environmental contamination/ spill/ pollution etc. 4. CLEAN UP environmental contamination/ spill/ pollution etc. 5. Environment Manager to NOTIFY EXTERNAL contacts (see 6). (Duty Manager to provide external notifications if the Environment Manager is not available.) 6. NOTIFICATION DETAILS: 		
	Internal	External
Environmental Incident Class 3	Notify (1), (2, and (3)	
Environmental Incident Class 2	Notify (1), (2, and (3) Within 30 minutes	Notify (4), (5) and (6) As soon as practicable, within 30 minutes
Environmental Incident Class 1	Notify (1), (2, and (3) Immediately	Notify (4), (5) and (6) As soon as practicable, within 30 minutes
	Name	Contract #
1. Project Manager		
2. Contract Manager		
3. Delorean Energy Manager		
4. Environmental Protection representative		
5. Pollution Watch		
6. Other relevant Authorities		

VICTORIA – Contact List

Emergency Contacts	Telephone Number
Police	000
Ambulance	000
Fire Services	000
State Emergency Services	132 500
Environmental Protection Authority	1300 372 842
Council	
City Council	
Main Roads – hazard reporting & traffic	13 11 70
Dept. of Environment, Land, Water & Planning DEWLP	13 61 86
DEWLP – threatened species	13 61 86
Telecommunications	13 29 99
Electricity Distributor	13 17 99
Hospital	

20181148L001A_Biogass Development Stormwater Management Plan

10 September 2018

Biogass Renewables Pty Ltd
Level 5, Tower 2, 121 King William Street
Adelaide SA, 5000

Attention: Martyn Anderson

BIOGASS DEVELOPMENT STORMWATER MANAGEMENT PLAN

As requested, we have undertaken an assessment of the proposed facility and have prepared the following Stormwater Management Plan (SMP).

Background

Biogass Renewables is proposing to develop a new facility at Gidgie Court, Edinburgh. The site is currently vacant land and lies within the City of Salisbury (Council) local government area. In order to obtain development approval, a SMP must be submitted to Council. The site will consist of a bunded area for tank storage, new buildings and a wastewater treatment plant (WWTP) for the treatment of process water and stormwater.

Requirements

The following Council and Salisbury Water requirements are to be considered:

Council

- Detention of runoff such that the post-development flow rate leaving the site does not exceed the pre-development flow rate, in order to prevent increase in flood risk downstream.
- Management of external flows.
- Water quality to meet state-wide objectives (DEWNR¹), as shown in Table 1.1.

Table 1.1 DEWNR Stormwater Performance Targets

Pollutant	Current best practice performance targets
Total suspended solids (SS)	80% reduction of the untreated urban annual load
Total phosphorus (TP)	60% reduction of the untreated urban annual load
Total nitrogen (TN)	45% reduction of the untreated urban annual load
Litter	90% reduction of the untreated urban annual load
Flows	Maintain discharges to within the capacity of the existing receiving stormwater infrastructure

Salisbury Water

- Maximum flow rate into the Salisbury Water network on Woomera Road of 25 L/s.
- Water quality to meet managed aquifer recharge (MAR) standards.

¹ Department of Environment, Water and Natural Resources (2013) 'Water sensitive urban design'.

Site Operation

As part of the Biogas operations, process water and surface runoff will be treated in the WWTP. The rate of flow through the WWTP is 400 m³/day operating 24 hours per day, 7 days per week. This equates to approximately 4.7 L/s which will mostly be reused within the plant.

Any treated water that is not reused within the plant will be pumped to the Salisbury Water distribution pipe on Woomera Avenue. Salisbury Water have indicated that they can receive a maximum rate of 25 L/s. This is the combined rate for waste water and stormwater inputs into the system, with a connection expected to be on Woomera Avenue. Process water will not be discharged into Council's stormwater network.

Stormwater will be falling on three catchment areas within the site: the bunded area housing various tanks, the roof area and the ground. It is recommended that:

- The bunded area is large enough to capture the full volume of the 1% annual exceedance probability (AEP) 24-hour rainfall event (equivalent to the 100-year average recurrence interval (ARI) event).
- The roof water is captured in tanks and is sent directly to the Salisbury Water distribution pipe in Woomera Avenue at a rate of 20 L/s.
- The surface water is captured in underground tanks and then sent to the WWTP at a maximum rate of 4.7 L/s. This assumes that the WWTP can be used solely for processing of stormwater during high storm periods.

This arrangement ensures a total flow to the distribution pipe of approximately 25 L/s, comprising a maximum flow of 5 L/s from the treatment plant and 20 L/s from the roof area.

Hydrological and Hydraulic Modelling

DRAINS, a hydrological and hydraulic software package, was used to size the various stormwater components for the development including storage tanks, detention tanks and pipe sizes. The parameters used in the model are:

- | | |
|--|-----------------------|
| • Bunded area | 6,913 m ² |
| • Roof area | 3,876 m ² |
| • Surface area | 11,910 m ² |
| • Impervious % (surface area) | 75.5% |
| • Pervious % (surface area) | 24.5% |
| • Impervious depression storage | 1 mm |
| • Pervious depression storage (pre-development) | 30 mm |
| • Pervious depression storage (post-development) | 45 mm |
| • Continuing loss | 3 mm/hr |
| • Impervious time of concentration | 5 min |
| • Pervious time of concentration | 20 min |

Stormwater Management Plan

The SMP has been prepared such that the receiving drainage systems are protected from potential site contaminants, sediments and an increase in runoff volumes. Each of the three catchments are being managed differently as outlined below and illustrated on the SMP attached to the end of this letter.

Bunded Area

The bunded area is likely to be contaminated with suspended solids, hydrocarbons and other pollutants from the plant equipment. Therefore, no stormwater is to overflow from the bunded area and spill towards Council's drainage system untreated. It is recommended that stormwater up to and including the 1% AEP 24-hour event is retained within the bunded area. The stormwater is to be held within this area until such time that it can be processed through the onsite WWTP.

The DRAINS model indicates that the total volume of stormwater runoff within the bunded area for a 1% AEP 24-hour event is 720 m³. Based on the site layout drawings and tank sizes provided by Biogas, this

results in a flood depth of approximately 220 mm. Biogass will need to ensure that infrastructure within the bunded area is protected from stormwater flooding. As such, any critical infrastructure should be set with a floor level at least 300 mm above this flood depth.

The EPA² requires the bund volume to be large enough to contain 120% of the volume of the largest tank. Given the large volume of the proposed tanks, the relatively small stormwater volume within the bunded area will not be the determining factor of the bund height.

All stormwater falling within the bunded area is to be treated through the WWTP, before being reused within the plant or pumped to the Salisbury Water distribution pipe. This can be achieved using a sump pump system. It is recommended that at least two pumps are installed within the stormwater sump, with a combined flow rate of 4.7 L/s. Only one pump will be necessary for everyday small flows, with both pumps in operation for larger flows. The pumps should operate alternatively between storm events so that they are both regularly used and the risk of pump failure is minimised.

The time required to pump 720 m³ of stormwater at a rate of 4.7 L/s is in the order of 42 hours. Therefore, during major storm events the WWTP should be used solely for the processing of stormwater with usual process water bypassing the WWTP.

Roof Runoff

Stormwater from buildings is considered 'clean'. Salisbury Water has confirmed it will accept uncontaminated water directly from the roofing area. As such, it has been assumed in the calculations that roof runoff won't be processed through the WWTP.

Roof water can be directed to rainwater tanks for use within the operation of the plant or other non-potable uses if needed. The minimum size of rainwater tanks is 1,000 L, however Biogass will need to determine the tank size that is required for their purposes.

Additional tanks will be needed to store excess roof runoff whilst it is pumped to the Salisbury Water distribution pipe. It is recommended that these tanks are sized to hold up to the 1 exceedance per year (EY) event (equivalent to the 1-year ARI event), with a maximum pump outflow rate of 20 L/s. This arrangement is expected to capture most rainfall events for supply to the Salisbury Water network and therefore a larger system is not considered practicable.

The DRAINS model indicates that a tank with a capacity of 10 kL and a two stage pump arrangement would allow all events up to the 1 EY event to be pumped to the Salisbury Water distribution pipe. This could be a single tank with diameter of 2.5 m and height of 2 m, or multiple tanks in series providing the same volume. It is recommended that two pumps are installed in the tank which can operate independently or together depending on the incoming runoff volume. The pumps should operate alternatively between storm events so that they are both regularly used and the risk of pump failure is minimised.

Events exceeding the 1 EY event are to overflow to an underground detention tank (see Surface Runoff section below).

The size of this storage tank is flexible depending on Biogass' operations. If the tank size is changed or eliminated, then the detention tank volume will need to be reviewed. This can be finalised during the detailed design stage.

We have assumed that the capacity within the Salisbury Water distribution main won't be reduced due to low demand during the wet season.

Surface Runoff

Stormwater runoff from the ground is to be directed to an underground storage tank where the excess volume is stored until such time that it can be processed through the WWTP. It is recommended that

² Environment Protection Authority South Australia (2016) 'Bunding and spill management', EPA 080/16.

primary treatment devices consisting of a gross pollutant trap (GPT) and oil/grit separator be installed, allowing surface runoff to be treated prior to discharge into the underground tank.

The storage tank has been sized assuming that the runoff volume from a 1 EY event can be processed through the plant at a rate of 4.7 L/s. The DRAINS model indicates that a tank with a capacity of 125 kL would be required for storage of surface runoff for the 1 EY event. Pumping of water from the surface runoff storage tank should be prioritised over pumping of water from the sump pump within the bunded area.

The size of this storage tank is flexible depending on Biogass' operations. If the tank size is changed or eliminated, then the detention tank volume will need to be reviewed. This can be finalised during the detailed design stage.

Events larger than the 1 EY are to overflow to the same underground detention tank that the excess water from the roof area will overflow to.

Detention System

It is a Council requirement that the peak outflows from the site do not exceed the current (undeveloped) peak flow leaving the site for up to and including the 1% AEP event.

The DRAINS model indicates that a 140kL tank with an outflow pipe size of 300 mm would be required to meet Council requirements. The post-development flow rate leaving the site is 189 L/s, which is less than the pre-development flow rate of 246 L/s.

Outflows from the detention tank will join the existing Council stormwater drain (1,050 mm diameter) along Woomera Avenue. Outflows will not go through a treatment process, other than the initial GPT and oil/grit separator. However, it is anticipated that overflow is likely to occur only in events greater than the 1EY. Typically, stormwater treatment devices are designed for low flow events with larger storm events bypassing directly to the underground pipe or road. Therefore, the layout proposed in this SMP is aligned with general stormwater treatment practices.

Pipe Network

Council requires that the internal pipe network is sized to manage the 10% AEP event. In order to satisfy this criterion, the following pipe sizes are required:

- 300 mm diameter pipe for the overflow pipe from the roof runoff storage tank, discharging into the detention tank.
- 525 mm diameter pipe for the overflow pipe from the surface runoff storage tank, discharging into the detention tank.
- 300 mm diameter pipe for the outlet from the detention tank, discharging into Council's stormwater drain. The Data SA database shows that the invert of the Council drain is approximately 22.24 mAHD. The invert of the outlet pipe should be set at least 50 mm above this level.

External Flows

An assessment of regional flow paths has confirmed that the site will not be subject to flooding from external flows in a 1% AEP event.

Alternative SMP

If Biogass estimates that the construction of the surface runoff storage tanks and the processing costs are uneconomical, an alternative SMP may be adopted, as outlined below:

- Use the 'clean' roof water within the plant or pump to Salisbury Water network with any excess directed to the underground detention tank.
- Direct the surface runoff to a stormwater treatment train which will be sized to comply with state-wide water quality targets.
- Overflows from the treatment train will be directed to the underground detention tank. The detention tank will be sized to meet Council's discharge requirements.

Utilising a treatment train of water quality improvement devices will eliminate the need for Biogass to treat stormwater through the WWTP.

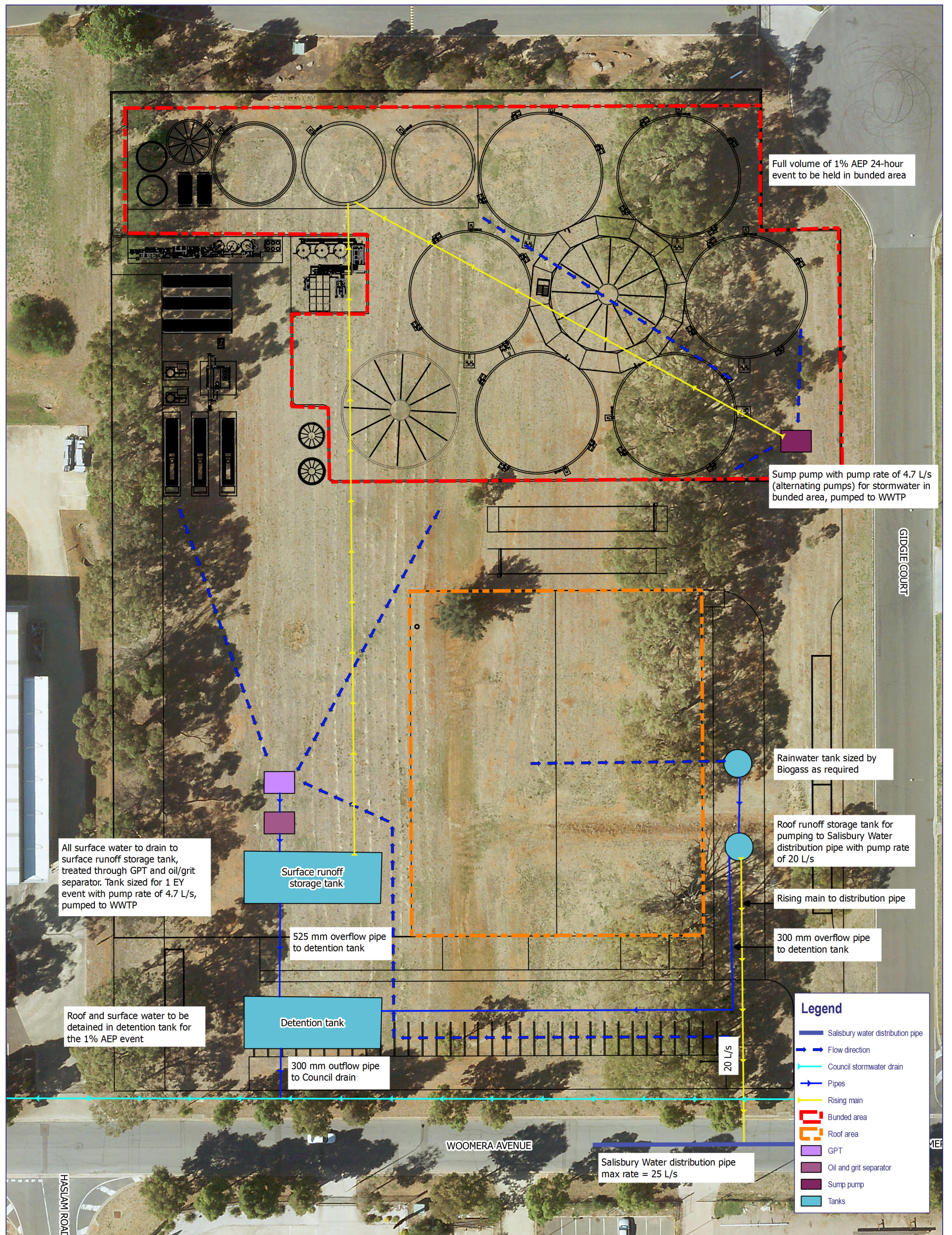
If you have any queries about the above, please contact Samantha West on 8273 3100.

Yours faithfully
TONKIN CONSULTING

A handwritten signature in blue ink that reads "S. West".

SJ West
Project Leader

Enc Figure 1 – Stormwater management plan schematic
Flood risk statement

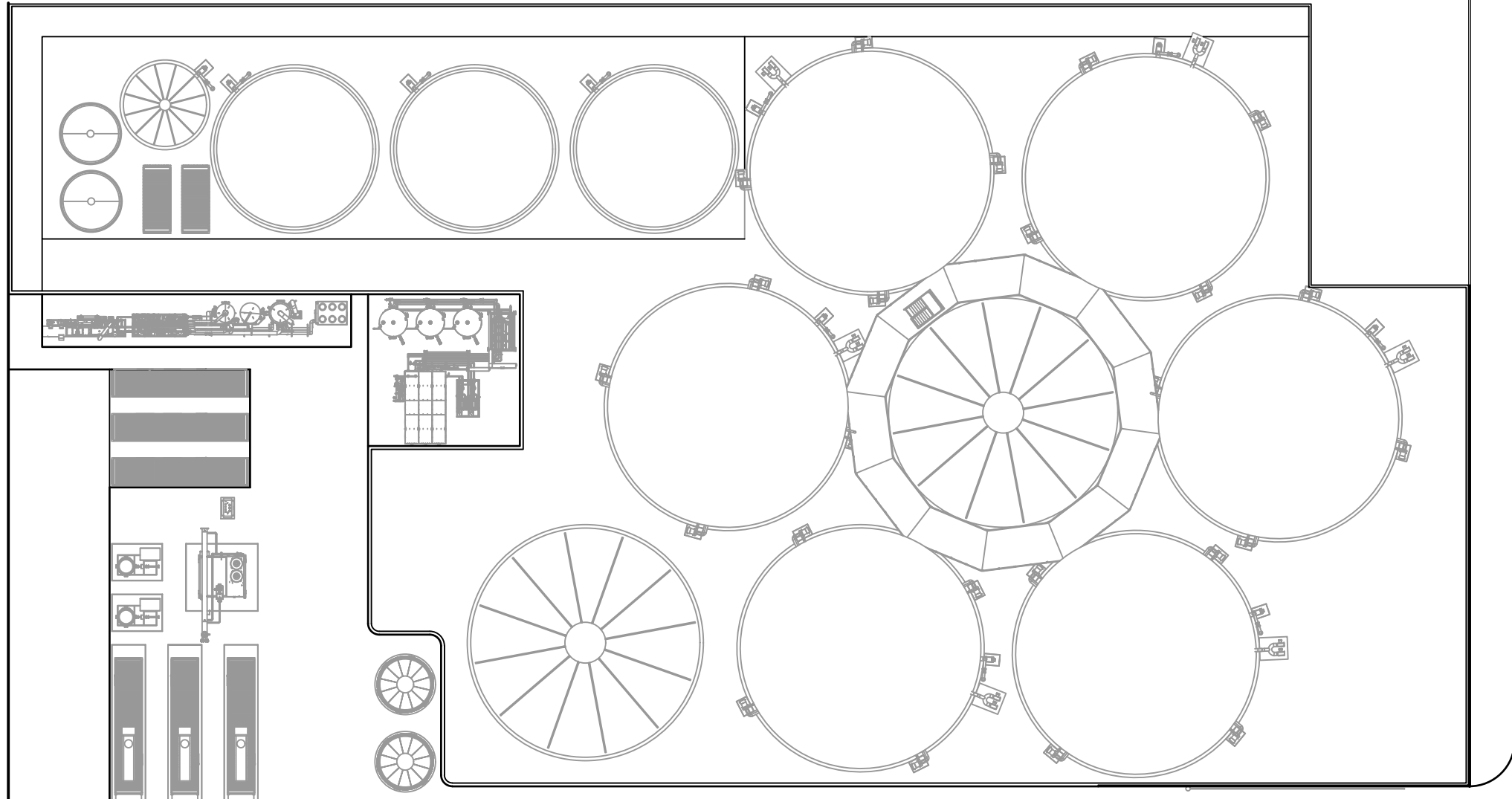


Flood Risk Statement

This statement forms part of, and is to be read in conjunction with, all flood reports and flood related data provided by Tonkin Consulting. Use of the flood reports and flood related data is conditional upon acceptance of this statement.

1. Flood risk is conventionally expressed in terms of Average Recurrence Interval which is the average or expected value of the period between exceedances of a given flood. For example, a flood with an average recurrence interval of 100 years:
 - is expected to be exceeded on average once in 100 years – a 1% probability of being exceeded in any given year
 - is expected to be exceeded at random - at a time which may be within any year of the 100 year interval, or not within the 100 year interval, or it may occur more than once in the 100 year interval.
2. The risk of inundation by flood is not eliminated, when the protection is based on specific Average Recurrence Interval criteria as exceedance of a flood of a specific Average Recurrence Interval is statistically inevitable.
3. Whilst care is taken to maximise the confidence in the predicability of flood risk, a degree of uncertainty is unavoidable.
4. Variations may occur, in the future, to the climate, catchment, watercourse or flood plain which could vary the flood risk.
5. The choice of the level of risk could consider, amongst others, the following factors:
 - likely damages and inconvenience
 - cost and time for replacement and repairs
 - type and use of the structure
 - access and safety during a flood
 - flood insurance cost and availability
 - intended life cycle of the structure
 - attitude of the owners of the structure to the acceptance of risk
 - the cost, practicality and environmental impact of reducing the risk further.
6. Denoted flood levels relate to predicted average water levels. FREEBOARD above a flood level, where noted, is an allowance for expected elevations of actual water levels, due to local disturbances, wave action and other causes, above the average water level, and is NOT A FACTOR OF SAFETY ALLOWANCE.
7. The flood report and data are the property of the client and the client shall determine and accept responsibility for the distribution of the report to others.

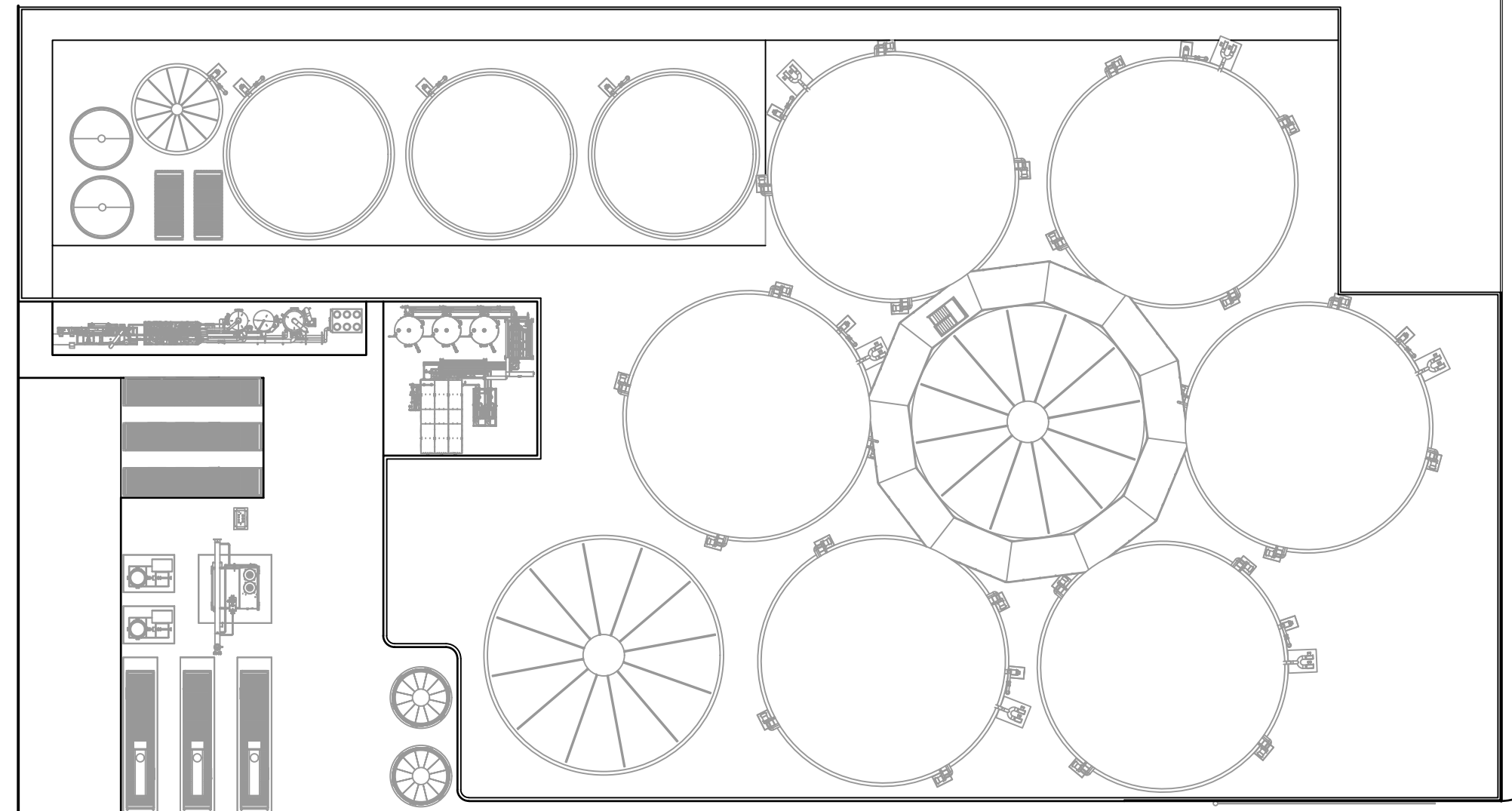
Further explanation of matters relating to flood risk is offered if required.



WOOMERA AVENUE

GIDGIE COURT

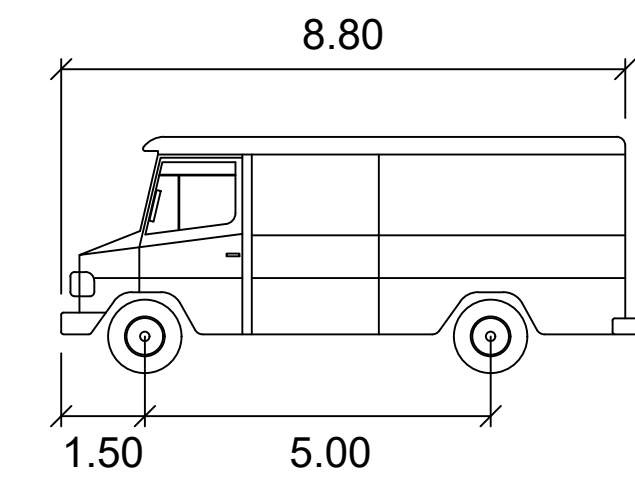
DOCKING REQUIREMENT 1



WOOMERA AVENUE

GIDGIE COURT

DOCKING REQUIREMENT 2

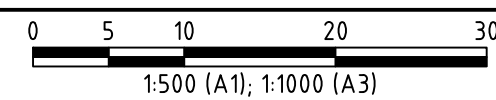


SERVICE VEHICLE

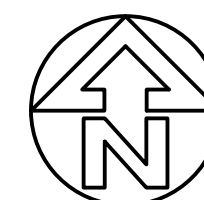
	Width	: 2.50	meters
	Track	: 2.50	
	Lock to Lock Time	: 6.0	
	Steering Angle	: 38.7	

NOTE:

1. TURN PATH ASSESSMENT BASED ON SITE LAYOUT PLAN AS SUPPLIED BY DELOREAN ENERGY. FINAL LAYOUT TO BE CONFIRMED SUBJECT TO ENGINEERING SURVEY.
2. PROPOSED GEOMETRY CAN CATER FOR RIGID TRUCK MOVEMENTS AS SHOWN.
3. SITE ENTRY SHALL BE VIA WOOMERA AVENUE; EXIT TO BE VIA GIDGIE COURT.



PUBLIC UTILITIES:
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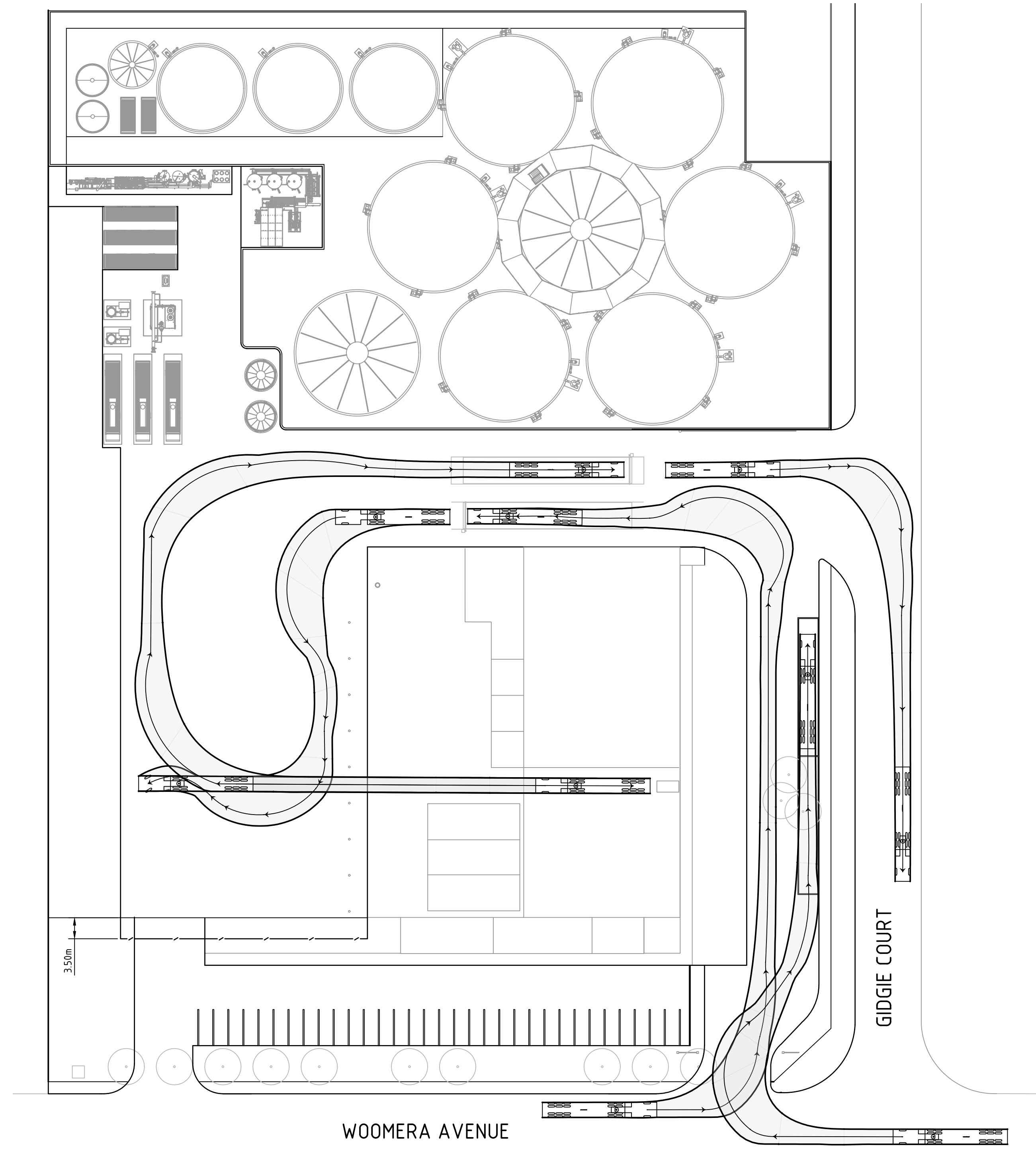


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ORIGINAL SURVEY BY	
SURVEY DATE:	
COORDS & DATUM	
COORDS TO (MGA94 ZONE54)	
ALL LEVELS TO A.H.D.	

PRELIMINARY			
BIOGASS RENEWABLES			
DELOREAN ENERGY SA ONE			
VEHICLE TURNING PATH ANALYSIS			
RIGID TRUCK ROUTE			
FILENAME:	20181513_TURNPATHS.DWG	JOB NUMBER	20181513
		SHEET NUMBER	01
		REVISION	3

REV	AMENDMENT / REASON FOR ISSUE	DATE	DES.	DWN.	DWGCHK.	VERIFIED	APPROVED
3	FOR CLIENT REVIEW	05.11.18		JJ	SB		SB
2	FOR CLIENT REVIEW	30.10.18		JJ	SB		SB
1	FOR CLIENT REVIEW	25.10.18		JJ	SB		SB

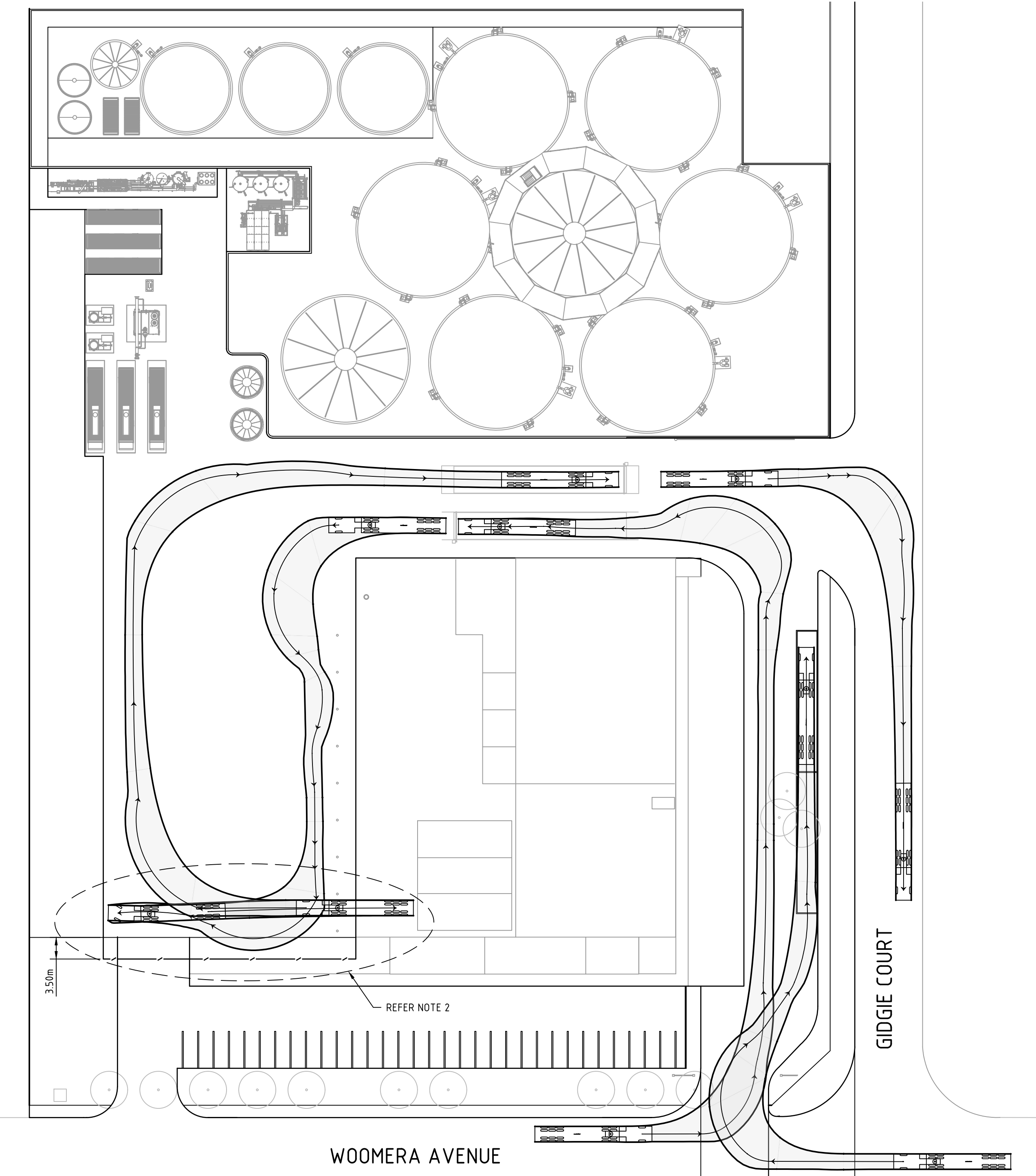
100mm ON ORIGINAL DRAWING - DO NOT SCALE DRAWING



WOOMERA AVENUE

GIDGIE COURT

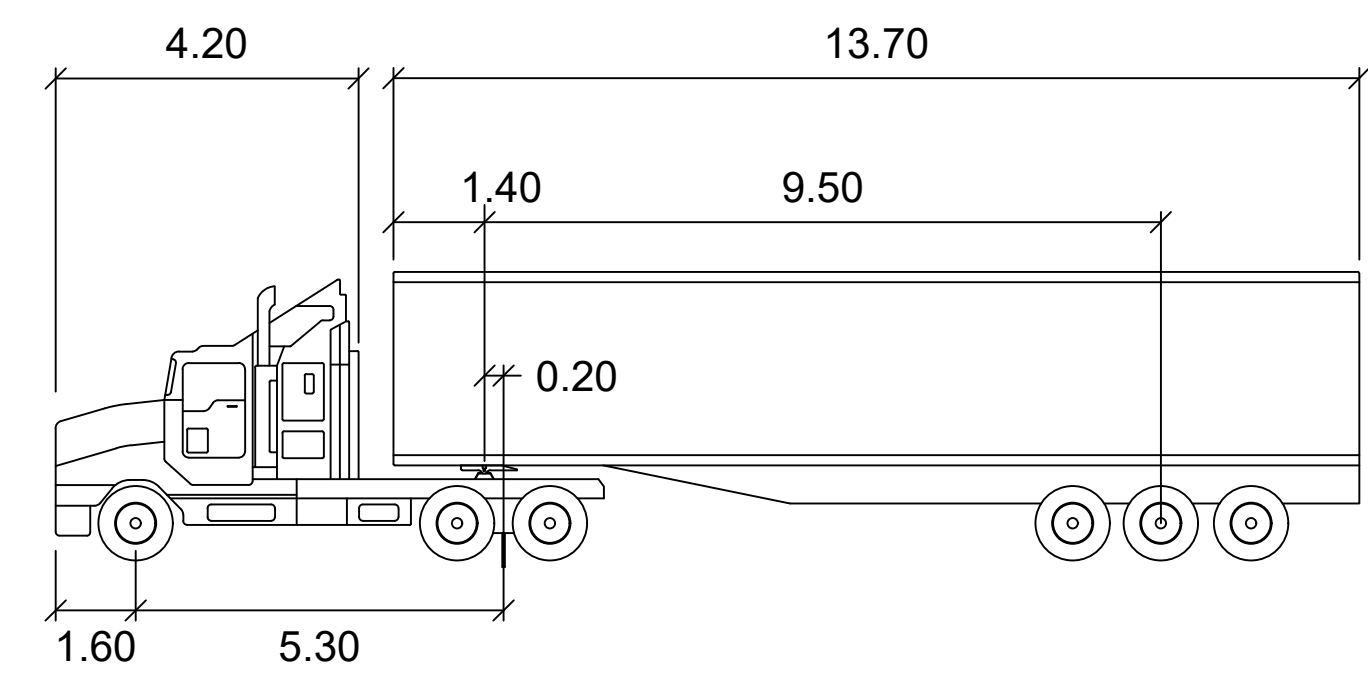
DOCKING REQUIREMENT 1



WOOMERA AVENUE

GIDGIE COURT

DOCKING REQUIREMENT 2



PM S 19M

Tractor Width : 2.50
Trailer Width : 2.50
Tractor Track : 2.50
Trailer Track : 2.50

Lock to Lock Time : 6.0
Steering Angle : 27.8
Articulating Angle : 70.0

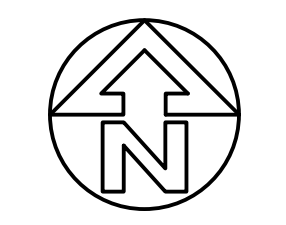
- NOTE:**
- PROPOSED GEOMETRY CAN CATER FOR 19m SEMI-TRAILER TRUCK MOVEMENTS AS SHOWN.
 - SOUTHERN MOST DOCKING LOCATION REQUIRES ADJUSTMENT OF FENCE 3.50m TO THE SOUTH TO CATER FOR TURN PATH.
 - SITE ENTRY SHALL BE VIA WOOMERA AVENUE; EXIT TO BE VIA GIDGIE COURT.

REV	AMENDMENT / REASON FOR ISSUE	DATE	DES.	DWN.	DWGCHK.	VERIFIED	APPROVED
3	FOR CLIENT REVIEW	05.11.18	JJ	SB			SB
2	FOR CLIENT REVIEW	30.10.18	JJ	SB			SB
1	FOR CLIENT REVIEW	25.10.18	JJ	SB			SB

0 5 10 20 30
1:500 (A1); 1:1000 (A3)

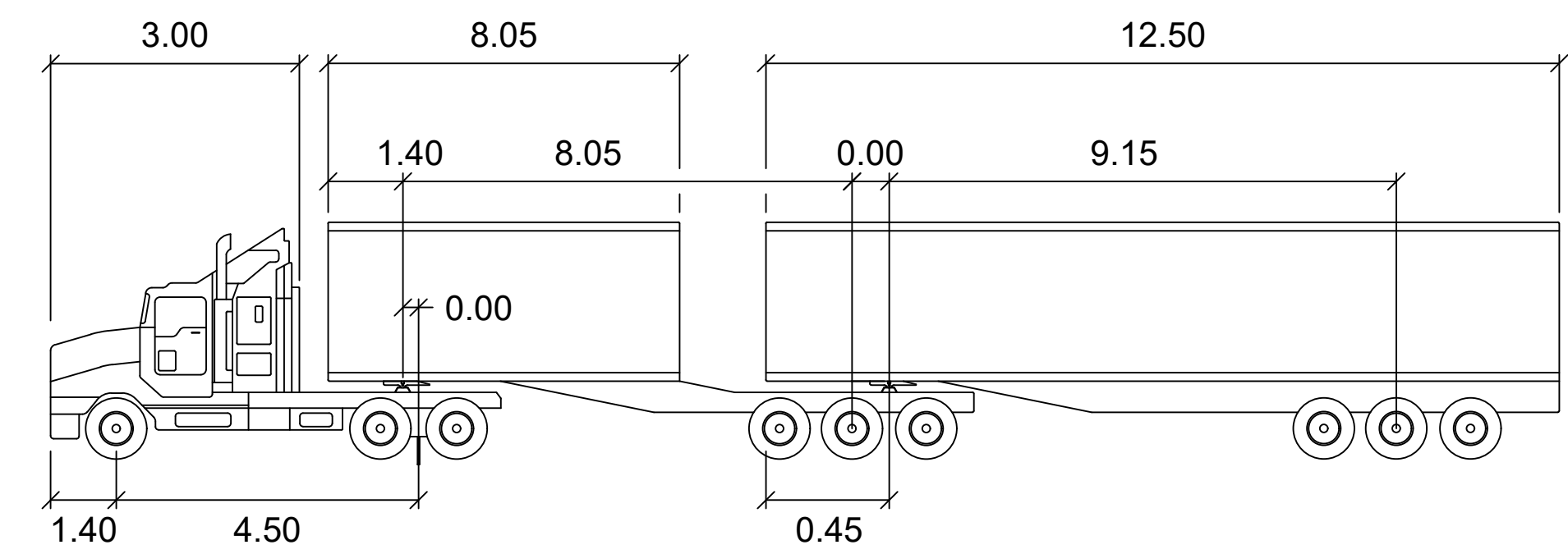
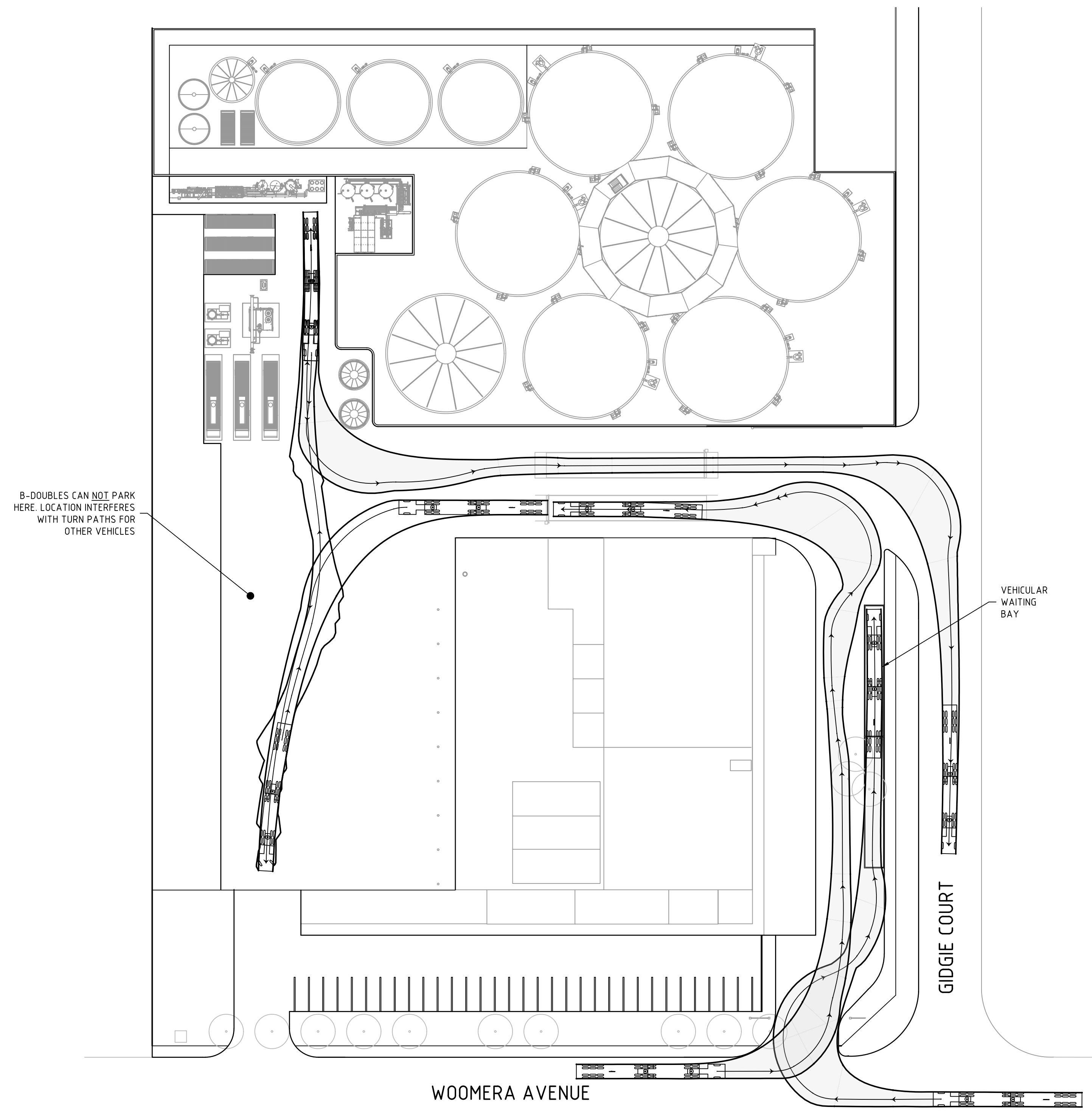
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100mm ON ORIGINAL DRAWING - DO NOT SCALE DRAWING



SHEET SIZE **A1**
SCALE: 1:500
ORIGINAL SURVEY BY
SURVEY DATE:
COORDS & DATUM
COORDS TO (MGA94 ZONE54)
ALL LEVELS TO A.H.D.

PRELIMINARY			
BIOGASS RENEWABLES			
DELOREAN ENERGY SA ONE			
VEHICLE TURNING PATH ANALYSIS			
SEMI-TRAILER TRUCK ROUTE			
FILENAME:	JOB NUMBER	SHEET NUMBER	REVISION
20181513_TURNPATHS.DWG	20181513	02	3



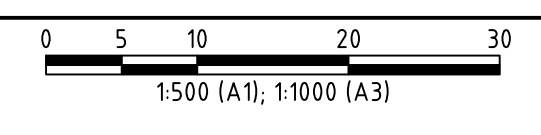
B-DOUBLE 26M

	metres		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 23.4
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

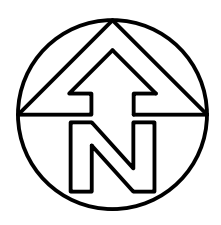
NOTE:

1. PROPOSED GEOMETRY CAN CATER FOR 26m B-DOUBLE TRUCK MOVEMENTS AS SHOWN.
2. B-DOUBLE ENTRY TO OCCUR FROM WOOMERA AVENUE, WITH EXIT ONTO GIDGIE COURT. ONE B-DOUBLE CAN STORE IN OFF-STREET WAITING AREA.
3. IT IS UNDERSTOOD THAT BETWEEN 2 & 4 B-DOUBLES WILL ENTER/EXIT THE SITE EACH DAY. ON-SITE REVERSING MANOEUVERS CAN BE MANAGED BY ENSURING THE AREA TO THE WEST OF THE SHED IS VACANT OF OTHER VEHICLES DURING THE TIME OF ENTRY / REVERSAL. SITE GEOMETRY DOES NOT CATER FOR B-DOUBLE MOVEMENTS IN FORWARD DIRECTION ONLY.

REV	AMENDMENT / REASON FOR ISSUE	DATE	DES.	DWN.	DWGCHK.	VERIFIED	APPROVED
3	FOR CLIENT REVIEW	05.11.18	JJ	SB			SB
2	FOR CLIENT REVIEW	30.10.18	JJ	SB			SB
1	FOR CLIENT REVIEW	25.10.18	JJ	SB			SB

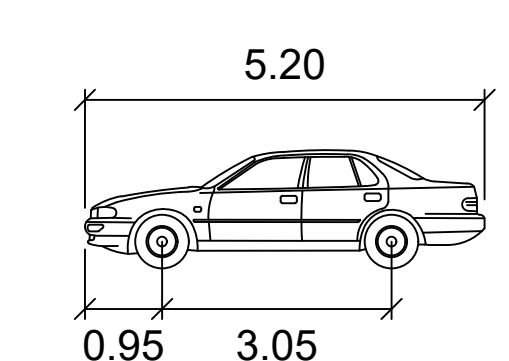
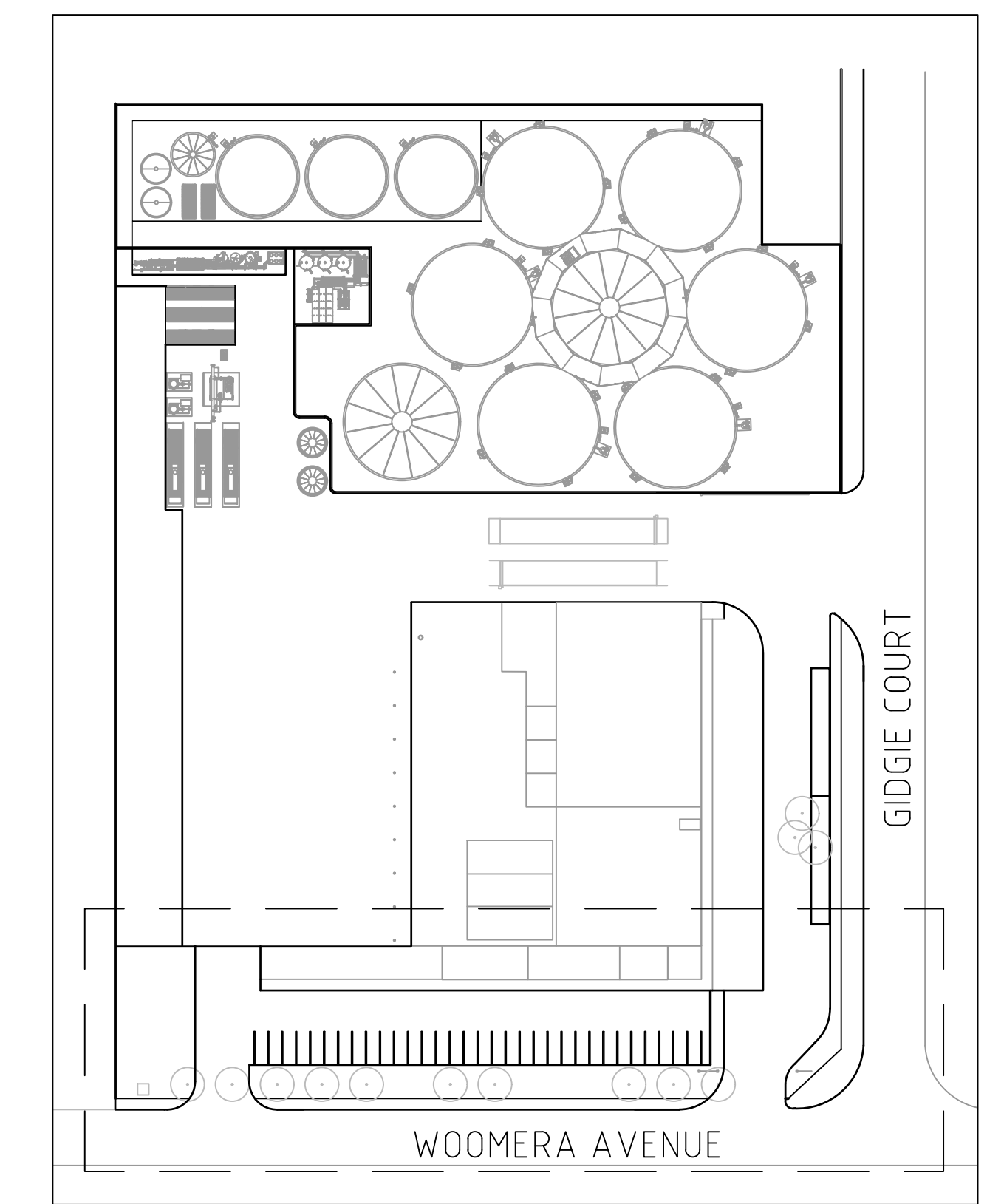
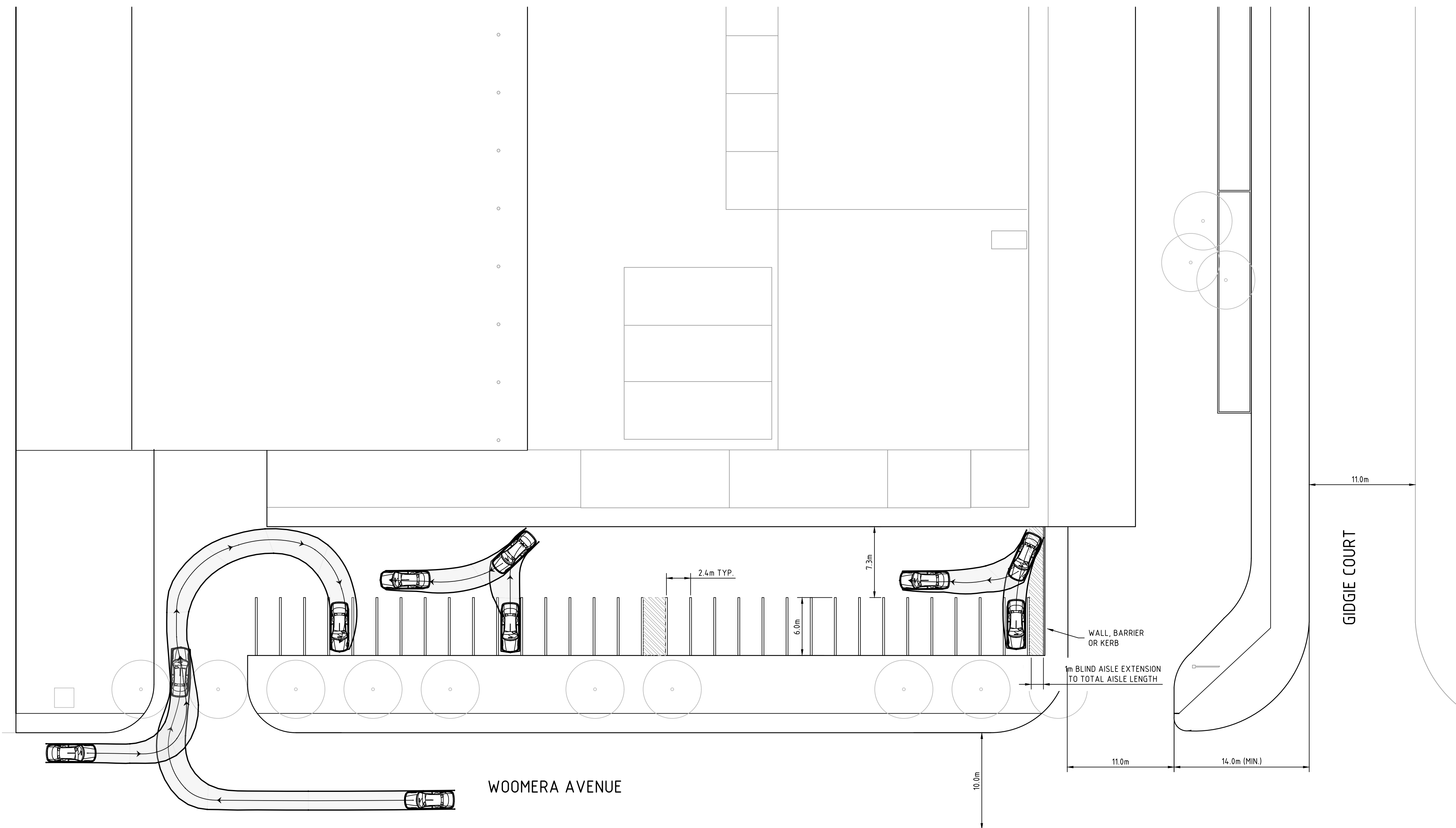


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SHEET SIZE	A1
SCALE	1:500
ORIGINAL SURVEY BY	
SURVEY DATE:	
COORDS & DATUM	
COORDS TO (MGA94 ZONE54)	
ALL LEVELS TO A.H.D.	

PRELIMINARY			
BIOGASS RENEWABLES			
DELOREAN ENERGY SA ONE			
VEHICLE TURNING PATH ANALYSIS			
B-DOUBLE TRUCK ROUTE			
FILENAME:	20181513_TURNPATHS.DWG	JOB NUMBER	20181513
		SHEET NUMBER	03
		REVISION	3



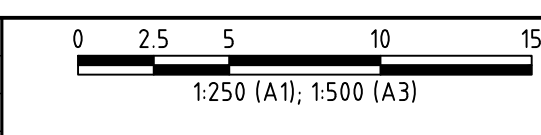
PASSENGER-CAR

Width : 1.94 meters
 Track : 3.05
 Lock to Lock Time : 6.0
 Steering Angle : 33.6

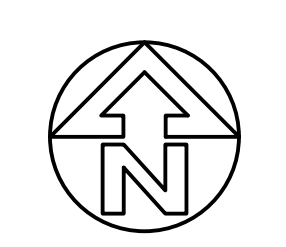
PARKING REQUIREMENT & LAYOUT

- NOTE:**
- PROPOSED GEOMETRY CAN CATER FOR 5.2m CAR MOVEMENTS AS SHOWN.
 - 90° CAR PARKING SPACES SHOULD MEASURE 2.4m x 5.4m (MIN).
 - FINAL CAR PARK DIMENSIONS TO BE DETERMINED IN ACCORDANCE WITH THE REQUIREMENTS OF AS2890.1:2004 PARKING FACILITIES (OFF-STREET CAR PARKING).
 - TURN PATHS AND CAR PARK LAYOUT GEOMETRY HAS BEEN REVIEWED ONLY. NO ASSESSMENT HAS BEEN UNDERTAKEN TO CONFIRM THE ADEQUACY (OR OTHERWISE) OF THE PROPOSED NUMBER OF PARKING SPACES.
 - CONSIDERATION SHOULD BE GIVEN TO THE PROVISION OF 'ACCESSIBLE' PARKING SPACES.
 - BOTH CYCLIST AND PEDESTRIAN PROVISIONS SHOULD BE INCLUDED.
 - NOTE: CARPARK AREA TO BE AS SHOWN, WITH SINGLE ENTRY/EXIT POINT. TURNAROUND AREAS TO BE PROVIDED AT END OF CARPARK (1.0m) AND IN CENTRE OF THE LENGTH OF THE BAYS (WIDTH OF CAR PARKING BAY).

REV	AMENDMENT / REASON FOR ISSUE	DATE	DES.	DWN.	DWGCHK.	VERIFIED	APPROVED
3	FOR CLIENT REVIEW	05.11.18	JJ	SB			SB
2	FOR CLIENT REVIEW	30.10.18	JJ	SB			SB
1	FOR CLIENT REVIEW	25.10.18	JJ	SB			SB

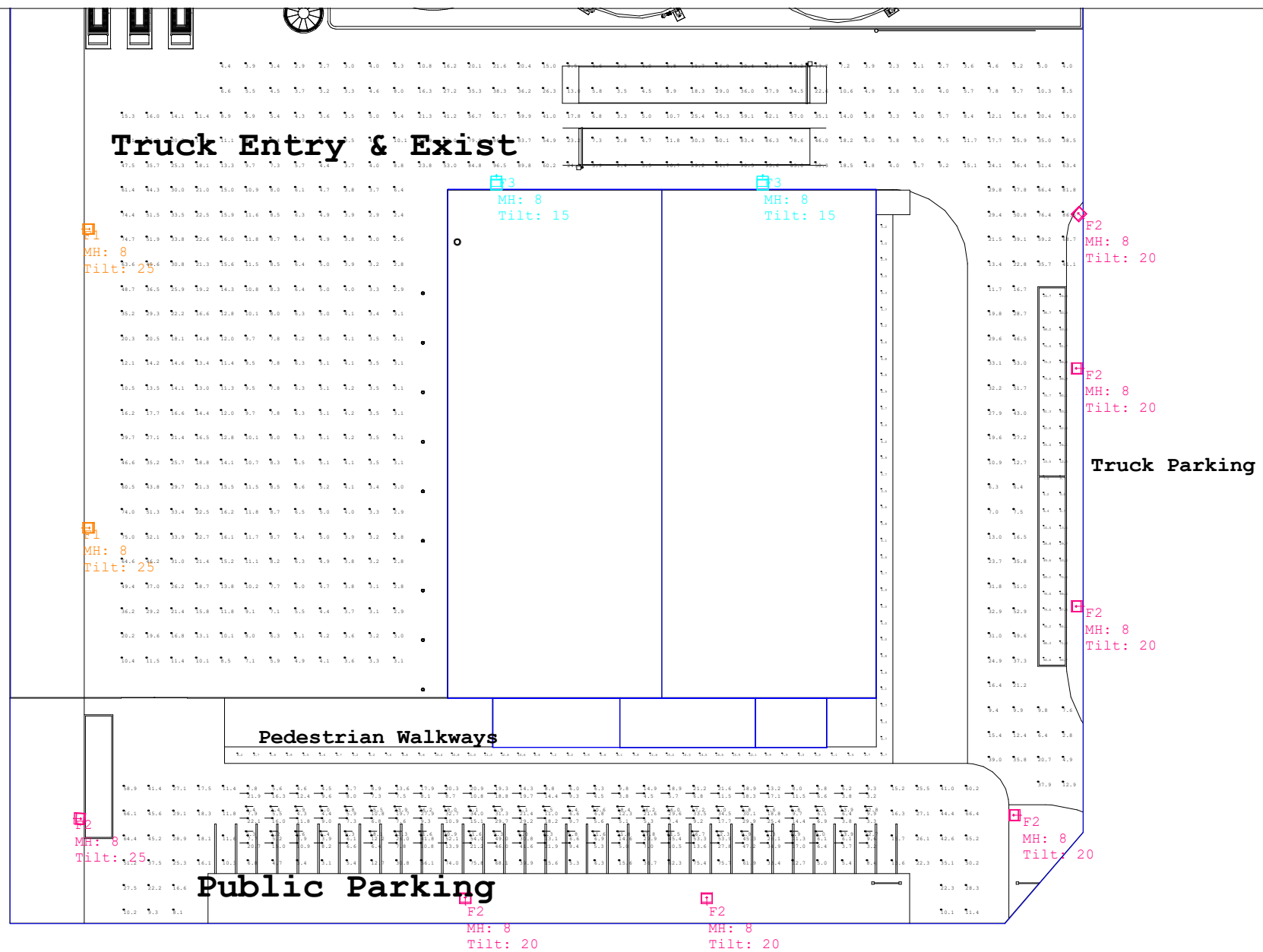


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SHEET SIZE	A1
SCALE	1:250
ORIGINAL SURVEY BY	
SURVEY DATE:	
COORDS & DATUM	
ALL LEVELS TO A.H.D.	

PRELIMINARY			
BIOGASS RENEWABLES			
DELOREAN ENERGY SA ONE			
VEHICLE TURNING PATH ANALYSIS			
LIGHT / CIVILIAN VEHICLE ROUTE & CARPARK			
FILENAME:	20181513_TURNPATHS.DWG	JOB NUMBER	20181513
		SHEET NUMBER	04
		REVISION	3



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Scale= 1: 695.65

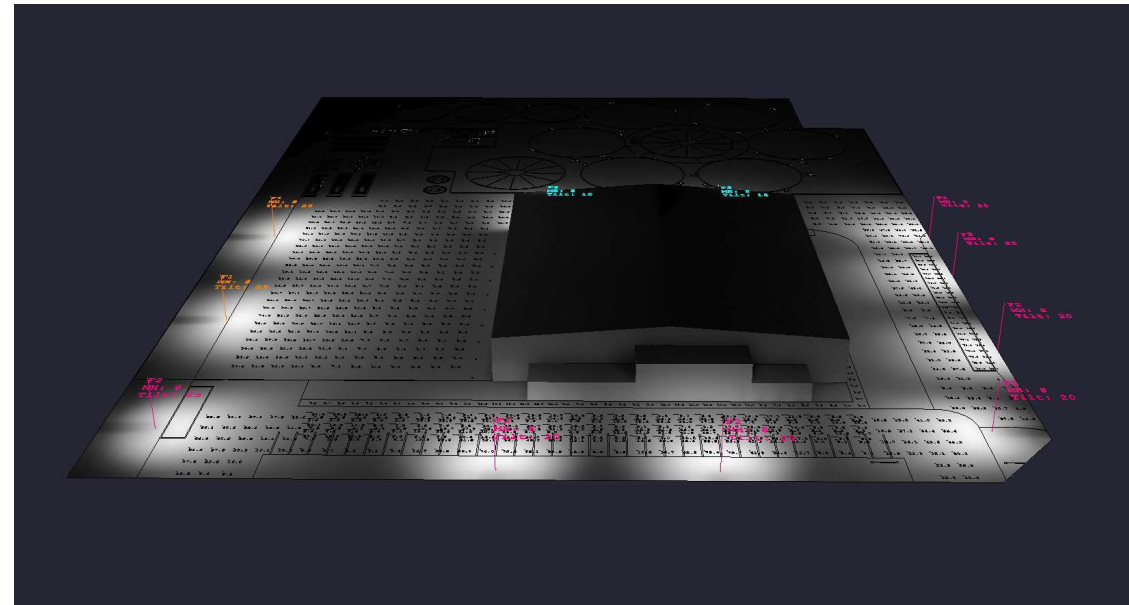
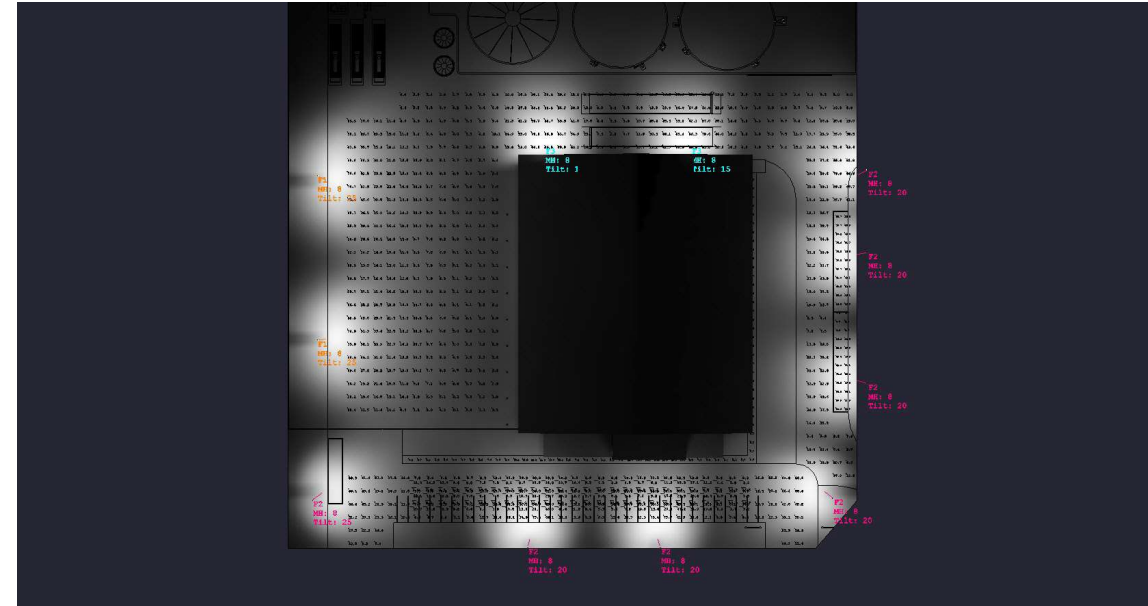
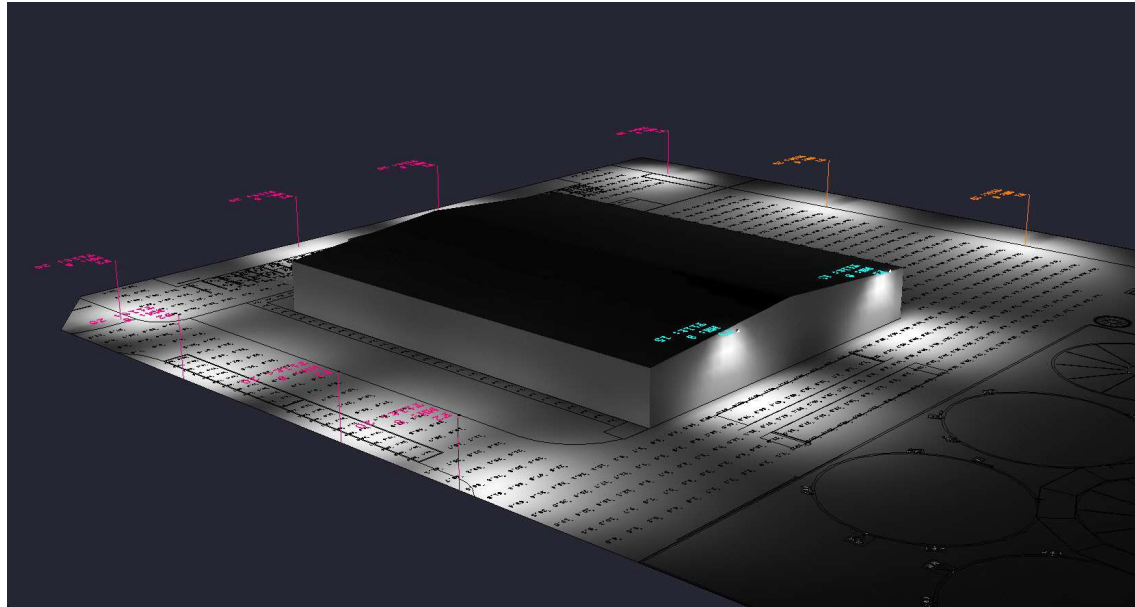
Luminaire Schedule							
Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description	Tag
	2	PARX300W-ASYM	SINGLE	N.A.	0.800	Haneco LED Floodlight 300W Pole Mounted	F1
	7	PARX200W-ASYM	SINGLE	24402.6	0.800	Haneco LED Floodlight 200W Pole Mounted	F2
	2	PARX200W ASYM	SINGLE	24402.6	0.800	Haneco LED Floodlight 200W Wall Mounted	F3




NOTE:

- THE LIGHTING LEVELS IN THIS CALCULATION WOULD ACHIEVE THE AUSTRALIAN STANDARDS
- AS/NZS 1158.3.1- CAT P11(b) PUBLIC CAR PARK AREAS
- AS/NZS 1158.3.1 CAT P1 FOR CARRIAGE AND ACCESS WAYS
- AS/NZS 1158.3.1 CAT P11(c) Truck Parking
- ALL CALCULATIONS ARE BASED ON NORMAL PARAMETERS AND WITH NO OBSTRUCTIONS.
- PHOTOMETRIC FILES SUPPLIED BY HANECO AND ITS SUPPORTING AGENTS.
- DESIGN SOFTWARE USED -AGI32.
- ANY CHANGES TO THE CALCULATION/PROJECT PARAMETERS WILL AFFECT THE FINAL ILLUMINATION LEVELS.
- CALCULATIONS ARE SUBJECT TO ACCURACIES AND TOLERANCES NOMINATED IN AS/NZS 3827.1:1998 AND 3827.2.1998.

THE LIGHT LOSS FACTOR (LLF) APPLIED TO THIS LIGHTING LAYOUT IS .80. A TYPICAL MAINTENANCE PROGRAM TO ACCOMMODATE THIS VALUE WOULD BE TO CLEAN AND INSPECT ALL LUMINAIRES EVERY 2 YEARS


 262 Marion Rd Netley, SA 5037 www.haneco.com.au PH: 08 8297 6373		PROJECT:	
		Food Energy WA	
SIZE	REFERENCE NUMBER	DATE OF ISSUE	REV
A3	5756	30/08/2018	
FILE: Food Energy WA.AGI		DESIGNER: Clarke Hu	
			1



Luminaire Schedule							
Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description	Tag
	2	PARX300W-ASYM	SINGLE	N.A.	0.800	Haneco LED Floodlight 300W Pole Mounted	F1
	7	PARX200W-ASYM	SINGLE	24402.6	0.800	Haneco LED Floodlight 200W Pole Mounted	F2
	2	PARX200W ASYM	SINGLE	24402.6	0.800	Haneco LED Floodlight 200W Wall Mounted	F3

NOTE:

- THE LIGHTING LEVELS IN THIS CALCULATION WOULD ACHIEVE THE AUSTRALIAN STANDARDS
- AS/NZS 1158.3.1- CAT P11(b) PUBLIC CAR PARK AREAS
- AS/NZS 1158.3.1 CAT P1 FOR CARRIAGE AND ACCESS WAYS
- AS/NZS 1158.3.1 CAT P11(c) Truck Parking
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- PHOTOMETRIC FILES SUPPLIED BY HANECO AND ITS SUPPORTING AGENTS.
- DESIGN SOFTWARE USED -AGI32.
- ANY CHANGES TO THE CALCULATION/PROJECT PARAMETERS WILL AFFECT THE FINAL ILLUMINATION LEVELS.
- CALCULATIONS ARE SUBJECT TO ACCURACIES AND TOLERANCES NOMINATED IN AS/NZS 3827.1:1998 AND 3827.2.1998.
- THE LIGHT LOSS FACTOR (LLF) APPLIED TO THIS LIGHTING LAYOUT IS .80. A TYPICAL MAINTENANCE PROGRAM TO ACCOMMODATE THIS VALUE WOULD BE TO CLEAN AND INSPECT ALL LUMINAIRES EVERY 2 YEARS

 262 Marion Rd Netley, SA 5037 www.haneco.com.au PH: 08 8297 6373	PROJECT: Food Energy WA		
	SIZE A3	REFERENCE NUMBER 5756	DATE OF ISSUE 30/08/2018
	FILE: Food Energy WA.AGI		REV
	DESIGNER: Clarke Hu		2

Luminaire Schedule							
Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description	Tag
	2	PARX300W-ASYM	SINGLE	N.A.	0.800	Haneco LED Floodlight 300W Pole Mounted	F1
	7	PARX200W-ASYM	SINGLE	24402.6	0.800	Haneco LED Floodlight 200W Pole Mounted	F2
	2	PARX200W ASYM	SINGLE	24402.6	0.800	Haneco LED Floodlight 200W Wall Mounted	F3

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Min/Avg	Min/Max
Pedestrian Walkways	Illuminance	Lux	7	14.5	2.9	N.A.	N.A.
Public Parking	Illuminance	Lux	24	75.8	3.1	N.A.	N.A.
Public Parking EV1	Illuminance	Lux	13	47.2	3.2	0.24	0.07
Public Parking EV2	Illuminance	Lux	14	41.6	2.2	0.16	0.05
Truck Entry & Exist	Illuminance	Lux	19	96.5	2.1	N.A.	N.A.
Truck Parking	Illuminance	Lux	50	87.8	3.0	N.A.	N.A.

Luminaire Location Summary						
LumNo	Label	X	Y	Z	Orient	Tilt
1093	PARX300W-ASYM	84.584	68.125	8	359.961	25
1097	PARX200W-ASYM	131.057	22.452	8	90	20
1098	PARX200W-ASYM	160.302	22.452	8	90	20
1100	PARX300W-ASYM	84.584	104.317	8	359.961	25
1102	PARX200W-ASYM	205.952	105.572	8	135.546	20
1103	PARX200W-ASYM	205.952	87.442	8	180	20
1104	PARX200W-ASYM	205.952	58.618	8	180	20
1105	PARX200W-ASYM	198.368	33.335	8	180	20
1106	PARX200W-ASYM	83.57	32.938	8	357.059	25
1107	PARX200W ASYM	134.825	110.708	8	90	15
1108	PARX200W ASYM	167.072	110.708	8	90	15



PARX Pole Mounted



PARX Wall Mounted

NOTE:

- THE LIGHTING LEVELS IN THIS CALCULATION WOULD ACHIEVE THE AUSTRALIAN STANDARDS
- AS/NZS 1158.3.1- CAT P11(b) PUBLIC CAR PARK AREAS
- AS/NZS 1158.3.1 CAT P1 FOR CARRIAGE AND ACCESS WAYS
- AS/NZS 1158.3.1 CAT P11(c) TRUCK PARKING AREAS
- AS4282 OBTRUSIVE LIGHTING HAS NOT BEEN ASSESSED OR IMPLIED AT THIS POINT.
- ALL CALCULATIONS ARE BASED ON NORMAL PARAMETERS AND WITH NO OBSTRUCTIONS.
- PHOTOMETRIC FILES SUPPLIED BY HANECO AND ITS SUPPORTING AGENTS.
- DESIGN SOFTWARE USED -AGI32.
- ANY CHANGES TO THE CALCULATION/PROJECT PARAMETERS WILL AFFECT THE FINAL ILLUMINATION LEVELS.
- CALCULATIONS ARE SUBJECT TO ACCURACIES AND TOLERANCES NOMINATED IN AS/NZS 3827.1:1998 AND 3827.2.1998.
- THE LIGHT LOSS FACTOR (LLF) APPLIED TO THIS LIGHTING LAYOUT IS .80. A TYPICAL MAINTENANCE PROGRAM TO ACCOMMODATE THIS VALUE WOULD BE TO CLEAN AND INSPECT ALL LUMINAIRES EVERY 2 YEARS

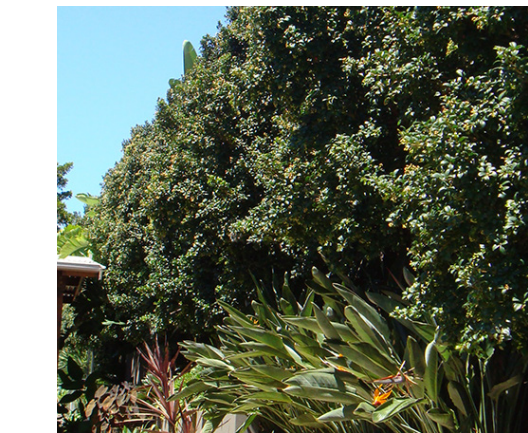
 HANECO IDEAS THAT SHINE 262 Marion Rd Netley, SA 5037 www.haneco.com.au PH: 08 8297 6373	PROJECT: Food Energy WA		
	SIZE A3	REFERENCE NUMBER 5756	DATE OF ISSUE 30/08/2018
	FILE: Food Energy WA.AGI		
	DESIGNER: Clarke Hu		



Precedent Images



① Planting character



② Screening planting character

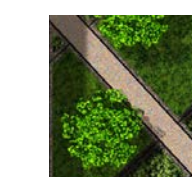
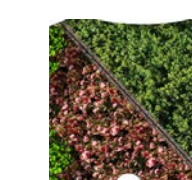
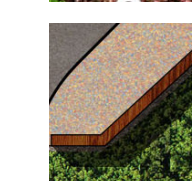
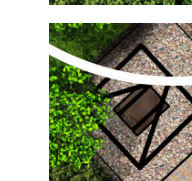
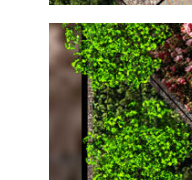
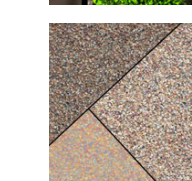
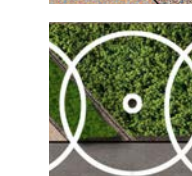


③ Container planting at building entries and control points



④ Decorative gravel patterns to boundary verge and focal points

Legend

-  Gravel pathway
-  Cross hatched pattern of low native shrub planting
-  Entry Signage Wall
-  Shelter and picnic table lunch seating area with bench seats
-  Screen planting to neighbouring lot
-  Gravel banding areas to amplify the cross hatch pattern
-  Existing Trees to be retained and protected

Plant Palette

Focal Point Tree



Acer rubrum 'October Glory'
Magnolia
H: 10m W: 8m



Pyrus betulaefolia
'Southworth Dancer'
H: 8m W: 6m

Screening Trees and Shrubs



Cupanopsis anacardioides
Tuckeroo
H: 6m W: 6m



Eucalyptus leucocylon 'Euky Dwarf'
Dwarf SA Blue Gum
H: 6m W: 4m



Dodonaea viscosa
Dwarf SA Blue Gum
H: 2.5m W: 1.5m

Shrubs



Acacia cognata
Lime light
H: 0.5m W: 0.8m



Correa pulchella
Autumn Blaze
H: 0.5m W: 1m



Eremophila nivea
Silky Eremophila
H: 1m W: 1m



Oleria axillaris
Salt bush
H: 1m W: 1m



Westringia fruticosa
Grey Box
H: 0.45m W: 0.45m



Rosmarinus officinalis
Rosemary
H: 0.8m W: 1m

Strappy



Lomandra longifolia 'Tanika'
Tanika Lomandra
H: 0.6m W: 0.6m



Dianella tasmanica 'Tassie red'
Tasman Flax Lily
H: 0.4m W: 0.4m

Groundcover



Myoporum parvifolium
Creeping Boobialla
H: 0.2m W: 1.5m

Design Intent:

PLANTS ARE PREDOMINATELY NATIVE AND HAVE BEEN SELECTED TO GIVE A STRONG IDENTITY TO WOOMERA AVENUE, WITH EACH SPECIES SERVING A SPECIFIC AESTHETIC FUNCTION, THEY HAVE BEEN SELECTED DUE TO THEIR LOW MAINTENANCE CAPABILITIES.

THE CARPARK GARDEN BEDS ARE LOW GROWING PLANTS THAT PROVIDE COLOUR, TEXTURE AND CONTRAST. MULCHED AREAS WILL BE PLANTED WITH SWATHES OF MASS PLANTINGS FOR VISUAL EFFECT.

IMPACT PLANTING WILL BE SITUATED AT THE VEHICLE ENTRIES & PEDESTRIAN LINKS TO PROVIDE AN INSTANT FEATURE FOR CUSTOMERS AS THEY MAKE THEIR WAY INTO THE SITE. THIS WILL BE ACHIEVED BY COLOUR AND TEXTURE OF FOLIAGE.

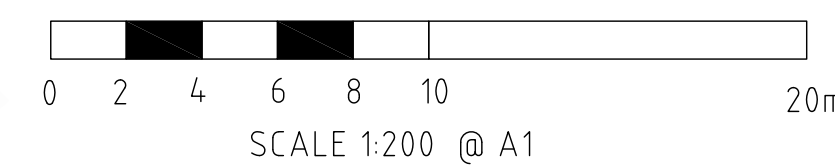
SCREENING TREES ARE PROPOSED ALONG THE EASTERN AND WESTERN EDGES OF THE SITE TO BLOCK VIEWS INTO AND OUT OF THE NEIGHBOURING BUSINESSES.

THE MAIN ENTRY WILL HAVE A SIGNAGE WALL TO HIGHLIGHT THE BUSINESS AND GUIDE TRUCKS TO THEIR DESTINATION.

EXISTING TREE TO THE EASTERN AND SOUTHERN EDGES OF THE SITE WILL BE RETAINED AND PROTECTED OTHER THAN THOSE MAKING WAY FOR NECESSARY DRIVEWAY ENTRANCES AND PATHWAYS.



PROJECT Project J116 Woomera Avenue Biogas
CLIENT Biogas Renewables Pty Ltd
DRAWING Landscape Concept Plan

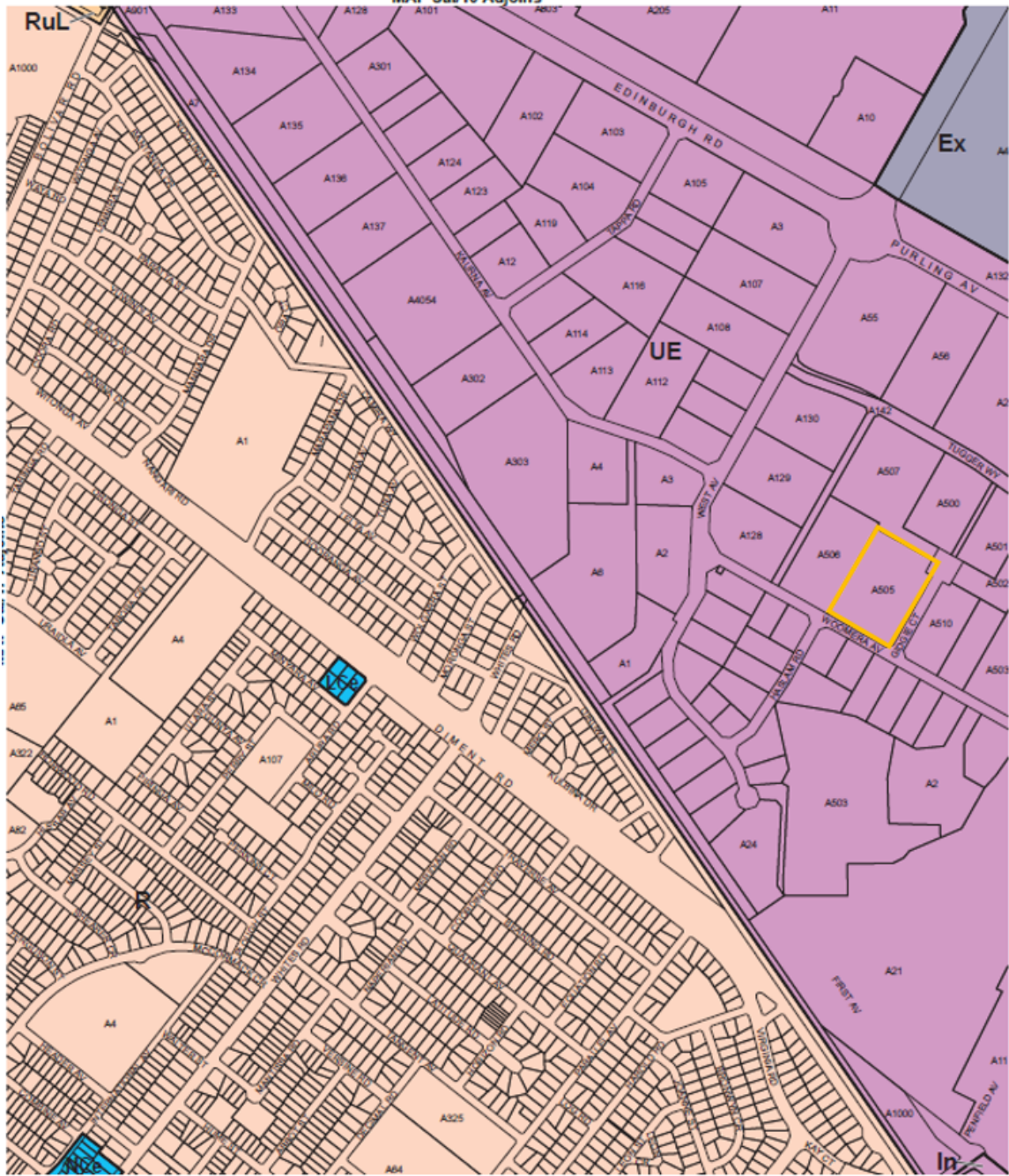


DATE: 14/11/2018

DWG NO. OS1830_CP01

BY: AL

APPROVED BY: PG



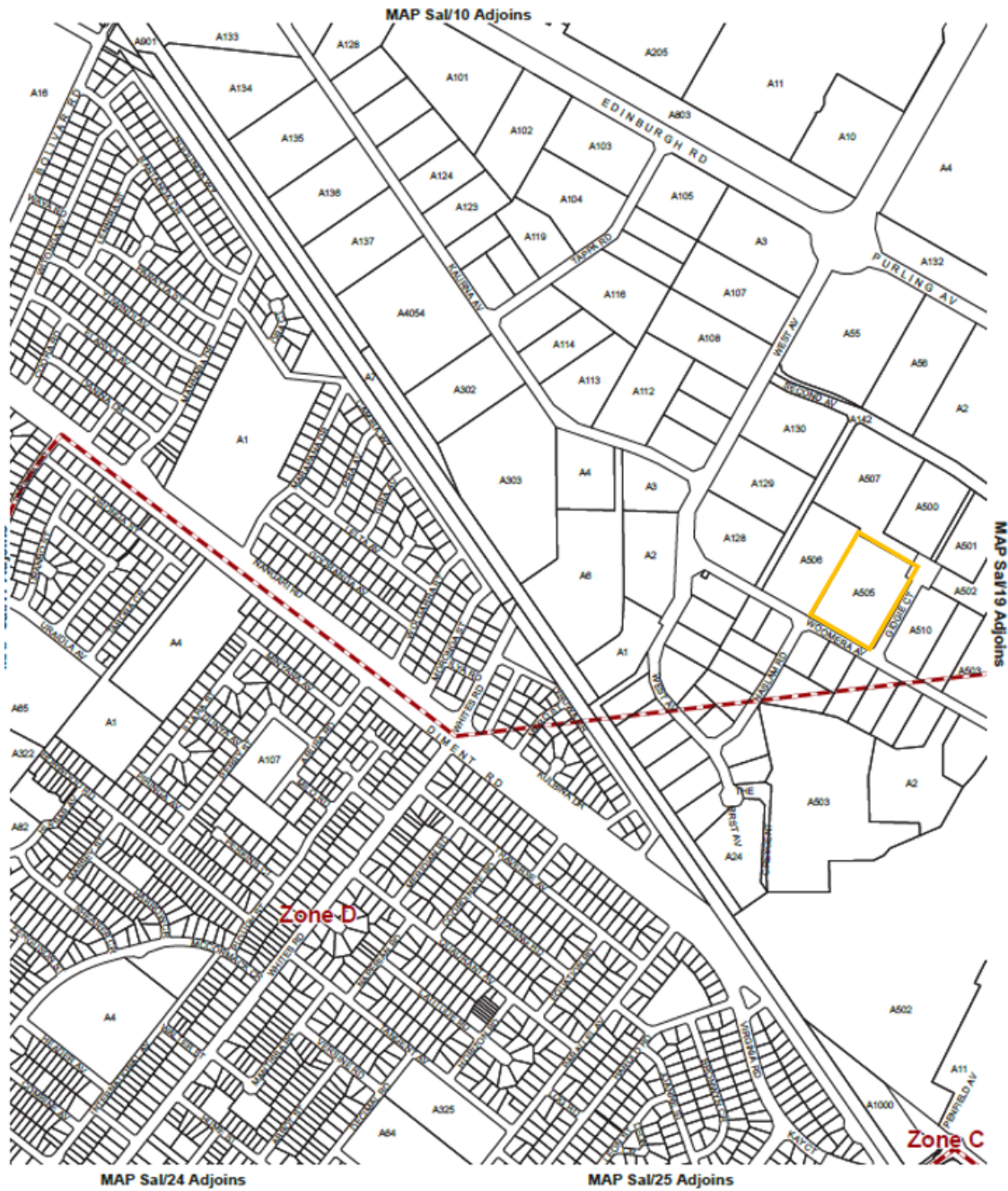
MAP Sal/24 Adjoins

MAP Sal/25 Adjoins

- Zones**
- Ex Excluded
 - In Industry
 - LCe Local Centre
 - NCe Neighbourhood Centre
 - R Residential
 - RuL Rural Living
 - UE Urban Employment
 - Zone Boundary

Zone Map Sal/18

SALISBURY COUNCIL
Consolidated - 15 December 2016



MAP Sal/24 Adjoins

NOTE: Airport Building Heights should be read in conjunction with concept plan map showing heights for Edinburgh Defence Airfield

Airport Building Heights
 Referral to Commonwealth Secretary for Dept. of Transport and Regional Services

Zone C All Structures Exceeding 15 metres above existing ground level
 Zone D All Structures Exceeding 45 metres above existing ground level


MAP Sal/25 Adjoins

0 500m

N

Overlay Map Sal/18

DEVELOPMENT CONSTRAINTS

 Airport Building Heights

SALISBURY COUNCIL
 Consolidated - 15 December 2016



Looking North from Woomera Avenue



Dip in land running north south



Regulated and Significant Trees – eastern side of allotment – adjacent Gidgie Court



Looking South- West from Gidgie Court



Environment Protection Authority
GPO Box 2607 Adelaide SA 5001
211 Victoria Square Adelaide SA 5000
T (08) 8204 2004
Country areas 1800 623 445

EPA Reference: 34394

10th October 2018

Mr Hamish Jolly
Ground Floor
1205 Hay Street
WEST PERTH WA 6005

hamish.jolly@biogass.com.au

Dear Mr Jolly,

Development Application Information Request

Development Application Number	361/L007/18
Applicant	DeLorean Energy
Location	A505 DP68296, Hundred Munno Para, 1-2 Gidgie Court, Edinburgh, SA 5111.
Proposal	Waste to energy anaerobic digestion plant: organic waste reception, storage, treatment and disposal; and production of electrical energy, bio methane and thermal heat.
Information required within 3 months from date of this letter.	

The above mentioned development application was referred to the Environment Protection Authority (EPA) by the State Commission Assessment Panel in accordance with section 37 of the *Development Act 1993*.

Thank you for the further information provided to the EPA via email on 27 September 2018.

The information provided to the EPA is insufficient for the EPA to undertake an environmental assessment. Therefore, as provided for by section 37(2) of the Development Act, the EPA requires the following additional information before it gives its response.

Air Quality

The processing of 125,000 tonnes per annum of organic waste (100,000 tonnes of food waste and 25,000 tonnes of grain dust) through a digestion system (six digesters) that produces a biogas, which is then either used in the power plant (3x526kW generators) or flared, raises air quality concerns relating to the following:

- odour from the handling of food waste

- odour from the anaerobic digestion process
- combustion products from the generator and flare
- odour from the removal of the spent organic material

In addition, it is understood that the facility would produce 4.7MW of electricity and 4.9MW of thermal heat (or upgraded to produce 21.7GJ of biomethane). This indicates that the facility would likely produce a total heat release greater than 5MW (and require a EPA licence for the activity of fuel burning). However, confirmation of the expected heat release is required.

Odour from the handling of food waste

All putrescible wastes are handled inside a sealed, negative pressure shed, with the exhausted odorous air from the shed passed through a purpose-built biofilter. If operated and maintained correctly, the EPA expect this methodology to work well.

Odour from the anaerobic digestion process

The submitted information indicates that the anaerobic digestion process is a fully enclosed system. There is limited information supporting this, and given the expectation is that the concentration of H_2S in the biogas is in the order of $10,000mg/m^3$ the EPA is concerned that some of this material may still leak from the system. As H_2S has an odour detection threshold in the order of $0.2-2.0\mu g/m^3$, it doesn't take very much material to cause a nuisance.

Combustion products from the generator and flare

The destruction efficiencies for the flare are quoted as 99% for methane and 99.95% for H_2S . The emissions estimates for H_2S are $5mg/m^3$ from the generator and $5.2mg/m^3$ from the flare. This equates to around $10,400mg/m^3$ H_2S in the biogas entering the flare (and the generator as well although the efficiency is not quoted). However, there is limited referencing of where the information on the efficiencies has been obtained. Also, the emission estimates from stack testing at the Biogas Jandakot facility have not been provided with any indication of consistency.

Furthermore, Table 2 (Section 3.1, page 9) quotes the public health standard ground level concentration (GLC) for H_2S as $510\mu g/m^3$ (3-minute average) from the *Environment Protection (Air Quality) Policy 2016* (the "Air EPP"), but there is no reference to the odour GLC from Schedule 2 of the Air EPP which is $0.15\mu g/m^3$ (3-minute average). This must also be met.

Odour from the removal of the spent organic material

It is stated that digestate is removed on a daily basis by being pumped into a storage tank, from which it is pumped into tankers for transport off site. The system is understood to be sealed, but no evidence is provided to support this.

Modelling Results

The modelling for CO , H_2S and SO_2 for public health GLC assessment is acceptable and indicates that the predicted GLCs are well below the public health standard levels in Schedule 2 of the Air EPP.

The modelled NO₂ 1-hour maximum is close to the GLC (250µg/m³) at 239µg/m³, which is a concern. It is not clear what the predicted maxima at all the nearest sensitive receivers are, as these have not been identified on the contour plot (figure 4). Please note, for a 1-hour GLC a sensitive receiver includes any location where people are likely to spend more than an hour at a time (i.e. not just residential properties but include offices, factories, sporting grounds etc.).

Also, the predicted maximum concentrations of H₂S for both the generator and flare (55 and 94µg/m³ respectively) are considerably higher than the odour GLC from Schedule 2 of the Air EPP (0.15µg/m³). Assuming that 0.15µg/m³ is at the odour threshold (i.e. 1OU) it is fair to say that the odour unit levels of the predicted H₂S maximum ground levels in the order of 300OU to 600OU (for generator and flare respectively). Even with a less conservative threshold of 2.0µg/m³ H₂S, this still results in ground level odour impacts of between 27OU and 47OU. The levels at the nearest sensitive receivers should be identified (as indicated in the contour plot for H₂S, which shows the levels at the Residential Zone in the order of 10-30µg/m³, which is significantly above the H₂S odour GLC). These are well above the acceptable odour unit criterion for Salisbury (i.e. 2OU for a population of greater than 2,000. Salisbury is part of Greater Adelaide).

Despite this, the odour assessment (Section 6.2, page 17) shows a predicted maximum 99.9th percentile 3-minute average odour level of 1.88OU. This discrepancy needs to be resolved.

Further Information:

1. Provide reference information relating to the destruction efficiencies for H₂S of the generator and flare.
2. Provide supporting information for the consistency of the destruction efficiencies for H₂S of the generator and the flare (i.e. are the exhaust emission estimates worse-case?).
3. Provide supporting information for the consistency of the exhaust emission estimates for the combustion pollutants from the generator and the flare.
4. Identify all the nearest sensitive receivers for the purposes of assessment against the 1-hour NO₂ ground level concentration and modelling predictions of worse-case maxima ground level concentrations at all these receivers.
5. Identify all the nearest sensitive receivers for the purposes of assessment against the 3-minute H₂S odour ground level concentration and modelling predictions of worse-case maxima ground level concentrations at all these receivers.
6. Provide evidence to demonstrate that handling of digestate does not cause an odour nuisance.
7. Provide clarification regarding the significant discrepancies between the predicted ground level concentrations of H₂S and the predicted ground level odour in odour units.
8. Provide confirmation of the expected heat release from the proposed plant.

Further guidance can be found at:

https://www.epa.sa.gov.au/environmental_info/air_quality/assistance_and_advice

Waste

9. Provide confirmation of the quantities of digestate / compost that would be:
 - a. sent off-site for further treatment, e.g. to a licenced composting facility
 - b. provide confirmation of the anticipated quantities of digestate (solids) to be sent off site in tonnes or m³ p.a.

Noise

10. As identified in the DeLorean Energy Environmental Report and the *Response to Development Application Information Request* prepared by Biogas Renewables, provide a report prepared by a suitably experienced, professional acoustic engineering consultant* demonstrating that worst case predicted noise from the proposal can meet the following Noise Criteria.

The report should state what the overall predicted noise would be at the most noise affected premises after adjustment for any noise character**.

If the report cannot demonstrate that the worst case predicted noise from the proposal can meet the following Noise Criteria, it should give details and specifications of what treatments, procedures and/or practices are required on the subject land to achieve compliance.

Worst case predicted noise includes, but not limited to, the overall noise from all equipment operating and activities being carried out and vehicles (including commercial vehicles, forklifts, reversing alarms) entering, leaving, moving and operating on site that could occur simultaneously.

Predictions should include worst case acoustic and meteorological conditions for the transmission of noise from source to noise affected premises (including CONCAWE meteorological category 5 day and CONCAWE meteorological category 6 night) and at maximum operating potential.

If meeting the Noise Criteria relies on certain, installations, barriers, separation distance and procedures (e.g. limited operating hours, acoustic treatments, doors being kept closed) then the report should give precise details and specifics about the type and location of these on the subject land.

The report should specify the highest resultant predicted noise level (adjusted for noise character) at the nearest noise affected premises after implementing any attenuation practices and/or installations. If the noise criteria will be met without the need for attenuation practices and/or installations, the report should still specify the resultant predicted noise level adjusted for noise character.

The report should be accompanied with a statement from the applicant that any recommendations in the report will be implemented by the applicant.

Noise Criteria

Residential zone

- 52dB(A) Leq between the hours of 7am and 10pm when measured and adjusted[#]
- 45dB(A) Leq between the hours of 10pm and 7am when measured and adjusted[#]
- 60dB(A) L_{Amax} between the hours of 10pm and 7am when measured;

at the nearest noise-affected premises in the City of Salisbury Residential zone in accordance with the *Environment Protection (Noise) Policy 2007*.

Urban Employment zone

- 59dB(A) Leq between the hours of 7am and 10pm
- 50dB(A) Leq between the hours of 10pm and 7am.

when measured and adjusted[#] at noise-affected premises in the City of Salisbury Urban Employment zone in accordance with the Environment Protection (Noise) Policy.

Notes *An acoustic engineer is defined as a person eligible for full Member status of both Engineers Australia and the Australian Acoustical Society.

***likely noise character should be discussed and results of predicted noise, with and without adjustment for character penalty, should be provided.*

[#]The above measured noise levels should be adjusted in accordance with the Environment Protection (Noise) Policy 2007 by the inclusion of a penalty for each characteristic where tonal/modulating/impulsive/low frequency characteristics are present.

The above noise levels may be exceeded where it can be shown by an acoustic engineer that the noise from the development will not cause an adverse impact due to the existing influence of ambient noise, or the limited duration and/or frequency of occurrence of the activity. The onus of proof will rest with the developer.

The further information must be supplied within 3 months of the date of this letter. Failure to comply with this request may result in the EPA advising the planning authority to refuse the application.

Please send the further information, labelled with your Development Application Number, to both the Environment Protection Authority and the planning authority at the addresses provided below. Please ensure correspondence is marked attention to Client Services Officer.

All information must be forwarded to:

Client Services Officer
Development Applications
Science and Assessment Division
Environment Protection Authority
GPO Box 2607
ADELAIDE SA 5001
DX 228
epa.planning@sa.gov.au

Laura Kerber
Senior Planning Officer
State Commission Assessment Panel
L5
50 FLINDERS Street
ADELAIDE, SA 5000
laura.kerber@sa.gov.au

Please direct all enquiries to Courtney Stollznaw on telephone (08) 8204 9402 or facsimile (08) 8124 4673 or email epa.planning@sa.gov.au

Early attention to this matter would be appreciated.

Yours faithfully



Hayley Riggs
Delegate
ENVIRONMENT PROTECTION AUTHORITY

cc: *Planning Authority:* State Commission Assessment Panel
Attention: Laura Kerber



Environment Protection Authority
GPO Box 2607 Adelaide SA 5001
211 Victoria Square Adelaide SA 5000
T (08) 8204 2004
Country areas 1800 623 445

EPA Reference: 34394

26th October 2018

Mr Hamish Jolly
Ground Floor
1205 Hay Street
WEST PERTH WA 6005

hamish.jolly@biogass.com.au

Dear Mr Jolly,

Development Application Information Request

Development Application Number	361/L007/18
Applicant	DeLorean Energy
Location	A505 DP68296, Hundred Munno Para, 1-2 Gidgie Court, Edinburgh, SA 5111.
Proposal	Waste to energy anaerobic digestion plant: organic waste reception, storage, treatment and disposal; and production of electrical energy, bio methane and thermal heat.
Information required within 3 months from date of this letter.	

The above mentioned development application was referred to the Environment Protection Authority (EPA) by the State Commission Assessment Panel in accordance with section 37 of the *Development Act 1993*.

Thank you for the further information provided to the EPA via email on 18 October 2018.

The information provided to the EPA is insufficient for the EPA to undertake an environmental assessment. Therefore, as provided for by section 37(2) of the Development Act, the EPA requires the following additional information before it gives its response.

Air Quality

Item 5 in the EPA's letter dated 10 October 2018 requested the following:

- *Identify all the nearest sensitive receivers for the purposes of assessment against the 3-minute H₂S odour ground level concentration and modelling predictions of worse-case maxima ground level concentrations at all these receivers.*

The response by Biogas Renewables included two tables in what appear to be two sets of predictions of 3-minute average H₂S levels at the nearest three sensitive receptors. It is not clear what these results represent² (e.g. are they the highest two 3-minute predictions of H₂S at each receptor or are they the maximum predicted levels from two separate modelling runs?).

Further, it doesn't identify all the nearest sensitive receptors for the purposes of assessment against the 3-minute H₂S odour ground level concentration in Schedule 2 of the *Environment Protection (Air Quality) Policy 2016* (Air EPP) as requested. This is because it doesn't identify those receptors that are commercial and industrial (and other) closer to the proposed facility than the Residential Zone. A 3-minute averaging time for pollutants in Schedule 2 requires assessment at all off-site locations where people are likely to spend greater than three minutes at a time. The EPA considers that for pollutants with a 3-minute averaging time in Schedule 2 of the Air EPP that assessment is at the boundary of the site.

In addition, the provided information does not assess the 3-minute H₂S ground level concentration predictions (at sensitive receptors) against the odour ground level concentration (GLC) in Schedule 2 of the Air EPP for H₂S. The odour GLC for H₂S (3-minute average) is 0.15µg/m³, and the listed predicted levels are between 10 and 37µg/m³. These predicted levels are orders of magnitude above the odour GLC.

Item 7 in the EPA's letter dated 10 October 2018 requested the following:

- *Provide clarification regarding the significant discrepancies between the predicted ground level concentrations of H₂S and the predicted ground level odour in odour units.*

The response to this request has not provided any clarification, which states: *"To clarify, predicted emissions are as stated in the emissions modelling report. The modelled predicted concentrations of H₂S at sensitive receptors were predominantly associated with emissions from the biomethane upgrade plant. The H₂S emission rates and the OU for the biomethane stack were derived from equipment information."*

The Biogas Renewables report predicts significant H₂S at ground level in the residential areas (in orders of magnitude above the odour GLC) yet the odour modelling (in odour units) predicts compliance with the two Odour Unit (OU) level in Schedule 3 of the Air EPP. The predicted H₂S GLC indicate an expectation that the odour due to H₂S generated by the proposed plant would be significantly above the compliance level in Schedule 2 of the Air EPP. As such, these two modelling results are contradictory.

Please provide the following information:

1. Please confirm the make and model of the CHP co-generation unit (previous documentation indicated that three x 526kW capacity Jenbacher 3-type biogas (GE JGS312 GS-N.L D225)), and provide the supplier's technical specification sheet/s which support the nominated electrical total output of 4.68MW and thermal output of 4.9MW.
2. Identify all the nearest sensitive receivers for the purposes of and undertake assessment against the 3-minute H₂S odour ground level concentration and

modelling predictions of worse-case maxima ground level concentrations at all these receivers.

3. Provide clarification regarding the significant discrepancies between the predicted ground level concentrations of H₂S and the predicted ground level odour in odour units.
4. Provide a methodology for mitigation of H₂S that would result in a reduction of the emission rate that can also be demonstrated to meet the Schedule 2 GLC for H₂S odour criterion (3-minute average) at the nearest sensitive receptors (including adjacent businesses).

Noise

The EPA has reviewed the acoustic report, prepared by Herring Storer Acoustics, titled *Environmental Noise Assessment*, dated October 2018 (reference : 23621#1#18204). The acoustic report is insufficient for the following reasons:

- The acoustic consultants have used their own interpretation of the *Environment Protection (Noise) Policy 2007* to create incorrect noise criteria instead of using the noise criteria outlined in the EPA letter dated 20 July 2018.
- In addition to meeting the noise criteria in the nearby residential area it is also important to meet the criteria in the Urban Employment Zone (where the subject land is) because the Urban Employment Zone allows for the development of noise-sensitive development such as "*commercial premises, offices, shops, training facilities and dwellings in association with industry*".
- There are several vague and ambiguous references in the report where specific and/or detailed information is required (e.g. in relation to the acoustic attenuation and predicted noise levels).

In addition to the above, the development application states that the subject land is at Allotment 505, 1-2 Gidgie Court, Edinburgh however the acoustic report states that the report is about "Lot 505 Woomera Avenue, Salisbury. The acoustic report should be referring to the same address as the development application.

Please provide the following information:

5. Amend the title of the acoustic report to include the same address given for the development application, which is Lot A505, 1-2 Gidgie Court, Edinburgh, South Australia.
6. If an acoustic attenuation package is required to be fitted to the generators to achieve the noise criteria stated in the EPA letter dated 20 July 2018, provide specific details of the attenuation package in the acoustic report. Please also confirm that any attenuation package is proposed to be installed/constructed as part of the development application.

7. Provide tabulated numerical results of noise predictions (in addition to the modelling plots provided in the Herring Storer Acoustics report), that demonstrate, after the inclusion of noise mitigation measures, the predicted noise levels meet the noise criteria provided in the EPA letter dated 20 July 2018 at all noise-affected premises in both the City of Salisbury Residential Zone and the City of Salisbury Urban Employment Zone.
8. Provide drawings that clearly demonstrate the location of acoustic attenuation barriers required to achieve the noise criteria stated in the EPA letter dated 20 July 2018. Please also confirm that any attenuation barriers are proposed to be installed/constructed as part of the development application. NB. The diagram showing the location of the barrier shown in plot 17W, Appendix B of the Herring Storer Acoustics report is too ambiguous. The drawing must be easily interpreted (including the fences mentioned in the last sentence on page 1 of the Herring Storer Acoustics report). Drawing of a quality at least as good as drawings J116-001, sheets 5 of 8 and 6 of 8 or J116-002 sheet 1 of 1 must be used.

*** An acoustic engineer is defined as a person eligible for full Member status of both Engineers Australia and the Australian Acoustical Society.*

The further information must be supplied within 3 months of the date of this letter. Failure to comply with this request may result in the EPA advising the planning authority to refuse the application.

Please send the further information, labelled with your Development Application Number, to both the Environment Protection Authority and the planning authority at the addresses provided below. Please ensure correspondence is marked attention to Client Services Officer.

All information must be forwarded to:

Client Services Officer
Development Applications
Science and Assessment Division
Environment Protection Authority
GPO Box 2607
ADELAIDE SA 5001
DX 228
epa.planning@sa.gov.au

Laura Kerber
Senior Planning Officer
State Commission Assessment Panel
L5
50 FLINDERS Street
ADELAIDE, SA 5000
laura.kerber@sa.gov.au

Please direct all enquiries to Courtney Stollznaw on telephone (08) 8204 9402 or facsimile (08) 8124 4673 or email epa.planning@sa.gov.au

Early attention to this matter would be appreciated.

Yours faithfully



Hayley Riggs
Delegate

ENVIRONMENT PROTECTION AUTHORITY

cc: *Planning Authority:*
Attention:

State Commission Assessment Panel
Laura Kerber



Environment Protection Authority
GPO Box 2607 Adelaide SA 5001
211 Victoria Square Adelaide SA 5000
T (08) 8204 2004
Country areas 1800 623 445

EPA Reference: 34394

27th November 2018

Mr Hamish Jolly
Ground Floor
1205 Hay Street
WEST PERTH WA 6005

hamish.jolly@biogass.com.au

Dear Mr Jolly,

Development Application Information Request

Development Application Number	361/L007/18
Applicant	DeLorean Energy
Location	A505 DP68296, Hundred Munno Para, 1-2 Gidgie Court, Edinburgh, SA 5111.
Proposal	Waste to energy anaerobic digestion plant: organic waste reception, storage, treatment and disposal; and production of electrical energy, bio methane and thermal heat.
Information required within 3 months from date of this letter.	

The above mentioned development application was referred to the Environment Protection Authority (EPA) by the State Commission Assessment Panel in accordance with section 37 of the *Development Act 1993*.

Thank you for the further information provided to the EPA via email on 14 November 2018.

The information provided to the EPA is insufficient for the EPA to undertake an environmental assessment. Therefore, as provided for by section 37(2) of the Development Act, the EPA requires the following additional information before it gives its response.

Air Quality

EPA Question 2:

Identify all the nearest sensitive receivers for the purposes of and undertake assessment against the 3-minute H_2S odour ground level concentration and modelling predictions of worse-case maxima ground level concentrations at all these receivers;

The reason behind the question regarding the map related to the lack of clarity of the impacted properties, with a request for a more detailed aerial photograph with overlaid pollutant contours. Consequently, the response that states "EPA wish to expand this to anyone who is exposed for >3 minutes." is a misunderstanding of the EPA's request for a better map. The intent of the EPA's comments were regarding the lack of assessment against the odour ground level concentration (GLC) for H₂S as required by the Schedule 2 of the *Environment Protection (Air Quality) Policy 2016*. The submitted information to date does not include the H₂S odour GLC.

The provided response also states that "...biomethane upgrade plant which will now emit zero H₂S utilising mitigation techniques outlined in response No. 4. This will be proven during commissioning." This suggests that there is currently no relevant data from proven commissioned plants that can show proof of the zero H₂S emission due to the proposed mitigation methodology.

The above comments also apply to the EPA question 3 and the provided response.

EPA Question 4:

Provide a methodology for mitigation of H₂S that will result in a reduction of the emission rate that can also be demonstrated to meet the Schedule 2 GLC for H₂S odour criterion (3-minute average) at the nearest sensitive receptors (including adjacent businesses).

The provided response states "To confirm, the design shall incorporate (sic) all necessary mitigation methods to reduce H₂S to meet the Schedule 2 GLC for H₂S odour criterion (3-minute average) at the nearest sensitive receptors (sic) and achieve an output of As Low As Reasonably Possible (ALARP)." This statement appears to commit to a design concept that would ensure meeting Schedule 2 GLC requirements for H₂S odour but also achieving an output of As Low As Reasonably Possible (ALARP). These two commitments may not correlate since the ALARP output may not achieve compliance with the odour GLC for H₂S.

The "Stage 1: Micro-dosing Gas Treatment System" states that "Sulphide clean-up managed via a biological removal system." and "The method is an industry standard practice and involves micro dosing air into the head space of the digester to give H₂S + O₂ = SO₄ + H₂O." It is not clear that the introduction of air into the system would effectively convert all H₂S from the anaerobic digestion process to result in little or no impact at ground level.

The "State 2: Carbon Activated Filter" appears to be a catch-all, suggesting that there is an expectation the Stage 1 system isn't efficient enough.

These systems appear to be concepts for H₂S removal that are theoretically valid. The EPA requires proof of concept in the form of data from a commissioned plant using exactly the same technology for the same type of feedstock.

If no data from an operating plant of comparable characteristics that utilises the same H₂S removal methodologies is available, there is no certainty that the operational plant would achieve what is being proposed with regards to odour mitigation. The expectation that there would be no H₂S emissions would suggest there is no longer a need to require modelling and assessment against the odour GLC in Schedule 2 of the *Environment Protection (Air Quality) Policy 2016*. However, the EPA requires actual data from a commissioned facility to provide

'proof of concept'. Without this the EPA would require modelling of the odour GLC.

The Objects of the Environment Protection Act require the EPA to support ecologically sustainable development and to consider environmental, social and economic factors. Further, the EPA must apply a precautionary approach to the assessment of risk of environmental harm and ensure that all aspects of environmental quality affected by pollution and waste are considered in decisions relating to the environment. Therefore, the EPA has to weigh up the potential economic and social benefits against the environmental risks based on the submitted information, which in this case includes significant uncertainty.

Further Information Request

1. Provide data from a commissioned plant (proof of concept) that shows zero H₂S emission due to the proposed mitigation methodology.
2. Update the predictive dispersion modelling to demonstrate that the Biofilter emissions (based on current configuration) would meet odour criteria of Schedule 3 of the *Environment Protection (Air Quality) Policy 2016*
3. Provide design details of the Biofilter including temperature control during hot days, humidity control and how the "Greenlane" waste gas would be managed. As above, it must be demonstrated where this technology has been successfully used on similar applications
4. Provide a description of the "micro dosing air" to oxidise sulphur dioxide to "sulphate" in the head space of the anaerobic digester, including (but not limited to):
 - a. how much air would be required;
 - b. whether this air requires a compressor;
 - c. how the good mixing of air and hydrogen sulphide in the headspace of the anaerobic digester would be achieved; and
 - d. what form the "sulphate" takes.
5. Provide a description of the "Greenlane" process including whether or not a compressor is required to enhance carbon dioxide and hydrogen sulphide solubility into water.

Noise

The *Environmental Noise Assessment*, prepared by Herring Storer Acoustics, October 2018, states that "Fan selection or attenuation of the bio-filter blower outlet to achieve a sound power of no more than 85dB(A) at the external outlet." This statement:

- demonstrates the type of fan that would be used on the bio-filter blower has not been chosen;
- does not demonstrate that a fan currently exists (able to be purchased) for the bio-filter blower that does not exceed a sound power level of 85dB(A);
- does not specify what attenuation would be fitted to limit the outlet noise sound power level to no greater than 85dB(A), if noise from the fan outlet exceeds a sound power level of 85dB(A).

Further Information Request

6. Amend the *Environmental Noise Assessment*, prepared by Herring Storer Acoustics (Reference: 23621#2#18204) as follows:
 - a. specify the type of fan (provide make, model, etc.) that would be installed (it is acceptable to include "...or equivalent") for the bio-filter blower which would have a sound power level no greater than 85dB(A) at the external outlet;
 - b. specify what type of attenuation (if required) to ensure the sound power at the external outlet of bio-filter blower fan would be no greater than 85dB(A).

General

Further Information Request

7. Provide a list of treatment chemicals/aids to manufacture (including inventories) and how they would be stored within a bunded area or otherwise stored to prevent water pollution.
8. Provide a current process diagram which shows all the proposed major plant items.

The further information must be supplied within 3 months of the date of this letter. Failure to comply with this request may result in the EPA advising the planning authority to refuse the application.

Please send the further information, labelled with your Development Application Number, to both the Environment Protection Authority and the planning authority at the addresses provided below. Please ensure correspondence is marked attention to Client Services Officer.

All information must be forwarded to:

Client Services Officer
Development Applications
Science and Assessment Division
Environment Protection Authority
GPO Box 2607
ADELAIDE SA 5001
DX 228
epa.planning@sa.gov.au

Janine Philbey
Planning Officer - Development
Assessment
State Commission Assessment Panel
L5
50 FLINDERS Street
ADELAIDE, SA 5000
janine.philbey@sa.gov.au

Please direct all enquiries to Courtney Stollznow on telephone (08) 8204 9402 or facsimile (08) 8124 4673 or email epa.planning@sa.gov.au

Early attention to this matter would be appreciated.

Yours faithfully



Michael Guy
Delegate

ENVIRONMENT PROTECTION AUTHORITY

cc: *Planning Authority:*
Attention:

State Commission Assessment Panel
Janine Philbey

EPA Reference: 34394

9th January 2019

Mr Hamish Jolly
Ground Floor
1205 Hay Street
WEST PERTH WA 6005

hamish.jolly@biogass.com.au

Dear Mr Jolly,

Development Application Information Request

Development Application Number	361/L007/18
Applicant	DeLorean Energy
Location	A505 DP68296, Hundred Munno Para, 1-2 Gidgie Court, Edinburgh, SA 5111.
Proposal	Waste to energy anaerobic digestion plant: organic waste reception, storage, treatment and disposal; and production of electrical energy, bio methane and thermal heat.
Information required within 3 months from date of this letter.	

The above mentioned development application was referred to the Environment Protection Authority (EPA) by the State Commission Assessment Panel in accordance with section 37 of the *Development Act 1993*.

The information received by the EPA on the 21 December 2018 has been reviewed and it is noted that some details relating to matters raised in the EPA's further information request letter dated 27 November 2018 have not been adequately addressed or raised further questions in the response.

The information therefore is still insufficient for the EPA to undertake an environmental assessment. As provided for by section 37(2) of the Development Act, the EPA requires the following additional information before it gives its response.

General

Previously it was indicated that 3 x Edina MWM TCG202V16 units with a total generation capacity of 11 MW(e) would be used; however Section 2.1.2 of the Air Quality Assessment mentions 3 x Jenbacher GE JCS312 GS-NL D225 units with a total generation capacity of 1.6

MW(e).

1. Provide clarification as to which generators will be utilised and the total generation capacity in MW.

Air Quality

The additional information indicates that the biofilter feed will have a relative humidity of 85% (Section 2.3.2 of the Air Quality Assessment states 70%) and a maximum temperature of 45°C. The EPA's understanding is that a 95% RH and a maximum temperature of up to 37°C are more typical operating conditions.

2. Provide examples of successful biofilters operating under the parameters submitted, including a statement of flowrates and residence time.

The EPA understands that the bio-methane₃ upgrade plant would use an iron oxide scrubber system, which would guarantee 0.15mg/m³ maximum emission concentration and the safety flare is for destruction of any gas that may come from any part of the plant. It is noted that Table 1 "Flares" emissions data has changed from the previous submission data. Previously H₂S emission at 5.2mg/m³ from the flares are now "below detection limit". If the flares are a bypass system, the EPA assumes that, given the unprocessed bio-methane hasn't changed, these numbers should still be the same.

3. Clarify why Table 1 "Flares" emissions data changed from the previous submission data.

It is noted that Table 2 of the *Salisbury Anaerobic Digestion Plant Air Quality Assessment*, prepared by Ramboll, dated 19 December 2018 (Air Quality Assessment), still doesn't include H₂S odour ground level concentration (GLC) but has been included as a comment under Table 3. It is important to note that the H₂S odour GLC from Schedule 2 of the *Environment Protection (Air Quality) Policy 2016*² (Air EPP) is 100th percentile (ie. maximum not to be exceeded) and, being an industrial process, it is the criterion to be met, not the population-based Schedule 3 odour unit criteria.

The criterion for H₂S odour GLC is 0.15ug/m³, which is around odour threshold, hence why 94ug/m³ is vastly higher, perhaps in the hundreds of odour units range which is considerably different to what has been submitted in the odour unit plot (which indicates compliance with the Schedule 3 criteria, however this is not the correct criteria which is Schedule 2).

4. Provide an assessment against the GLC H₂S odour criteria and appropriately update all relevant sections of the Air Quality Assessment report.

The response to question 4 contained in the letter from Hamish Jolly (Biogas Renewables) dated 20 December 2018, states a system is proposed that uses small amounts of air to remove H₂S as elemental sulphur. However, "point d" states "the sulphate is removed as a solid precipitate". It is noted that these do not correlate.

5. Provide clarification and more detail as to the final precipitate of oxidised H₂S; is it sulphur or sulphate.

The chemistry relating to this "biological desulphuriation" explained in response to question 4 in the letter from Hamish Jolly (Biogass Renewables) dated 20 December 2018 isn't supported with documentation.

6. Provide published information that supports this methodology.

It is noted that most of the contour plots within the Air Quality Assessment do not have units nor are the nearest sensitive receivers identified.

7. Provide updated contour plots with the missing metadata as detailed above.

The provided process diagram (Greenlane Totara Biogas Upgrading System Process Diagram) indicates that all H₂S entering the scrubber would be emitted to atmosphere from the stripper.

8. Confirm that all H₂S entering the scrubber and emitted to atmosphere from the stripper has been included (and therefore reflected) in the dispersion modelling

The iron oxide in the purifiers (product gas line) would eventually all be converted to iron sulphide. This material is also likely to odorous and requires appropriate handling.

9. Provide further details regarding handling and disposal of the iron sulphide.

Blow down

10. How would odour from the blow down water be managed to ensure that odour does not become a nuisance issue
11. Provide details of the operational criteria for blow down from the stripper
12. Provide details of the expected water quality in the blow down, particularly with regard to residual H₂S content.

Noise

The fourth dot on page 6 (Noise Mitigation Measures) of the *Environmental Noise Assessment, AD Plant, Lot 505 Woomera Avenue, Salisbury*, prepared by Herring Storer Acoustics (Document Reference: 23621#3#18204) does not provide certainty about what type of acoustic attenuation package, rated at 65 dB(A) at 1m, would be fitted to the generators.

13. Provide details of the acoustic measures proposed to be implemented including the location of the measures on a plans, details of materials to be used (including

- type, length, height, thickness).
14. Provide clarification if the noise from the compressors, the scrubber let down valve (between the scrubber and the flashing vessel) and the stripping vessel pump and fan have been incorporated into noise modelling.

The further information must be supplied within 3 months of the date of this letter. Failure to comply with this request may result in the EPA advising the planning authority to refuse the application.

Please send the further information, labelled with your Development Application Number, to both the Environment Protection Authority and the planning authority at the addresses provided below. Please ensure correspondence is marked attention to Client Services Officer.

All information must be forwarded to:

Client Services Officer
Development Applications
Science and Assessment Division
Environment Protection Authority
GPO Box 2607
ADELAIDE SA 5001
DX 228
epa.planning@sa.gov.au

Janine Philbey
Planning Officer - Development
Assessment
State Commission Assessment Panel
L5
50 FLINDERS Street
ADELAIDE, SA 5000
janine.philbey@sa.gov.au

Please direct all enquiries to Robert De Zeeuw on telephone (08) 8204 1112 or facsimile (08) 8124 4673 or email epa.planning@sa.gov.au

Early attention to this matter would be appreciated.

Yours faithfully
Michael Guy
Delegate
ENVIRONMENT PROTECTION AUTHORITY

cc: *Planning Authority:* State Commission Assessment Panel
Attention: Janine Philbey

EPA Reference: 34394

21st February 2019

Mr Hamish Jolly
Ground Floor
1205 Hay Street
WEST PERTH WA 6005

hamish.jolly@biogass.com.au

Dear Mr Jolly,

Development Application Information Request

Development Application Number	361/L007/18
Applicant	DeLorean Energy
Location	A505 DP68296, Hundred Munno Para, 1-2 Gidgie Court, Edinburgh, SA 5111.
Proposal	Waste to energy anaerobic digestion plant: organic waste reception, storage, treatment and disposal; and production of electrical energy, bio methane and thermal heat.
Information required within 3 months from date of this letter.	

The above mentioned development application was referred to the Environment Protection Authority (EPA) by the State Commission Assessment Panel in accordance with section 37 of the *Development Act 1993*.

Thank you for the further information received by the EPA on 11 February 2019.

The information therefore is still insufficient for the EPA to undertake an environmental assessment. As provided for by section 37(2) of the Development Act, the EPA requires the following additional information before it gives its response.

Air Quality

The EPA has reviewed the *Biogass Renewables Salisbury Anaerobic Digestion Plant Air Quality Assessment*, prepared by Ramboll, dated February 2019. It is the EPA's understanding that the H₂S input to the CHP and Flare are both based on the scrubber manufacturer's guarantee 0.1ppm level. The biomethane H₂S theoretical levels before the scrubber are presumably the same (60ppm) based on the Richgro information. Regardless of that, the EPA does not understand how the modelled ground level results in 0.13µg/m³ which is above that for Blue

Lake Milling ($0.116\mu\text{g}/\text{m}^3$) when the inputs into the CHP and Flares are considerably higher at Blue Lake Milling (i.e. 60ppm c.f. 0.1ppm), when the destruction efficiencies are the same. Also, given how close this predicted GLC is to the Schedule 2 odour GLC for H_2S , and the H_2S input is based on a weekly average from the Richgro data (noting the odour GLC for H_2S is a 3min average) the EPA requires clarification as to the confidence in the 0.1ppm guaranteed limit for the scrubber.

1. Provide clarification in regards to how the modelled ground level H_2S results in $0.13\mu\text{g}/\text{m}^3$ which is above that for Blue Lake Milling ($0.116\mu\text{g}/\text{m}^3$) when the inputs into the CHP and Flares are considerably higher at Blue Lake Milling (i.e. 60ppm c.f. 0.1ppm) when the destruction efficiencies are the same.
2. Given the H_2S input is based on a weekly average from the Richgro data (noting the odour GLC for H_2S is a 3min average) provide clarification as to the confidence in the 0.1ppm guaranteed limit for the scrubber.

Noise

Thank you for providing details of the acoustic measures proposed to be implemented including the location of the measures on a plans, details of materials to be used (including type, length, height, thickness) in the letter from Edina UK dated 20 January 2019.

3. Please update the fourth dot on page 6 (Noise Mitigation Measures) of the *Environmental Noise Assessment, AD Plant, Lot 505 Woomera Avenue, Salisbury*, prepared by Herring Storer Acoustics (Document Reference: 23621#3#18204) to include the acoustic measures proposed to be implemented including the location of the measures on a plans, details of materials to be used (including type, length, height, thickness) in order for the overall operation to achieve the noise criteria specified in the EPA's letter dated 20 July 2018.

The further information must be supplied within 3 months of the date of this letter. Failure to comply with this request may result in the EPA advising the planning authority to refuse the application.

Please send the further information, labelled with your Development Application Number, to both the Environment Protection Authority and the planning authority at the addresses provided below. Please ensure correspondence is marked attention to Client Services Officer.

All information must be forwarded to:

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epa.planning@sa.gov.au

Janine Philbey
Planning Officer - Development
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State Commission Assessment Panel
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50 FLINDERS Street
ADELAIDE, SA 5000
janine.philbey@sa.gov.au

Please direct all enquiries to Courtney Stollznaw on telephone (08) 8204 9402 or facsimile (08) 8124 4673 or email epa.planning@sa.gov.au

Early attention to this matter would be appreciated.

Yours faithfully

Hayley Riggs

Delegate

ENVIRONMENT PROTECTION AUTHORITY

cc: *Planning Authority:*

Attention:

State Commission Assessment Panel

Janine Philbey



Environment Protection Authority
GPO Box 2607 Adelaide SA 5001
211 Victoria Square Adelaide SA 5000
T (08) 8204 2004
Country areas 1800 623 445

EPA Reference: 34394

22 March 2019

Ms Janine Philbey
Planning Officer - Development Assessment
State Commission Assessment Panel
L5
50 FLINDERS Street
ADELAIDE SA 5000

Dear Ms Philbey

DIRECTION - Activities of Major Environmental Significance

Development Application No.	361/L007/18
Applicant	DeLorean Energy (Biogas Renewables Pty Ltd)
Location	A505 DP68296, Hundred Munno Para, 1-2 Gidgie Court, Edinburgh, SA 5111.
Activity of Environmental Significance	Schedule 8 Item 11; Schedule 22 Part A Activities, Item 22-3(3), 22-8(2)
Proposal	Waste to energy anaerobic digestion plant: organic waste reception, storage, treatment and disposal; and production of electrical energy, bio methane and thermal heat.

Decision Notification	A copy of the decision notification must be forwarded to: Client Services Officer Environment Protection Authority GPO Box 2607 ADELAIDE SA 5001
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I refer to the above development application forwarded to the Environment Protection Authority (EPA) in accordance with Section 37 of the *Development Act 1993*. The proposed development involves an activity of major environmental significance as described above.

The following response is provided in accordance with Section 37(4)(b)(ii) of the *Development Act 1993* and Schedule 8 Item 11 of the *Development Regulations 2008*.

In determining this response the EPA had regard to and sought to further the objects of the *Environment Protection Act 1993*, and also had regard to:

- the General Environmental Duty, as defined in Part 4, Section 25 (1) of the Act; and
- relevant Environment Protection Policies made under Part 5 of the Act.

Please direct all queries relating to the contents of this correspondence to Courtney Stollznov on telephone (08) 8204 9402 or facsimile (08) 8124 4673 or email Courtney.Stollznov@epa.sa.gov.au.

THE PROPOSAL

The proposal is to establish a waste to energy anaerobic digestion facility receiving approximately 125,000 tonnes per annum of organic waste and generating up to 8MW.

The 125,000 tonnes of waste is proposed to include Commercial and Industrial waste and agricultural waste feedstock in the form of solids, semi-solids and liquids. Expected feedstocks are proposed to include (but not limited to):

- fruit and vegetables
- packaged 'dry' food wastes
- animal processing wastes
- milk processing by-products
- pre-consumer fresh food wastes
- agricultural waste feedstock.

Outputs from the facility are proposed to include:

- 4.7MW of electrical energy
- 21.47GJ/hr of biomethane
- 4.9MW of thermal heat
- digestate separated into liquid and solid fractions.

The proposed development would operate 24 hours per day, seven days per week.

SITE DESCRIPTION

The site of the proposed development is located at 1-2 Gidgie Court, Edinburgh.

The subject land is located within the Urban Employment Zone as delineated by the Salisbury Council Development Plan.

The site is currently vacant and located approximately 450m from the nearest residential receivers.

CONSIDERATION

Advice in this letter includes consideration of the location with respect to existing land uses and is aimed at protecting the environment and avoiding potential adverse impacts upon the locality.

The EPA in its assessment of environmental impacts, has had regard to the following additional information provided in response to the EPA's further information requests:

- *Biogas Renewables Salisbury Anaerobic Digestion Plant Air Quality Assessment*, prepared by Ramboll, dated September 2018

- Response to Development Application Information Request Round 6 Clarifications, prepared by Biogass, dated 26 February 2019
- Attachments to the email from Jonathan Luu (Biogass) to the EPA titled *Development Application Information Request - EPA Ref 34394 - Round 5 Clarifications - Email 2 of 2*, dated 11 February 2019
- Attachments to the email from Jonathan Luu (Biogass) to the EPA titled *Development Application Information Request - EPA Ref 34394 - Round 5 Clarifications - Email 1 of 2*, dated 11 February 2019
- Attachments to the email from Jonathan Luu (Biogass) to the EPA titled *Development Application Information Request - EPA Ref 34394 - Round 4 Clarifications*, dated 20 December 2018
- Attachments to the email from Jonathan Luu (Biogass) to the EPA titled *Development Application Information Request - EPA Ref 34394 - Round 3 Clarification*, dated 13 November 2018
- Attachments to the email from Jonathan Luu (Biogass) to the EPA titled *Development Application Information Request - EPA Ref 34394 - Round 2 Clarifications*, dated 18 October 2018
- Attachments to the email from Jonathan Luu (Biogass) to the EPA titled *Development Application Information Request - EPA Ref 34394*, dated 27 September 2018

Environmental Issues

Interface Between Land Uses

If not appropriately designed and managed, anaerobic digestion facilities may result in air quality and noise impacts.

The EPA's *Evaluation distances for effective air quality and noise management* (2016)

http://www.epa.sa.gov.au/files/12193_eval_distances.pdf ('the Evaluation Distance publication') recommends the following evaluation distances between certain activities and sensitive land uses:

Waste or recycling depot (other - e.g. resource recovery facility)	300 metres
Fuel Burning	Individual assessment determined according to the scale of the facility and the types of fuels used.

The nearest residential dwelling is located approximately 450 metres from the subject site.

In addition, the proposal should demonstrate it can satisfy the general environmental duty as described in section 25 of the Environment Protection Act (EP Act):

- *a person must not undertake an activity that pollutes, or might pollute, the environment unless the person has taken all reasonable and practicable measures to prevent or minimise any resulting environmental harm.*

Odour and noise are defined as pollutants by the EP Act. Potential odour and noise impacts are discussed in more detail below.

Air Quality

The main air quality pollutants of concern with the anaerobic digestion are odour from hydrogen sulphide (H_2S) generation and fine particles (PM_{10}), sulphur dioxide (SO_2), oxides of nitrogen (NO_x) and carbon monoxide (CO) from fuel burning. The EPA requires that such emissions are adequately dispersed in accordance with the *Environment Protection (Air Quality) Policy 2016* (Air EPP) and associated ground level concentrations listed in Schedule 2. Furthermore, pursuant to clause 18 of the Air EPP, the EPA must consider potential odour impacts from development.

To minimise odour impacts off-site the following is proposed:

- fully enclosed building with fast close roller doors
- negative air pressure with bio-filters
- scrubber
- flare.

To ensure the above measures effectively manage odour to nearby sensitive receivers, the doors must be kept fully closed at all times except when required to be opened for vehicles and the equipment (e.g. the bio-filters, flare and scrubber) must be maintained and operational at all times.

The *Biogas Renewables Salisbury Anaerobic Digestion Plant Air Quality Assessment*, prepared by Ramboll, dated September 2018 predicts that there would be adequate dispersion of H_2S , PM_{10} , NO_x , SO_2 and CO to meet the Ground Level Concentrations as specified within the Air EPP with the proposed above measures. As such, the EPA considers that the proposed development is unlikely to result in adverse air quality impacts to sensitive receivers.

Ongoing management of the site would likely be managed via conditions of an EPA licence. Conditions of licence may include requirements to:

- undertake post commissioning monitoring to validate the inputs used in the model for all identified pollutants of concern
- undertake on-going H_2S monitoring of pre-scrubber and post scrubber biomethane
- prepare a contingency plan to outline measures that would be actioned in the event that roller doors and/or bio-filters/scrubber fail or in the event that H_2S is detected at sensitive receivers.

A note to this effect is recommended below.

To minimise the generation of dust on-site the building is proposed to be fully enclosed with a sealed floor and all other operational areas sealed with concrete. This is satisfactory to the EPA. A condition to this effect is directed below.

Noise

Potential sources of noise associated with development include fans, pumps, biomethane unit and blower, flares, generators, pasteurizer and chiller. On-site truck movements and deliveries can also

generate noise.

It is understood the anaerobic digestion facility would operate 24 hours a day, seven days a week in various capacities.

The EPA has reviewed the *Environmental Noise Assessment, AD Plant, Lot A505, 1-2 Gidgie Court Edinburgh - South Australia (including Bio Methane Upgrade Plant)*, prepared by Herring Storrer Acoustics, dated February 2019 (Reference: 23621-5-18204). The EPA is satisfied the report appropriately assesses noise from the proposed development and describes noise mitigation measures required to meet the *Environment Protection (Noise) Policy 2007*. A condition is directed below to ensure the noise mitigation measures are installed prior to the commencement of operation.

Waste Management

Waste feedstock proposed to be received include:

- fruit and vegetables
- packaged 'dry' food wastes
- animal processing wastes
- milk processing by-products
- pre-consumer fresh food wastes
- agricultural waste feedstock.

All waste feedstock would be received within the receival area which is proposed to be located inside a bunded concrete floored building. Bulk liquid wastes would be delivered by tanker truck and would be discharged directly into the feed system of the bunded pre-treatment plant (located adjacent the receival area). Agricultural wastes (e.g. damaged or off-spec wheat, barley etc) would be pumped directly into the holding silos before entering the feed system. Onsite storage of waste feedstock would be limited to the materials that would be processed within 48 hours. The EPA is satisfied that receipt of waste feedstock would be appropriately contained to prevent spills and leaks of waste material impacting on soil or surface waters.

To ensure that inappropriate wastes are not received at the site and processed through the digesters the following appropriate measures are proposed:

- loads entering to be visually inspected and rejected if unsuitable
- testing of loads completed for new feedstock types
- regular testing of samples from loads and final product in on-site laboratory.

Digestate from the completion of the anaerobic digestion would be dewatered through a centrifuge producing both liquid and solid fractions. The liquid stream is proposed to be recycled back into the system, and the solids are proposed to be suitable as an organic fertiliser and would be transported off-site to a compost facilities. The digestate recovery is proposed to take place within the bunded concrete floored reception building to ensure stormwater is not contaminated and no spills are released to the environment.

The proposed management of waste is satisfactory to the EPA. Ongoing management of the site (including waste management) would be managed via conditions of EPA licence.

Water Quality

Bunding

To ensure compliance with the *Environment Protection (Water Quality) Policy 2015* and the general environmental duty, the EPA Guideline *Bunding and spill management (2016)* http://www.epa.sa.gov.au/files/47717_guide_bunding.pdf provides guidance to facilities that use and/or store liquids above ground, and provides information on bunds or spill containment systems to minimise the risk of environmental harm from liquid spills and leaks.

The site has been designed to minimise the risk of generating contaminated surface water through containing all product transfer, handling, pre-processing and drying activities within enclosed buildings, and all other processes within sealed vessels located on banded concrete hardstands.

All tanks are proposed to be banded to 120% of tank volume to safeguard against potential spillage from tank failure. Bunding is proposed to consist of approximately a 1.5m high wall completely enclosing the perimeter of all tank zones.

All run-off collected within the bunds are proposed to be diverted to sump areas and redirected to the onsite wastewater treatment plant for treatment and reuse in the anaerobic digestion process or exported to Salisbury Water.

Chemicals required onsite would be stored within either IBC containers or steel drums in a self contained lockable chemical storage containers. Spill kits are also proposed to be located at each storage point.

The EPA is satisfied that the proposed bunding would ensure stormwater is not contaminated and no spills are released to the environment. A condition is directed below to ensure bunding is in place prior to commencement of operations.

Aquifer Storage

The liquid fractions that result from the anaerobic digestion process and have been dewatered through a centrifuge is proposed to be treated via a Ultrafiltration (UF) unit (membrane filtration system) with filtered water then passed through a Reverse Osmosis (RO) unit. This treated water is proposed to be recirculated for use as process water or diverted to the Salisbury Water Managed Aquifer Recharge (MAR) Scheme.

Given the reuse of water in the process, or by supply of fit for purpose water to a third party, the EPA is satisfied that the water management is sufficient to ensure that no wastewater is discharged directly from the site.

CONCLUSION

The EPA is satisfied that the proposed construction of the anaerobic digestion facility would not cause adverse environmental impacts on both sensitive receivers and the surrounding environment, subject to the conditions directed below being included on any development approval. Ongoing management at the site would also be managed via conditions of the existing EPA licence.

DIRECTION

The planning authority is directed to attach the following conditions to any approval:

1. Prior to commencement of operations, all noise mitigation measures must be installed as outlined in section 5 of the *Environmental Noise Assessment* prepared by Herring Storer Acoustics, dated February 2019 (document reference: 23621#5#18204).
2. Prior to operation, all operational areas must be sealed with concrete (or other impervious material).
3. Prior to the commencement of operations, bunding must be installed and all liquids and waste materials must be stored within the bunded area so as to contain any spillages that may occur. Note: Information on bunding is available in the *EPA Guidelines: Bunding and Spill Management* (2012) http://epa.sa.gov.au/files/47717_guide_bunding.pdf
4. Prior to commencement of operations, the Schlumberger Iron Oxide Scrubber must be installed and operational.

The following notes provide important information for the benefit of the applicant and are requested to be included in any approval:

- The applicant is reminded of its general environmental duty, as required by section 25 of the *Environment Protection Act 1993*, to take all reasonable and practicable measures to ensure that the activities on the whole site, including during construction, do not pollute the environment in a way which causes or may cause environmental harm.
- An environmental authorisation in the form of a licence is required for the operation of this development. Conditions of licence may include requirements to:
 - undertake post commissioning monitoring to validate the inputs used in the model for all identified pollutants of concern
 - undertake on-going H₂S monitoring of pre-scrubber and post scrubber biomethane
 - prepare a contingency plan to outline measures that would be actioned in the event that roller doors and/or bio-filters/scrubber fail or in the event that H₂S is detected at sensitive receivers.
- The applicant is required to contact the Environment Protection Authority before acting on this approval to ascertain licensing requirements. Information on applying for a licence (including licence application forms) can be accessed here: http://www.epa.sa.gov.au/business_and_industry/applying_for_a_licence
- A licence may be refused where the applicant has failed to comply with any conditions of development approval imposed at the direction of the Environment Protection Authority.
- EPA information sheets, guidelines documents, codes of practice, technical bulletins etc can be accessed on the following web site: <http://www.epa.sa.gov.au>.
- The applicant is reminded that demolition and construction is required to be carried out so that it complies with the construction noise provisions of the *Environment Protection (Noise) Policy 2007*.

Yours faithfully

Hayley Riggs

Delegate

ENVIRONMENT PROTECTION AUTHORITY



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16 November 2018

State Commission Assessment Panel
GPO Box 1815
ADELAIDE SA 5001

scapadmin@sa.gov.au

Dear Sir/Madam

Applicant: DeLorean Energy
Application No: 361/1010/2018/S49
Subject Site: 1-2 Gidgie Court , Edinburgh SA 5111
Proposed Development: WASTE TO ENERGY ANAEROBIC DIGESTION PLANT: ORGANIC WASTE RECEPTION, STORAGE, TREATMENT AND DISPOSAL; AND PRODUCTION OF ELECTRICAL ENERGY, BIOMETHANE AND THERMAL HEAT. REMOVAL OF 5 REGULATED TREES AND 11 SIGNIFICANT TREES

Thank you for referring the above-mentioned Development Application to Council for consideration in accordance with Section 49(4a) of the *Development Act 1993*.

In summary, the proposal is considered to be generally consistent with the intent of the Zone, subject to detailed consideration of some issues as discussed further below. The proposal is lacking in some key information and further consideration of these matters will need to take place by SCAP once the further information is received.

Site

The site is 1-2 Gidgie Court, Edinburgh. The site has an area of 2.274ha and has frontages to Woomera Avenue of 120m and Gidgie Court of 182m. The site is devoid of any buildings. There are a number of mature trees on the site.

Proposal

The applicant seeks approval for a waste to energy anaerobic digestion plant. The facility incorporates organic waste reception, storage, treatment and disposal, production of electrical energy, biomethane and thermal heat.

Removal of 5 Regulated Trees and 11 Significant Trees are proposed.

Procedural Matters

The site is located within the Urban Employment Zone under the Salisbury Development Plan, Consolidated 15th December 2016. Development of this kind is neither listed as a Complying or non-complying form of development and is therefore assessed on-merit.



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The application has been referred to the EPA in accordance with Schedule 8(11) of the *Development Regulations 2008*. We note the EPA have requested further information in respect to the proposal. The applicant has submitted a further response earlier this week.

The application was subject to Category 2 public notification. Five representations were received during this period. The representors have raised concerns with the proposal relating to:

- The development will detract from the desired character of the precinct;
- The development is fundamentally incompatible with existing businesses in the locality;
- The development will create nuisance odour and noise;
- The development will generate a significant number of heavy vehicle movements;
- The development will attract pests and vermin;
- The removal of the Regulated and Significant Trees is not justified.

Comments

- The Zone seeks:

A wide range of activities that generate employment, focusing on industry, indoor industrialised horticulture and associated processing and packaging, transport and technology-based activities that can operate on a twenty-four hour, seven day per week basis where appropriate, together with offices and industry-related training and educational establishments.

The proposed development fits within the definition of industry as per Schedule 1 of the *Development Regulations 2008* and is an envisaged use in the Zone.

The Zone further seeks:

A high level of compatibility between land uses in the zone is envisaged to ensure a quality and attractive business environment is maintained. Clustering of industrial activities to share resources and reduce waste impacts and energy needs is encouraged in the zone.

The activity is expressly encouraged in that it seeks reduction of waste and energy needs. At the same time, the activity has potential to generate substantial off-site impacts such as odour and noise if the operations are not managed in line with the application or if redundancies are not in place or not effective. The activity must demonstrate that it will achieve a high level of compatibility with existing uses.

The activity may constitute a 'special industry' as per Schedule 1 of the *Development Regulations 2008* if adverse impacts were experienced outside of the site and if that were to occur the activity is considered to be inappropriate in this location. In the Desired Character Statement, in respect to 'special industry' it states:

Special industry should not occur in the zone unless associated with food and beverage production, is considered necessary to support major manufacturing clusters or involves bulk handling activities associated with intermodal and transport operations. Such industries should not be located adjacent or in close proximity to local activity centres, sensitive land uses or other zones. Where special industry is proposed, use of best available technology, economically achievable will be encouraged to minimise land use impacts and reduce the need for large buffer or separation areas.

The applicant has submitted an acoustic report and odour report by experienced consultants which suggest the proposed activity will be in line with the *Environment*



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Protection (Noise) Policy and Environment Protection (Air Quality) Policy. The EPA is reviewing the contents of the reports against these policies but is yet to provide a final response. It is appropriate that the EPA form a final position regarding these matters and the proposal should not be approved unless the EPA is satisfied that it meets their policies.

It is noted that the activity will be subject to an ongoing EPA license and associated conditions which places onus on the proponent to operate in line with EPA requirements. This provides existing uses in the locality with assurance that the activity will be undertaken appropriately and impacts of the activity are in line with modelled predictions. Where necessary, ongoing controls shall be employed to manage potential risks.

Subject to the above, the activity would appear to be compatible with existing uses in the locality and will provide opportunity for the "*establishment of business clusters that create opportunities for innovation, start up and growth of new businesses and link businesses to global investment opportunities*".

- Objective 5 of the Zone seeks:

5 *A high standard of development which promotes distinctive building, landscape and streetscape design, with high visual and environmental amenity, particularly along arterial roads and the boundaries of adjoining zones.*

The Desired Character Statement for the Zone further seeks:

High quality, innovative contemporary architect that is both adaptable and flexible to accommodate multiple uses. Buildings will comprise low reflective materials and provide a variation in finishes, façade treatments and setbacks rather than appearing as large uniform buildings with blank facades.

The plans incorporate a two storey site office/reception to the front of the building. The plans are in block form and do not give a clear indication of the architectural expression. Accordingly, it is difficult to ascertain if the standard of built form is of 'high quality' and of 'innovative contemporary architecture'. More detailed architectural plans should be provided in respect to the overall presentation of the building to Woomera Avenue.

Conditions should be in place in respect to:

- Use of low reflective materials in natural tones to all buildings including the tanks;
- Landscaping to be established prior to commencement of use;
- Fencing to be in chain wire mesh in PVC coated 'black' or similar.

Should the application be approved, Council can provide draft conditions of consent for the consideration of SCAP.

- An arborist report has been submitted by Arborman Tree Solutions. The report has assessed all Regulated and Significant Trees upon the site. In total, there are 23 trees on the site, 10 Regulated Trees and 13 Significant Trees. The report recommends removal of 7 Regulated Trees and 11 Significant Trees. A further 3 Regulated Trees and 2 Significant Trees are recommended for retention. Several of the trees have been assessed as poor specimens and removal is therefore recommended. Another two trees are assessed as a



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potential fire risk and are therefore recommended for removal. The remaining trees are in direct conflict with the development and are therefore recommended for removal.

The removal of the Regulated Trees is in line with the criteria for removal of Regulated Trees as per the General Section, "Regulated Trees" module of the Development Plan. In respect to the Significant Trees, the criteria for removal is more confined. Under the General Section, "Significant Trees" module, Objective 2 seeks "*The conservation of significant trees in balance with achieving appropriate development*". Principle of Development Control 3 further states that:

3 *Significant trees should be preserved, and tree-damaging activity should not be undertaken, unless:*

- (i) The tree is diseased and its life expectancy is short;*
- (ii) The tree represents an unacceptable risk to public or private safety;*
- (iii) The tree is within 20 metres of a residential, tourist accommodation or habitable building and is a bushfire hazard within a Bushfire Prone Area.*

Council recognises the need to balance appropriate development with preservation of Significant Trees. The location and number of Significant Trees upon the site is such that the proposed development may be difficult to achieve without conflict with some tree damaging activity. However, it is unclear what degree of preliminary design has occurred in order to take into consideration the Significant Trees and what attempts have been made to work around them as best as practicably could be achieved. Based on the location of the Significant Trees, it appears that some Significant Trees could be retained and worked into the design. This approach is encouraged in the Zone whereby "*Car parking areas will include trees to provide shade and enhance visual amenity*". This matter should be further considered by SCAP.

- The site is located in close proximity to Edinburgh Airfield. The applicant has provided information that the proposal is unlikely to interrupt operations associated with Edinburgh airfield, noting that the building works will not exceed 15m in height, as per Concept Plan Map Sal/1. Notwithstanding this, the scale of the building works is such that crane operations are likely to be required and such operations have potential to impact upon operations of Edinburgh Airbase. In this regard, it is recommended that further consultation take place with Edinburgh Airbase. Contact details for Edinburgh Airbase are as follows:

Mr J Smith
Manager Technical Services
Department of Defence
Building EP2
PO Box 1500
EDINBURGH SA 5111

Mr T Hogan
Estate and Infrastructure Group
Department of Defence
DSRGIDEP.ExecutiveSupport@defence.gov.au



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- The initial proposal was accompanied by a Traffic Management Plan, prepared by DeLorean Energy. The Traffic Management Plan suggests up to 50 heavy vehicles will visit the site per day and the maximum design vehicle will be that of a 26m long B-double. Up to 9 heavy vehicles may be accommodated at one time.

It is understood that Tonkin Consulting have reviewed the proposal and recommended some changes to address appropriate traffic management. Some turning path templates have also been received from Tonkin Consulting which suggest manoeuvring for the maximum design vehicle can be accommodated. The egress point to Gidgie Court has also been deleted and the most recent set of plans from Biogass reflect this.

It is recommended that a comprehensive traffic management report be submitted. This report should not only include consideration of the turning manoeuvres necessary for the vehicles using the facility as mentioned above but should also include consideration of:

- a) Expected volumes of traffic and the expected route taken to access the site and commentary regarding suitability of the road network to cater for these movements;
- b) Commentary regarding the necessary design of the access points and the location (to achieve adequate sightlines and satisfy Council design requirements);
- c) Adequacy of on-site car parking for projected staff and visitors, noting the parking calculation in the planning report (pages 12 and 13) appears to be inaccurate;
- d) Any other recommendations/design changes necessary to facilitate the design in line with appropriate traffic management and Australian Standards.

Further examination of this report will be necessary.

- The facility proposes to send a volume of water in the amount of 128m³/day through a water treatment system and supply to Salisbury Water. Advanced discussions have taken place between Salisbury Water and Biogass, however, arrangements are still to be finalised and are subject to final agreement being in place. SCAP should be satisfied that the network capacity is sufficient to cater for the volume of water to be provided.
- Should the application be approved, the development must be accompanied by detailed civil and siteworks details. This type of plan should incorporate the following:
 - a) Finished floor levels for the building, driveways, hardstand and all other impervious surfaces;
 - b) Cut/fill details;
 - c) All services;
 - d) Necessary bunding and wastewater tanks;
 - e) Kerbing and driveway inverts/crossovers;
 - f) Pedestrian paths;
 - g) Pavement design details, driveway widths and gradients;
 - h) Water quality treatment systems including primary treatment (ie. gross pollutant traps) and secondary treatment using water sensitive design elements;
 - i) Stormwater management system including all sumps, drains, pipes etc., their sizes and fall to ensure appropriate stormwater infrastructure;
 - j) Alteration to road/verge infrastructure to facilitate the above.

This plan should be submitted to Council for approval, prior to Development Approval.



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- The application is not accompanied by detailed access plans, showing the location of the access points in relation to existing street trees and other verge infrastructure. Accordingly, it is difficult to ascertain if there is conflict. A detailed survey showing the new invert and crossover locations and their relationship to adjacent street trees and verge infrastructure should be provided to Council.

In respect to the access point to Woomera Avenue nearest to Gidgie Court, there is a side entry pit, telecommunications pit and several street trees in this location. The infrastructure would appear to be in conflict with this access. In respect to the Woomera Avenue access furthest from Gidgie Court, there is another side entry pit and a number of street trees in this location. The applicant shall be responsible for any relocation of these services to the satisfaction of the infrastructure provider. Council will also need to give authorisation for any trees removed.

- The proposed landscape plan, provided by Outer Space, incorporates landscape plantings and other landscape features within the Woomera Avenue and Gidgie Court verge. The plantings and other features are subject to a verge application and shall be approved by Council, prior to commencement of works.

Please consider the above comments as part of your assessment.

Should you require any assistance or further advice about any matter referred to above, please do not hesitate to contact me on the details below.

Yours sincerely

Aaron Curtis
Team Leader - Planning
Phone: 08 8406 8367
Email: acurtis@salisbury.sa.gov.au

South Australian
DEVELOPMENT ACT, 1993
REPRESENTATION ON APPLICATION – CATEGORY 2

Applicant: DeLorean Energy
Development Number: 361/L007/18
Nature of Development: Construction of a waste to energy anaerobic digestion plant comprising: organic waste reception, storage, treatment and disposal; and production of electrical energy, biomethane and thermal heat. Removal of 7 regulated trees, 11 significant trees. Construction of temporary signage.
Development Type: Merit
Zone / Policy Area: Urban Employment Zone
Subject Land: 1-2 Gidgie Court, Edinburgh Parks
Contact Officer: Janine Philbey
Phone Number: 7109 7062
Close Date: 23 October 2018

My Name: LIN ANDREWS My phone number: 0418 820 952

Primary method(s) of contact: Email: lin.andrews@linandrews.com.au
Postal Address: 237-239 SOUTH ROAD Postcode: 5031
MILE END SA

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard by the State Commission Assessment Panel in support of your submission.

My interests are: (please tick one)
 owner of local property
 occupier of local property
 a representative of a company/other organisation affected by the proposal
BERACAH PROPERTIES PTY LTD
 a private citizen

The address of the property affected is:

55 WOOMERA AVENUE, EDINBURGH PARKS Postcode 5111

My interests are: (please tick one)
 I support the development
 I support the development with some concerns
 I oppose the development

The specific aspects of the application to which I make comment on are:

PLEASE REFER TO ATTACHED RESPONSE SUBMISSION
(PAGES 1 TO 5)

I: wish to be heard in support of my submission
(please tick one) do not wish to be heard in support of my submission
(Please tick one)

By: appearing personally ON BEHALF OF BERACAH PROPERTIES PTY LTD.
(please tick one) being represented by the following person
(Please tick one)

Signature: 

Date: 22-10-2018.

L.M. ANDREWS, 5079/DIRECTOR, BERACAH PROPERTIES PTY LTD.

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 /or
Email: scapreps@sa.gov.au

**South Australian
DEVELOPMENT ACT, 1993
REPRESENTATION ON APPLICATION – CATEGORY 2**

Applicant: DeLorean Energy
Development No: 361/L007/18
Subject Land: 1-2 Gidgie Court, Edinburgh Parks
Respondent: L M (Lin) ANDREWS
Secretary/Director
Beracah Properties Pty Ltd

RESPONSE TO APPLICATION

Background

Beracah Properties Pty Ltd owns 55 Woomera Avenue, Edinburgh Parks.

Beracah Properties Pty Ltd operates as part of the Lin Andrews Property Group and is owned by two families of property investors.

55 Woomera Avenue was purchased at public auction in July 2018 with settlement taking place on 3rd October 2018. During this time period no formal notification of the proposed DeLorean Energy development was received. The Respondent only became aware of the proposed DeLorean Energy development on 10th October 2018 during discussions with a neighbouring property owner.

Beracah Properties Pty Ltd proposes to undertake a multi-unit commercial/industrial development on the property and has already held preliminary discussions with Salisbury Council planning staff (who have been supportive of the proposal). In line with the provisions of the Salisbury Council Development Plan (Consolidated 15 December 2016) the proposed cluster of units will target start-up and new businesses. The Respondent hopes that their development will encourage employment in the Edinburgh Parks precinct.

Concerns

It is apparent that any development of the nature proposed by DeLorean Energy will give rise to the potential for unacceptable emissions and odours. Such emissions and odours would clearly detract from the existing environment. While Beracah Properties Pty Ltd endorses the development of new renewable energy options, especially those reducing waste to landfill, it questions the suitability of the Edinburgh Parks site for the development of an anaerobic digestion plant. The Respondent considers that developments of this nature should be located in areas where there is adequate provision for wide separation from neighbouring activities.

The subject land is zoned "Urban Employment" and specifically nominated for the creation of employment destinations. The Respondent is concerned that the proposed DeLorean Energy development will detract from the desired character of the Edinburgh Parks precinct as outlined in the Salisbury Council Development Plan (Consolidated 15 December 2016).



The proposed development:

- gives rise to the potential for serious nuisance for other long established businesses in close proximity to the subject land, and
- will adversely impact on the appeal and commercial viability of any future development at 55 Woomera Avenue.

DeLorean Energy's planning report claims that, *"the development will take all possible safety precautions to eliminate risk to public safety and will not create unacceptable risks..."* (Planning Report, page 7) When studied in more detail it is observed that the report also acknowledges that there is a degree of risk with the proposed development.

Any development with an acknowledged risk of emissions and/or odours should be placed well away from other user groups. The Applicant claims that, *"The proposed development will be separated from sensitive land uses and environmentally sensitive areas."* (Planning Report, page 13) The respondent's property at 55 Woomera Avenue is under 100 metres from the subject land; it seems that DeLorean Energy consider that future users/occupants of facilities on this site (and other nearby sites) do not have the right to expect or to be guaranteed an emission and odour free work environment.

The Applicant goes as far as to claim that the subject land is *"250m away from public open spaces"*. (Planning Report, page 14) This claim is refuted.

The "South Australia Development Act 1993, Part 1—Preliminary, 4—Interpretation" provides the following definition:

***public place** includes a street, road, square, reserve, lane, footway, court, alley and thoroughfare which the public are allowed to use (whether formed on private property or not), any public watercourse, and any foreshore;*

The proposed development site is certainly not more than 250m from a street or road which the public are allowed to use. The fact that the applicant suggest the development should be 250 metres away from a public place would suggest that the subject land is definitely unsuitable for the proposed development/ use.

While the Applicant states that the development will adhere to Salisbury Council Development Plan setback guidelines in relation to building bulk, there appears to be no provision for (or attempt to make provision for) any form of realistic buffer zone or separation area in response to the nature of the proposed operations and the associated potential for nuisance to neighbouring properties from emissions and odours.

DeLorean Energy propose to construct a plant that will process 125,000 tonnes of waste per annum. The consultant, Biogas Renewables Pty Ltd, claims to have undertaken over 30 plant design and feasibility analyses for Australian bioenergy plants – details as to the size and sophistication of each of these projects are not given with the exception of brief reference to one development undertaken in Jandakot, Perth, WA. The Jandakot plant is reported to process between 35,000 and 50,000 tonnes of waste per annum – this shows that the size of the plant and the potential impact on the locality is significantly less than the phase 1 facilities proposed by DeLorean Energy for Edinburgh Parks.

The Respondent is concerned that DeLorean Energy proposes to bring significant quantities of waste into the Edinburgh Parks precinct – packaged food waste, bulk dry/wet solids, bulk liquids and agricultural waste. It is noted that the facility is expected to draw 50 trucks per day, 5 days a week. Bringing this volume of waste into Edinburgh Parks appears to contradict the stated desired character for the precinct.

The Applicant's Planning Report makes a series of statements/claims,

"As the waste operations are completed within the shed, there is no chance for dust or other pollutants to escape the confines" (page 10)

How can the Applicant guarantee that there is NO chance for dust or other pollutants to escape? While it is noted that the Applicant plans to install fast acting doors and a negative pressure system there will still be

extended periods when the receival building is “open” (i.e. when vehicles are entering or exiting) creating opportunity for odour and other pollutants to escape.

“Emissions of the fumes from the CHP and emergency flare will be controlled and modelled to ensure adverse effects on both the environment and other land holders are not adversely affected.” (page 10)

How can the Applicant guarantee that other land holders will not be adversely affected?

“The development will not impede the operation of established land uses through encroachment, over development of sites or noise/emissions or any other harmful or nuisance creating impact.” (page 14)

How can the Applicant guarantee that the development will not allow emissions or any other harmful or nuisance creating impact?

“The plant equipment with potential to cause an environmental nuisance include the following:

- 1 x Biogas to Biomethane upgrade
- 3 x Cogeneration CHP engines
- 2 x Emergency Flares
- 1 x Biofilter exhaust

The above-mentioned plant items are all located within the urban employment zone and are not situated near an allotment not zoned for employment. The Development will be designed to minimise the effect this plant has on the amenity of the locality.”

The Applicant acknowledges that various items of plant may cause environmental nuisance but only goes as far as to say that such nuisance will be minimised not totally avoided. Why should neighbouring property owners be expected to accept any form of nuisance from the proposed plant? The Applicant appears to believe that as the subject land is surrounded by sites having the same zoning, this makes the use of plant equipment with the potential to cause environmental nuisance acceptable. The Respondent rejects this suggestion.

“The digestion tank area is bunded to allow the capture of 120% of the tank volume. The area is designed to capture any tank rupture and storm water and divert them into the waste water processing plant on site.” (page 20)

The Applicant places great emphasis on the fact that the plant will contain all activities within a sealed environment. In the event of a tank rupture there appears to be no provision for the protection of surrounding properties and their occupants from unacceptable emissions and odours. No details are provided regarding the timeframe for cleaning up any form of rupture or spillage.

In the “Environmental Report” it is stated that, *“Biogass Renewables aims to exceed environmental performance expectations....”* (page 17). While this is a commendable objective, the documentation proceeds to note that even though practices such as:

- piping of liquid waste,
- minimising storage time,
- having bulk waste handling and pre-treatment areas within an enclosed building,
- use of Ferric Chloride,
- etc....

may minimise odour and Hydrogen Sulphide generation, they will not remove the risk of emissions to air. There is no guarantee that significant odours and emissions will be, or can be, contained so that nearby properties won't be subject to “nuisance-creating impact”.

The Salisbury Council Development Plan (Consolidated 15 December 2016) specifically states that,

“Development should not impede the operation of established land uses through encroachment, over development of sites or noise/emissions or any other harmful or nuisance creating impact.” (refer Principles of Development Control, page 280, Clause 4).

Similarly while it is noted that it is proposed to use *“high efficiency CHP, water heater and flare units”* to maximise combustion efficiency it is clearly stated that this will only, *“minimise the generation of unwanted gaseous by-products”* (Environmental Report. page 17) – not remove them.

The Environmental Report also acknowledges that, *“the proposed facility will generate emissions to air in both the construction phase and operations phase.”* (page 22). It is noted that during construction the primary focus will be managing nuisance dust to ensure that it does not cause issues for neighbouring properties. The Respondent has only limited concerns about the construction period noting that any inconvenience and/or nuisance would only be for a finite period. The operational period however is seen as an ongoing area for concern with the Applicant even noting that,

“potential emissions may include:

- *Unclassified Indicators (both dust and odour) to be generated,*
- *Substances generated and emitted through the combustion of biogas; and*
- *Odorous emissions (Hydrogen Sulphide)”* (page 23)

The Environmental Report recognises that there is a risk of odour generation from the proposed operations, particularly in the waste receipt, handling and pre-treatment stages. It is proposed that all handling and processing of material will be within enclosed buildings and that *“an odour removal system will also be installed to treat any odours that are generated.”* (page 23) The Applicant states that if the proposed odour removal system doesn't work adequately there will be room to expand the system! Statements such as this simply reinforce the Respondent's concerns that there will be emission and odour issues and demonstrate that even with the best of intentions DeLorean Energy do not (and cannot) guarantee that there will be no odour released from the facility and no impact on neighbouring properties.

The anaerobic digestion plant will generate substances such as Carbon Monoxide, Oxides of Nitrogen, Sulphur Dioxide, Volatile Organic Compounds, particulates and Hydrogen Sulphide. The Applicant claims that, *“it is expected that emission rates will be within acceptable parameters.”* (Environmental Report, page 24) This statement is clearly not a guarantee that acceptable parameters will be met. Furthermore while the Applicant expects that Hydrogen Sulphide generation will be kept within acceptable parameters, by the use of Ferric Chloride, there is no guarantee that this will be the case.

Comments such as *“Air emissions from the proposal are not at levels where they are expected to impact local amenity or public health”* (Environmental Report, page 24) do not provide any certainty for neighbouring property owners who will be directly impacted by any form of emission and/or odour from the proposed plant.

The Applicant states that consultation was undertaken with *“members of the SA Government, councils and local community members.....”* (Environmental Report, page 8). While it is acknowledged that any consultation is of value, it is disappointing to note that the stakeholder engagement list (Refer Appendix 4) indicates that there was no consultation with any property or business owner in the vicinity of the subject land.

Of most concern to the Respondent is the fact that the Environmental Report has been undertaken on the basis of incorrect zoning information. On page 5 of the report the zoning of 1-2 Gidgie Court, Edinburgh Parks is listed as “Industrial” whereas it is actually “Urban Employment”. Any support for the establishment of an anaerobic digestion plant in Edinburgh Parks provided in the Environmental Report cannot be considered as the report has been based on the wrong zoning. A facility that may be appropriate in an industrial area is not necessarily appropriate for another zone.

An Air Quality Assessment Report has been provided by the Applicant. This report notes that, "*applicable pollutants, background levels are relatively low in the region.*" (page 10) The assessment of likely emissions, air dispersion patterns and likely impacts are based on normal operations and typical weather conditions (using 2009 CALMET annual wind rose data). The assessment of potential risks and their associated impacts are, by their very nature, observed to be largely speculative relying on "normal" or "average" climatic conditions (i.e. wind direction, wind speeds, etc.) and standard operational arrangements. At best the results are estimations as Section 2.2 of the report indicates. DeLorean Energy cannot give a guarantee that these conditions will prevail consistently, 24/7, 365 days a year.

The Air Quality Assessment Report also notes that, "*non-routine emissions from the biogas plants (apart from the infrequent flaring) may potentially arise as a result of a malfunctioning of the flare, the air extraction system or the biofilter*" (page 7). In such circumstances there would appear to be no provision for the protection of neighbouring properties that would potentially be exposed to a harmful or nuisance-creating impact. The report notes that such non-routine emission events have not been included in the modelling assessment.

The respondent considers this approach to be unacceptable as it fails to protect the best interest of neighbouring properties and, by default, considers them to be non-sensitive receptors.

The 2009 CALMET annual wind rose data shows strong prevailing wind to the east 50% for the time with winds directly towards the Respondent's property 8% of the time. While the report suggests that odour concentrations predicted to occur "at the nearest residential and other sensitive receptor locations remains below 0.5 OU", it is observed to be clearly higher over the Respondent's property. The Respondent believes that regardless of the predicted level(s) any change must be assessed against the prevailing/existing conditions. Any change in background levels is considered to be unacceptable based on the stated desired character for the "Urban Employment" zone.

Due to the time limitations associated with the preparation of this response the Respondent has been unable to obtain independent comment on the air quality claims and predictions/estimations that form part of the DeLorean Energy application.

Conclusion

Beracah Properties Pty Ltd requests that the DeLorean Energy application to establish an anaerobic digestion plant in Edinburgh Parks BE REFUSED.

The proposed development is considered to be an inappropriate use for the Gilgie Court/Woomera Avenue site. Not only is the proposed transporting of waste into the Edinburgh Parks area seen as undesirable but the proposed processing of waste in the precinct is seen to undermine the desired character of the "Urban Employment" zone.

The Applicant has acknowledged that there is a risk of airborne emissions and associated odours escaping from the proposed plant. While seeking to minimise such events, the Applicant has clearly failed, and is unable, to provide a guarantee that these emissions and odours will not adversely impact and/or cause unacceptable nuisance to neighbouring properties.

The proposed development fails to make provision for adequate buffer zones/separation from neighbouring properties. As a result the risk of unacceptable emissions and odours from the proposed plant is seen to threaten more appropriate land uses and future developments within the precinct.


L.M. ANDREWS
Beracah Properties Pty Ltd
5099, DUNDAS 22nd October 2018



South Australian
DEVELOPMENT ACT, 1993
REPRESENTATION ON APPLICATION – CATEGORY 2

Applicant: DeLorean Energy
Development Number: 361/L007/18
Nature of Development: Construction of a waste to energy anaerobic digestion plant comprising: organic waste reception, storage, treatment and disposal; and production of electrical energy, biomethane and thermal heat. Removal of 7 regulated trees, 11 significant trees. Construction of temporary signage.
Development Type: Merit
Zone / Policy Area: Urban Employment Zone
Subject Land: 1-2 Gidgie Court, Edinburgh Parks
Contact Officer: Janine Philbey
Phone Number: 7109 7062
Close Date: 23 October 2018

My Name: ANTHONY MOORE My phone number: 0418810577

Primary method(s) of contact: Email: anthony.moore@linandrews.com.au
Postal Address: 237-239 SOUTH ROAD Postcode: 5031
MILE END SA

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard by the State Commission Assessment Panel in support of your submission.

My interests are:
(please tick one)

owner of local property
 occupier of local property
 a representative of a company/other organisation affected by the proposal
WOOMERA AVENUE PTY LTD
 a private citizen

The address of the property affected is:

78 WOOMERA AVENUE, EDINBURGH PARKS Postcode 5111

My interests are:
(please tick one)

I support the development
 I support the development with some concerns
 I oppose the development

The specific aspects of the application to which I make comment on are:

PLEASE REFER TO ATTACHED RESPONSE SUBMISSION
(PAGES 1 TO 5)

I: wish to be heard in support of my submission
(please tick one) do not wish to be heard in support of my submission
(Please tick one)

By: appearing personally ON BEHALF OF WOOMERA AVENUE PTY LTD
(please tick one) being represented by the following person
(Please tick one)

Signature: AM Moore Date: 22nd OCTOBER 2018
DIRECTOR
WOOMERA AVE PTY LTD

**South Australian
DEVELOPMENT ACT, 1993
REPRESENTATION ON APPLICATION – CATEGORY 2**

Applicant: DeLorean Energy
Development No: 361/L007/18
Subject Land: 1-2 Gidgie Court, Edinburgh Parks
Respondent: ANTHONY R MOORE
Director
Woomera Avenue Pty Ltd

RESPONSE TO APPLICATION

Background

Woomera Avenue Pty Ltd ATF Woomera Avenue Property Trust owns 78 Woomera Avenue, Edinburgh Parks. This property is on the western corner of the Woomera Avenue/Haslam Road intersection. Woomera Avenue Pty Ltd operates as part of the Lin Andrews Property Group; the Woomera Avenue property Trust is owned by a syndicate of property investors.

78 Woomera Avenue was under contract for some time prior to settlement on 18th October 2018. During this time no formal notification of the proposed DeLorean Energy development was received. The Respondent only became aware of the proposed DeLorean Energy development on 10th October 2018 during discussions with a neighbouring property owner.

Woomera Avenue Pty Ltd proposes to undertake a multi-unit commercial/industrial development on the property and has already held preliminary discussions with Salisbury Council planning staff (who have been supportive of the proposal). In line with the provisions of the Salisbury Council Development Plan (Consolidated 15 December 2016) the proposed cluster of units will target start-up and new businesses. The Respondent hopes that their development will encourage employment in the Edinburgh Parks precinct.

Concerns

It is apparent that any development of the nature proposed by DeLorean Energy will give rise to the potential for unacceptable emissions and odours. Such emissions and odours would clearly detract from the existing environment. While Woomera Avenue Pty Ltd endorses the development of new renewable energy options, especially those reducing waste to landfill, it questions the suitability of the Edinburgh Parks site for the development of an anaerobic digestion plant. The Respondent considers that developments of this nature should be located in areas where there is adequate provision for wide separation from neighbouring activities.

The subject land is zoned "Urban Employment" and specifically nominated for the creation of employment destinations. The Respondent is concerned that the proposed DeLorean Energy development will detract from the desired character of the Edinburgh Parks precinct as outlined in the Salisbury Council Development Plan (Consolidated 15 December 2016).

The proposed development:

- gives rise to the potential for serious nuisance for other long established businesses in close proximity to the subject land, and
- will adversely impact on the appeal and commercial viability of any future development at 78 Woomera Avenue.

DeLorean Energy's planning report claims that, *"the development will take all possible safety precautions to eliminate risk to public safety and will not create unacceptable risks..."* (Planning Report, page 7) When studied in more detail it is observed that the report also acknowledges that there is a degree of risk with the proposed development.

Any development with an acknowledged risk of emissions and/or odours should be placed well away from other user groups. The Applicant claims that, *"The proposed development will be separated from sensitive land uses and environmentally sensitive areas."* (Planning Report, page 13) The respondent's property at 78 Woomera Avenue is only a little over 30 metres from the subject land; it seems that DeLorean Energy consider that future users/occupants of facilities on this site (and other nearby sites) do not have the right to expect or to be guaranteed an emission and odour free work environment.

The Applicant goes as far as to claim that the subject land is *"250m away from public open spaces"*. (Planning Report, page 14) This claim is refuted.

The "South Australia Development Act 1993, Part 1—Preliminary, 4—Interpretation" provides the following definition:

***public place** includes a street, road, square, reserve, lane, footway, court, alley and thoroughfare which the public are allowed to use (whether formed on private property or not), any public watercourse, and any foreshore;*

The proposed development site is certainly not more than 250m from a street or road which the public are allowed to use. The fact that the applicant suggest the development should be 250 metres away from a public place would suggest that the subject land is definitely unsuitable for the proposed development/ use.

While the Applicant states that the development will adhere to Salisbury Council Development Plan setback guidelines in relation to building bulk, there appears to be no provision for (or attempt to make provision for) any form of realistic buffer zone or separation area in response to the nature of the proposed operations and the associated potential for nuisance to neighbouring properties from emissions and odours.

DeLorean Energy propose to construct a plant that will process 125,000 tonnes of waste per annum. The consultant, Biogas Renewables Pty Ltd, claims to have undertaken over 30 plant design and feasibility analyses for Australian bioenergy plants – details as to the size and sophistication of each of these projects are not given with the exception of brief reference to one development undertaken in Jandakot, Perth, WA. The Jandakot plant is reported to process between 35,000 and 50,000 tonnes of waste per annum – this shows that the size of the plant and the potential impact on the locality is significantly less than the phase 1 facilities proposed by DeLorean Energy for Edinburgh Parks.

The Respondent is concerned that DeLorean Energy proposes to bring significant quantities of waste into the Edinburgh Parks precinct – packaged food waste, bulk dry/wet solids, bulk liquids and agricultural waste. It is noted that the facility is expected to draw 50 trucks per day, 5 days a week. Bringing this volume of waste into Edinburgh Parks appears to contradict the stated desired character for the precinct.

The Applicant's Planning Report makes a series of statements/claims,

"As the waste operations are completed within the shed, there is no chance for dust or other pollutants to escape the confines" (page 10)

How can the Applicant guarantee that there is NO chance for dust or other pollutants to escape? While it is noted that the Applicant plans to install fast acting doors and a negative pressure system there will still be

extended periods when the receival building is "open" (i.e. when vehicles are entering or exiting) creating opportunity for odour and other pollutants to escape.

"Emissions of the fumes from the CHP and emergency flare will be controlled and modelled to ensure adverse effects on both the environment and other land holders are not adversely affected." (page 10)

How can the Applicant guarantee that other land holders will not be adversely affected?

"The development will not impede the operation of established land uses through encroachment, over development of sites or noise/emissions or any other harmful or nuisance creating impact." (page 14)

How can the Applicant guarantee that the development will not allow emissions or any other harmful or nuisance creating impact?

"The plant equipment with potential to cause an environmental nuisance include the following:

- 1 x Biogas to Biomethane upgrade
- 3 x Cogeneration CHP engines
- 2 x Emergency Flares
- 1 x Biofilter exhaust

The above-mentioned plant items are all located within the urban employment zone and are not situated near an allotment not zoned for employment. The Development will be designed to minimise the effect this plant has on the amenity of the locality."

The Applicant acknowledges that various items of plant may cause environmental nuisance but only goes as far as to say that such nuisance will be minimised not totally avoided. Why should neighbouring property owners be expected to accept any form of nuisance from the proposed plant? The Applicant appears to believe that as the subject land is surrounded by sites having the same zoning, this makes the use of plant equipment with the potential to cause environmental nuisance acceptable. The Respondent rejects this suggestion.

"The digestion tank area is bunded to allow the capture of 120% of the tank volume. The area is designed to capture any tank rupture and storm water and divert them into the waste water processing plant on site." (page 20)

The Applicant places great emphasis on the fact that the plant will contain all activities within a sealed environment. In the event of a tank rupture there appears to be no provision for the protection of surrounding properties and their occupants from unacceptable emissions and odours. No details are provided regarding the timeframe for cleaning up any form of rupture or spillage.

In the "Environmental Report" it is stated that, *"Biogass Renewables aims to exceed environmental performance expectations..."* (page 17). While this is a commendable objective, the documentation proceeds to note that even though practices such as:

- piping of liquid waste,
- minimising storage time,
- having bulk waste handling and pre-treatment areas within an enclosed building,
- use of Ferric Chloride,
- etc....

may minimise odour and Hydrogen Sulphide generation, they will not remove the risk of emissions to air. There is no guarantee that significant odours and emissions will be, or can be, contained so that nearby properties won't be subject to "nuisance-creating impact".

The Salisbury Council Development Plan (Consolidated 15 December 2016) specifically states that,

“Development should not impede the operation of established land uses through encroachment, over development of sites or noise/emissions or any other harmful or nuisance creating impact.” (refer Principles of Development Control, page 280, Clause 4).

Similarly while it is noted that it is proposed to use *“high efficiency CHP, water heater and flare units”* to maximise combustion efficiency it is clearly stated that this will only, *“minimise the generation of unwanted gaseous by-products”* (Environmental Report. page 17) – not remove them.

The Environmental Report also acknowledges that, *“the proposed facility will generate emissions to air in both the construction phase and operations phase.”* (page 22). It is noted that during construction the primary focus will be managing nuisance dust to ensure that it does not cause issues for neighbouring properties. The Respondent has only limited concerns about the construction period noting that any inconvenience and/or nuisance would only be for a finite period. The operational period however is seen as an ongoing area for concern with the Applicant even noting that,

“potential emissions may include:

- *Unclassified Indicators (both dust and odour) to be generated,*
- *Substances generated and emitted through the combustion of biogas; and*
- *Odorous emissions (Hydrogen Sulphide)”* (page 23)

The Environmental Report recognises that there is a risk of odour generation from the proposed operations, particularly in the waste receipt, handling and pre-treatment stages. It is proposed that all handling and processing of material will be within enclosed buildings and that *“an odour removal system will also be installed to treat any odours that are generated.”* (page 23) The Applicant states that if the proposed odour removal system doesn't work adequately there will be room to expand the system! Statements such as this simply reinforce the Respondent's concerns that there will be emission and odour issues and demonstrate that even with the best of intentions DeLorean Energy do not (and cannot) guarantee that there will be no odour released from the facility and no impact on neighbouring properties.

The anaerobic digestion plant will generate substances such as Carbon Monoxide, Oxides of Nitrogen, Sulphur Dioxide, Volatile Organic Compounds, particulates and Hydrogen Sulphide. The Applicant claims that, *“it is expected that emission rates will be within acceptable parameters.”* (Environmental Report, page 24) This statement is clearly not a guarantee that acceptable parameters will be met. Furthermore while the Applicant expects that Hydrogen Sulphide generation will be kept within acceptable parameters, by the use of Ferric Chloride, there is no guarantee that this will be the case.

Comments such as *“Air emissions from the proposal are not at levels where they are expected to impact local amenity or public health”* (Environmental Report, page 24) do not provide any certainty for neighbouring property owners who will be directly impacted by any form of emission and/or odour from the proposed plant.

The Applicant states that consultation was undertaken with *“members of the SA Government, councils and local community members.....”* (Environmental Report, page 8). While it is acknowledged that any consultation is of value, it is disappointing to note that the stakeholder engagement list (Refer Appendix 4) indicates that there was no consultation with any property or business owner in the vicinity of the subject land.

Of most concern to the Respondent is the fact that the Environmental Report has been undertaken on the basis of incorrect zoning information. On page 5 of the report the zoning of 1-2 Gidgie Court, Edinburgh Parks is listed as “Industrial” whereas it is actually “Urban Employment”. Any support for the establishment of an anaerobic digestion plant in Edinburgh Parks provided in the Environmental Report cannot be considered as the report has been based on the wrong zoning. A facility that may be appropriate in an industrial area is not necessarily appropriate for another zone.

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The respondent considers this approach to be unacceptable as it fails to protect the best interest of neighbouring properties and, by default, considers them to be non-sensitive receptors.

The 2009 CALMET annual wind rose data shows a strong prevailing wind to the south west, directly in line with the Respondent’s property. While the report suggests that odour concentrations predicted to occur “at the nearest residential and other sensitive receptor locations remains below 0.5 OU”, it is observed that over the Respondent’s property the level is double this figure. The Respondent believes that regardless of the predicted level(s) any change must be assessed against the prevailing/existing conditions. Any change in background levels is considered to be unacceptable based on the stated desired character for the “Urban Employment” zone.

Due to the time limitations associated with the preparation of this response the Respondent has been unable to obtain independent comment on the air quality claims and predictions/estimations that form part of the DeLorean Energy application.

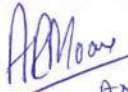
Conclusion

Woomera Avenue Pty Ltd requests that the DeLorean Energy application to establish an anaerobic digestion plant in Edinburgh Parks BE REFUSED.

The proposed development is considered to be an inappropriate use for the Gilgie Court/Woomera Avenue site. Not only is the proposed transporting of waste into the Edinburgh Parks area seen as undesirable but the proposed processing of waste in the precinct is seen to undermine the desired character of the “Urban Employment” zone.

The Applicant has acknowledged that there is a risk of airborne emissions and associated odours escaping from the proposed plant. While seeking to minimise such events, the Applicant has clearly failed, and is unable, to provide a guarantee that these emissions and odours will not adversely impact and/or cause unacceptable nuisance to neighbouring properties.

The proposed development fails to make provision for adequate buffer zones/separation from neighbouring properties. As a result the risk of unacceptable emissions and odours from the proposed plant is seen to threaten more appropriate land uses and future developments within the precinct.


ANTHONY R. MOORE
DIRECTOR
WOOMERA AVE PTY LTD.
22nd OCTOBER 2018
Woomera Avenue Pty Ltd
October 2018

South Australian
DEVELOPMENT ACT, 1993
REPRESENTATION ON APPLICATION - CATEGORY 2



Applicant: DeLorean Energy
Development Number: 361/L007/18
Nature of Development: Construction of a waste to energy anaerobic digestion plant comprising: organic waste reception, storage, treatment and disposal; and production of electrical energy, biomethane and thermal heat. Removal of 7 regulated trees, 11 significant trees. Construction of temporary signage.
Development Type: Merit
Zone / Policy Area: Urban Employment Zone
Subject Land: 1-2 Gidgie Court, Edinburgh Parks
Contact Officer: Janine Philbey
Phone Number: 7109 7062
Close Date: 23 October 2018

My Name: MR ALAN STEELE OF MAYFIELD PROPERTY HOLDINGS PTY LTD My phone number: 0427 006 623

Primary method(s) of contact: Email: Alan.Steele@mayfieldindustries.com.au
Postal Address: 3 GIDGIE COURT EDINBURGH SA Postcode: 5111

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard by the State Commission Assessment Panel in support of your submission.

My interests are: (please tick one)
 owner of local property
 occupier of local property
 a representative of a company/other organisation affected by the proposal
 a private citizen

The address of the property affected is:

3 GIDGIE COURT, EDINBURGH Postcode 5111

My interests are: (please tick one)
 I support the development
 I support the development with some concerns
 I oppose the development

The specific aspects of the application to which I make comment on are: PLEASE SEE ATTACHED REPRESENTATION PREPARED BY HILDITCH LAWYERS ON OUR BEHALF

I: wish to be heard in support of my submission
(please tick one) do not wish to be heard in support of my submission
(Please tick one)

By: appearing personally.
(please tick one) being represented by the following person JAMES HILDITCH OF HILDITCH LAWYERS
(Please tick one)

Signature:

Date: 23 OCTOBER 2018



HILDITCH LAWYERS

Level 1, 24 Grote Street
Adelaide SA 5000

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lawyers@hilditchlawyers.com

23 October 2018

The Secretary
State Commission Assessment Panel
Development Division
Department of Planning, Transport and Infrastructure
Level 5, 50 Flinders Street
ADELAIDE SA 5000
scapreps@sa.gov.au
(Via hand delivery and email)

Dear Secretary

1-2 Gidgie Court, Edinburgh Parks (DA No. 361/L007/18) – Statement of representation

We act for Mayfield Property Holdings Pty Ltd, being the owner of 3 Gidgie Court, Edinburgh Parks and Mayfield Industries, being the business which occupies and operates from 3 Gidgie Court, Edinburgh Parks ("**our clients' land**").

We are instructed to make a written representation on behalf of our clients in relation to DA No. 361/L007/18 which proposes a development described by the SCAP as "*Construction of a waste to energy anaerobic digestion plant comprising: organic waste reception, storage, treatment and disposal; and production of electrical energy, biomethane and thermal heat. Removal of 7 regulated trees, 11 significant trees. Construction of temporary signage*" ("**the proposed development**") on land known as 1-2 Gidgie Court, Edinburgh ("**the subject land**"). Our clients' land is immediately adjacent to, and to the north of, the subject land.

Our clients are opposed to the proposed development and submit that the DAC should refuse planning consent.

Our instructions in relation to our clients' land

Mayfield Industries ("**Mayfield**") is a specialist engineering company which designs, manufactures, installs and commissions switchboards, switchrooms and motor control centres. The business has been operating since 1936. Mayfield's products are used by a diverse range of sectors including, for

example, mining and mineral, utilities, renewable energy, power generation, co-generation facilities, water treatment and processing plants, wastewater treatment and processing plants, manufacturing and processing industries and the oil and gas sector. Many of these sectors are of strategic economic importance to South Australia. Furthermore, Mayfield presently exports a significant amount of product to other states in Australia. It also has regular interstate customers visit its site to view its facilities.

Mayfield is a major employer within the area and presently employs 165 personnel within the business. The business has recently undertaken significant investment with the addition of a hardstand area and infrastructure on its site. This has been done following a State Government grant under the "Next Generation Manufacturing Improvement Program". This improvement has been undertaken to support the growth that Mayfield has realised to date and is planning for in the future. Our clients are proud of their facility and wish to maintain a level of amenity which will be completely compromised by the proposal.

Overview of reasons for representation

The applicant is seeking approval for a development with an identified cost of \$33 million.

The proposed facility will receive a wide variety of waste streams including, for example, fruit and vegetable matter, by-products from food manufacturing industries and out of date products from supermarkets, waste food and grease traps. It is expected that the facility will, for example, treat approximately 125,000 tonnes per year of organic waste from food processors in the surrounding region. The facility is expected to generate approximately 4.7MW of electricity, 21.7GJ/hr of biomethane and 4.9MW of thermal heat. Approximately 166,600 cubic metres per year of anaerobic digestion water will be produced. It is designed to operate with a continuous process 24 hours per day, 7 days per week.

The proposed facility will accommodate heavy vehicle traffic including dump trucks, tankers and road trains. Whilst as many as 50 trucks (which equates to 100 separate movements) are expected to visit the facility every day (with very little information in relation to the size and type of trucks), it has apparently been designed to ensure that the plant can accept up to 9 trucks at any one time. It will use machinery and complex mechanical processes which can be expected to be vulnerable to failure and break-down and will, for example, incorporate flares to burn excess biogas on site at extremely high temperatures (there is no independent fire safety report). The plant will clearly emit significant noise from truck movements and mechanical plant including the proposed co-generation units. Little if any consideration has been given, for example, to noise and odour from a significant amount of heavy vehicle movements through the local road network on a daily basis before they enter the confines of any proposed building.

The proposal clearly has the potential to create significant impacts for surrounding occupants of land.

Against this background, the applicant appears to be of the view that the subject land comprises an "industrial site" within an "Industrial Zone" (see, for example, the "Environmental Report" prepared by the applicant and dated 11 June 2018 at page 6). This demonstrates a lack of sensitivity toward the carefully worded policies incorporated within the Development Plan ("DP") for the Urban Employment Zone. It is not a traditional "Industrial Zone" at all.

The applicant has then demonstrated a clear and obvious misunderstanding of the South Australian EPA referral process. At pages 17 and 18 of the DeLorean Group "Planning Report" dated 19 September 2018 the applicant apparently concludes that the development will not require any referral pursuant to section 37 of the *Development Act 1993* and will not involve an activity of "environmental significance". This is clearly incorrect and the applicant appears, with respect, to have misconstrued clause 3(3) in Schedule 22 of the *Development Regulations, 2008*.

Section 37 of the *Development Act, 1993* relevantly provides as follows:

"37—Consultation with other authorities or agencies

(1) *The regulations may provide that where an application for consent to, or approval of, a proposed development of a prescribed class is to be assessed by a relevant authority—*

- (a) *the relevant authority must refer the application, together with a copy of any relevant information provided by the applicant, to a body prescribed by the regulations (including, where the relevant authority is a council, the Development Assessment Commission); and*
- (b) *the relevant authority must not make its decision until it has received a response from that prescribed body in relation to the matter or matters for which the referral was made (but if a response is not received from the body within a period prescribed by the regulations, it will be presumed, unless the body notifies the relevant authority within that period that the body requires an extension of time because of subsection (3) (being an extension equal to that period of time that the applicant takes to comply with a request under subsection (2)), that the body does not desire to make a response, or concurs (as the case requires))."*

Regulation 24 of the *Development Regulations, 2008* relevantly provides as follows:

"24—Referrals

(1) *Pursuant to section 37 of the Act, if an application for consent or approval relates to a development that falls within a class of development prescribed under Schedule 8, the relevant authority—*

- (a) *must refer the application, together with a copy of any relevant information provided by the applicant, to the relevant body prescribed under Schedule 8; and*

- (b) *must not make its decision until it has received a response from that body in relation to the matter or matters for which the referral was made (but if a response is not received from the body within the period prescribed by Schedule 8, it will be presumed, unless the body notifies the relevant authority within that period that the body requires an extension of time because of section 37(3) of the Act, that the body does not desire to make a response, or concurs (as the case requires))."*

Schedule 8 of the Regulations relevantly provides as follows by way of example:

Development	Body	Period	Conditions
(iii) does not have any adverse effect on the environment			
11—Activities of major environmental significance			
Development that involves, or is for the purposes of, an activity specified in Schedule 22 (including, where an activity is only relevant when a threshold level of capacity is reached, development with the capacity or potential to operate above the threshold level, and an alteration or expansion of an existing development (or existing use) where the alteration or expansion will have the effect of producing a total capacity exceeding the relevant threshold level)	Environment Protection Authority	6 weeks	Direction

Schedule 22 of the Regulations relevantly provides as follows:

"Schedule 22—Activities of major environmental significance

Part A—Activities

...

3—Waste Treatment and Disposal

(3) Waste or Recycling Depots: the conduct of a depot for the reception, storage, treatment or disposal of waste other than—

- (a) *temporary storage at the place at which the waste (not being tyres or tyre pieces) is produced while awaiting transport to another place; or*
- (b) *storage, treatment or disposal of domestic waste at residential premises; or*
- (c) *a depot that the Environment Protection Authority is satisfied will be conducted for such limited purposes that a referral is not necessary and has provided written confirmation of this to the relevant authority."*

Having regard to the above, it is apparent that the application must be referred to the EPA which will then have a critical power of direction in relation to the application. It would appear that a referral has now potentially been undertaken pursuant to section 37 of the Act and related provisions above however this is not clear. The correct referral process must be followed. Our client trusts that the planning authority will take steps to ensure that an appropriate referral process which accords with the *Development Act 1993* and *Development*

Regulations 2008 proceeds. The proposal apparently involves the conduct of a depot for the reception and treatment of waste as well as fuel burning.

Furthermore, the application is obviously for a very significant proposal. It has been submitted without the basic information which the planning authority should reasonably require in relation to a proposal of this kind such as an acoustic report from an independent and qualified acoustic engineer and a traffic report from an independent and qualified traffic engineer.

The applicant also does not appear to have received any advice from a qualified town planning consultant practising in South Australia either when identifying this site as an appropriate site or when preparing the application. There is no report from a qualified planner in the application documentation available to us. As a result, some of the language used in the "Planning Report" prepared by the applicant is confusing. For example, at pages 17 to 22 of the report the applicant purports to provide a table which "outlines the complying criteria/conditions the proposed development will achieve". This entire exercise is, with respect, misguided. The nature of the proposed development detailed in the application documentation is not of a kind which is described as "complying" in the Urban Employment Zone. As a result, an analysis of the conditions which apply to "complying development" is unproductive and pointless. The proposed development is not, and cannot be, a "complying development". Reference therefore to the standards for "complying" development is unhelpful and irrelevant.

For all the above reasons our clients have developed grave concerns in relation to the obvious impacts which may result from the proposed development.

It is clear that the assessment process should not proceed further until a variety of matters are considered and dealt with, both from a process perspective and a practical planning assessment perspective.

Further detail in relation to our clients' opposition to the proposal

The Development Plan and its intent

Our clients are opposed to the proposed development as it will give rise to fundamental land use conflicts which will prejudice and compromise the operations of Mayfield. There is no basis whatsoever upon which the SCAP could conclude that the proposed development will be able to coexist with Mayfield in the manner envisaged in the relevant provisions for the Urban Employment Zone ("**the Zone**").

It is well settled in the Courts that the role of the planning authority is to identify the relevant provisions in the DP so as to then identify the DP's overall intent, purpose and desired character. The planning authority then needs to decide whether the DP speaks for or against any particular proposal.

The first observation I would make is that the relevant provisions for the Zone certainly only seek to promote industrial land uses which are compatible with adjoining uses. So much is made abundantly clear in the statement of Desired Character for the Zone ("**the SDC**").

For example the SDC provides as follows:

"A high level of compatibility between land uses in the zone is envisaged to ensure a quality and attractive business environment is maintained".

At a very basic level it is quite obvious that the intent of the DP is to offer protection and certainty for existing and future land uses that their operations will not be compromised or prejudiced by inappropriate future development on adjoining sites. The obvious and unsurprising intention is to encourage future occupants of the Zone to have confidence that the critical objectives of the Zone will be realised and observed at all times.

The DP certainly does not seek to encourage future development at the expense of, or to the detriment of, existing development. The authors of the DP clearly would not envisage the establishment of a new use which will prejudice and constrain an important operator such as Mayfield and potentially lead to its vacation from the Zone. This would certainly be an unintended, illogical and highly undesirable outcome.

The question is, is this an appropriate site to accommodate the proposed development having regard to the relevant provisions in the DP and the existing state of development in the locality? Our clients contend that it certainly is not.

Whilst the Zone does envisage "industry", the SCAP will be aware that there are all kinds of industries. At one end of the spectrum is an operation such as that conducted by Mayfield. Our clients' business has no problematic impacts on its neighbours due to the fundamental nature of its operations. At the other end of the spectrum is the kind of facility proposed by the applicant which could have all kinds of impacts on the locality due to the nature, scale and complexity of the proposed use. Our clients and their employees do not accept that they should be exposed to, for example, unpleasant odour, airborne pollutants, significant increase in vehicle movements (including from large rubbish trucks, tankers and road trains), escape of waste, noise nuisance and attraction of pests and vermin in their working environment. It is not the intention of the DP that these kinds of uses, which are at the opposite ends of the spectrum, should now be required to coexist with one another on adjoining sites. Mayfield will certainly have no adverse impacts on the proposed development. However the proposed development could have very significant consequences for Mayfield and other existing businesses in the locality.

So how does the DP deal with this scenario?

The first point to note is that the only active and clear encouragement for any kind of waste facility of the kind proposed in the City of Salisbury is in the Industry Zone (see Infrastructure Policy Area 9). The subject land is not within the Industry Zone.

The second point is that the DP goes to great lengths to avoid the establishment of incompatible land uses on adjoining sites. The raft of Council Wide provisions which specifically seek to avoid this outcome include the following:

- Industrial Development Objective 5 at page 45.
- Industrial Development PDC 6 at page 46.
- Interface Between Land Uses Objectives 1 and 3 at page 49.
- Interface Between Land Uses PDCs 1 and 2 at page 49.
- Orderly and sustainable Development Objective 3 at page 77.
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Then the Zone provisions themselves guard against the concerns expressed by our clients. Zone Objective 4 seeks to ensure the *“effective location ... of activities at the interface of industrial/commercial activity with land uses that are sensitive to these operations”*.

Zone Objective 5 only contemplates *“a high standard of development which promotes ... environmental amenity ...”*.

The whole flavour of the statement of “Desired Character” is that it encourages high quality enterprise which will provide a focus for manufacturing, research and technology, logistics and transport services, intermodal operations and expansion of defence industries. The kind of “industry” envisaged in the Zone has nothing to do with the kind of industry proposed by the applicant. The proposed development clearly has the potential to operate as a “special industry” within the meaning of Schedule 1 of the *Development Regulations, 2008*. Special Industry is specifically discouraged in the statement of Desired Character (see paragraph 3 on page 278 of the DP) *“unless associated with food and beverage production, is considered necessary to support major manufacturing clusters or involves bulk handling activities associated with intermodal and transport operations”*. Furthermore the DP provides that the limited Special Industries which are contemplated must incorporate the use of best available technology so as to minimise the need for *“large buffer or separation areas”* which would be a waste of land in the Zone.

It is quite obvious that the proposed facility has no place in the Zone insofar as the Zone provisions are concerned. The proposed development will simply result in undesirable impacts on surrounding land uses and related land use conflict. It will also result in the waste of a limited resource as any potential for the subject land to achieve the Zone’s objectives will not be realised for so long as it may be utilised for a purpose which is not intended in the Zone.

We contend that these submissions all support the conclusion that the proposed development is seriously at variance with the relevant DP and must not be granted consent accordingly having regard to section 35(2) of the *Development Act, 1993*.

For these fundamental planning reasons at least, our clients contend the proposed development should, and indeed must (having regard to section 35(2) of the *Development Act, 1993*), be refused.

The impacts of the proposal

The impacts of odour emissions, significant increase in traffic movements (including from large rubbish trucks, tankers and road trains), escape of waste, migration of dust and other airborne pollutants, noise nuisance and the attraction of pests and vermin are examples of the significant concerns held by our clients. Our clients hold serious concerns that the impacts of the proposed development could significantly jeopardise the ongoing sustainability and viability of their business.

The total number of vehicle movements which the proposal will generate is not at all clear. At most, the application documentation provides an understanding that up to 50 trucks per day are expected to visit the site (which will equate to a total of 100 truck movements). It is therefore clear that the proposal will generate significant traffic movements, including from large rubbish trucks, tankers and road trains (which will all carry different types of waste and generate their own individual impacts). Trucks will of course bring with them a number of associated impacts in terms of noise, vibration and dust. It is noted, for example, that the proposal is designed to accommodate up to 9 trucks at any one time. A glaring omission from the application is the absence of any report from a qualified traffic engineer addressing issues such as, for example, the number of movements which will be generated to and from the site, the impact of those movements on the existing road network, whether site access and internal manoeuvring for the anticipated vehicles will meet relevant Australian Standards, whether the capacity of the road network and intersections to accommodate the proposed truck movements are appropriate and the potential for vehicle and pedestrian conflict. Our clients are very concerned about the users of their operations and their employees as a result of the very substantial increase in truck movements in the locality.

The processes involved in Mayfield's business include, for example, the installation of environmentally sensitive components including programmable logical controllers, electrical relays, and intelligent control networks. These components are particularly susceptible to damage from dust and other airborne pollutants. Furthermore, the manufacture of transportable switch rooms for heavy industry throughout Australia and off shore is undertaken at our clients' land under open canopies which are susceptible to airborne particles. It is not clear how these concerns could be addressed.

It is noted that page 10 of the DeLorean report states that "Noise modelling will be completed on the Development to ensure acceptable noise restricts are adhered to". It is plainly inappropriate for a planning authority to rely on an assertion of this kind. It is quite obvious that the planning authority should insist that the applicant is able to demonstrate exactly how it is proposed to control noise impact from the overall site (including vehicle movements) through the provision of a detailed and thorough report from a qualified and experienced acoustic engineer prior to any detailed planning assessment.

Proposal to remove regulated and significant trees

It is noted that the proposed development requires the removal of a number of regulated and significant trees.

Objective 1 and PDC 2 under the heading "Regulated Trees" in the "General Section of the DP relevantly provide as follows:

- "1 *The conservation of regulated trees that provide important aesthetic and/or environmental benefit.*
- ...
- 2 *A regulated tree should not be removed or damaged other than where it can be demonstrated that one or more of the following apply:*
- (a) *the tree is diseased and its life expectancy is short*
 - (b) *the tree represents a material risk to public or private safety*
 - (c) *the tree is causing damage to a building*
 - (d) *development that is reasonable and expected would not otherwise be possible*
- ..."

PDCs 1 and 3 under the heading "Significant Trees" in the "General Section of the DP relevantly provides as follows:

- "1 *Development should preserve the following attributes where a significant tree demonstrates at least one of the following attributes:*
- (a) *makes an important contribution to the character or amenity of the local area; or*
 - (b) *is indigenous to the local area and its species is listed under the National Parks and Wildlife Act 1972 as a rare or endangered native species*
 - (c) *represents an important habitat for native fauna*
 - (d) *is part of a wildlife corridor of a remnant area of native vegetation*
 - (e) *is important to the maintenance of biodiversity in the local environment*
 - (f) *forms a notable visual element to the landscape of the local area*
- ...
- 3 *Significant trees should be preserved, and tree-damaging activity should not be undertaken, unless:*

- (a) *in the case of tree removal, where at least one of the following apply:*
 - (i) *the tree is diseased and its life expectancy is short*
 - (ii) *the tree represents an unacceptable risk to public or private safety*
 - (iii) *the tree is within 20 metres of a residential, tourist accommodation or habitable building and is a bushfire hazard within a Bushfire Prone Area*
- (b) *the tree is shown to be causing or threatening to cause substantial damage to a substantial building or structure of value*
- (c) *all other reasonable remedial treatments and measures have been determined to be ineffective*
- (d) *it is demonstrated that all reasonable alternative development options and design solutions have been considered to prevent substantial tree-damaging activity occurring.*
- (e) *in any other case, any of the following circumstances apply:*
 - (i) *the work is required for the removal of dead wood, treatment of disease, or is in the general interests of the health of the tree*
 - (ii) *the work is required due to unacceptable risk to public or private safety*
 - (iii) *the tree is within 20 metres of a residential, tourist accommodation or habitable building and is a bushfire hazard within a Bushfire Prone Area*
 - (iv) *the tree is shown to be causing or threatening to cause damage to a substantial building or structure of value*
 - (v) *the aesthetic appearance and structural integrity of the tree is maintained*
 - (vi) *it is demonstrated that all reasonable alternative development options and design solutions have been considered to prevent substantial tree-damaging activity occurring."*

It has been well established by the Supreme Court (see for example *Lacey v City of Burnside* [2009] SASC 136) that the applicant for consent bears the onus of satisfying the planning authority that there is a proper basis for the removal of trees having regard to provisions of the kind outlined above. The applicant has not discharged this onus. The report of Arborman Tree Solutions does not assist the applicant in any meaningful way when seeking to discharge the onus. Furthermore, an applicant certainly does not discharge the onus of satisfying the planning authority that alternatives to whole tree removal have been explored and considered simply by putting forward a single development proposal which requires their removal together with the assertion that the subject proposal requires the removal of the trees. There is nothing in the application documents which demonstrates that reasonable alternatives to whole tree removal have been considered. One obvious observation which could be made is that the proposed development is poorly configured for the

site. It is quite obvious that any number of developments which meet the spirit and intent of the zone could be developed and configured so as to avoid the need to remove any of these trees. The argument that no reasonable alternative to whole tree removal exists might arise, for example, with respect to a residential development proposal on a small piece of residential land which has a tree in the middle of it and which cannot be developed unless the tree is removed. In this kind of situation the planning authority is able to authorise the removal of a healthy tree which would otherwise sterilise the development potential of a site. This is not the case here at all. It is quite obvious that any number of anticipated developments could proceed on the site without the need to remove the trees. The footprint of the overall development is simply configured in an unfortunate way which necessitates the removal of many trees. The circumstances surrounding the proposal do not present a proper basis for the authorisation of whole tree removal in relation to healthy and substantial regulated and significant trees. This is a zone in which visual amenity retains a level of importance (once again, it is not a traditional "Industrial Zone"). Appropriate amenity outcomes are to be encouraged through all reasonable means envisaged in the DP, including through the retention of regulated and significant trees.

Summary

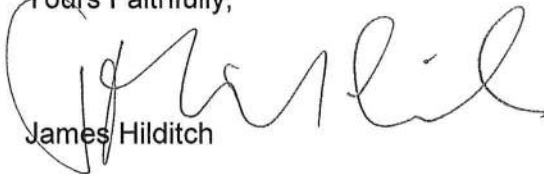
In summary our clients are opposed to the proposed development for the reasons outlined above. No support can be found for the proposed development in the DP. There is no reason whatsoever for the planning authority to grant consent to a proposal on the subject land which is not supported by the DP. There are no unique circumstances at all which would justify a departure from the clear policies expressed for the Zone in this case. Furthermore the proposed development will have very real adverse consequences for surrounding development and for the realisation of the Zone objectives in the relevant locality and potentially beyond.

In addition to the above, the proposal requires the removal of a number of regulated and significant trees in circumstances where there is absolutely no evidence to warrant their removal.

We wish to be heard by the State Commission Assessment Panel in relation to our clients' representation and would be grateful if you would advise us of the date and time of the relevant meeting.

Please contact me if you have any queries.

Yours Faithfully,



James Hilditch

james@hilditchlawyers.com

Our Ref: JRH:000640

South Australian
DEVELOPMENT ACT, 1993
REPRESENTATION ON APPLICATION – CATEGORY 2

RECEIVED
23 OCT 2018
State Commission
Assessment Panel

Applicant: DeLorean Energy
Development Number: 361/L007/18
Nature of Development: Construction of a waste to energy anaerobic digestion plant comprising: organic waste reception, storage, treatment and disposal; and production of electrical energy, biomethane and thermal heat. Removal of 7 regulated trees, 11 significant trees. Construction of temporary signage.
Development Type: Merit
Zone / Policy Area: Urban Employment Zone
Subject Land: 1-2 Gidgie Court, Edinburgh Parks
Contact Officer: Janine Philbey
Phone Number: 7109 7062
Close Date: 23 October 2018

RECEIVED
23 OCT 2018
State Commission
Assessment Panel

My Name: M R DES AHRNS My phone number: 0417 879 769

Primary method(s) of contact: Email: ahrns@bigpondi.com
Postal Address: PO BOX 6101 BURTON SA Postcode: 5110

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard by the State Commission Assessment Panel in support of your submission.

- My interests are: (please tick one)
- owner of local property
 - occupier of local property
 - a representative of a company/other organisation affected by the proposal
 - a private citizen

The address of the property affected is:
76 WOOLMERA AVENUE, EDINBURGH PARKS Postcode 5111

- My interests are: (please tick one)
- I support the development
 - I support the development with some concerns
 - I oppose the development

The specific aspects of the application to which I make comment on are:
PLEASE SEE ATTACHED REPRESENTATION PREPARED BY HILDITCH LAWYERS ON OUR BEHALF

- I: wish to be heard in support of my submission
(please tick one) do not wish to be heard in support of my submission
(Please tick one)

By: appearing personally
(please tick one) being represented by the following person JAMES HILDITCH OF HILDITCH LAWYERS
(Please tick one)

Signature:  Date: 23 OCTOBER 2018



HILDITCH LAWYERS

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lawyers@hilditchlawyers.com

23 October 2018

The Secretary
State Commission Assessment Panel
Development Division
Department of Planning, Transport and Infrastructure
Level 5, 50 Flinders Street
ADELAIDE SA 5000
scapreps@sa.gov.au
(Via hand delivery and email)

Dear Secretary

1-2 Gidgie Court, Edinburgh Parks (DA No. 361/L007/18) – Statement of representation

We act for Mr Des Ahrns and Ms Bev Ahrns, being the owners of 76 Woomera Avenue, Edinburgh Parks, as well as Ahrns Handling Equipment Pty Ltd, being the occupier of 76 Woomera Avenue, Edinburgh Parks ("**our clients' land**").

We are instructed to make a written representation on behalf of our clients in relation to DA No. 361/L007/18 which proposes a development described by the SCAP as "*Construction of a waste to energy anaerobic digestion plant comprising: organic waste reception, storage, treatment and disposal; and production of electrical energy, biomethane and thermal heat. Removal of 7 regulated trees, 11 significant trees. Construction of temporary signage*" ("**the proposed development**") on land known as 1-2 Gidgie Court, Edinburgh Parks ("**the subject land**"). Our clients' land is directly opposite, and to the south of, the subject land.

Our clients are opposed to the proposed development and submit that the DAC should refuse planning consent.

Our instructions in relation to our clients' land

Ahrns Handling Equipment Pty Ltd ("**Ahrns**"), a family owned and operated transport engineering company, operates from our clients' land. It currently employs approximately 25 people. The business specialises in transport engineering, predominately with respect to tilt slide and recovery trucks and vehicle loading cranes. Ahrns is an agent for Fassi and Tadano cranes.

Liability limited by a scheme approved under Professional Standards Legislation.

Hilditch Lawyers Pty Ltd ACN 145 516 276

Ahrns previously operated from leased premises on Burton Road, Burton. In 2006 a decision was taken to relocate the business to its current location (i.e. 76 Woomera Avenue, Edinburgh Parks) in part due to the expansion of the Inghams chicken factory directly across the road from the business at Burton. The external impacts of the Inghams factory were adversely impacting on our clients' business. One of several factors that led to Ahrns' decision to move was the odours which emanated from the Inghams premises.

Ahrns operates the very kind of high standard development which is encouraged in the Urban Employment Zone.

Ahrns purchased the land at 76 Woomera Avenue, Edinburgh Parks in 2008. One of the main reasons Ahrns purchased this land was due to the fact that Edinburgh Parks was marketed as a hi-tech manufacturing district with a primary focus on automotive and defence industries and associated businesses. Ahrns subsequently moved their business operation to Woomera Avenue in 2008.

Since moving to Edinburgh Parks Ahrns has grown and, as a result, purchased adjoining land to the south of 76 Woomera Avenue (being the land known as 9-11 Haslam Road, Edinburgh) to enable further expansion of the business' manufacturing facility.

Overview of reasons for representation

The applicant is seeking approval for a development with an identified cost of \$33 million.

The proposed facility will receive a wide variety of waste streams including, for example, fruit and vegetable matter, by-products from food manufacturing industries and out of date products from supermarkets, waste food and grease traps. It is expected that the facility will, for example, treat approximately 125,000 tonnes per year of organic waste from food processors in the surrounding region. The facility is expected to generate approximately 4.7MW of electricity, 21.7GJ/hr of biomethane and 4.9MW of thermal heat. Approximately 166,600 cubic metres per year of anaerobic digestion water will be produced. It is designed to operate with a continuous process 24 hours per day, 7 days per week.

The proposed facility will accommodate heavy vehicle traffic including dump trucks, tankers and road trains. Whilst as many as 50 trucks (which equates to 100 separate movements) are expected to visit the facility every day (with very little information in relation to the size and type of trucks), it has apparently been designed to ensure that the plant can accept up to 9 trucks at any one time. It will use machinery and complex mechanical processes which can be expected to be vulnerable to failure and break-down and will, for example, incorporate flares to burn excess biogas on site at extremely high temperatures (there is no independent fire safety report). The plant will clearly emit significant noise from truck movements and mechanical plant including the proposed co-generation units. Little if any consideration has been given, for example, to noise and odour from a significant amount of heavy vehicle movements through

the local road network on a daily basis before they enter the confines of any proposed building.

The proposal clearly has the potential to create significant impacts for surrounding occupants of land.

Against this background, the applicant appears to be of the view that the subject land comprises an "industrial site" within an "Industrial Zone" (see, for example, the "Environmental Report" prepared by the applicant and dated 11 June 2018 at page 6). This demonstrates a lack of sensitivity toward the carefully worded policies incorporated within the Development Plan ("DP") for the Urban Employment Zone. It is not a traditional "Industrial Zone" at all.

The applicant has then demonstrated a clear and obvious misunderstanding of the South Australian EPA referral process. At pages 17 and 18 of the DeLorean Group "Planning Report" dated 19 September 2018 the applicant apparently concludes that the development will not require any referral pursuant to section 37 of the *Development Act 1993* and will not involve an activity of "environmental significance". This is clearly incorrect and the applicant appears, with respect, to have misconstrued clause 3(3) in Schedule 22 of the *Development Regulations, 2008*.

Section 37 of the *Development Act, 1993* relevantly provides as follows:

"37—Consultation with other authorities or agencies

(1) The regulations may provide that where an application for consent to, or approval of, a proposed development of a prescribed class is to be assessed by a relevant authority—

- (a) the relevant authority must refer the application, together with a copy of any relevant information provided by the applicant, to a body prescribed by the regulations (including, where the relevant authority is a council, the Development Assessment Commission); and*
- (b) the relevant authority must not make its decision until it has received a response from that prescribed body in relation to the matter or matters for which the referral was made (but if a response is not received from the body within a period prescribed by the regulations, it will be presumed, unless the body notifies the relevant authority within that period that the body requires an extension of time because of subsection (3) (being an extension equal to that period of time that the applicant takes to comply with a request under subsection (2)), that the body does not desire to make a response, or concurs (as the case requires))."*

Regulation 24 of the *Development Regulations, 2008* relevantly provides as follows:

"24—Referrals

(1) Pursuant to section 37 of the Act, if an application for consent or approval relates to a development that falls within a class of development prescribed under Schedule 8, the relevant authority—

- (a) *must refer the application, together with a copy of any relevant information provided by the applicant, to the relevant body prescribed under Schedule 8; and*
- (b) *must not make its decision until it has received a response from that body in relation to the matter or matters for which the referral was made (but if a response is not received from the body within the period prescribed by Schedule 8, it will be presumed, unless the body notifies the relevant authority within that period that the body requires an extension of time because of section 37(3) of the Act, that the body does not desire to make a response, or concurs (as the case requires))."*

Schedule 8 of the Regulations relevantly provides as follows by way of example:

Development	Body	Period	Conditions
(iii) does not have any adverse effect on the environment			
II—Activities of major environmental significance			
Development that involves, or is for the purposes of, an activity specified in Schedule 22 (including, where an activity is only relevant when a threshold level of capacity is reached, development with the capacity or potential to operate above the threshold level, and an alteration or expansion of an existing development (or existing use) where the alteration or expansion will have the effect of producing a total capacity exceeding the relevant threshold level)	Environment Protection Authority	6 weeks	Direction

Schedule 22 of the Regulations relevantly provides as follows:

"Schedule 22—Activities of major environmental significance

Part A—Activities

...

3—Waste Treatment and Disposal

(3) Waste or Recycling Depots: the conduct of a depot for the reception, storage, treatment or disposal of waste other than—

- (a) *temporary storage at the place at which the waste (not being tyres or tyre pieces) is produced while awaiting transport to another place; or*
- (b) *storage, treatment or disposal of domestic waste at residential premises; or*
- (c) *a depot that the Environment Protection Authority is satisfied will be conducted for such limited purposes that a referral is not necessary and has provided written confirmation of this to the relevant authority."*

Having regard to the above, it is apparent that the application must be referred to the EPA which will then have a critical power of direction in relation to the application. It would appear that a referral has now potentially been undertaken

pursuant to section 37 of the Act and related provisions above however this is not clear. The correct referral process must be followed. Our client trusts that the planning authority will take steps to ensure that an appropriate referral process which accords with the *Development Act 1993* and *Development Regulations 2008* proceeds. The proposal apparently involves the conduct of a depot for the reception and treatment of waste as well as fuel burning.

Furthermore, the application is obviously for a very significant proposal. It has been submitted without the basic information which the planning authority should reasonably require in relation to a proposal of this kind such as an acoustic report from an independent and qualified acoustic engineer and a traffic report from an independent and qualified traffic engineer.

The applicant also does not appear to have received any advice from a qualified town planning consultant practising in South Australia either when identifying this site as an appropriate site or when preparing the application. There is no report from a qualified planner in the application documentation available to us. As a result, some of the language used in the "Planning Report" prepared by the applicant is confusing. For example, at pages 17 to 22 of the report the applicant purports to provide a table which "outlines the complying criteria/conditions the proposed development will achieve". This entire exercise is, with respect, misguided. The nature of the proposed development detailed in the application documentation is not of a kind which is described as "complying" in the Urban Employment Zone. As a result, an analysis of the conditions which apply to "complying development" is unproductive and pointless. The proposed development is not, and cannot be, a "complying development". Reference therefore to the standards for "complying" development is unhelpful and irrelevant.

For all the above reasons our clients have developed grave concerns in relation to the obvious impacts which may result from the proposed development.

It is clear that the assessment process should not proceed further until a variety of matters are considered and dealt with, both from a process perspective and a practical planning assessment perspective.

Further detail in relation to our clients' opposition to the proposal

The Development Plan and its intent

Our clients are opposed to the proposed development as it will give rise to fundamental land use conflicts which will prejudice and compromise the operations of Ahrns. There is no basis whatsoever upon which the SCAP could conclude that the proposed development will be able to coexist with Ahrns in the manner envisaged in the relevant provisions for the Urban Employment Zone ("**the Zone**").

It is well settled in the Courts that the role of the planning authority is to identify the relevant provisions in the DP so as to then identify the DP's overall intent, purpose and desired character. The planning authority then needs to decide whether the DP speaks for or against any particular proposal.

The first observation I would make is that the relevant provisions for the Zone certainly only seek to promote industrial land uses which are compatible with adjoining uses. So much is made abundantly clear in the statement of Desired Character for the Zone ("**the SDC**").

For example the SDC provides as follows:

"A high level of compatibility between land uses in the zone is envisaged to ensure a quality and attractive business environment is maintained".

At a very basic level it is quite obvious that the intent of the DP is to offer protection and certainty for existing and future land uses that their operations will not be compromised or prejudiced by inappropriate future development on adjoining sites. The obvious and unsurprising intention is to encourage future occupants of the Zone to have confidence that the critical objectives of the Zone will be realised and observed at all times.

The DP certainly does not seek to encourage future development at the expense of, or to the detriment of, existing development. The authors of the DP clearly would not envisage the establishment of a new use which will prejudice and constrain an important operator such as Ahrns and potentially lead to its vacation from the Zone. This would certainly be an unintended, illogical and highly undesirable outcome.

The question is, is this an appropriate site to accommodate the proposed development having regard to the relevant provisions in the DP and the existing state of development in the locality? Our clients contend that it certainly is not.

Whilst the Zone does envisage "industry", the SCAP will be aware that there are all kinds of industries. At one end of the spectrum is an operation such as that conducted by Ahrns. Our clients' business has no problematic impacts on its neighbours due to the fundamental nature of its operations. At the other end of the spectrum is the kind of facility proposed by the applicant which could have all kinds of impacts on the locality due to the nature, scale and complexity of the proposed use. Our clients and their employees do not accept that they should be exposed to, for example, unpleasant odour, airborne pollutants, significant increase in vehicle movements (including from large rubbish trucks, tankers and road trains), escape of waste, noise nuisance and attraction of pests and vermin in their working environment. It is not the intention of the DP that these kinds of uses, which are at the opposite ends of the spectrum, should now be required to coexist with one another on adjoining sites. Ahrns will certainly have no adverse impacts on the proposed development. However the proposed development could have very significant consequences for Ahrns and other existing businesses in the locality.

So how does the DP deal with this scenario?

The first point to note is that the only active and clear encouragement for any kind of waste facility of the kind proposed in the City of Salisbury is in the Industry Zone (see Infrastructure Policy Area 9). The subject land is not within the Industry Zone.

The second point is that the DP goes to great lengths to avoid the establishment of incompatible land uses on adjoining sites. The raft of Council Wide provisions which specifically seek to avoid this outcome include the following:

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Then the Zone provisions themselves guard against the concerns expressed by our clients. Zone Objective 4 seeks to ensure the *"effective location ... of activities at the interface of industrial/commercial activity with land uses that are sensitive to these operations"*.

Zone Objective 5 only contemplates *"a high standard of development which promotes ... environmental amenity ..."*.

The whole flavour of the statement of "Desired Character" is that it encourages high quality enterprise which will provide a focus for manufacturing, research and technology, logistics and transport services, intermodal operations and expansion of defence industries. The kind of "industry" envisaged in the Zone has nothing to do with the kind of industry proposed by the applicant. The proposed development clearly has the potential to operate as a "special industry" within the meaning of Schedule 1 of the *Development Regulations, 2008*. Special Industry is specifically discouraged in the statement of Desired Character (see paragraph 3 on page 278 of the DP) *"unless associated with food and beverage production, is considered necessary to support major manufacturing clusters or involves bulk handling activities associated with intermodal and transport operations"*. Furthermore the DP provides that the limited Special Industries which are contemplated must incorporate the use of best available technology so as to minimise the need for *"large buffer or separation areas"* which would be a waste of land in the Zone.

It is quite obvious that the proposed facility has no place in the Zone insofar as the Zone provisions are concerned. The proposed development will simply result in undesirable impacts on surrounding land uses and related land use conflict. It will also result in the waste of a limited resource as any potential for the subject land to achieve the Zone's objectives will not be realised for so long as it may be utilised for a purpose which is not intended in the Zone.

We contend that these submissions all support the conclusion that the proposed development is seriously at variance with the relevant DP and must not be granted consent accordingly having regard to section 35(2) of the *Development Act, 1993*.

For these fundamental planning reasons at least, our clients contend the proposed development should, and indeed must (having regard to section 35(2) of the *Development Act, 1993*), be refused.

The impacts of the proposal

The impacts of odour emissions, significant increase in traffic movements (including from large rubbish trucks, tankers and road trains), escape of waste, migration of dust and other airborne pollutants, noise nuisance and the attraction of pests and vermin are examples of the significant concerns held by our clients. Our clients hold serious concerns that the impacts of the proposed development could significantly jeopardise the ongoing sustainability and viability of their business.

The total number of vehicle movements which the proposal will generate is not at all clear. At most, the application documentation provides an understanding that up to 50 trucks per day are expected to visit the site (which will equate to a total of 100 truck movements). It is therefore clear that the proposal will generate significant traffic movements, including from large rubbish trucks, tankers and road trains (which will all carry different types of waste and generate their own individual impacts). Trucks will of course bring with them a number of associated impacts in terms of noise, vibration and dust. It is noted, for example, that the proposal is designed to accommodate up to 9 trucks at any one time. A glaring omission from the application is the absence of any report from a qualified traffic engineer addressing issues such as, for example, the number of movements which will be generated to and from the site, the impact of those movements on the existing road network, whether site access and internal manoeuvring for the anticipated vehicles will meet relevant Australian Standards, whether the capacity of the road network and intersections to accommodate the proposed truck movements are appropriate and the potential for vehicle and pedestrian conflict. Our clients are very concerned about the users of their operations and their employees as a result of the very substantial increase in truck movements in the locality.

It is noted that page 10 of the DeLorean report states that "Noise modelling will be completed on the Development to ensure acceptable noise restricts are adhered to". It is plainly inappropriate for a planning authority to rely on an assertion of this kind. It is quite obvious that the planning authority should insist that the applicant is able to demonstrate exactly how it is proposed to control noise impact from the overall site (including vehicle movements) through the provision of a detailed and thorough report from a qualified and experienced acoustic engineer prior to any detailed planning assessment.

Proposal to remove regulated and significant trees

It is noted that the proposed development requires the removal of a number of regulated and significant trees.

Objective 1 and PDC 2 under the heading "Regulated Trees" in the "General Section of the DP relevantly provide as follows:

"1 The conservation of regulated trees that provide important aesthetic and/or environmental benefit.

...

2 A regulated tree should not be removed or damaged other than where it can be demonstrated that one or more of the following apply:

- (a) the tree is diseased and its life expectancy is short*
- (b) the tree represents a material risk to public or private safety*
- (c) the tree is causing damage to a building*
- (d) development that is reasonable and expected would not otherwise be possible*

..."

PDCs 1 and 3 under the heading "Significant Trees" in the "General Section of the DP relevantly provides as follows:

"1 Development should preserve the following attributes where a significant tree demonstrates at least one of the following attributes:

- (a) makes an important contribution to the character or amenity of the local area; or*
- (b) is indigenous to the local area and its species is listed under the National Parks and Wildlife Act 1972 as a rare or endangered native species*
- (c) represents an important habitat for native fauna*
- (d) is part of a wildlife corridor of a remnant area of native vegetation*
- (e) is important to the maintenance of biodiversity in the local environment*
- (f) forms a notable visual element to the landscape of the local area*

...

3 Significant trees should be preserved, and tree-damaging activity should not be undertaken, unless:

- (a) in the case of tree removal, where at least one of the following apply:*
 - (i) the tree is diseased and its life expectancy is short*
 - (ii) the tree represents an unacceptable risk to public or private safety*

- (iii) *the tree is within 20 metres of a residential, tourist accommodation or habitable building and is a bushfire hazard within a Bushfire Prone Area*
- (b) *the tree is shown to be causing or threatening to cause substantial damage to a substantial building or structure of value*
- (c) *all other reasonable remedial treatments and measures have been determined to be ineffective*
- (d) *it is demonstrated that all reasonable alternative development options and design solutions have been considered to prevent substantial tree-damaging activity occurring.*
- (e) *in any other case, any of the following circumstances apply:*
 - (i) *the work is required for the removal of dead wood, treatment of disease, or is in the general interests of the health of the tree*
 - (ii) *the work is required due to unacceptable risk to public or private safety*
 - (iii) *the tree is within 20 metres of a residential, tourist accommodation or habitable building and is a bushfire hazard within a Bushfire Prone Area*
 - (iv) *the tree is shown to be causing or threatening to cause damage to a substantial building or structure of value*
 - (v) *the aesthetic appearance and structural integrity of the tree is maintained*
 - (vi) *it is demonstrated that all reasonable alternative development options and design solutions have been considered to prevent substantial tree-damaging activity occurring."*

It has been well established by the Supreme Court (see for example *Lacey v City of Burnside* [2009] SASC 136) that the applicant for consent bears the onus of satisfying the planning authority that there is a proper basis for the removal of trees having regard to provisions of the kind outlined above. The applicant has not discharged this onus. The report of Arborman Tree Solutions does not assist the applicant in any meaningful way when seeking to discharge the onus. Furthermore, an applicant certainly does not discharge the onus of satisfying the planning authority that alternatives to whole tree removal have been explored and considered simply by putting forward a single development proposal which requires their removal together with the assertion that the subject proposal requires the removal of the trees. There is nothing in the application documents which demonstrates that reasonable alternatives to whole tree removal have been considered. One obvious observation which could be made is that the proposed development is poorly configured for the site. It is quite obvious that any number of developments which meet the spirit and intent of the zone could be developed and configured so as to avoid the need to remove any of these trees. The argument that no reasonable alternative to whole tree removal exists might arise, for example, with respect to a residential development proposal on a small piece of residential land which has a tree in the middle of it and which cannot be developed unless the tree is removed. In this kind of situation the planning authority is able to authorise the

removal of a healthy tree which would otherwise sterilise the development potential of a site. This is not the case here at all. It is quite obvious that any number of anticipated developments could proceed on the site without the need to remove the trees. The footprint of the overall development is simply configured in an unfortunate way which necessitates the removal of many trees. The circumstances surrounding the proposal do not present a proper basis for the authorisation of whole tree removal in relation to healthy and substantial regulated and significant trees. This is a zone in which visual amenity retains a level of importance (once again, it is not a traditional "Industrial Zone"). Appropriate amenity outcomes are to be encouraged through all reasonable means envisaged in the DP, including through the retention of regulated and significant trees.

Summary

In summary our clients are opposed to the proposed development for the reasons outlined above. No support can be found for the proposed development in the DP. There is no reason whatsoever for the planning authority to grant consent to a proposal on the subject land which is not supported by the DP. There are no unique circumstances at all which would justify a departure from the clear policies expressed for the Zone in this case. Furthermore the proposed development will have very real adverse consequences for surrounding development and for the realisation of the Zone objectives in the relevant locality and potentially beyond.

In addition to the above, the proposal requires the removal of a number of regulated and significant trees in circumstances where there is absolutely no evidence to warrant their removal.

We wish to be heard by the State Commission Assessment Panel in relation to our clients' representation and would be grateful if you would advise us of the date and time of the relevant meeting.

Please contact me if you have any queries.

Yours Faithfully,



James Hilditch

james@hilditchlawyers.com

Our Ref: JRH:000640

South Australian
DEVELOPMENT ACT, 1993
REPRESENTATION ON APPLICATION – CATEGORY 2

Applicant: DeLorean Energy
Development Number: 361/L007/18
Nature of Development: Construction of a waste to energy anaerobic digestion plant comprising: organic waste reception, storage, treatment and disposal; and production of electrical energy, biomethane and thermal heat. Removal of 7 regulated trees, 11 significant trees. Construction of temporary signage.
Development Type: Merit
Zone / Policy Area: Urban Employment Zone
Subject Land: 1-2 Gidgie Court, Edinburgh Parks
Contact Officer: Janine Philbey
Phone Number: 7109 7062
Close Date: 23 October 2018

My Name: Antonio Vallelonga My phone number: 0417808136

Primary method(s) of contact: Email: tonye.valls.com.au
Postal Address: PO Box 433 Postcode: 5343
Berri SA

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard by the State Commission Assessment Panel in support of your submission.

My interests are: (please tick one)
 owner of local property
 occupier of local property
 a representative of a company/other organisation affected by the proposal
 a private citizen

The address of the property affected is:

70 Woomera Ave Edinburgh Postcode _____

My interests are: (please tick one)
 I support the development
 I support the development with some concerns
 I oppose the development

The specific aspects of the application to which I make comment on are:

As per attached letter

I: wish to be heard in support of my submission
(please tick one) do not wish to be heard in support of my submission
(Please tick one)

By: appearing personally
(please tick one) being represented by the following person
(Please tick one)

Signature: A. Jolly Date: 9/10/18

Philbey, Janine (DPTI)

Subject: FW: Development Application : 361/L007/18

From: Ernest van Niekerk [mailto:ernest@valls.com.au]

Sent: Tuesday, 23 October 2018 2:50 PM

To: Philbey, Janine (DPTI)

Cc: Tony Vallelonga; Jeff Olney; Ryan Vallelonga

Subject: RE: Development Application : 361/L007/18

Hi Janine

The owners of 70 Woomera Ave would like to put on record that they oppose the proposed development on 1-2 Gidgie Court, Edinburgh.

There are various reasons for this decision, but the main reason is that the owners of the property as mentioned is manufacturers of styrene packaging products that is used in the seafood and fruit/vegetable industries. The facility in Edinburgh were bought to be used as a production and storage facility for their styrene products. Food manufacturers and exporters expect the packaging material supplied to them to be of the highest quality and to conform to HACCP standards. Having a waste processing plant on our doorstep with the possibility of raw waste spillage and contamination of our products leave us open to be held liable for millions of dollars of compensation if food manufacturers or exporters find that the products that we supply them are contaminated in any way. We also run the risk of loosing our customer base and eventually our business that we worked hard to build over a thirty year period.

Having factories in the Riverland where they harvest grapes every year, we have first hand experience of the amount of spillage that happen on the roads from closed trucks that is supposed to be sealed. The proposed waste site is designed to handle 50 trucks of waste per day. That is 12 500 trucks per year if we assume a 5 day working week. If there is spillage from only 1% of the trucks that enter the premises, that would mean a spillage every second day. Some of the products that is proposed to be used there include abattoir waste, we assume it is not safe for human consumption. Our trucks drive through the spilled product on the road into our premises with contaminated wheels, and the we offload the trucks onto the contaminated ground. You can see that the risk for us is real and threaten the existence of our business.

We are not opposed to waste management, but in an area where it is not a threat to the future of other businesses.

We are willing to send a representative to a meeting if you need more insight into our business and why we oppose the development.

Regards

Ernest van Niekerk
Financial Controller
Valls Group of Companies
Jury Road, Berri,
South Australia, 5343.

Ph: +61 8 85821155

W: www.vallsgroup.com.au

Our ref: JAL/218097

13 December 2018

Janine Philbey
Planning Officer
Planning and Development
Department of Planning, Transport and Infrastructure

By email: janine.philbey@sa.gov.au

Dear Janine

DA 361/L007/18 – Construction of Anaerobic Digestion facility - Lot 505 Woomera Avenue, Edinburgh

This firm acts for the applicant and this response to representations is made on our client's behalf.

The Department received four valid representations about our client's application from:

1. Woomera Ave Pty Ltd, dated 22 October 2018;
2. Valls Group of Companies, dated 23 October 2018;
3. Ahrns Handling Equipment, dated 23 October 2018; and
4. Mayfield Property Holding Pty Ltd, dated 23 October 2018.

The representations raise a number of issues that are not relevant to the assessment of the application. We respond here only to those matters which are relevant to planning assessment.

Summary of the proposed development

The development will receive organic waste such as commercial and industrial (C&I) food waste and dry grain/agricultural feedstock in solid and liquid forms. The material will be received and unloaded inside or using an enclosed conveyor system and then sorted in an enclosed building. It is placed into agricultural silos or containment bunkers where it is further sorted and any foreign waste streams (such as plastics or other inorganic matter) are removed. The waste is then mixed with water before proceeding to the digester feed tank. Following the feed tank the waste is pasteurised (heated at 70°C for at least an hour) to kill pathogens. It then moves into a series of six 3500m³ primary mesophilic anaerobic digester tanks. It is in these tanks that the biological anaerobic digestion process occurs breaking down the volatile organic matter in the slurry by feeding methane forming bacteria.

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The bacteria naturally converts the organic acids to methane gas, carbon dioxide and water. This produces a biogas with a concentration of about 60 to 65% methane. The biogas is discharged into the headspace dome of the digester where it is then “cleaned” to remove sulphides and water to increase the concentration of methane. The gas is then extracted either to be concentrated into biomethane and reinserted into the natural gas pipeline system or to fuel a combined heat and power unit to generate heat and electricity.

Organic solids that remain undigested by the bacterial process are then removed and the slurry is separated by a mechanical solid-liquid separator to create a drier organic compost and water. The water is treated in the on-site treatment plant for reuse. The compost material is sent off site to be used as feedstock for composting or for mulch in agricultural applications.

The site will employ up to 11 staff when fully operational. The front-end receipt of waste will occur five days per week between 7 AM and 5 PM whereas the digester systems will operate 24 hours a day seven days a week.

The system has a set of emergency high-temperature enclosed flares in the event that the biological digestion process generates more methane gas than can be fed into the combined heat and power generation units. The high-temperature enclosed flare will activate to safely dispose of the methane in those circumstances.

It is likely that the facility will accept and process 125,000 tonnes per year of trucked organic waste consisting of approximately 100,000 tonnes of commercial and industrial organic waste and 25,000 tonnes of dry grain/agricultural feedstock.

The biomethane produced can be fed directly into the natural gas pipeline and the electrical energy can be fed into the grid.

This essential operation is supplemented with sophisticated systems and processes to prevent any inappropriate noise, odour or other volatile emissions (as described in the various technical reports contained in the application documents and response to the EPA).

Appropriate land use in the Zone and locality

The Urban Employment Zone relevantly contemplates –

"a mixed use employment zone that primarily accommodates a range of industrial land uses..." (Obj 1).

"Provision for large floor plate enterprises, such as major logistics and manufacturing plants...located to take advantage of existing and future road and rail infrastructure" (Obj 3).

"Development that promotes business clusters that provide a range of economic and environmental benefits" (Obj 6).

"Coordinated and integrated development that ...contributes to the improvement of the ... economic conditions of adjoining communities where appropriate" (Obj 7).

"Greater Edinburgh Parks will be a high quality enterprise and employment destination attracting a specialised workforce and providing a focus for manufacturing...." (DCS first paragraph).

“Desirable land uses include a wide range of activities that generate employment, focusing on industry, indoor industrialised horticulture and associated processing... ..activities that can operate on a 24-hour, seven-day per week basis were appropriate...” (DCS page 278 first paragraph)

“A high level of compatibility between land uses in the zone is envisaged to ensure a quality and attractive business environment is maintained. Clustering of industrial activities to share resources and reduce waste impacts and energy needs is encouraged in the zone...” (DCS page 278)

“Special industry...associated with food and beverage production...” DCS page 278 3rd paragraph)

“The following forms of development are envisaged in the zone... Electricity substation... Industry...” (PDC 1).

The proposal is plainly an industrial use of the type contemplated in the Zone. It has the substantial floor plate and transport needs that render it consistent with objective 3. It is clustered near to other waste services and close to other food production operators to take advantage of food waste as an input and energy as an output. It is clear that the location of a food waste system in proximity to a large number of businesses producing food waste is orderly and economic development.

The proposal is not novel to the locality; the site is adjacent to a waste depot receiving inert waste for recycling.

The development of this industrial use with commercial uses in the Zone will provide economic and environmental benefits to other local occupiers by facilitating waste disposal at a considerably lower cost than in landfill, and future reduced cost electricity. The proposed development has been designed to produce minimal impacts on the amenity of surrounding land uses, and sited to provide maximum economic benefit to the surrounding land occupiers.

The proposal will assist local food and beverage producers to reduce waste impacts, energy needs, and therefore costs, as well as increasing employment and business opportunities. The proposal is the type of essential food production related infrastructure that should encourage further food businesses to the area.

Obviously not “seriously at variance”

The proposal is clearly not “seriously at variance” with the Development Plan. The Supreme Court has established principles that guide the scope and meaning of the “seriously at variance” test. Those principles include:

- (a) mere variance from the Development Plan is not the test; it is a question of whether there is ‘...an important or grave departure in either quantity or degree from the Development Plan...’;¹ and
- (b) the assessment is likely to involve a judgment as to planning merit based on matters of fact and degree.²

¹ *Courtney Hill Pty Ltd v SAPC* (1990) 59 SASR 259 at p. 261; *Mar Mina (SA) Pty Ltd v City of Marion and Others* (2008) 163 LGERA 24 at [33].

² *City of Kensington & Norwood v DAC & Boscaini Investments Pty Ltd* (1998) 70 SASR 471 at p. 480.

The proposal is a land use expressly envisaged in the Zone. It has inherent measures built in to prevent adverse off site impacts, particularly in light of the emissions and acoustic reports discussed below. In no way can it be a grave departure from the Development Plan.

Appropriate management of odours and emissions

Wastes are received into an enclosed building under negative pressure to prevent the escape of air and odour, processed and then sent off site in sealed vehicles, buildings or vessels. The entire processing system is contained in sealed vessels. There are no wastes or processes left open to the atmosphere or in a manner that allows the escape of odours or other emissions to the locality.

The Emissions Assessment Report prepared by Ramboll demonstrates that all and any emissions, and odour concentrations, will remain below the levels set by the *Environment Protection (Air Quality) Policy 2016*. The modelling considered both routine and full flaring operations, in isolation and cumulatively.

Modelling by Ramboll shows that the ground level concentrations for NO₂ and NO_x will be well below the EPA's relevant criteria. Modelling shows that the maximum 1-hour average NO₂ ground level concentrations at nearby sensitive receivers were at no more than 30% of the EPA's standards, and the odour concentrations to be less than 25% of the applicable criteria set by the EPA at the nearest sensitive receivers.

The proposed development also employs micro air dosing technology to minimise hydrogen sulphide (H₂S) released. Any remaining H₂S is either combusted in the CHP/flare ensuring complete destruction or it is removed through an iron oxide filter unit (product ID SULFATREAT 2242 Plus), to the point where the level is below 0.1 ppm and acceptable to the EPA.

Contrary to the assertions of the representors, PDC 13 of the Zone states:

Any plant or equipment with potential to cause an environmental nuisance (including a chimney stack or air-conditioning plant) should be sited as far as possible from adjoining allotments not zoned for employment, and should be designed to minimise its effect on the amenity of the locality.

The Development Plan therefore envisages that some development may impact amenity, but requires this impact to be as low as possible. As evidenced from the Emissions Assessment Report, any impact will be low and within what is acceptable to the EPA. There is nothing in the Desired Character statement for the Zone which states, as the representors assert, that absolutely no changes to background odour levels are permissible.

While the risk of tank rupture is extremely low and will likely never occur, in the event of a rupture, the tank is designed so that all liquids are captured by a containment bund and diverted to a sump, from which the liquid is pumped to the site waste water treatment plant. There will therefore be an extremely limited exposure of any escaped liquids to the atmosphere.

Prior to digestion, the food waste is pasteurised, ensuring that pathogens are not present within the liquid to be processed.

As the development is a fully closed in-vessel system there is no chance for raw waste to escape from the facility. The facility will receive two types of organic material to the facility, C&I food waste and dry grain/agricultural feedstock.

The trucks delivering the C&I food waste will be approved waste trucks with waterproof and solid-proof containment vessels. Truck operators are separately regulated by the EPA.

Truck unloading and loading is all undertaken in an enclosed building under negative pressure. Leakage from trucks could occur only due to improper maintenance by the vehicle operators or a major road accident. A 1% spillage rate from trucks as asserted by the representors is a severe overestimation of actual statistics for spillage rates.

Should a spillage event occur, the applicant will ensure proper containment of the affected area to ensure the spill does not grow or adversely affect neighbouring land.

Proper mitigation of noise

An Acoustic Assessment carried out by Herring Storer Acoustics found that the proposal (including associated vehicle movements) complies with the requirements of the Development Plan, and the *Environment Protection (Noise) Policy 2007*. It is appropriate for the adjacent industrial premises and more distant residential premises, provided that common acoustic barrier fences is installed to 3m high adjacent to the generators, and 2.4m high adjacent to the truck access area. The acoustic report also considered that noise emission levels were within the parameters set for the closest residential areas.

Separate to the initial Acoustic Assessment, further noise countermeasures have been incorporated into the design. A wall surrounding the CHP generators up to a height of 7m has been included to further attenuate noise from neighbouring properties. Furthermore, biofilter fans will be placed inside the reception hall building to limit noise emissions.

The proposal includes the installation of these acoustic barriers.

Appropriate management of dust

Grain waste is received using an enclosed conveyor system which is designed to contain dust. The reception hall (to which waste is delivered) is maintained at negative pressure, which draws air in from outside when doors are opened. As a result, there is no opportunity for dust to escape the hall. The doors in the reception hall are fast close doors. Further, a biofilter is installed, which filters any escaping air to ensure its quality is within the appropriate parameters of the EP Air Policy. Critical spares for the biofilter and spare dust filters will be kept on site in the unlikely event of failure.

Management of pests and vermin

The strict processing of waste products in a closed system means that the facility will not attract pests or vermin (no more than any other building).

Not “special industry”

The representors attempt to assert that the proposal is for a “special industry”.

The Schedule 1 of the *Development Regulations 2008* defines “special industry” as:

an industry where the processes carried on, the methods of manufacture adopted or the particular materials or goods used, produced or stored, are likely—

- (a) *to cause or create dust, fumes, vapours, smells or gases; or*
- (b) *to discharge foul liquid or blood or other substance or impurities liable to become foul,*

and thereby—

- (c) *to endanger, injure or detrimentally affect the life, health or property of any person (other than any person employed or engaged in the industry); or*
- (d) *to produce conditions which are, or may become, offensive or repugnant to the occupiers or users of land in the locality of or within the vicinity of the locality of the land on which (whether wholly or partly) the industry is conducted.*

The emissions report clearly shows that any emissions from the proposed development will not endanger, injure or detrimentally affect the life, health or property of any person, and will not produce conditions that are offensive or repugnant to the occupiers or users of the land in the locality.

The assertion made overlooks the modelling showing emission levels well below the standards set by the EPA, and appears to be based on a misunderstanding of the proposal.

The proposal uses a combination of top tier generation equipment, filtration systems, and closed loop in-vessel digestion processes, to ensure that there are no emission impacts. It incorporates the best available technology to avoid the need for buffer or separation areas and is associated with food and beverage production, as a provider of decreased food waste disposal costs and energy fees.

Tree removal

The Development Plan provisions relating to Regulated Trees state two objectives:

- 1 *The conservation of regulated trees that provide important aesthetic and/or environmental benefit.*
- 2 *Development in balance with preserving regulated trees that demonstrate one or more of the following attributes:*
 - (a) *significantly contributes to the character or visual amenity of the locality*
 - (b) *indigenous to the locality*
 - (c) *a rare or endangered species*
 - (d) *an important habitat for native fauna.*

The Development Plan seeks to protect regulated trees that provide important aesthetic benefits. It does not seek to protect all regulated trees. The Significant Trees provisions are broadly similar.

If a tree does not provide an important aesthetic or environmental benefit (and therefore does not warrant protection under the above objectives), it is not necessary to consider the criteria for removal.

This test was set out in *Summers v City of Unley*³, which considered development plan provisions similar to the objectives set out above related to significant trees. In that case, the Court considered that the effect of the objectives was that only certain trees, rather than every tree deemed significant, should be made worthy of retention:

It could not be the intended consequence of the Development Plan provisions that every tree, regardless of species, characteristics, benefit provided, contribution to amenity, should be retained, unless it is diseased and will die, presents a safety risk to persons, buildings or valued structures...that cannot be the intended consequence of the Development Plan provisions; one can readily imagine examples to show how ridiculous such a result would be, and it would fly in the face of the objects of Development Plans.

³ [2002] SAERDC 113 at [32].

The criteria in the objectives above must be considered to assess whether a regulated tree is worthy of retention.

Once determined, PDC 2 for Regulated Trees and PDC 3 for Significant Trees contains the “test” for the removal of trees that are prima facie worthy or retention on the basis that they provide some important aesthetic or environmental benefit.

If a tree is worthy of retention on that basis, PDC 2/3 relevantly provides that a regulated or significant tree(s) may nonetheless be worthy of removal if it satisfies one of the criterion (a) – (e) in Regulated Trees PDC 2, or (a) – (e) in Significant Trees PDC 3. Criterion (d) in PDC 2 of Regulated Trees provides as follows:

(d) development that is reasonable and expected would not otherwise be possible

Criterion (d) in PDC 3 of Significant Trees provides as follows:

(d) it is demonstrated that all reasonable alternative development and design solutions have been considered to prevent substantial tree-damaging activity occurring.

The effect of these provisions is that if trees that are otherwise worthy of retention, but are preventing the reasonable development of the land, their removal is justified. However, only trees which provide important aesthetic and environmental benefit should be subjected to the “test” set out in PDC 2/3.

The proposed development constitutes the reasonable and expected development of the land.

The Arboricultural Impact Assessment Report produced by Arborman Tree Solutions Pty Ltd found that the proposed development could not be achieved if Trees 9-19 and 21-24 were retained and that the retention of Trees 7 and 8 would pose a fire risk. The Report states that the position of the trees to be removed, as wholly within the site, rather than at its edge, means that they cannot be retained if the site is to be meaningfully developed. As the trees on the Left side of the site run directly next to the site border, this area of vegetation was readily kept undisturbed. Provisions have been made around the asphalted areas on the West side of the site to accommodate these trees, however R7 and R8 pose a potential fire issue being in close proximity to the CHP generators and flares.

The flares and generators are required to be located a set distance from the digestion area for fire safety and also to allow access for servicing. These items also need to be away from the public eye. The applicant has therefore demonstrated consideration of all reasonable alternative design solutions.

Given that industry use is a form of development envisaged in the Zone, it must be expected that the site will be developed in a way that may result in the removal of trees. The Zone Objectives which provide for large floor plate enterprises and major logistics plants, clearly contemplate that trees may need to be removed to facilitate such large-scale development.

The proposal has already been modified to retain Trees 1-6. Biogass worked with the arborist to design the site so as to retain the maximum number of trees. The essential elements of the development take up about 16,605m² which equates to about 73% of the site area. Those features need to be laid out to accommodate the requirements of the system and to accommodate access and manoeuvring areas.

The design provides 14% of site area for landscaping (in excess of the 10% anticipated by the Development Plan).

Proximity to public open space

The representors incorrectly assert that the proposed development will be within 250m of public open space. The representors apply the definition of public space in the *Development Act 1993* to public open space, which are two separate concepts with two separate meanings. While the legislation does not define public open space, there is some guidance about its intended meaning in the Council Wide Open Space and Recreation provisions, which suggest that public open space is more appropriately defined to mean parks, recreation areas, reserves, and trails, than streets and roads as asserted by the representors.

We reject the notion that a street or road is classified as public open space from which the proposed development should be separated, and maintain that the development will be further than 250m from public open space properly defined.

Experience and capabilities of Biogass

The representors are concerned about the experience and capabilities of Biogass Renewables Pty Ltd, asserting that insufficient information about their past projects has been provided. This is not a valid planning consideration.

Summary

My client wishes to appear at the SCAP meeting when this application is considered, to respond to the representations. Please advise me of the date and time of the relevant meeting when it is known.

Yours faithfully



James Levinson
BOTTEN LEVINSON
Mob: 0407 050 080
Email: jal@bllawyers.com.au

Philbey, Janine (DPTI)

Subject: FW: Response to reps and council

From: Martyn Anderson [mailto:martyn.anderson@biogass.com.au]

Sent: Tuesday, 18 December 2018 3:02 PM

To: Philbey, Janine (DPTI) <Janine.Philbey@sa.gov.au>

Cc: Jonathan Luu <jonathan.luu@biogass.com.au>; Joseph Oliver <joseph.oliver@biogass.com.au>; Hamish Jolly <hamish.jolly@biogass.com.au>

Subject: RE: Response to reps and council

Hi Janine

I have included comments from us regarding the report submitted by the City of Salisbury. Our comments are below:

Significant and Regulated Trees

Delorean group have worked with both SCAP and their contracted arborist to design the facility with as little impact on established trees as possible, ensuring any trees removed will be replanted to reduce the impact on the land and surrounding area. The difficulty arises from the location of the row of trees lining the Eastern side of Lot 505, which presents a serious impediment to development. The trees are approximately 25m from the road, couple this with the tree protection zones, this becomes a large channel of undeveloped land. If this were to be enforced, the development would not be able to go ahead. We feel we have addressed this in the development approval and arborist report limiting impact.

Crane Operations

Biogass Renewables, the licenced builder of the site, will liaise with the department of defence and develop a construction plan with approval from the department of defence. Construction design and scheduling will be efficiently developed to reduce crane up time as much as possible, with the Department of defence being kept up to date at all times.

Traffic management

Traffic management of the facility as been reviewed by an independent experienced contractor assessing the impact and traffic movement on site, it was deemed the location of the site and the area being developed by renewable SA the impact on traffic in the local area had been planned and managed as per the report

A more in depth and comprehensive traffic management plan can be developed to address the concerns of the City of Salisbury if required. Preliminary design and traffic analysis has determined the following:

- The roads leading up to the proposed development are designed and appropriate for use via a B-double truck or smaller (B-double being the largest receival vehicle on site)
- The site inlets and outlets have been designed and are appropriately designed to accommodate all expected vehicles both heavy and light vehicles.

Finer development of the traffic impacts and design will be completed before construction, with Delorean Group seeking building approval from the council.

Water Offtake

Delorean Group are closing out the contract for water offtake with Salisbury Water. Salisbury Water have confirmed there is capacity in the pipeline and a strong desire to take the outlet water which meets the MAR standards for aquifer recharge, and have expressed a large interest in receiving the water. An agreement will be made prior to the facility going into construction

Detailed drawings and siteworks

Delorean Group will complete construction drawings via Biogass renewables ready for Building approval and permit, engineering sign off before construction begins as per the conditions set for Building approval. Delorean Group will submit the signed plans to the City of Salisbury, seeking building approval.

Street Tree and access plans

A detailed survey of the services locations, street trees and other access locations will be completed to allow for design and engineering drawings to be completed and approved for building approval. Delorean Group will be responsible for the relocation of any services if they are required and will seek approval from the relevant infrastructure provider and the City of Salisbury.

Landscaping

Any landscaping that occurs on the verge of Woomera Avenue or Gidgie Court will be subject to a verge application, with Delorean Group seeking approval from the City of Salisbury before the commencement of the works.

If you need me to submit this in different format please let me know and I will get it done ASAP.

Kind Regards

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Urban Employment Zone

Refer to the [Map Reference Tables](#) for a list of the maps that relate to this zone.

OBJECTIVES

- 1 A mixed use employment zone that **primarily** accommodates a range of industrial land uses together with other employment and business activities that generate wealth and employment for the State.
- 2 Local activity centres, which include a range of activities including shops, consulting rooms, personal service establishments, child care and training facilities that provide support services for businesses and an expanding workforce.
- 3 Provision for large floor plate enterprises, such as major logistics and manufacturing plants, and high technology and/or research and development facilities, located to take advantage of existing and future road and rail infrastructure.
- 4 The effective location and management of activities at the interface of industrial/commercial activity with land uses that are sensitive to these operations.
- 5 A high standard of development which promotes distinctive building, landscape and streetscape design, with high visual and environmental amenity, particularly along arterial roads and the boundaries of adjoining zones.
- 6 Development that promotes business clusters that provide a range of economic and environmental benefits.
- 7 Co-ordinated and integrated development that:
 - (a) incorporates high speed information technology and telecommunications facilities and infrastructure
 - (b) contributes to the improvement of the physical, social and economic conditions of adjoining communities where appropriate.
- 8 Development that contributes to the desired character of the zone.

DESIRED CHARACTER

Greater Edinburgh Parks will be a high quality enterprise and employment destination, attracting a specialised workforce and providing a focus for manufacturing, research and technology, logistics and transport services, intermodal operations and expansion of defence industries in particular. Development will build on existing industrial and enterprise activities at Edinburgh Parks, the Defence Science Technology Organisation and RAAF Base, and major automotive manufacturing at Elizabeth South.

Superior road and rail connections and information communication technology will also link the area to ports and harbours and specialised defence and technology precincts at Osborne and Mawson Lakes, providing significant competitive advantages for the State. Coordinated staging of development and infrastructure, and integration with the Salisbury and the Elizabeth Centres, is envisaged to contribute to the improvement of the physical, social and economic conditions of adjoining communities, including enhancing access to public transport.

This zone provides for the establishment of business clusters that create opportunities for innovation, start up and the growth of new businesses, and link businesses to global investment opportunities.

Desirable land uses include a wide range of activities that generate employment, focusing on industry, indoor industrialised horticulture and associated processing and packaging, transport and technology-based activities that can operate on a twenty-four hour, seven day per week basis where appropriate, together with offices and industry-related training and educational establishments. Existing defence operations, including explosive ordnance activities, will be protected and not adversely impacted by development. Development should also comprise high technology and/or research and development related uses where it is compatible with adjoining uses.

As a primary freight route and key access into Greater Edinburgh Parks, Heaslip Road will be a focus for road-based logistics, warehousing, distribution and transport services requiring convenient access to Port Wakefield Road, the Northern Expressway and rail facilities. Large allotment sizes are envisaged adjacent both sides of Heaslip Road to accommodate large floor plate enterprises. Edinburgh Road will provide the key access route into Edinburgh Parks from Heaslip Road. Access points onto Edinburgh Road and Heaslip Road will therefore be limited and direct property access onto these roads should not occur in order to preserve their planned function.

Special industry should not occur in the zone unless associated with food and beverage production, is considered necessary to support major manufacturing clusters or involves bulk handling activities associated with intermodal and transport operations. Such industries should not be located adjacent or in close proximity to local activity centres, sensitive land uses or other zones. Where special industry is proposed, use of best available technology economically achievable will be encouraged to minimise land use impacts and reduce the need for large buffer or separation areas.

The development of local activity centres accommodating local shops (including cafes and restaurants), consulting rooms, service trade premises, child care facilities, recreation facilities and training facilities is encouraged in the zone to support an expanding workforce and provide support services for business. These activity nodes will be compatible with the function of other zones or nearby centres. More sensitive land uses such as educational establishments, child care centres and consulting rooms will be located and designed to ensure that higher impact land uses such as general industry do not undermine the successful operation of any land use. Locations of activity nodes are shown on [Concept Plan Map Sal/7 – Greater Edinburgh Parks](#).

The bulky goods node or other local activity centres should provide the primary location of bulky goods outlets.

A high level of compatibility between land uses in the zone is envisaged to ensure a quality and attractive business environment is maintained. Clustering of industrial activities to share resources and reduce waste impacts and energy needs is encouraged in the zone, as well as shared use of facilities and services, including training, communication and information technology, shipping and receiving facilities, and car parking areas where practical. Allotments that adjoin the boundary of another zone where more sensitive land uses are anticipated (e.g. residential development), will be large enough to accommodate design features and siting arrangements that limit impact on the adjoining zone. Conventional horticulture is not anticipated in the zone, and will be replaced by envisaged land uses over time. Consequently, establishing new conventional horticulture should not occur. Development will also respect the historical character of places of cultural or heritage significance such as the Sturton Church and graveyard.

Development will comprise high quality, innovative contemporary architecture that is both adaptable and flexible to accommodate multiple uses or changes in future land uses where practical. Buildings will comprise low reflective materials and provide a variation in finishes, façade treatments and setbacks rather than appearing as large uniform buildings with blank facades. Outdoor storage and service areas will also be located away from major roads or residential areas and be screened from public view with fencing/structures of varied materials that limit potential for vandalism.

Landscaping will be used to define gateways to the area and be carefully integrated with built form, ensuring that vegetation is sustainable, drought tolerant, locally indigenous and matched to the scale of development, while also providing a comfortable, pleasant and attractive environment. Siting of development and setbacks from arterial roads, freight routes and the Northern Expressway in particular will allow for suitable landscaped areas to enhance the visual amenity of key movement, entry and arrival points to the area. Car parking areas will include trees to provide shade and enhance visual amenity. The appearance of outdoor storage areas will also be enhanced through landscaping. Landscaping will be carefully designed to minimise opportunity for crime by ensuring passive/active surveillance and minimising places of entrapment. Landscaping, building and structures should also be sited and designed to ensure that the security of the DSTO security fence is not compromised.

Water Sensitive Urban Design systems, including the harvest, treatment, storage and reuse of stormwater, will be integrated throughout the area at the neighbourhood, street, site and building level, taking advantage of large allotment sizes and impervious areas. Roadways will be designed to accommodate major stormwater flows in excess of the capacity of underground drainage systems. Major stormwater drainage infrastructure should be developed in accordance with [Concept Plan Map Sal/7 – Greater Edinburgh Parks](#) and be designed in an attractive form with grass-lined sides and allow for the planting of trees and shrubs on both sides of open channels. Harvested stormwater will improve the aesthetic and functional value of landscaping and open spaces, including public access ways and greenways, contributing to a superior working environment.

Two buried high pressure gas transmission pipelines traverse some areas within the zone, namely the Epic Energy and SEA Gas pipelines. These transmission pipelines are to be designed, constructed, operated and maintained in accordance with Australian Standard (AS) 2885: Pipelines – Gas and Liquid Petroleum to ensure protection of the pipeline, which in turn ensures the safety of the community, protection of the environment and security of (gas) supply to users.

Any change to the use of land and/or proposed construction activity in the vicinity of these pipelines require a detailed assessment to be undertaken to ensure that all risks associated with continued pipeline operations remain acceptable. In light of these requirements, development within 640 metres of the SEAGAS gas pipeline and 400 metres of the Epic gas pipeline as shown on *Overlay Map Sal/1 Development Constraints* should conform with the minimum pipeline safety requirements for AS2885 (Pipeline Gas and Liquid Petroleum).

Infrastructure for Greater Edinburgh Parks

Development within the Greater Edinburgh Parks requires the co-ordinated delivery of infrastructure and should only proceed where it has been demonstrated that such co-ordination exists to ensure infrastructure between development sites (or a stage of a development) facilitates the overall achievement of the relevant Concept Plan. In some cases this may include provision for temporary works pending development of adjacent land or other land within the same Concept Plan area.

Particular attention will be given to infrastructure co-ordination to achieve the following:

- (a) an efficient and easily maintained stormwater management system comprising a series of drainage channels and retention / detention basins and /or wetlands
- (b) key upgrades to local road junctions (including Heaslip / Edinburgh Roads, Argent / Womma Roads, Heaslip / Womma Roads and Andrews / Womma Roads to provide either an intersection upgrade or provision of a roundabout to distribute traffic to the existing road network
- (c) key electricity substations located near the intersection of Penfield / Short Roads and Mill / Short Roads to accommodate the requirements of SA Power Networks.

PRINCIPLES OF DEVELOPMENT CONTROL

Land Use

1 The following forms of development, or combination thereof, are envisaged in the zone:

- consulting room
- dwelling in association with industry
- electricity substation
- fuel depot
- indoor industrialised horticulture
- indoor recreation centre
- industry
- intermodal rail freight facility
- motor repair station
- office
- petrol filling station

- pre-school
 - prescribed mains
 - public service depot
 - road transport terminal
 - service trade premises
 - service industry
 - shop or group of shops
 - training facility
 - store
 - warehouse.
- 2 Development listed as non-complying is generally inappropriate.
- 3 Development should be in accordance with the relevant [Concept Plan Map Sal/7 – Greater Edinburgh Parks](#).
- 4 Development should not impede the operation of established land uses through encroachment, over development of sites or noise/emissions or any other harmful or nuisance-creating impact.
- 5 Shops or groups of shops (other than bulky good outlets and service trade premises) should serve the local workforce within the zone and have a gross leasable floor area less than:
- (a) 2500 square metres where located in designated local activity centres shown on [Concept Plan Map Sal/7 – Greater Edinburgh Parks](#).
 - (b) 250 square metres where outside of designated local activity centres
- 6 Bulky goods outlets and service trade premises should only be located in the bulky goods node or local activity centres identified on [Concept Plan Map Sal/7 – Greater Edinburgh Parks](#).
- 7 Bulky goods outlets and service trade premises should not have any adverse impacts on heavy vehicle access or freight movements.
- 8 Restaurants and cafes should only be located in bulky goods outlets or service trade premises that are larger than 2000 square metres, and should have a gross leasable area of 150 square metres or less.
- 9 Short term workers accommodation or other sensitive uses within the zone should be designed and located to ensure the ongoing operation of any existing activity within the zone is not impeded.

Form and Character

- 10 Development should not be undertaken unless it is consistent with the desired character for the zone.
- 11 In areas where a uniform street setback pattern has not been established, buildings should be set back in accordance with the following parameters:

Building height (metres)	Minimum setback from the primary road frontage (metres)	Minimum setback from the secondary road frontage (metres)
6 metres	8 metres	4 metres
Greater than 6 metres	10 metres	4 metres

- 12 Building façades facing land zoned for residential purposes should not contain openings or entrance ways that would result in the transmission of noise or light spillage that would adversely affect the amenity of nearby residents.

- 13 Any plant or equipment with potential to cause an environmental nuisance (including a chimney stack or air-conditioning plant) should be sited as far as possible from adjoining allotments not zoned for employment, and should be designed to minimise its effect on the amenity of the locality.
- 14 Development should control noise emissions through the use of attenuation devices and sound proofing, particularly activities requiring extended hours of operation.
- 15 The hours of operation of an activity should not detract from the amenity of any residential area.
- 16 Within 50 metres of a residential zone boundary:
 - (a) non-residential development (including loading and unloading activities) should:
 - (i) demonstrate appropriate acoustic performance
 - (ii) ensure that all noise sources including machinery, loading, unloading and other service areas on allotments nearest to the residential boundary are located within the building
 - (b) development should be designed and constructed of a material to ensure noise emissions are minimised within acceptable standards.
- 17 Development should be adaptable to allow for flexibility of use over time and accommodate multiple uses and shared facilities where practical, including training areas and car parking.
- 18 Buildings should not occupy more than 50 percent of the total area of the site upon which they are located, unless it can be demonstrated that stormwater can be harvested, treated, stored and reused on the site of the development to minimise impacts on external stormwater infrastructure.
- 19 Industries, warehouses, stores and similar developments should be provided with sufficient and convenient parking for staff and visitors based on the following rates:

Building Component	Number of required vehicle parking spaces
Part of development used as office space	3.3 spaces per 100 square metres
Part of development used as non-office space	2 spaces per 100 square metres where industrial building area is under 200 square metres
	1.33 spaces per 100 square metres where industrial building area is between 200-2000 square metres
	0.67 spaces per 100 square metres where industrial building area is greater than 2000 square metres
Service trade premises	2 spaces per 100 square metres

- 20 For labour-intensive industries where car parking demand exceeds the rates in [Principle 20 above](#), the total car parking should be provided at a rate of 0.75 spaces by the number of employees
- 21 For non-labour intensive industries, the rates in [Principle 20 above](#) can be varied having regard to expected maximum staff and visitor levels.
- 22 Development within the “Runway Public Safety Area”, but located outside of the “Limited Development Area”, as identified in [Concept Plan Map Sal/6 – Urban Employment Zone](#) should not:
 - (a) contain any land uses or industries that result in a significant increase in people working or congregating in that area (except warehousing and/or road transport terminals)
 - (b) involve land uses that store flammable or hazardous materials.

- 23 No development should occur within the “Limited Development Area” as identified in [Concept Plan Map Sal/6 – Urban Employment Zone](#), except for the following developments that have heights of no greater than 2.1 metres above ground level:
- (a) car parking
 - (b) outdoor storage area (but not including storage of flammable or hazardous materials)
 - (c) ancillary structures (eg. fencing and street lights)
 - (d) landscaping.
- 24 No development should occur in the “No Structures and Development Area” as identified in [Concept Plan Map Sal/6 – Urban Employment Zone](#).

Land Division

- 25 Land division should create allotments that are of a size and shape suitable for the intended use.

PROCEDURAL MATTERS

Complying Development

Complying developments are prescribed in Schedule 4 of the *Development Regulations 2008*.

In addition, the following forms of development, or any combination, are designated as complying subject to the requirements in [Table Sal/1 Building Setbacks from Road Boundaries](#):

Form of development	Complying criteria / conditions
(a) light industry (b) service industry (c) service trade premises (d) warehouse.	<p>1 The building, or any part, is not located within:</p> <ul style="list-style-type: none"> (a) areas affected by aircraft noise shown on Concept Plan Map Sal/2 - Edinburgh Defence Airfield Aircraft Noise Exposure (b) an area shown on Concept Plan Map Sal/3 - Edinburgh Defence Airfield Lighting Constraints where restrictions on the amount of upward light apply. <p>2 The development does not involve an activity of environmental significance or major environmental significance identified in Schedules 21 and 22 of the <i>Development Regulations 2008</i>.</p> <p>3 The development does not require referral pursuant to Section 37 of the <i>Development Act 1993</i>.</p> <p>4 The development site is greater than 60 metres from the nearest residential zone boundary.</p> <p>5 The development has direct access to a sealed roadway.</p> <p>6 All vehicles able to access/egress the site in a forward direction.</p> <p>7 A site coverage of less than 50 per cent.</p> <p>8 Building height does not exceed airport building heights shown on Concept Plan Map Sal/1 - Edinburgh Defence Airfield Defence (Area Control) Regulations and is no greater than 12 metres.</p> <p>9 Building setback in accordance with the following:</p> <ul style="list-style-type: none"> (a) buildings up to a height of 6 metres sited at least 8 metres from the primary street alignment (b) buildings exceeding a height of 6 metres sited at least 10 metres from the primary street alignment

Form of development	Complying criteria / conditions
	(c) 4 metres from the secondary street frontage.
10	The development is designed as follows: <ul style="list-style-type: none"> (a) buildings adjacent public streets are designed to overlook the street and have a maximum unarticulated length of 30 metres (15 metres for offices) (b) comprise low-reflective materials and pre-colour treatment if metal clad.
11	Landscaping comprises: <ul style="list-style-type: none"> (a) an area of not less than 10 per cent of the site (b) a landscaped setback area of more than 3 metres wide along any street boundary, except where a building is setback a lesser distance from any street boundary in which case the intervening setback is landscaped (c) a mix of species expected to grow to less than 0.5 metres in height and species expected to grow with clear stems to 2 metres height and with the canopy above.
12	A clearance of not less than 3 metres being provided for access purposes between any structure and one side boundary of the site.
13	Off-street vehicle parking and specifically marked disabled parking provided at the rate of not less than: <ul style="list-style-type: none"> (a) 2 per 100 square metres (industrial building area under 200 square metres) (b) 1.33 per 100 square metres (industrial building area 200-2000 square metres) (c) 0.67 per 100 square metres (industrial building area greater than 2000 square metres) (d) 3.3 spaces per 100 square metres (office building area) (e) 2 per 100 square metres (service trade premises building area).
14	All buildings, including the associated filling of land - are sited, designed and constructed to prevent the entry of floodwaters in a 1-in-100 year average return interval flood event.
15	Areas used for the loading or unloading of materials or for the storage of chemicals and materials used in industrial operations and processes are to incorporate bunding or containment facilities that: <ul style="list-style-type: none"> (a) prevent the entry of external stormwater (b) contain any spilt materials from entering the stormwater system.
16	All loading and/or unloading of vehicles to occur within the boundaries of the site.
17	All outside loading and unloading and goods storage areas should be screened by solid fencing or dense screen landscaping.
18	All stormwater drainage is retained and treated on-site or connected to an approved stormwater management scheme.
19	Waste collection and storage areas provided which are: <ul style="list-style-type: none"> (a) screened and separated from adjoining areas (b) designed to ensure that wastes do not contaminate stormwater or enter the stormwater collection system.

Form of development	Complying criteria / conditions
	<p>20 The development comprises a maximum of two advertising displays, each of which does not encroach upon the public road reserve and accords with the following:</p> <p>(a) A maximum of one pylon sign per site that:</p> <ul style="list-style-type: none"> (i) has a maximum height of 6 metres (ii) has a maximum area of 8 square metres (iii) is located between the building and the front property boundary. <p>(b) A maximum of one freestanding directory sign per site that:</p> <ul style="list-style-type: none"> (i) has a maximum height of 3 metres (ii) has a maximum length of 6 metres. <p>(c) A maximum of one flush wall sign per site that:</p> <ul style="list-style-type: none"> (i) has a maximum area of 8 square metres (ii) is erected on the building façade (iii) is located below the parapet of the building.
	<p>21 Fencing exceeding 2.1 metres in height (including colour –coated wire mesh fencing) adjacent to public roads should be set back in one of the following ways:</p> <ul style="list-style-type: none"> (a) in-line with the building façade (b) behind the building line (c) behind a landscaped area that softens its visual impact.

Non-complying Development

Development (including building work, a change in the use of land, or division of an allotment) involving any of the following is non-complying:

Form of development	Exceptions
Advertisement or advertising hoarding	Except where the advertisement or advertising hoarding: <ul style="list-style-type: none"> (a) does not move, rotate or incorporate flashing light(s) (b) has no part that projects above the walls or fascia where attached to a building (c) covers less than 10 per cent of the total surface area of a wall oriented to a public road or reserve (d) does not include bunting, streamers, flags or wind vanes.
Amusement machine centre	
Caravan or residential park	Except for minor alterations and additions within a caravan park or residential park.
Dwelling or Dwellings	Except: <ul style="list-style-type: none"> (a) for short term accommodation that is ancillary to and in association with industry (b) for alterations and additions to existing dwellings.
Intensive animal keeping	
Motel	
Nursing home	
Place of worship	
Prescribed mining operations	
Primary school	

Form of development	Exceptions
Secondary school	
Stadium	
Stock slaughter works	
Tourist accommodation	

Public Notification

Categories of public notification are prescribed in Schedule 9 of the *Development Regulations 2008*.

In addition, the following forms of development, or any combination thereof (except where the development is classified as non-complying), are designated:

Category 1	Category 2
All kinds of development except where the site of the proposed development is within 60 metres of a Residential Zone or a Mixed Use Zone boundary	Development where the site of the proposed development is within 60 metres of a Residential Zone or a Mixed Use Zone boundary



BIOGASS RENEWABLES

Proposed In-Vessel Waste-to-Energy Anaerobic Digestion Design Report

DELOREAN ENERGY SA ONE

125,000TPA Salisbury SA Facility - Phase 1

1-2 Gidgie Court, Edinburgh SA 5111

Date	Revision	Status	Prepared	Reviewed	Approved
10/06/2018	A	Final	MA	JO	HJ
14/09/2018	B	Final	MA	JO	HJ

Design Report

Job No: J116
Document No: J116-001
Date: 10/06/18
Rev: A



DESIGN REPORT

Biogas Renewables

TABLE OF CONTENTS

Abbreviations and Acronyms	5
Units.....	5
1. BACKGROUND	6
2. KEY OBJECTIVES.....	8
3. DESIGN EXECUTION STRATEGY	9
3.1. LOCATION	9
3.2. DESIGN WORKS	9
3.2.1. Concrete	9
3.2.2. Structural.....	9
3.2.3. EI&C	9
3.3. REPORTING	9
3.4. DESIGN SCHEDULE	10
4. QUALITY CONTROL.....	10
5. PROCESS DESIGN	10
5.1.1. Waste Reception Hall.....	11
5.1.2. Digester Feed Tank	13
5.2.3 Pasteurisation Tanks	13
5.2.4 Anaerobic Digestion Process	14
5.2.5 Digestate Solid and Liquid Separation.....	15
5.2.5 Waste Water Treatment Plant.....	16



5.2.6 Gas Management and Power Utilities 16

5.2. SITE OFFICE AND FACILITY RECEPTION..... 18

6. BASIS OF DESIGN 19

6.1. Appearance 19

6.2. DESIGN LIFE.....20

6.2.1. Operational Design Life.....20

6.2.2. Structural Design Life20

6.3. PLANT PERSONNEL AND OPERATION SCHEDULE20

6.4. DESIGN REDUNDANCY20

6.5. SITE LAYOUT21

6.5.1. Public and Pedestrian Access21

6.5.2. Road Layout.....21

6.5.3. Traffic Management.....21

6.5.4. Signage.....23

6.5.5. Tank Bunding.....23

6.5.6. Drainage.....23

6.6. BUILDINGS AND TECHNICAL.....23

6.7. EARTHWORK AND GROUND CONDITIONS.....24

6.7.1. Foundations.....24

6.7.1. Landscaping24

6.8. ORGANICS RECEPTION HALL24

6.8.1. Concrete Slab.....25

6.9. BOUNDARIES AND FENCING25

6.10. FIRE PROTECTION26

6.11. COMMUNICATIONS26

7. SAFETY IN DESIGN26



Design Report

Job No: J116
Document No: J116-001
Date: 10/06/18
Rev: A



Abbreviations and Acronyms

AD	Anaerobic Digestion
ADF	Anaerobic Digestion Facility
BOD	Biological Oxygen Demand
CHP	Combined Heat & Power
COD	Chemical Oxygen Demand
DS	Dry solids
EI&C	Electrical Installation & Control
OS	Organic Solids
PLC	Programmable Logic Controller
PU	Packaged Unit
SS	Suspended Solids

Units

TPA	tons per annum
TPW	tons per week
TPD	ton per day
t/hr	ton per hour
dm ³	cubic decimeter (= 1 liter)
t/m ³	ton per cubic meter
kg VS/m ³ ·day	kg Volatile Solids per cubic meter reactor volume per day.
m ³ /hr	cubic meter per hour
Nm ³ /hr	normal cubic meter per hour
MW	megawatt
MWhr	megawatt hour
MW(th)	megawatt thermal energy
MW(e)	megawatt electrical energy
GJ	gigajoule
ppm	parts per million
kg/hr	kilograms per hour
mbar	millibar
m ³ /m ² *hr	cubic meter (air) per square meter surface area per hour



DESIGN REPORT

Biogass Renewables Pty Ltd

1. BACKGROUND

Biogass Renewables is an Australian energy company building mature-technology, site-specific anaerobic digestion facilities for the commercial, industrial, resources and government sectors in Australasia.

We integrate best-of-breed Australian, European and British componentry and design, delivered in the Australian context, using Australian know-how.

Biogass retains its own commercial, engineering and technical expertise in Australia, supported by a consortium of specialist European and British technology suppliers and technicians.

Biogass Renewables has successfully commissioned a 35,000-50,000 tonne per annum food waste capable of 2.4MW(e) 2.6MW(th) capacity bioenergy plant for Richgro at its principle metropolitan composting and manufacturing operations south of Perth in Western Australia.

Biogass Renewables operates a biogas potential testing laboratory enabling Biogass to sample and test prospective feedstocks to estimate biogas yields to assist in the design and feasibility for each new AD plant and also retains the in-house expertise to support the development of submissions for financial assistance.

Biogass Renewables is a member of the Australian Organics Recycling Association, Bioenergy Australia and the Waste Management Association of Australia.

The organic processing facility designed by Biogass Renewables, has been designed to meet bespoke design criteria, which will evolve through the design process.

The facility proposed is capable of processing up to 125,000TPA of expired industrial and commercial organic and agricultural waste, the facility utilises an option to include mechanical separation of contamination from the organic waste streams which has



been designed to process up to 10% of contamination at the front end, installed within an enclosed negative pressure reception hall to meet the EPA requirements.

The reception building is designed to output a clean organic waste stream as the feedstock for a mesophilic biological anaerobic digestion process. The process breaks down the volatile organic matter in the feed sludge through a process of hydrolysis, pasteurisation, and then in-vessel biodigestion in the presence of methanogen bacteria. The methane forming bacteria convert the organic acids to methane gas, carbon dioxide and water, producing biogas at around 60 – 65% methane.

Biogas is cleaned with in the headspace of the digester through a chemical conversion of H₂S and micro-dosing of air (O₂) to give sulphate (SO₄) and water (H₂O), chilled through a biogas dryer and associated gas management equipment, before:

- 1) Upgrading to biomethane for a baseline of 22GJ/hr of gas energy; and
- 2) Boosting and combusting through three Combined Heat and Power Units (CHP) for up to 4.68MW electricity and 4.86MW thermal production. These are high-efficiency reciprocating engines for the production of electricity and heat to be utilised on site for the running of the plant before exporting surplus power into the local electricity grid.

The facility incorporates an enclosed compliant high-temperature flare which activates only if the generator is not operational, or excessive surplus biogas is generated.

In the biodigestion process, non-volatile solids (along with the few non-biodegradable organic solids) become digested sludge that is fed from the digester tanks into a digester outlet tank, ready to be separated into the solid and liquid fractions. The solid fraction is exported offsite by truck as a viable commercial biofertilizer product, whilst the liquid fraction is passed through an onsite wastewater treatment plant for clean-up to meet MAR standards. A proportion of the processed water is recirculated back into the anaerobic digestion system with the balance exported from the site to Salisbury Water for compliant usage or disposal within its network.



2. KEY OBJECTIVES

The objective of the design of this project is to build and operate a commercially viable anaerobic digestion facility in Salisbury, South Australia. This facility will be designed to:

- Accept and process up to 125,000TPA of trucked organic waste consisting of;
 - 100,000TPA of Commercial & Industrial (C&I) Organic Waste
 - 25,000TPA of Solid Agricultural Feedstock Waste
- Include an option for processing contaminated waste streams and pre-treating a broad range of wastes
- Be capable of producing a baseline of 291 1m³ of biogas per hour for use in generation of electricity and heat with the options to:
 - upgrade biogas to biomethane for injection into the gas mains.
 - Pipe biogas to nearby business customers in and adjacent to the Food Park to enable decentralised biogas-fuelled generation at various locations in the Food Park (each would require its own approval under this option)
- To supply the existing site operations with power and heat to meet the parasitic energy draw from the facility.
- Minimise odour
- Maximise re-use opportunities for digestate

The key design objectives for the project are:

- Achieving zero harm
- A facility with a high level of operability, maintainability and constructability; and
- No delays or additional cost on site due to design issues or errors;

The objectives of this Design Report are to:

- Detail how the design will be performed by the Contractor;
- Specify the policies and procedures applicable to the design which are to be used by the Project Design Team; and
- Assign responsibilities to key members of the Project Team.



3. DESIGN EXECUTION STRATEGY

The design will be completed in-house by Biogas, unless otherwise specified.

3.1. LOCATION

The proposed site location is:

Lot 505,1-2 Gidgie Court, Edinburgh, South Australia 5111

3.2. DESIGN WORKS

3.2.1. Concrete

The design of all concrete works including footings, bunding, storm water capture and drainage and ground slabs will incorporate steel fibre reinforcement. The steel fibre reinforcing reduces construction time whilst assisting in minimising thickness and shrinkage cracks in ground slabs. Correct sealing methods will be used to seal the tanks and ensure tank integrity. Where applicable, Strand7 a Finite Element Analysis program will be used to design the concrete and will be designed with the local civils contractor.

3.2.2. Structural

All structural design will be completed on the structural analysis package Space Gass or similar as well as internal programs and spreadsheets. Design shall be in accordance with relevant Australian standards and building codes and shall incorporate elements for ease of construction.

3.2.3. EI&C

To accelerate the project schedule preliminary electrical calculations, modelling and earth grid design will be completed for input into the grid connection submission at the start of the project. The remainder of deliverables will be completed in accordance with the project schedule when mature primary electrical data, equipment lists, and General Arrangements are completed.

3.3. REPORTING

A weekly design progress report will be produced for the Project Report which shall include as a minimum work pack progress, earned hours, hold ups and outstanding



technical queries.

3.4. DESIGN SCHEDULE

The design schedule is included as a sub-section of the full project schedule. Progress of deliverables and associated works packs will be updated weekly to allow correct tracking to baseline.

4. QUALITY CONTROL

Quality assurance and control shall be in accordance with Biogas - ISO 9001 compliant Design Procedure. The following processes are included in the procedure and will ensure compliance with ISO 9001 requirements.

- Design Project Commencement Process
- Safety in Design Process
- 3D Model Development and Review
- Design Drawing Development and Review Process
- Design Document Development and Review Process
- Vendor and Sub-contractor Document Review Process
- Design Hold Process
- Design Change Process
- TQ/RFI Process
- Non-conformance Process
- Corrective Action Process
- Preventive Action Process
- Design Project Completion Process

5. PROCESS DESIGN

The process design has been broken out in to three sections:



- Reception Hall
- In-Vessel Anaerobic Digestion Process
- Gas Management and Power Utilities

5.1.1. Waste Reception Hall

Receival of solid organic and liquid feed material into an insulated circa 70x52m negative-pressure Shed

Solid and liquid organic input material is imported to site by truck. Trucks will pass through a weighbridge at the entrance to the site before entering an insulated Reception Hall through fast-closing doors.

Once inside the Reception Hall, solid material will be tipped into storage bays (each allowing for up to 800m³ of volume or two days' tipping capacity). At this point plant operators will have first sight of the input material and will be able to remove any large or problematic waste materials, before the materials are loaded into the process.

Liquid material is pumped directly into a 3,500m³ Digester Feed Tank from inside the Reception Hall, via two dedicated four-inch cam lock liquid inlet connection points. The liquid waste stream is piped through a filter system into the Feed Tank. The liquid connection area houses a bunded area which captures any spills from the truck pump-out process and pumps back in to the feed tank for capture.

The Reception Hall allows for 5 waste trucks to back in at any one time, with the reception building housing traffic lights to indicate which bay is free for the following waste truck to pull in to.

The design has allowed for 4 pre-processing units for removal of inert and plastic waste streams. The pre-processing units separates inert material from the organic fraction. Inert material is captured in outlet skips for subsequent disposal to landfill. The pre-processing units will be capable of processing up to 12-15T/hour. The solid fraction is diluted with recirculated process liquor ensuring a pumpable organic sludge output as per the attached mass balance (Appendix 1).

Solid agricultural waste streams

Solid agricultural waste streams are imported to site via truck from agricultural and



farming regions within South Australia. The dry agricultural waste is input directly into 2 grain Silos on site using a pneumatic conveyor system. The pneumatic conveyor system utilises moving air within a “blowline” to transfer or “blow” agricultural waste from the delivery truck into the silos within fully contained pipework.

The Silos will have a total combined capacity of circa 200T of agricultural waste, allowing for at least 2 days storage on site. The Silos will be connected to a mixing system that will combine liquid and the agricultural waste into a pumpable slurry. The slurry is then pumped directly into the Digester Feed Tank.

Odour capture within the Reception Hall - Biofilter

The Reception Hall I is connected to an appropriately-sized biofilter and remains under a slight negative pressure to capture and extract all odours from within the building. Partitioning in the form of curtains will be incorporated into the design to separate the odour producing areas from the rest of the shed. The extraction and biofilter system is sized to deliver 4-5 air changes of the odour producing areas per hour. Extracted air is captured through an internal ducting system and passed through a biological air scrubber for removal and cleaning of odour. The biofilter medium is spongolite – a porous rock formed from fossilised sea sponge (similar to scoria medium which is widely used for biofiltration). The spongolite medium is maintained in an enclosed, humid environment allowing a habitat for odour-eating bacteria.

The biofilter will be located within the Reception Hall and will be designed with an exhaust stack, dispersing any exhaust into the air. The stack will extend upwards from the filter unit and penetrate through the Reception Hall roof into the open air. The exhaust stack will undergo emissions modelling where the final design will ensure compliance with emission and odour regulations.

Additionally, the Reception Hall will be fitted with fast-closing (30-second) doors so that tipping and pumping from trucks all takes place in a fully enclosed environment.

The Reception Hall construction includes cladding incorporating cool room-slab insulation to minimise the ambient temperature inside the Hall and to prevent premature decomposition before materials are processed.

Standing operating procedure is that all solid materials must be loaded into the plant process before close of business each day, with end of day washdown of the reception floor and bays to prevent potential for odorous materials laying overnight or



accumulation on the floor.

5.1.2. Digester Feed Tank

The Digester Feed Tank (3,500m³) starts the first phase of digestion – the hydrolysis phase and is designed to hold the mechanically processed organic waste stream inputs at ambient temperature, allowing for storage of 5 days of accumulated input. The Digester Feed Tank is sized to dispense material into the process 7 days a week, allowing 365-day digester operation. This also allows for more storage capacity if the output process is not operational for a short period of time.

The digester feed tank is mixed by an in-tank agitator, ensuring a homogenous mix and keeping the solids in suspension ready for output to a pasteuriser - based on an input waste stream of up to 20% dry solid content.

All pumps are vortex centrifugal chopper pumps reducing particle size for greater surface area as well as processing a higher percentage of dry solids.

5.2.3 Pasteurisation Tanks

A volume of clean organic liquid feed is piped from the Digester Feed Tank on an hourly basis into a three-tank pasteurising system. The process is designed to meet PAS110 standards and can handle 22T/hour of wet feedstock. Heating of the pasteuriser is achieved by using surplus heat from the AD Plant co-generation units as per the attached mass balance (Appendix 1).

Within the three-tank pasteurisation process, the first operation is to fill and pre-heat up to 72°C, with the second phase holding at 70°C for a period of 1 hour. The third phase is emptying into the AD plant's main Digester Tanks. Each phase takes approximately 1 hour to complete, allowing for full pasteurisation to the European PAS110 standards within 3 hours. Holding each batch at over 72°C for 1 hour will ensure the pathogen log kill is reduced and stabilised before inputting into the Digester Tank.

In addition to pathogen kill, the pasteurisation process delivers efficiencies by enabling a shorter bioreactor retention time by thermal treating waste streams pre-digestion and can deliver a slightly higher breakdown and gas yield. This process will also assist in breaking down fats, grease and oils, by thermal treatment.

The process can be switched to pasteurise the outlet digestate instead of the input feedstock if required.



5.2.4 Anaerobic Digestion Process

The AD Plant is controlled from a Main Control Centre (MCC) located in a container next to the Reception Hall. Operation and control of the AD Plant process is provided by a programmable logic controller (PLC) in the MCC. Process status display and control parameters are monitored and adjusted via the MCC's human machine interface (HMI). The operation and adjustment of the HMI is by trained staff only. The MCC is connected to a SCADA system for remote system monitoring, operation, rectification and intervention if required.

Design of the 3500m3 Primary Digester Tanks

The primary anaerobic digestion process will take place inside six 3500m3 primary mesophilic 38°C digesters.

The Digesters are designed for a 30-day retention period, to maximise breakdown of different types of waste streams. Using a continuous feed process, proposed commercial and industrial organic waste streams which are generally low in fibre and high in sugars will break down in a mesophilic process within 15 days and is 95% exhausted of energy within 20 days from input.

The Digesters are designed to allow for removal of small floating plastics such as fruit labels, and other light floating organic fraction as well as any non-organic settled solids, such as small grit and glass, by way of a top and bottom capture exit point.

The Digesters process a set volume of blended feed every hour in a continuous diet feeding system. Based on a 30-day retention, each Digester will receive circa 5m3/hour.

The Digesters use an external mixing and heating / cooling system allowing for maintenance and repair of these systems from outside the tank without impacting Digester operation.

The external Digester mixing system has been designed to operate as follows:

- A directional mixing nozzle works by increasing the speed of the digestate at the bottom of the tank causing the contents to turn within the tank.
- A venturi mixing nozzle draws biogas from the roof space connection by creating a vacuum on the gas connection side, hydrolysing the digestate to improve gas yields and take off.

Job No: J116

Design Report

Document No: J116-001

Date: 10/06/18

Rev: A



- A top mixing nozzle which enables the mixing of the tank's digestate through an actuated valve is utilised to break up any caking or crusting of the surface material.

The external heating system on the Digesters has been designed to operate as follows:

- The Digester tank has a heat exchanger built into one mixing configuration, which is used to maintain and raise the temperature within the Digester.
- Three (3) temperature-measuring points are located on the tank which monitors the sludge temperature and hot water temperature.
- If the sludge temperature drops below a set value, the hot water from the CHP will be directed to flow through the heat exchanger.
- The heating system is operational during normal operating process to ensure a constant linear heat transfer through the material ensuring a homogenous mixture within the digestate.

Operation of the 3000m3 Digester Discharge Tank

Spent digestate is passed from the Digesters into a Digester Discharge Tank for buffering pending separation and post-processing of the digestate.

The Digester discharge tank is fed hydrostatically from the Digester tanks. The digestate in this tank contains active bacteria that will decline due to lack of feed, however will still produce methane gas that is fed back to the primary Digester tanks' gas space. The spent digestate is actively mixed to ensure a constant blend of dry solids and liquid product. The mixed product is outputted to a centrifuge located in the Reception Hall on an 8 hours/day, 5 days per week basis. The digester outlet tank has enough capacity to store digestate for a period of time if the centrifuge is not operational.

5.2.5 Digestate Solid and Liquid Separation

Mixed digestate product is output from the outlet tank and piped into the Reception Hall where it is mechanically separated by centrifuge into liquid and solid fractions. The solid fraction is outputted at 30% dry solids (a spadeable material suitable as a bio-fertiliser) into a collection bay, with the liquid fraction piped into an adjacent wastewater treatment plant.



5.2.5 Waste Water Treatment Plant

Separated liquid wastewater (and storm water as required) will be diverted to a purpose-built waste water treatment plant for processing. The objective of the wastewater treatment plant is to process the wastewater to MAR standard. The liquid will go through a homogenization phase before being diverted into an anoxic reactor. The liquids will then be channelled into one of 2 aerobic reactors.

The liquid will then go through an ultrafiltration phase which produces a UF permeate. The Permeate is processed in a reverse osmosis unit, after which it is put back into the digestion process.

The system also utilises a reverse osmosis unit for the treating of UF permeate from the ultrafiltration units.

Post processing, a proportion of the MAR-compliant wastewater will be recirculated back into the AD process, with the balance exported from site by connection to Salisbury Water's pipe infrastructure for use or complaint disposal by Salisbury Water.

5.2.6 Gas Management and Power Utilities

Biogas generated within the Digesters is collected in the biodome headspace collecting circa 500m³ of biogas per Digester. Biogas from agricultural and food waste organics has the following general characteristics:

- 60-65% CH₄
- 35-40% CO₂
- Typically, a minute amount of H₂S up to 500ppm.

Design of Gas Offtake Lines

Digester biogas offtake lines are fed automatically from the gas levels within the primary Digester Tanks and the Discharge Tank. The pressure within the Digester Tank (and Discharge Tank) are monitored by the PLC but would not exceed circa 8 mbar, similar to the gas pressure of a household stove.

The offtake lines on the Digester Tanks will be monitored by the MCC system to ensure that the gas flow is maintained at correct pressure and humidity content to either activate the Flare or CHP. From the offtake point, biogas is processed as follows:

Job No: J116

Design Report

Document No: J116-001

Date: 10/06/18

Rev: A



- The offtake lines will direct the gas into a dehumidifier to reduce the liquid content of the gas. The recovered liquid is recirculated back into the digestion system.
- The flow of gas from the primary digester tank to the off-take lines is at a normal operating rate when the gas reaches a pressure of 7 to 8 mbar.
- The offtake lines will direct the gas to a gas booster system, where the pressure of the gas will be increased from 8 mbar to 110 mbar to fuel the biogas CHP units, or for activation of the enclosed high-temperature Flare if required.

Biomethane Upgrade

The design incorporates a biomethane upgrade process to convert biogas (65% methane) to mains-grade biomethane (97% methane) equivalent to natural gas.

A gas upgrade system will remove carbon dioxide, hydrogen sulphide, water and other contaminants from the biogas. The purification process removes contaminants from the raw biogas stream - these being absorbed or scrubbed leaving more methane per unit volume of gas.

The biogas will be consumed at a maximum rate up to 2000m³/hr which can convert the gas to approximately 1020m³/hr of biomethane. During regular operation however, with the CHP units in use, the gas unit is expected to consume approximately 1,100m³/hr of biogas and produce 570m³/hr of biomethane. The expected energy potential from the biomethane produced will be approximately 22GJ/hr

The biomethane will be injected into the local gas mains where it will be used by businesses and dwellings in the area connected to the mains.

Design of the Combined Heat & Power Unit (CHP)

As described, the Digesters are under a small positive pressure to allow the biogas to flow out of the Digester to the gas management skid, with the dry biogas then boosted up to the operation pressure – 110mbar/10KPA for consumption within three 1.56MWe Combined Heat and Power (CHP) reciprocating units. At 60-65% CH₄ the generators will each combust a maximum of 600m³/hour of biogas producing 1,560kWe and 1,620kWth – 95 °C hot water, giving a maximum electrical efficiency of 43%, and a thermal efficiency of 44% capturing the exhaust gas hot water circuit for full thermal efficiency.

The CHP Unit is designed for biogas, allowing for a high tolerance of H₂S as required.



The CHP unit is operational when biogas is produced by the digesters. The engines are designed to run on biogas at between 50-100% capacity or 780-1,560kW.

The biodome gas bag levels within each Digester are measured to set the load rate of the engines. If the gas bag level is increasing in volume, the engine load signal is increased to match the gas production. Alternatively, the gas bags can be used as storage to meet the grid network peak loads to capitalise on the export of power during peak intervals.

Design of H₂S Removal and Gas Clean Up

H₂S clean up within the biogas is managed by a chemical conversion - adding a micro-dose of air in to the head space of each Digester to give $H_2S + O_2 = SO_4 + H_2O$, which enables the SO₄ – sulphate to drop out into the digestate for removal.

Design of High Temperature Enclosed Flare

Being a biological process continuously breaking down volatile matter, the process generates biogas at all times. If the AD plant's power generation engines are not in operation, two emergency High Temperature Enclosed flares will operate automatically to safely combust the surplus biogas.

The High Temperature Enclosed Flares are designed to burn at 1000 °C at a combined total flow rate up to 4000m³/hour to ensure a safe site can be maintained without any venting to the atmosphere. The Flare is designed to combust the excess biogas produced under a controlled safe system. At 1000 °C the Flare will eliminate any potential airborne pathogens from the biogas ensuring a 100% combusted biogas to carbon release to atmosphere.

The Flare activates automatically when Digester gas pressure reaches a defined level set just below the pressure relief valve set point.

The Flare will be monitored by the AD Supervisor to ensure that the automatic operation of flare ignition is maintained when the CHP unit is not operating.

5.2. SITE OFFICE AND FACILITY RECEPTION

The facility will be designed to show the site office and reception at the front of the site by the entry and exit ways to show an appealing "shop front" whilst shielding the



operations and plant from public view.

The office layout will comprise of the following rooms:

- Ground Level
 - o Reception area
 - o Meeting room
 - o Office room
 - o Kitchen/Lunch room
 - o Restrooms – Male, Female and Disabled
- Second Level
 - o Observation/Education area

The Building will be constructed with full disabled access in mind, with ramps, large walkways and an elevator to travel between floors. A separate restroom will also be designed for the use of the disabled.

The office will be designed to Australian and council standards and will have all necessary features to deem it acceptable such as appropriate entries and exits (including emergency exits) and adequate exit signage.

6. BASIS OF DESIGN

6.1. Appearance

The facility will be designed to enhance the appearance of the localities and the wider area around Edinburgh. The design of the buildings will be consistent with buildings in the area and will be the first and foremost part of the site the public will view. The land immediately adjacent to the roads will be landscaped and maintained in a presentable manner

Multiple driveways will provide access into the facility site from both Woomera Avenue and Gidgie Court. Commercial Vehicles will use separate entrances and exits to allow safe access for the public.



Signage promoting the facility will be placed by the entrances of the site depicting the company logo of "DeLorean Energy" along with the facility name. The signage will be consistent with signage by others in the area and will comply with Council requirements.

6.2. DESIGN LIFE

6.2.1.Operational Design Life

With regular routine maintenance, the Facility has a 25-year design life period.

6.2.2.Structural Design Life

The infrastructure and concrete elements within the facility have been designed for a design life of 50 years. The structure is designed to safely withstand a 1/100-year storm.

6.3. PLANT PERSONNEL AND OPERATION SCHEDULE

The Plant will have personnel comprising of operators and office workers working in both the plant facility and office. The site will comprise of the following personnel:

- 1 x Plant Manager
- 4 x Plant Operators
- 1 x Receptionist
- 2 x Office staff.

The plant has a proposed front-end processing operational schedule of 5 days a week, 7AM – 5PM, with all personnel working to these time requirements. The anaerobic and generation process is will be running 24 hours a day, 7 days a week.

6.4. DESIGN REDUNDANCY

The steel structures will offer design redundancy by providing multiple load paths, either through bracing systems or utilising the steel-concrete interface. Utilising an integrated footing system in the shed means there is a larger distribution stress, which manifests as further design redundancy.

The facility process design offers redundancy to ensure the total volume of waste, facility design – 125,000TPA can be processed within the operational time for standard operations.



6.5. SITE LAYOUT

The facility will have multiple entry points for both public and commercial use. There will be multiple driveways into the facility from both Woomera Avenue and Gidgie Court for convenience and ease. Commercial Vehicles will use separate entrances and exits to the public to allow safe access for employees and the public alike.

The car park will span along Woomera Avenue and Gidgie Court, with space available for parking consistent with Council requirements and more than enough to service both employees and the public. The delineation of the parking and traffic direction will be applied to current Australian standards and will comply with council requirements.

6.5.1.Public and Pedestrian Access

From the car park, there is a designated path to a site office and welfare facilities. There is also a potential to install a viewing room to the reception Hall for educational purposes. Visitors will be able to see the operations with appropriate supervision in designated viewing areas on site. For safety and to prevent interference with the process, the viewing areas will be demarcated with guard railing, compliant to AS 1657. An elevated viewing platform will be included, also equipped with the appropriate safety apparatus to observe the facility operations.

6.5.2.Road Layout

Access roads will be sealed bitumen road with crushed rock base course and select fill sub-base. The road layout has been designed to allow for minimum interference between incoming and outgoing vehicles. The area in front of the shed provides adequate room to manoeuvre a truck or heavy vehicle. The car park is situated away from the loading point to eliminate the interface between visitors and loading vehicles. The waste will be delivered inside the Reception Hall directly into bunkers which can be used as an area for stockpiling two days of waste.

6.5.3.Traffic Management

Traffic is split into two categories:

- Light Vehicles (e.g. personnel and visitors)



- Heavy Vehicles (e.g. dump trucks, tankers, road trains).

Light Vehicles will enter the site through either of the two entrance ways provided on Woomera Avenue with parking located running along Woomera Avenue. Vehicles can then choose to exit from either of the same entrances on Woomera Avenue or, in the unlikely event of obstructions, the Heavy Vehicle entrance on Gidgie Court.

Heavy Vehicles will enter the site on the entrance way provided on Gidgie Court. Trucks will stop on the weighbridge before entering the industrial area of the site. From here, trucks will have ample room to manoeuvre and position themselves to offload material.

Once material has been offloaded, Vehicles will proceed to a second weighbridge prior to the exit on Gidgie Court. Once weighed in, the truck will exit onto Gidgie Court. The layout of the site has been designed to avoid collisions through the reduction of intersecting paths and separate entry and exit ways.

As many as 50 Trucks are expected to visit the facility every day once the site is in full operation, resulting in approximately 5 trucks every hour. The Facility has been designed to cope with the influx of vehicles with the following measures:

- 4 x commercial and industrial solid food waste receival bays
- 3 x digestate trailer bays
- 1 x Liquid feedstock receival bay
- 1 x Agricultural waste intake bay

This assures that the plant can accept up to 9 trucks at any one time.

As stated in section 5.1.1, The Reception Hall will have traffic lights installed to indicate which bays are free and which are in use.

Heavy Vehicle parking is also supplied on the Gidgie Court side of the site to allow large vehicles to stop on site without impeding other vehicles in the event the weighbridge is engaged. A bus waiting bay is also included, opening the opportunity for educational tours for large groups such as schools and universities.

All vehicles will be able to travel in a forward motion when entering, exiting and navigating around the site. Refer to the attached Traffic Management Plan for more information.

Refer to Traffic Management Plan for more information



6.5.4. Signage

Adequate signage will be provided as per the requirements in the relevant Acts and Standards. Areas will be clearly marked with the appropriate signage for visitors and operators alike.

6.5.5. Tank Bunding

The plant is required to have capture capacity of 120% of the largest tank at all times resulting in a required 4,200m³ of capture volume. Bunding will be installed around the perimeter of the tank area which will be designed to capture any liquids and divert them to drainage points scattered around the site.

The bunded area will be completely sealed, allowing no liquids captured within the area to leach into the ground or surrounding environment. Refer to *Appendix 2: Lot 505 Preliminary Design Drawings for an illustration of the site with the bunded area.*

6.5.6. Drainage

The stormwater from the shed roof and surrounding site area will be diverted into sump areas on site. Stormwater will either be diverted into the on-site waste water treatment plant for further processing or exported to Salisbury Water for compliant usage or disposal within its network depending on the site requirements at the time and the water quality.

6.6. BUILDINGS AND TECHNICAL

The buildings and structures will be designed to adhere to Australian building standards and council standards. Structural layouts, with details of connection methods will be issued once the design has been finalised.

The building specification for the materials and workmanship will comply with the Salisbury Council Development Plan and Australian standards. A full schedule of materials, finishes, plant and equipment details will be provided to the council upon design finalisation.

Essential fire safety provisions will be adhered to in the final design.

Refer to Appendix 3 - Material and Colour Schedules for more information on building/structural materials.



6.7. EARTHWORK AND GROUND CONDITIONS

It is assumed that ground conditions at the site will be capable of sustaining a bearing pressure of 200kPa and CBR of 7% by utilising standard static compaction methods (i.e. without ground improvement). The site has also been assumed as being able to be excavated utilising traditional earthmoving equipment without drilling or blasting.

Two copies of calculations based on the footing report with an accredited engineers' recommendations and supporting structural computations will be supplied to comply with the development act and regulations once the design has been finalised.

6.7.1. Foundations

With the requirements set out above, the foundations for equipment, tanks and shed are one of the following:

- Pad/strip footings
- Raft footing
- Ground slab with integrated thickenings

No allowance for concrete or screw piles have been made as it is assumed that the ground conditions can be met.

6.7.1. Landscaping

The Site will be landscaped to match the aesthetic of the surrounding land and businesses in the area. The front of the business will be landscaped to promote an appealing image from public view whilst adhering to council requirements.

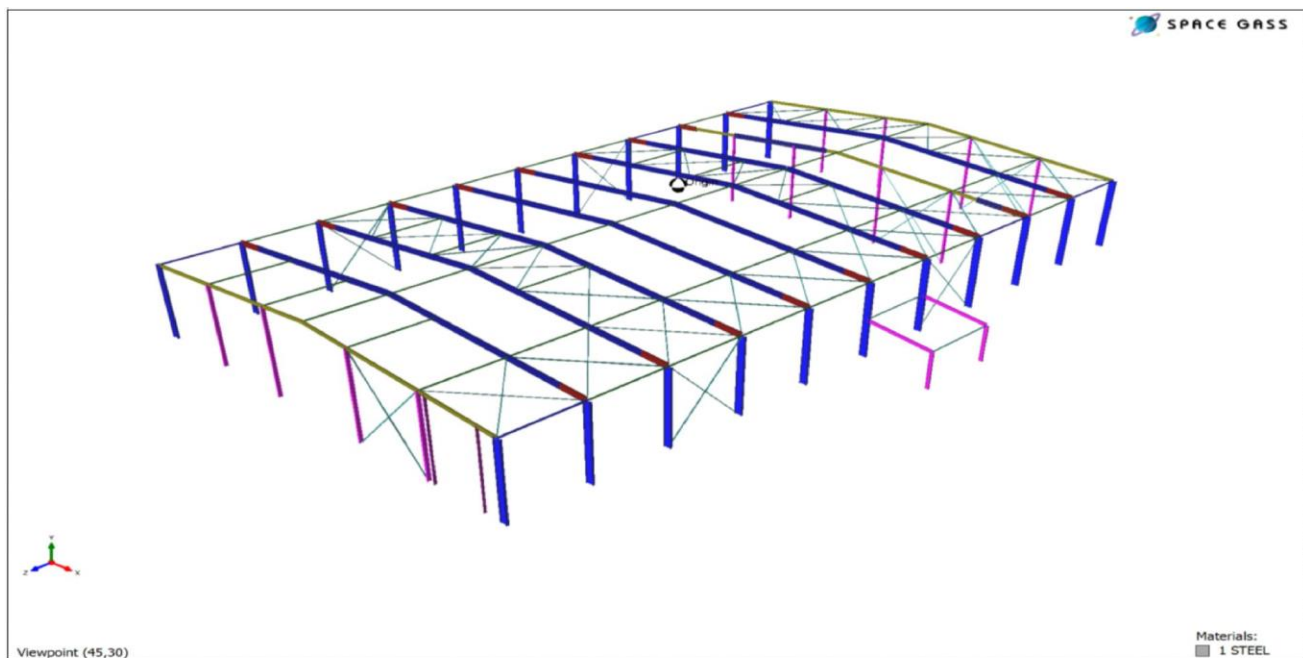
6.8. ORGANICS RECEPTION HALL

The organics Reception Hall makes up majority of the structural work. The shed is a steel portal frame building with Colorbond cladding and insulation. The concept designed focused on providing ample space to carry out the required process whilst also satisfying the following codes and Australian standards:

- Building Code of Australia
- AS/NZS 1170 – Structural Design Actions
- AS 4100:1998 – Steel Structures

- AS/NZS 4859.1:2002 – Materials for the thermal insulation of buildings
- AS/NZS 3500.3:2015 – Plumbing and Drainage

The dimensions of the shed are circa 70 x 52m. With 3m high bunkers in the inside of the building, there is more than 800 m³ storage capacity (equivalent to two days of waste). The bunker walls are equipped with cast in steel to prevent damage from the loader



6.8.1. Concrete Slab

The concrete slab is reinforced with steel fibres to increase the spacing of joints and streamline the construction process by eliminating the need to tie traditional reinforcement (rebar or mesh).

6.9. BOUNDARIES AND FENCING

Internal fencing around the perimeter of the site will be constructed and made to match



internal fencing of other businesses in the area whilst adhering to council requirements. The fencing will be made from suitable materials able to withstand environmental factors

6.10. FIRE PROTECTION

An adequate quantity of hydrants, booster pumps and street fire plugs (if deemed necessary) will be included in the final design. Locations and quantities will adhere to council and Australian Standards.

6.11. COMMUNICATIONS

Site communications for remote access and package plant access will be either hard wired from the existing telecommunications on site to meet the network requirements.

7. SAFETY IN DESIGN

Safety in design will be completed in accordance with the relevant acts and standards. A risk register will be maintained to mitigate and control any risks identified before and throughout the design and construction phases.



Appendix 1: Mass Balance



Appendix 2: Lot 505 Preliminary Design Drawings



Appendix 3: Material and Colour Schedules

High Level Mass Balance

Project Name	Delorean Energy	Document No:	P210-P100
Project Number	J116	Revision:	A
Project Section	Feedstock Analysis As Tested	Date:	10/06/2018
		Compiled By:	J Oliver
		Checked By:	
		Approved By:	H Jolly



Design Basis

	Units	Grain Waste	C&I Organic Waste		ReCirc - Process Water
Annual Throughput	TPA	25,000	100,000		120,000
Weekly Throughput	TPW	480.77	1923.08		2,308
Daily Throughput	TPD	68	274		329
DM%	%	89%	28%		0.5%
VM%	%	93%	89%		90.0%
Density	Kg/m3	200	720		1000.0
Biogas Yield	m3/ tonne	420	150		0.5
Methane Content	%	60%	60%		60%
Volitile solids	vskg/T	828	179		4.50
Biogas Production /yr	m3 / year	10500000.00	15000000.00		60000.00
Biogas Production /hr	m3 / hour	1198.63	1712.33		6.85

Daily Load

Water input		273.97
Water recycled		328.77
Total water input		602.74
M3 Volume input / day	M3/day	671.23
Tonnes of feedstock	tds/day	342.47
Tonnes per hour - 8hours	tds/day	42.81

Blended Feed Characteristics

Dry Solids	20.8%
Contaminant	0% Assumed
Water	79%

Operation

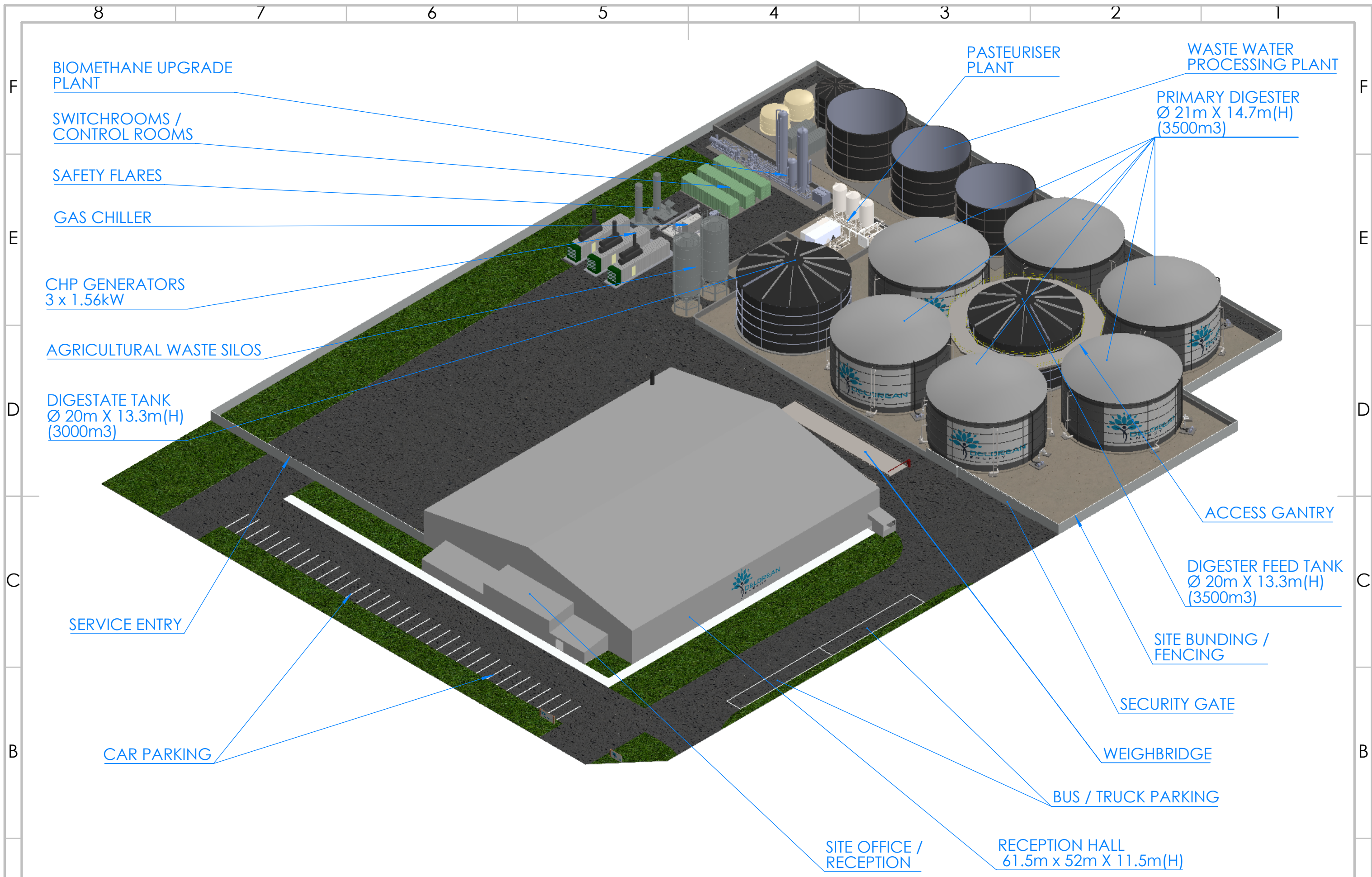
Days	Digestion	365	Days/pa
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Phase 1

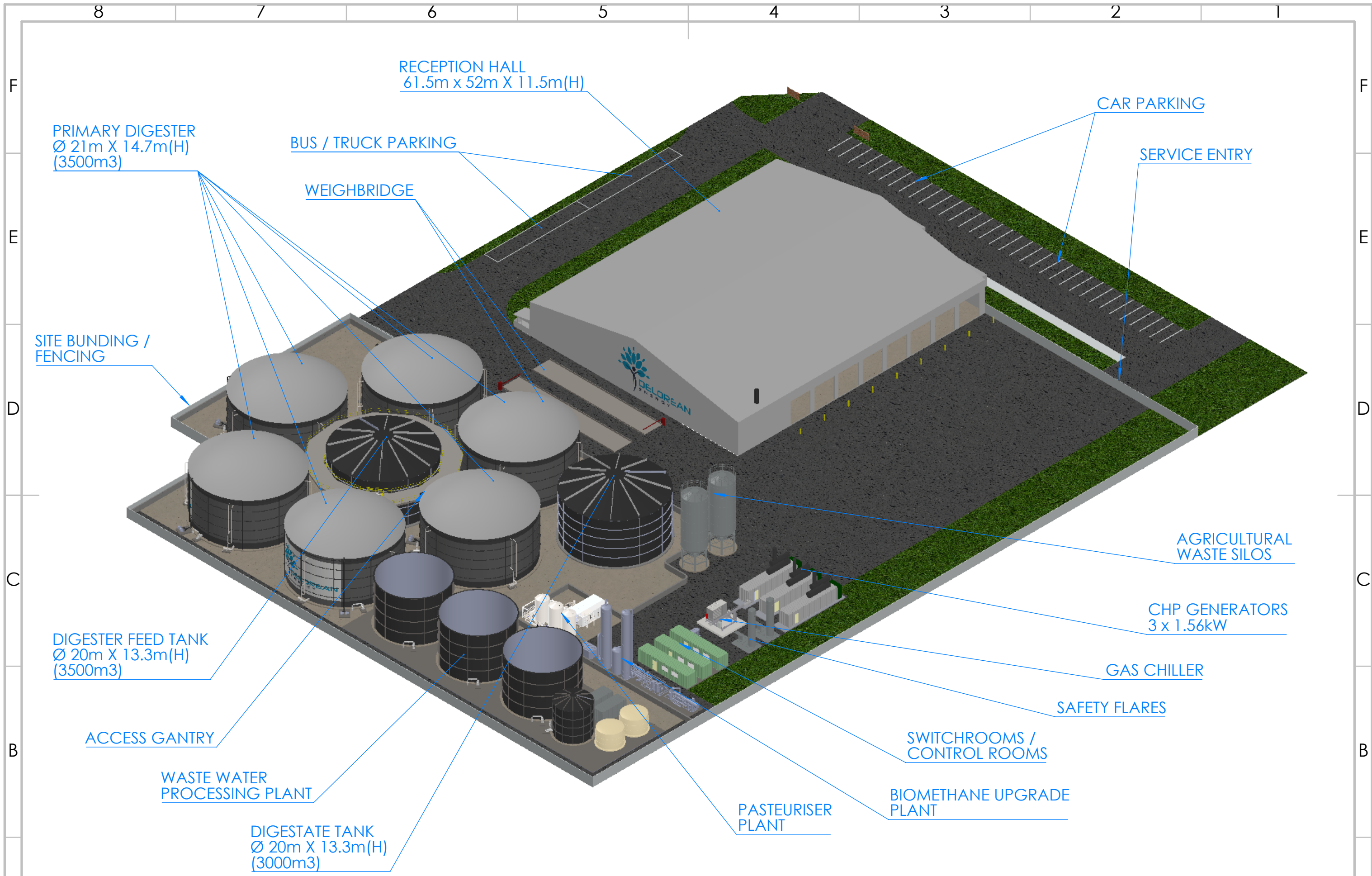
Total Annual Throughput	245,000
KGVS/M3 / day	5.37
Total Digestion volume	20,000
Digestion Retention	30
Total Digestion Capacity at 30 Days Retention	243,333
Digestion Spare Capacity at 30 Days Retention	-1%

Total Output @	7%	208,250
Solids seperated to	35% Tonnes / year	41,650
	Tonnes / day	114
Liquid fraction < 1% solids	m3 / year	166,600
	m3 / day	456
Liquid Recirculated	m3 / day	329
Liquid Output	m3 / day	128

		m3 / hour	m3 / Day	m3 / Year
Total Biogas / Hour		2910.96	69863.01	25500000.00
Feedstock ave gas production / M3		104.08		
Biogas to Heat	KW thermal/hr	15282.53	366.78	133875.00
or			MW / Day	MW / Year
Biogas to CHP	KW thermal/hr	7859.59	188.63	68850.00
	KW Elec/hr	7568.49	181.64	66300.00
	Kg/Hour	2672.26	Tonne / day	Tonne / Year
	CO2 output		64.13	23409.00
or		m3 / hour	m3 / Day	m3 / Year
Biogas to biomethane	m3/hr-97%CH4	1484.59	35630.14	13005000.00
			GJ/day	GJ/Year
Total GJ produced	GJ/Hour	56.80	1363.21	497570.49



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1	SECOND REVISION	14/09/2018	MARTYN A.	JOSEPH O.				ALL DIMENSIONS IN mm	SCALE 1:600	DWG NO. J116-002	SHEET NO. 1 OF 15	REV 1
0	ISSUED FOR REVIEW	22/05/2018	MARTYN A.	JOSEPH O.								
REVISION	REVISION DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED							



REVISION	REVISION DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED
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0	ISSUED FOR REVIEW	22/05/2018	MARTYN A.	JOSEPH O.	

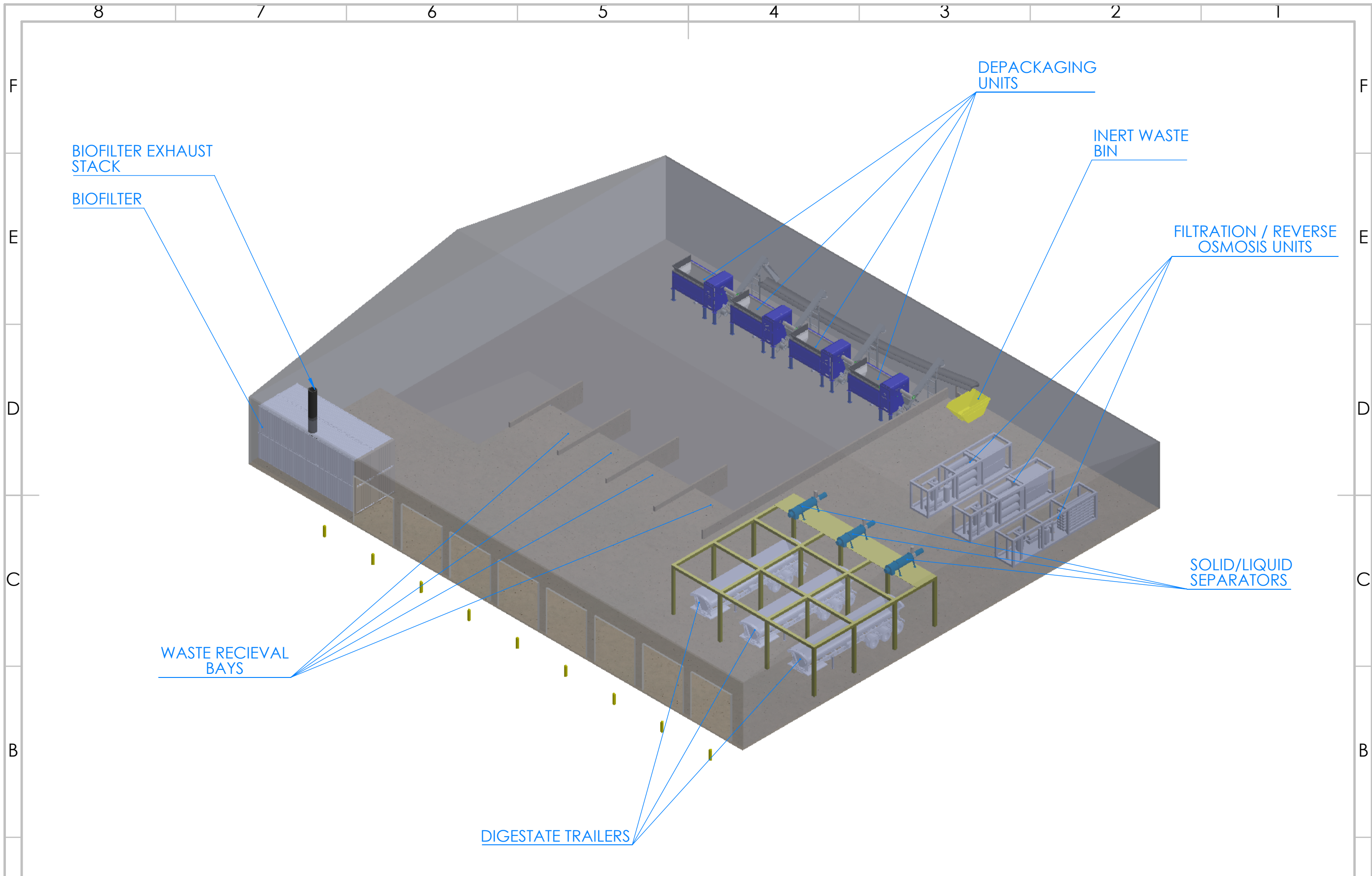
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CLIENT: DELOREAN GROUP
 PROJECT NO: J116
 ALL DIMENSIONS IN mm
 SCALE 1:600

TITLE: DELOREAN ENERGY SA ONE
 PLANT CONCEPT LAYOUT
 DWG NO. J116-002 SHEET NO. 2 OF 15
 REV 1



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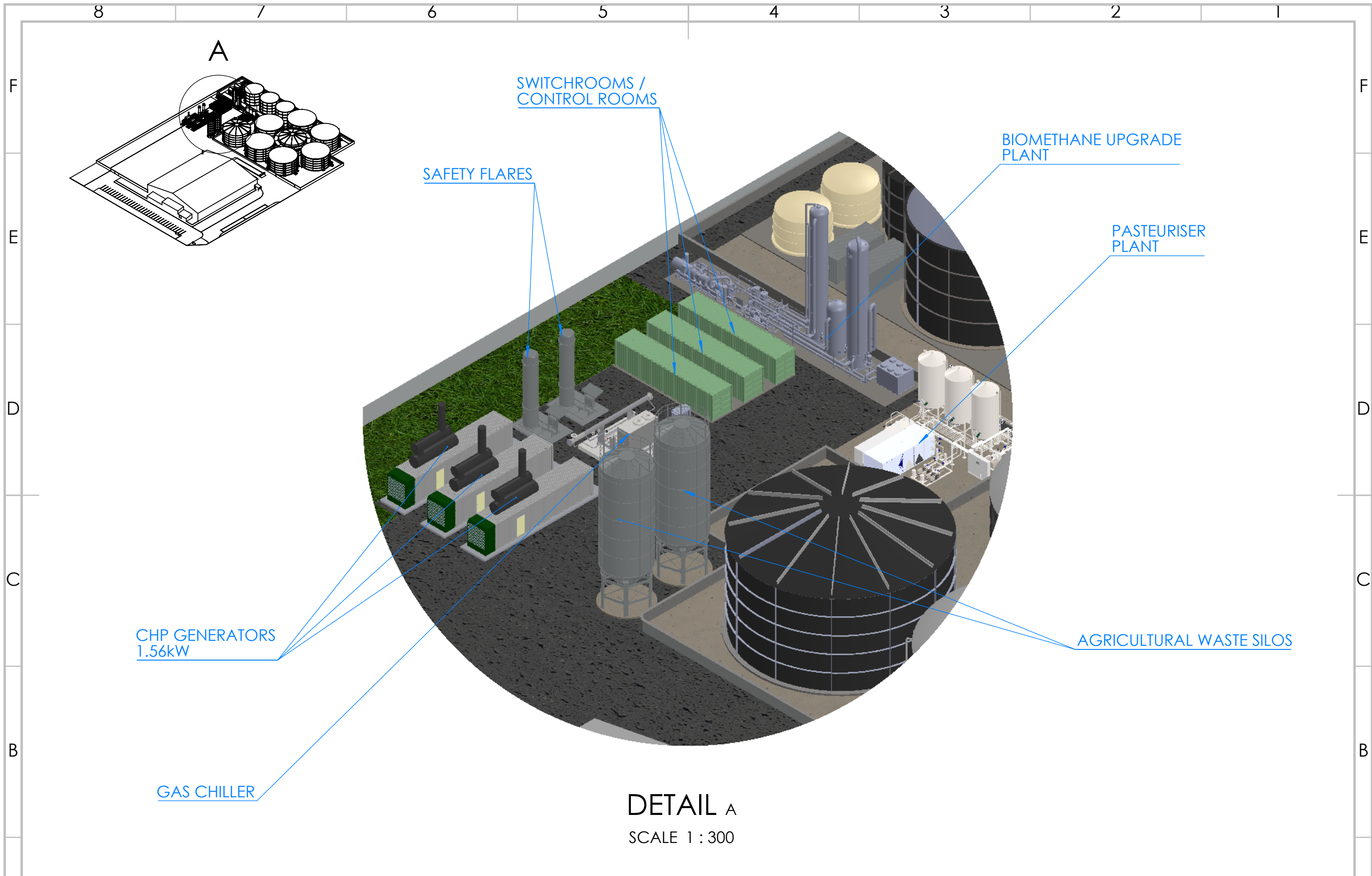
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 PROJECT NO: J116

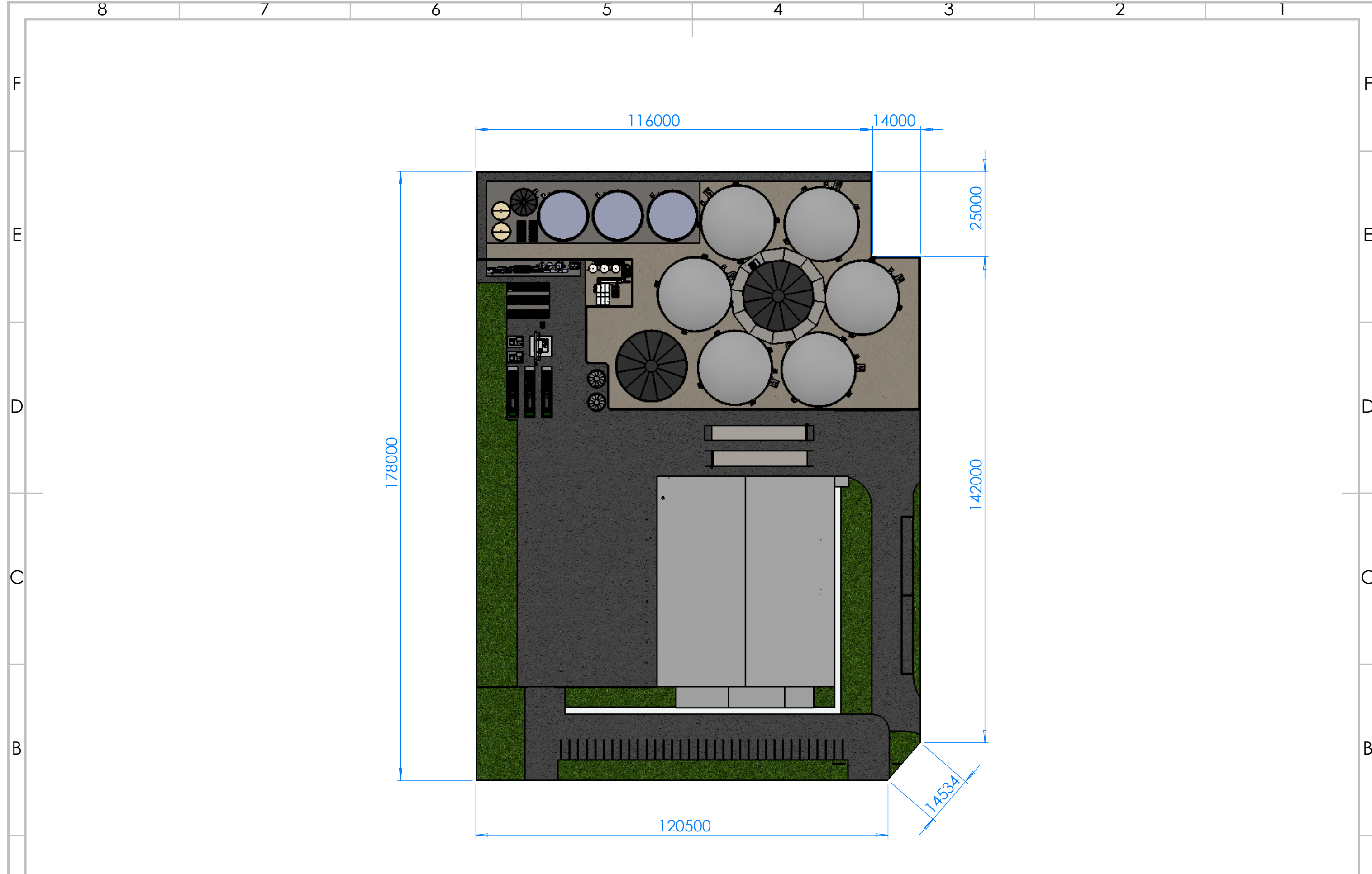
TITLE: DELOREAN ENERGY SA ONE
 RECIEVAL HALL DETAIL

ALL DIMENSIONS IN mm SCALE 1:300 DWG NO. J116-002 SHEET NO. 3 OF 15 REV 1



DETAIL A
SCALE 1 : 300

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1	SECOND REVISION	14/09/2018	MARTYN A.	JOSEPH O.		ALL DIMENSIONS IN mm	SCALE 1:300	DWG NO. J116-002	SHEET NO. 4 OF 15	REV 1	
0	ISSUED FOR REVIEW	22/05/2018	MARTYN A.	JOSEPH O.							
REVISION	REVISION DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED						



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1	SECOND REVISION	14/09/2018	MARTYN A.	JOSEPH O.	
0	ISSUED FOR REVIEW	22/05/2018	MARTYN A.	JOSEPH O.	

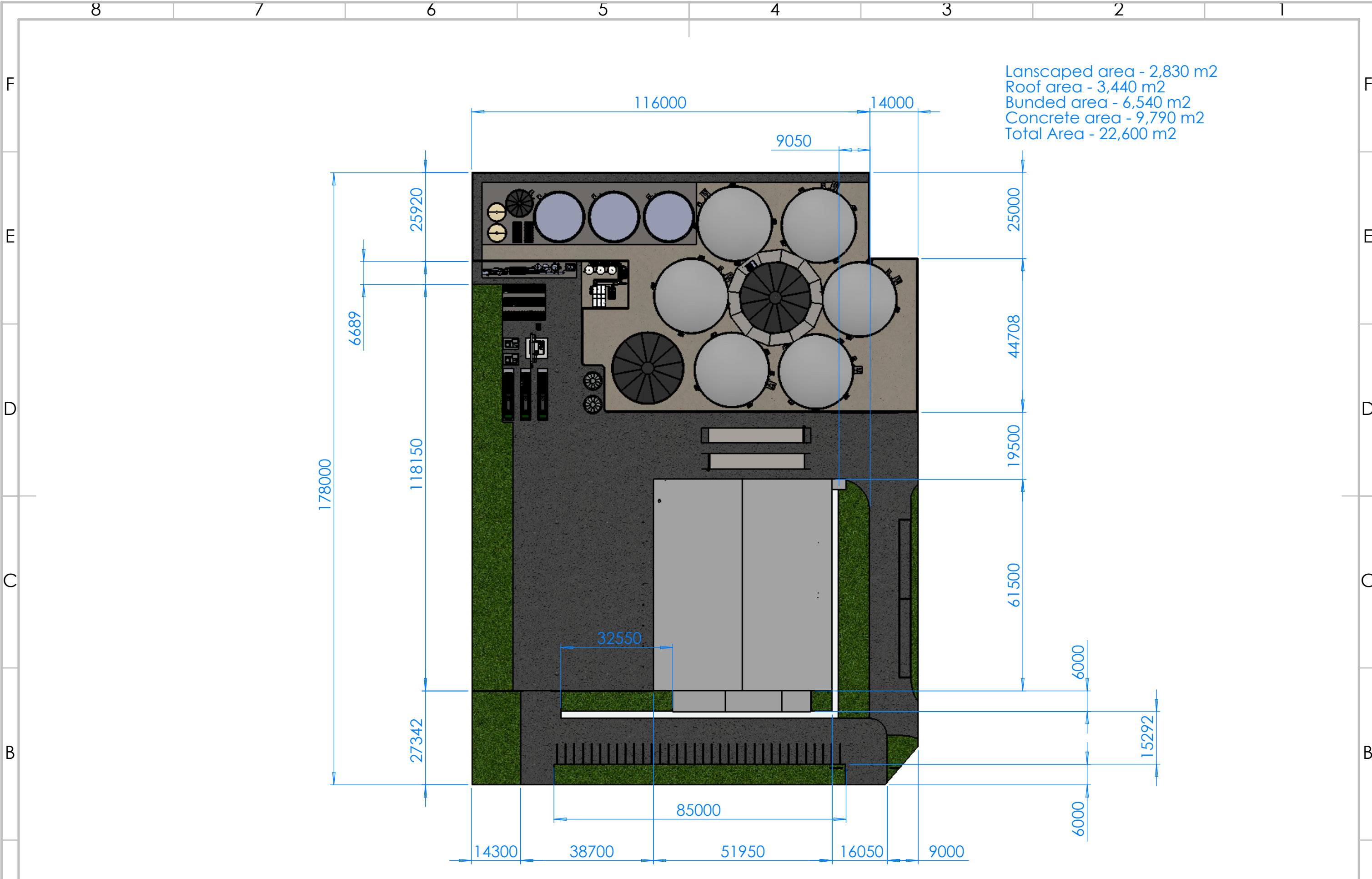
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CLIENT: DELOREAN GROUP
 PROJECT NO: J116
 ALL DIMENSIONS IN mm

TITLE: DELOREAN ENERGY SA ONE
 SITE DIMENSIONS
 DWG NO. J116-002 SHEET NO. 5 OF 15
 SCALE 1:1000
 REV 1



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1	SECOND REVISION	14/09/2018	MARTYN A.	JOSEPH O.	
0	ISSUED FOR REVIEW	22/05/2018	MARTYN A.	JOSEPH O.	

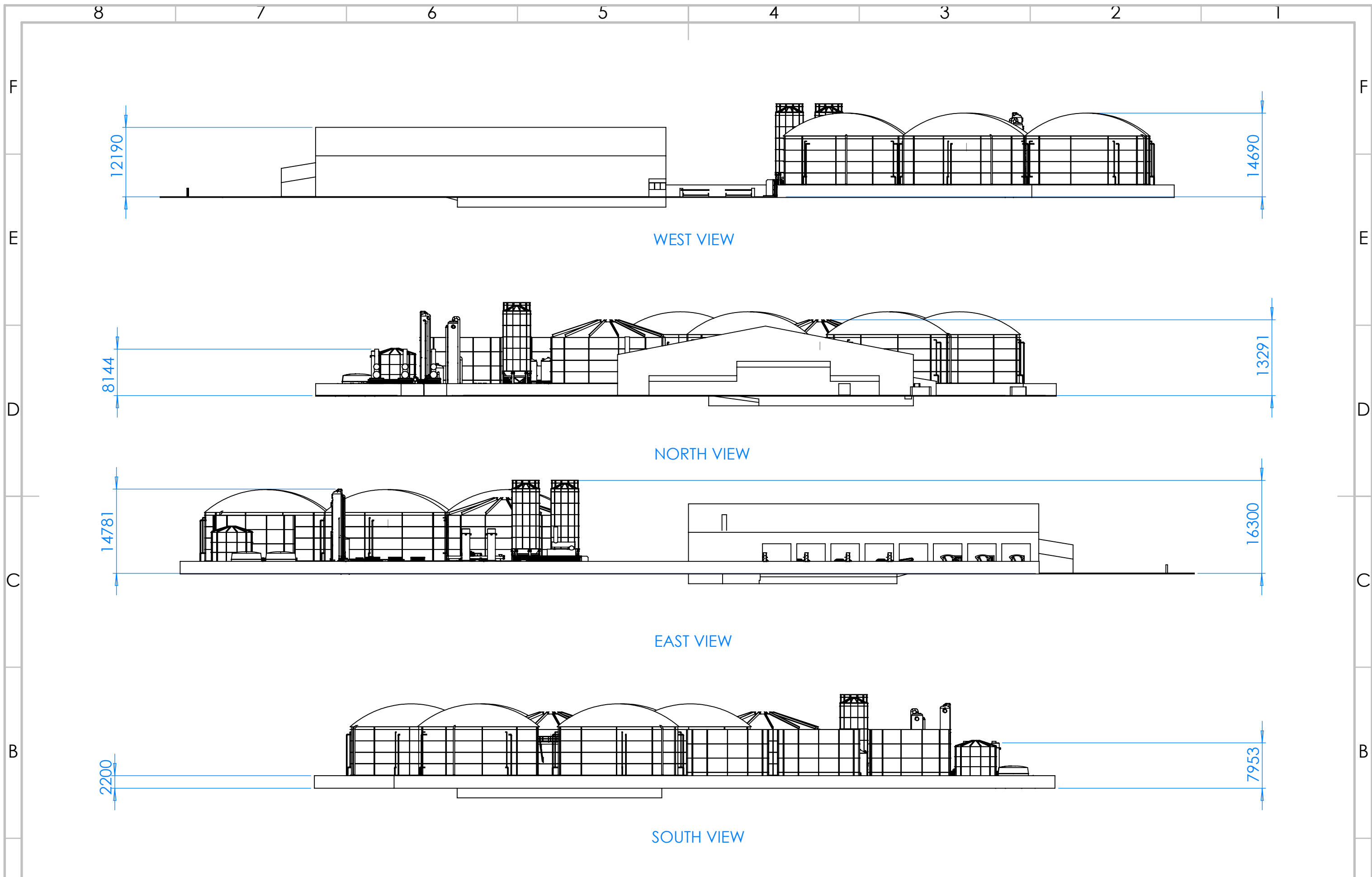
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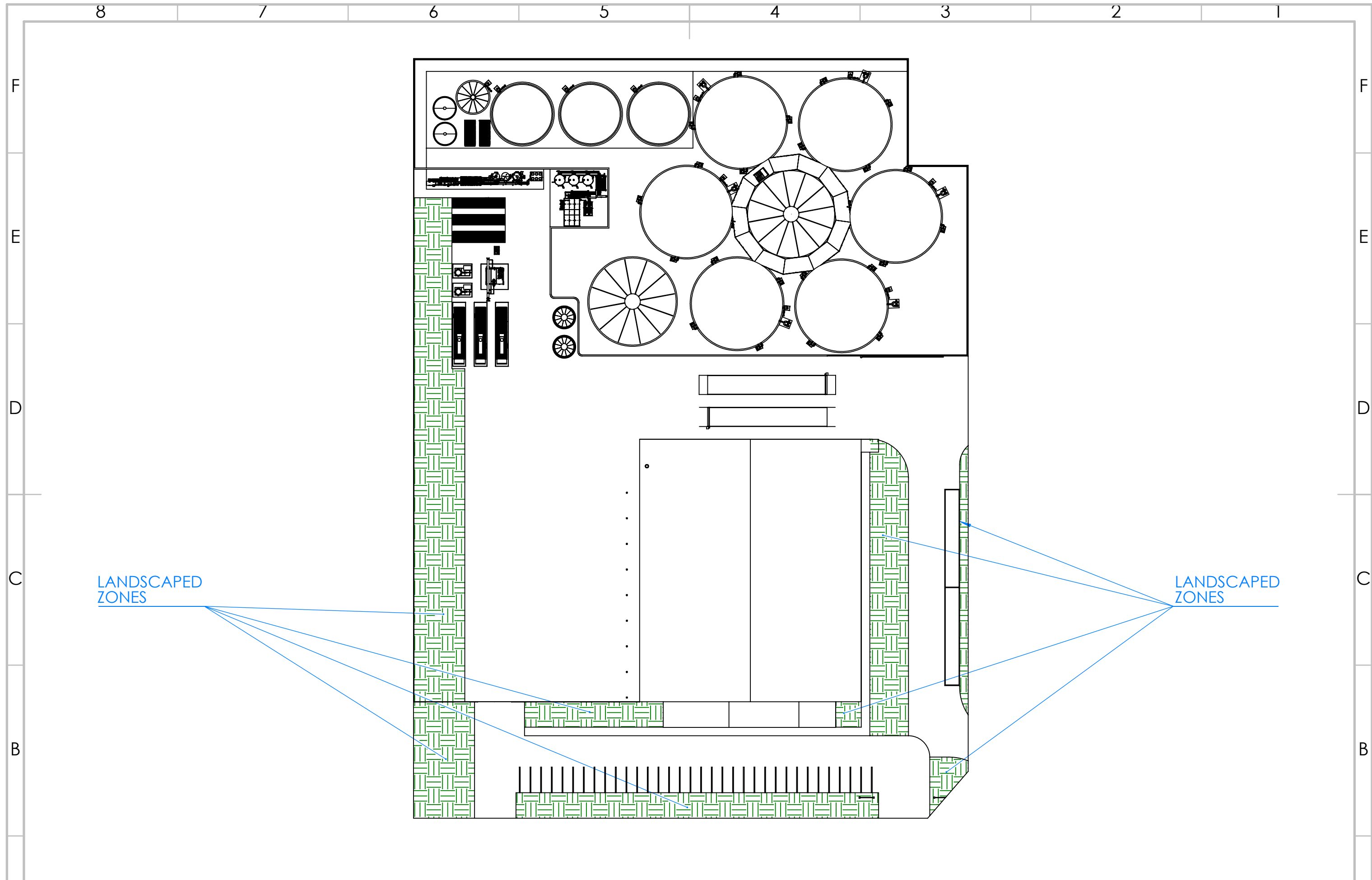


CLIENT: DELOREAN GROUP
 PROJECT NO: J116
 ALL DIMENSIONS IN mm

TITLE: DELOREAN ENERGY SA ONE
 SITE DIMENSIONS
 SCALE 1:1000
 DWG NO. J116-002 SHEET NO. 6 OF 15
 REV 1



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1	SECOND REVISION	14/09/2018	MARTYN A.	JOSEPH O.		ALL DIMENSIONS IN mm		SCALE 1:600		DWG NO. J116-002 SHEET NO. 7 OF 15	
0	ISSUED FOR REVIEW	22/05/2018	MARTYN A.	JOSEPH O.						REV 1	
REVISION	REVISION DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED						



LANDSCAPED ZONES

LANDSCAPED ZONES

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 PROJECT NO: J116

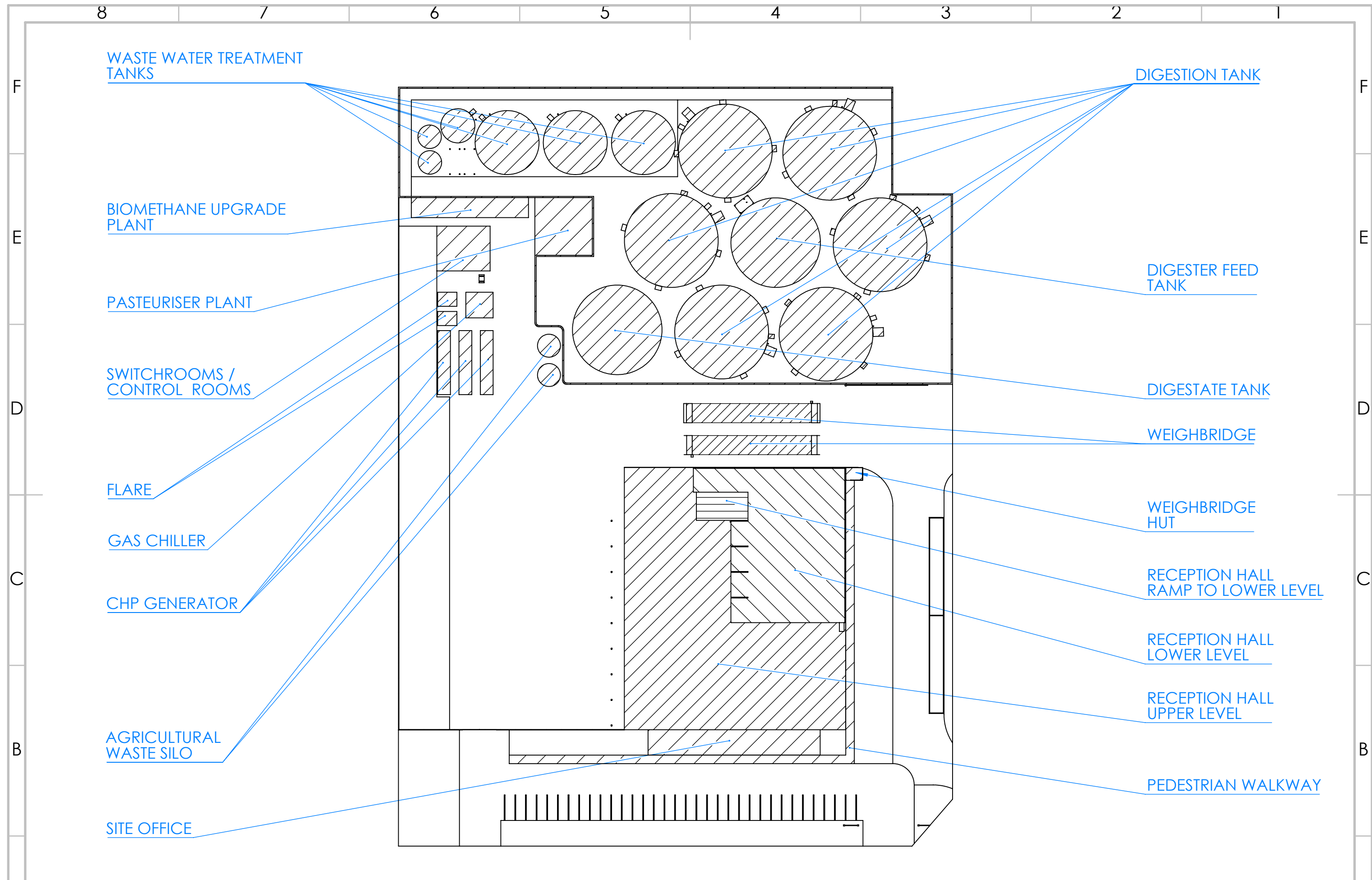
TITLE: DELOREAN ENERGY SA ONE
 LANDSCAPING LAYOUT

ALL DIMENSIONS IN mm

SCALE 1:800

DWG NO. J116-002 SHEET NO. 8 OF 15

REV 1



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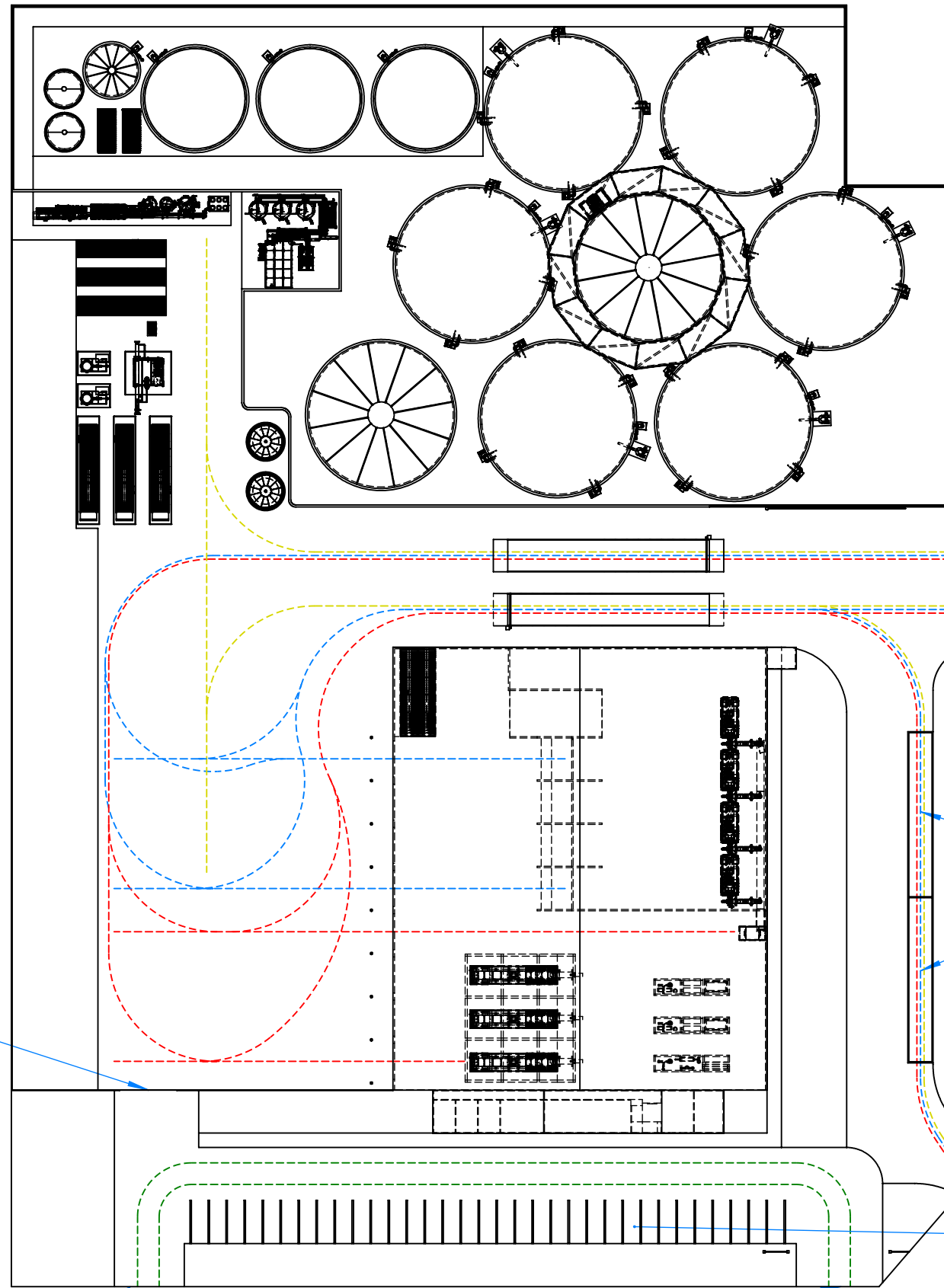


CLIENT: DELOREAN GROUP
 PROJECT NO: J116

TITLE: DELOREAN ENERGY SA ONE
 CIVILS LAYOUT

ALL DIMENSIONS IN mm SCALE 1:800
 DWG NO. J116-002 SHEET NO. 9 OF 15 REV 1

LEGEND	
RIGID TRUCK ROUTE	
SEMITRAILER TRUCK ROUTE	
B-DOUBLE TRUCK ROUTE	
LIGHT/CIVILIAN VEHICLE ROUTE	



SERVICE ENTRY

Light/Civilian Vehicle Entrance and Exit

Truck/Heavy Vehicle Exit

Truck/Heavy Vehicle Entry

Truck/Heavy Vehicle Parking

Truck/Heavy Vehicle Entry with waiting bays

Public Parking

REVISION	REVISION DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED
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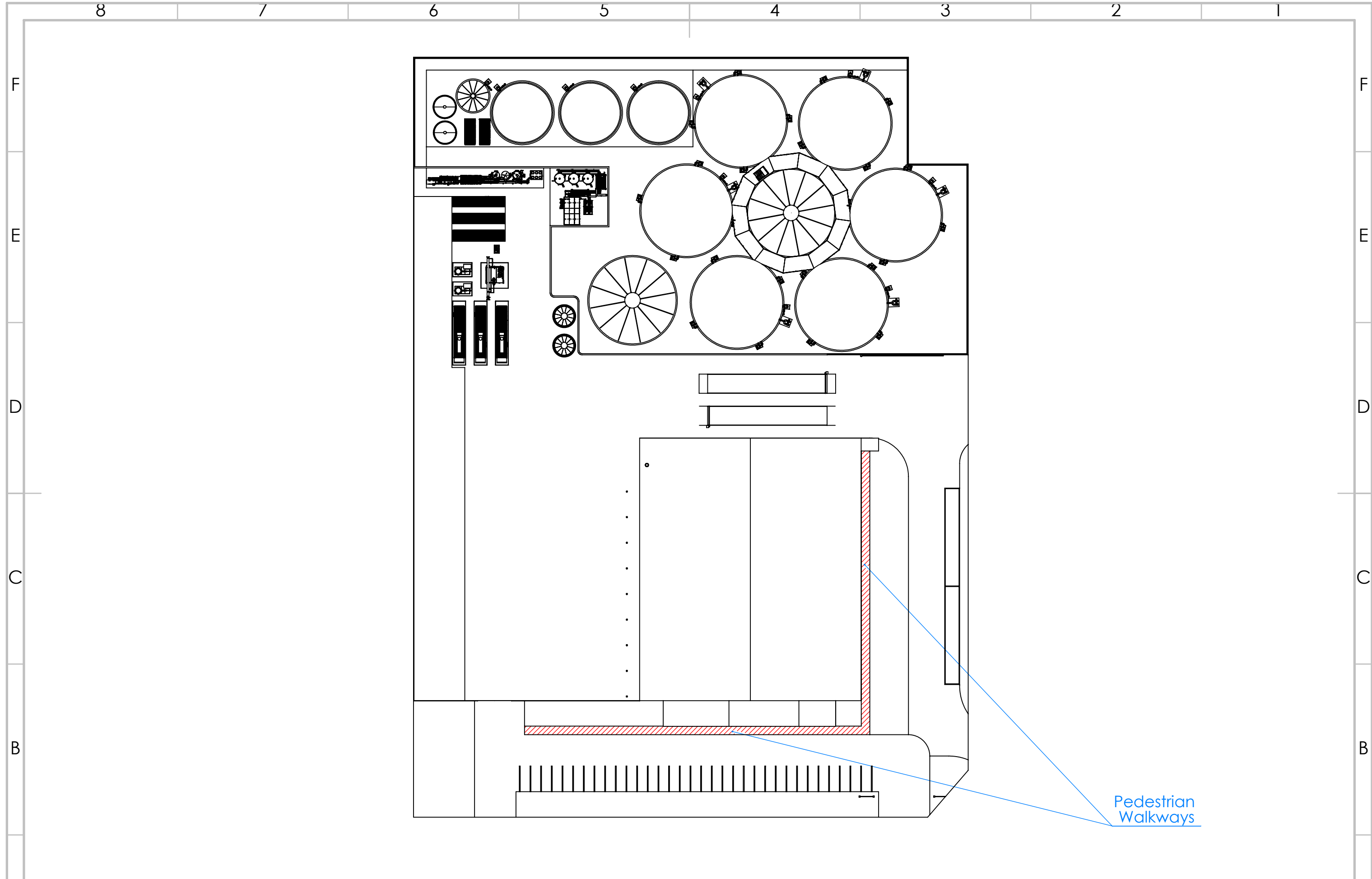
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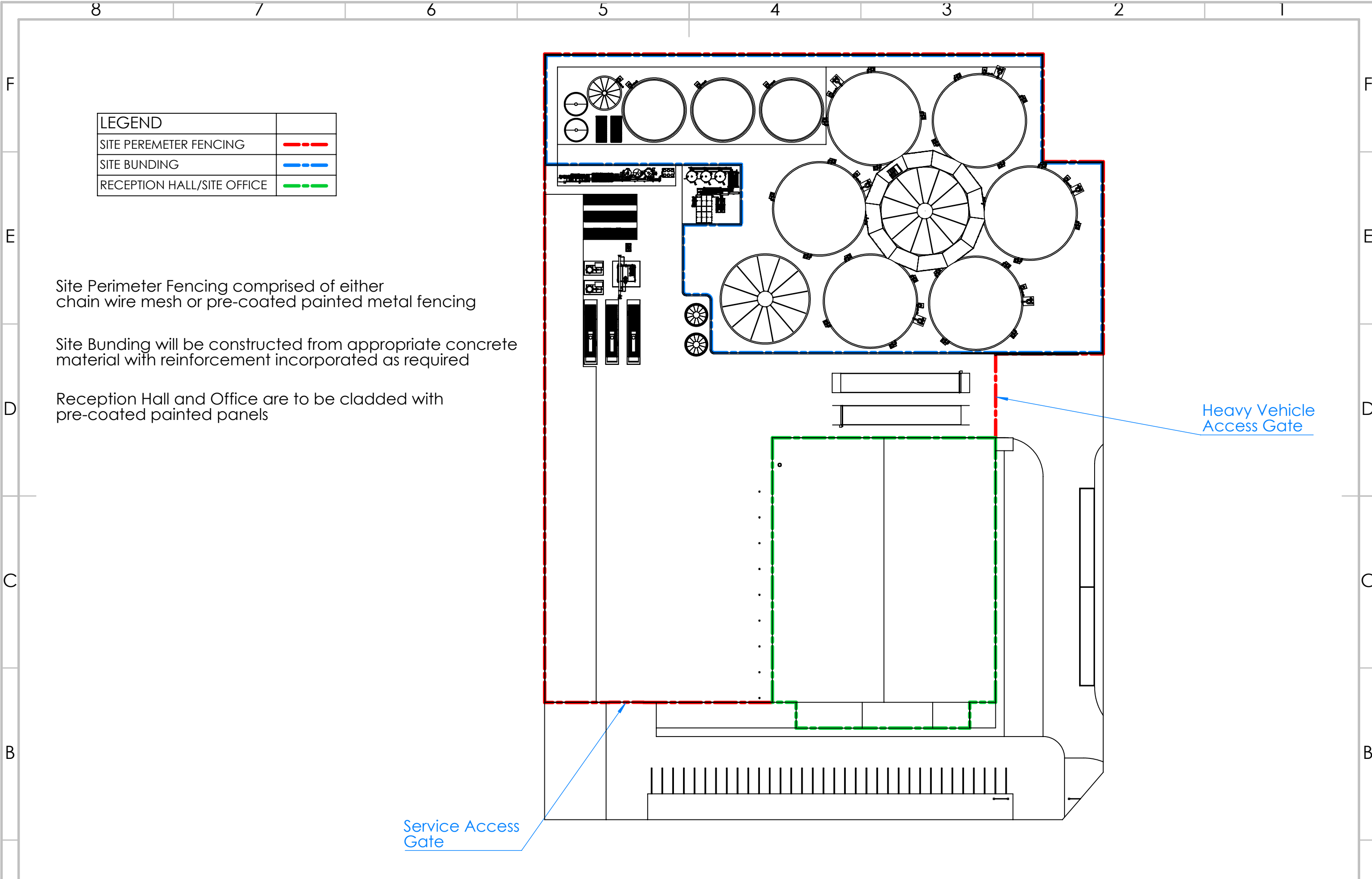
CLIENT: DELOREAN GROUP
 PROJECT NO: J116

TITLE: DELOREAN ENERGY SA ONE
 SITE ACCESS DIAGRAM

ALL DIMENSIONS IN mm SCALE 1:800 DWG NO. J116-002 SHEET NO. 10 OF 15 REV 1



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1	SECOND REVISION	14/09/2018	MARTYN A.	JOSEPH O.		ALL DIMENSIONS IN mm		SCALE 1:800	DWG NO. J116-002	SHEET NO. 11 OF 15	REV 1
0	ISSUED FOR REVIEW	22/05/2018	MARTYN A.	JOSEPH O.							
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LEGEND	
SITE PEREMETER FENCING	
SITE BUNDING	
RECEPTION HALL/SITE OFFICE	

Site Perimeter Fencing comprised of either chain wire mesh or pre-coated painted metal fencing

Site Bunding will be constructed from appropriate concrete material with reinforcement incorporated as required

Reception Hall and Office are to be cladded with pre-coated painted panels

Heavy Vehicle Access Gate

Service Access Gate

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CLIENT: DELOREAN GROUP
 PROJECT NO: J116

TITLE: DELOREAN ENERGY SA ONE
 CIRCULATION AND FENCING

ALL DIMENSIONS IN mm SCALE 1:800 DWG. NO. J116-002 SHEET NO. 12 OF 15 REV 1



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CLIENT: DELOREAN GROUP
 PROJECT NO: J116
 ALL DIMENSIONS IN mm

TITLE: DELOREAN ENERGY SA ONE
 SITE OVERVIEW LAYOUT
 SCALE 1:2000
 DWG NO. J116-002 SHEET NO. 13 OF 15 REV 1



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8 7 6 5 4 3 2 1

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1	SECOND REVISION	14/09/2018	MARTYN A.	JOSEPH O.	
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CLIENT: DELOREAN GROUP
 PROJECT NO: J116
 ALL DIMENSIONS IN mm

TITLE: DELOREAN ENERGY SA ONE
 SITE OVERVIEW LAYOUT
 SCALE 1:2200
 DWG NO. J116-002 SHEET NO. 14 OF 15
 REV 1



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CLIENT: DELOREAN GROUP
 PROJECT NO: J116
 ALL DIMENSIONS IN mm

TITLE: DELOREAN ENERGY SA ONE
 SITE ALLOTMENT BOUNDARY
 DWG NO. J116-002 SHEET NO. 15 OF 15 REV 1



Site Material Schedule

Structure	Exterior Material	Coating (Indicative)
Site Office	Brickwork with exterior cladding	Painted - White
Reception Hall	Colourbond Steel	Painted - White
Digester Feed Tank	Glass fused steel/Stainless Steel	Painted - Cobalt Blue
Digester Tank - Walls	Glass fused steel/Stainless Steel	Painted - Cobalt Blue
Digester Tank - Roof	PVC coated polyester fabric	Painted - White
Digester Digestate Tank	Glass fused steel/Stainless Steel	Painted - Cobalt Blue
Waste Water Treatment Tanks	Glass fused steel/Stainless Steel	Painted - Cobalt Blue
CHP Co-generator	Steel	Painted – Beige
Emergency Flare	Galvanised Steel	Galvanised
Grain Silos	Steel	Painted - TBD
Control Rooms	Steel	Painted - Beige
Site Fencing	Colourbond Steel	Painted - White
Site bunding	Concrete	Concrete

Material Schedule