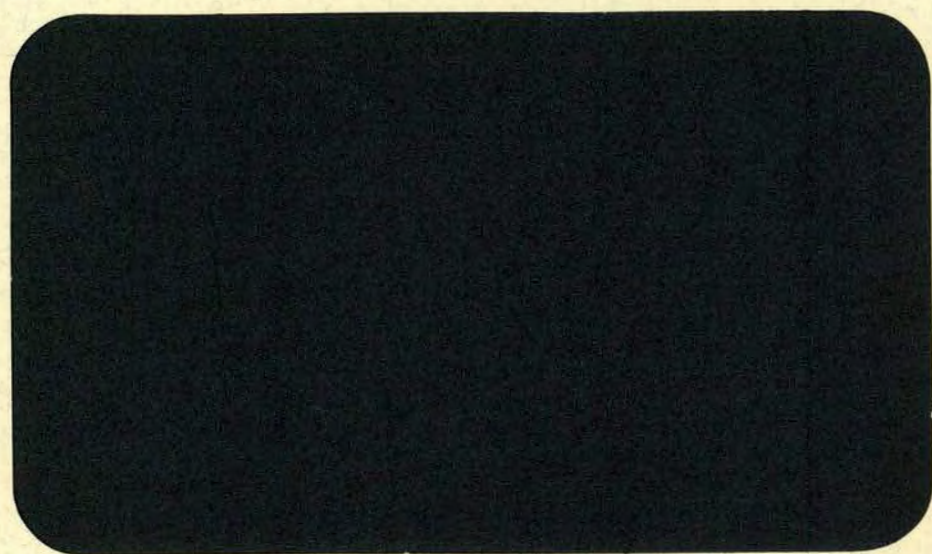


hab•i•tat, n. an environment or place for living









**STATEMENT OF  
ENVIRONMENTAL EFFECTS**

**MODIFICATION OF FOOD  
PROCESSING PLANT**

**CRAWFORD ROAD,  
WILLBRIGGIE, GRIFFITH**

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**MARCH 2006**

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*hab•i•tat, n. "an environment or place for living"*

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#### ACRONYMS

BOD	Biological Oxygen Demand
DEC	Department of Environment and Conservation
DIPNR	former Department of Planning and Natural Resources
DoP	Department of Planning
EIS	Environmental Impact Statement
EPA	Environmental Protection Authority
EP& A Act	Environmental Planning and Assessment Act 1979
LEP	Local Environmental Plan
SEE	Statement of Environmental Effects

#### KEY REFERENCE

Coffey Geosciences (2000) - *Environmental Impact Statement for Proposed Food Processing Plant, Farm 1059, Willbriggie, for Parle Foods Pty Ltd NSW*



## 1. INTRODUCTION

This Statement of Environmental Effects (SEE) provides information in support of an application to modify existing development consent for a Food Processing Plant near Griffith. The consent was issued by the then Minister of Urban Affairs and Planning subject to conditions on the 1<sup>st</sup> of December 2000. The applicant is Parle Foods Pty Ltd and the modification is sought by the Nugan Group who purchased the property and plant late in 2005.

The intention of the new owners is to continue the operation of the food processing plant on the property with some variations to the process as described in the approved Parle Foods Environmental Impact Statement (EIS). The modification is to accommodate the new owner's operation as well as to address the development that was commenced by the applicant but not always in accordance with the approved EIS. The modification application is therefore an opportunity to amend the plans in accordance with existing development on site as well as proposed changes.

This application for modification is made under Section 96(1A) of the *Environmental Planning and Assessment Act 1979* on the advice of the Department of Planning (DoP), as the consent authority. The proposed modified development can be seen as substantially the same development as what was approved under the original consent and is of minimal environmental impact. The SEE accompanying the modification application addresses the matters listed by the DoP in their letter of 24<sup>th</sup> January 2006 (see Appendix A).

Subclause 2(4) of Part 1 of Schedule 1 to the *Environmental Planning and Assessment Regulation 2000* specifies the matters to be addressed in a statement of environmental effects as follows:

- (a) *the environmental impacts of the development,*
- (b) *how the environmental impacts of the development have been identified,*
- (c) *the steps taken to protect the environment or to lessen the expected harm to the environment,*
- (d) *any matters required to be indicated by any guidelines issued by the Director-General for the purpose of this clause.*

In addressing these requirements it is noted that contact was also made with the Department of Environmental Conservation (DEC) and Griffith City Council as requested by DoP.

This report contains the relevant site details, a description of the proposal, functions and operational matters of the plant, consideration of relevant statutory requirements, and various environmental impact matters related to the operation of the plant. Comparisons are also provided between the approved plant and what is proposed under the new operation.



## 2. THE SITE

### 2.1. Property description

The subject land is identified as Farm No. 1059, Willbriggie located approximately 10 kilometres south of Griffith on the Kidman Way. The farm comprise of a total area of 178ha with access provided from Crawford Road. The property description is Lots 76 and 77 in Deposit Plan 751686, Parish of Kamarooka, County of Cooper.

### 2.2. Local environment

The property is located in a rural environment, which is reflected by the application of the 1(a) Rural (General) zone within the Griffith Local Environmental Plan (LEP) 2002 to the land. The subject land is generally utilised for cropping and irrigation with the exception of the food processing plant approved under the existing development consent (see attached map). The immediate adjoining properties to the north are owned by Bartters Enterprises and are operated in conjunction with their chicken and egg production business.

A significant area of the subject land has been 'laser leveled' for the purpose of flood irrigation, with past production including the growing of rice. The area also includes a dredged irrigation channel which runs along the north, west and southern sides of the site. The subject land is therefore largely modified with the only remaining natural feature being the low-lying swampy area of approximately 4ha located in the centre of the site. This historically functions as a drainage basin for surface water runoff. Due to the largely modified environment the subject land contains little native vegetation and therefore is of limited habitat value.

The area of the subject land identified as the development site is sufficient to accommodate not only the plant infrastructure but also the waste management systems with adequate buffers from surrounding road networks and existing developments in the area. The structural diversity of the subject site was identified in the Fauna and Flora Assessment undertaken for the EIS as very low with overstorey mainly occurring only along fence lines bordering the site. The Fauna and Flora Assessment did not record any threatened species on the subject land. The survey further revealed a total of 20 fauna species, which included three introduced species. The majority of species found on the site was relatively tolerant towards disturbance. The survey concluded that the proposed development, which is substantially the same as the proposed modified development, is *"unlikely to have a significant effect on threatened species, populations or ecological communities, or their habitats."*

The proposed operation of the food processing plant will be located in a central location on the property as proposed by the approved development consent, with an adequate buffer separating the buildings from surrounding boundaries. Under the approved EIS the majority of the construction works have been completed with buildings for the food processing plant existing on site. The works approved under the EIS and constructed include:

- Buildings for food processing plant, cold storage area and dry storage area (administration building and public car park as proposed by EIS not constructed with location of parking area to be amended).



- Waste water storage and treatment dams which included Waste water storage dams of 4 megalitres(Ml), stormwater detention dam of 5 Ml and a potable water storage dam of 110 m. Under Parle Foods two additional dams, not approved under the EIS, was also constructed being a second dam for wastewater treatment and a additional water storage dam of 24 Ml. All the above dams will be retained as part of the modified proposal to assist in an improved waste water treatment system. The proposed modification also therefore seeks to have the dams that were unlawfully constructed by the previous owners to be acknowledged and included in the modified development consent. The proposed ornamental lake that formed part of the EIS will not be constructed as part of the modification application.
- Proposed access road and internal road network for the plant.
- Weighbridge constructed.
- Sewerage treatment tank constructed.
- Utility services for the site.
- Irrigation works for the site.
- 15ha woodlot established.

The following is a list of the proposed amendments that will be made to the site plan in accordance with the modification application;

- Enlarge the waste treatment anaerobic dam (lagoon 1) from 4ML to 18 ML . usable storage.
- Maintaining two additional dams, that was unlawfully constructed by Parle Foods, as part of the proposed modification application. This include Lagoon 2 to be an 11 ML dam used as the aerobic pond and Lagoon 3 a 24MGL dam to be used for storage of treated waste water for irrigation purposes. The dams will assist in providing an improved waste water treatment system as part of the modification application.
- Maintaining the approved and constructed stormwater detention dam of 5 Ml and the potable water storage dam of 110Ml.
- The sealing of main access road and all internal roads around the processing plant to limit impact of potential dust pollution and improve quality of development.
- Relocation of the car parking area to areas surrounding the existing food processing factory and cold storage area.
- Relocation of administration section to the existing factory building.

The layout of the plant as approved by the existing development consent is contained in Figure 1 with the proposed amended layout plan that is the subject of this modification application included in Figure 2.



### 2.3. Existing infrastructure

Additional infrastructure and services have been established as part of the approved development consent. Reticulated sewerage and water is not available to the site with the requirement of the development consent to provide for adequate potable water supply for the development to comply with the relevant WHO and NHMRC standards at all times. The site has access to a Murrumbidgee Irrigation supply channel and has entitlements to draw up to 1,084ML of high security and 1,260ML of normal security supply from the channel. Construction on the site included a 110ML freshwater storage dam to provide adequate supply to the food processing plant with a newly installed micro-filtration unit to treat 1.1MGL per day.

A proposed sewerage treatment plant has been commissioned and installed in accordance with the proposal contained in the Parle EIS.

The main source of energy to be used for the juice extraction and refrigeration will be electricity supplied by Country Energy with and natural gas supplied by A.G.L in accordance with the approved EIS. Connection of electricity service is from the high voltage lines (33,000V) within the Kidman Way road reserve. The power is supplied to the site via an underground connection.

Gas is provided via the main supply line that passes along the north eastern boundary (Kidman Way) also as per the approved Parle EIS.

The supply of all these utility services will therefore be in accordance with the existing approved development.

Fuel storage on site includes an LPG gas tank with capacity of 5.1kl, as per the existing approved development consent.

### 3. DESCRIPTION OF PROPOSAL

The proposal is to modify the existing development consent to accommodate the new owner's requirements for the food processing operation. The modification application provides for different quantities of product input and output to what was discussed in the EIS prepared for Parle Foods in 2000. Although the proposal will make use of the buildings and various utility services and dams that were constructed under the existing EIS, the internal layout and processes involved will be slightly different.

The new proposal includes the installation of three lines for juice extraction from citrus, apple/grape and carrot. This will replace the fruit and vegetable processing and canning operation previously approved. Although the type of input and output is different it involves an operation of similar processes including boilers, evaporators and freezers and makes use of similar utility resources including water, electricity and gas for the operation of the plant. More detail as to the anticipated capacity of utility services required for the new modified process is addressed below. The modification also proposes the inclusion of an administration section within the constructed factory with relevant internal changes to this building to accommodate the new processing lines for juice extraction.

The quantity of product input per annum anticipated for the modified plant will be 80,000 tonne which at this stage is significantly less than the 200,000 tonne per annum approved under the existing consent. This in effect will result in a reduction in waste generation. Under the proposed modification the waste water treatment plant will be improved with Lagoon 1 as the existing approved waste water treatment plant to be enlarged from 4ML to 18ML, and to be fully lined and enclosed. The improved waste water treatment plant will result in the modification of two additional constructed dams which include Lagoon 2, a fully lined dam with a capacity of 11ML as the aerobic pond and Lagoon 3 of approximately 24MGL capacity to be the finishing pond for storage of treated water for irrigation purposes on the subject land. These dams have already been constructed by the previous owners, with the modification to amend them according to the new improved waste water system that is proposed under the modification. Nugan Food Services have done all relevant compaction tests to insure that the dam walls and floors have required compacted surfaced to insure that there will be no impact on the ground water. The stormwater runoff from the hardstand areas around the plant will also be redirected to the storage dam. The proposed waste water treatment system of this modified plant was designed to effectively manage and treat the waste water from the plant before it is re-used for irrigation on the subject land.

### 3.1. Plant operation

The Nugan Group will establish a food processing plant that would source fresh produce from the surrounding area, including fruit and vegetables, and the processing of these products into juice concentrates. The plant is located is close to the source of raw material to ensure a high quality end product. The processing plant will normally operate from 0500hrs on Mondays to 2400hrs on Fridays. In exceptional circumstances this time will be extended between 1700hrs on Sundays to 1200hrs on Saturdays. The plant will employ a total of 40 workers, which is significantly less than the estimated 120 employees (full time and part time) stated by Parle Foods in the EIS.

The modified proposal will remove all the existing process equipment that was installed by Parle Foods and replace it with three separate operation lines for juice extraction. The existing processing equipment of Nugan Quality Foods will be removed from the current site at 36-40 Collier Street, in suburban Griffith and relocated on the subject site at Crawford Road. The development will include the establishment of three separate process lines for the extraction of juices from citrus, apple/grape and carrot.

The process of fruit and vegetables will generally include:

- Initial preparation of incoming raw product such as de-leafing, washing, sorting, grading, peeling and inspection.
- Intermediate process such as mashing, milling, extraction of juices, pasteurization with the concentration of these juices through evaporators.
- Final processing such as cooling, quality control, packaging of juice concentrates into 200 litre drums, blast freezing and frozen storage.



- Dispatching of the end product via trucks to relevant markets.

This process of juice extraction is less intense than the proposed processing required by the approved plant which included the blanching and cooking of the product and the canning of these products such as corn, tomatoes, peaches, pickles, capsicums, celery, carrots, rice and onions.

A typical process for the juice extraction that is the subject of the proposed modification to the plant includes washing and mulching of fruit and the extraction of juice through use of two boilers (1,000kw and 500kw) and three evaporators with the freezing of the concentrated juice into 200 litre containers and storage of the final product in the cold storage area. Process Flow Charts for each of the three processes involved in the modified plant is attached in Appendix B.

The proposed annual inputs of fresh produce through the modified plant is set out in Table 1.

**Table 1: Fresh product input for Nugan Quality Foods modification**

INPUTS (per annum)	
Fresh Produce	Tonne
Carrots	60,000
Apples	10,000
Citrus	5,000
Grape	500
Olive	2,000
Juice Purchased	1,100
<b>Total</b>	<b>78,600</b>

A total of 78,600 tonne of fresh produce will initially be processed in the plant which is considerable less than the 200,000 tonne proposed by the existing approved plant.

The resources required for the operation of the modified plant and packaging requirements are summarized in Table 2.

**Table 2: Proposed utilities and packaging used – Nugan Quality Foods modification**

Utilities	Usage
Water	360 MGL
Gas	50,000 GJ
Electricity	7,000,000 kWh
Packaging	Tonne
Steel drums	1,400
Plastic Bags	25

No information with regards to the annual usage of utility services and packaging material for the approved Parle plant was provided in the EIS. Due to the different process involved such as bulk freezing of concentrated juice in drums versus the canning of vegetables and fruit previously proposed, it could be assumed that the usage of packaging material is far less in the proposed modified process.

Table 3 provides a comparison between the outputs per annum expected for the proposed modified processing plant and that expressed in the EIS for the approved processing plant.

**Table 3: Comparison of outputs**

<b>PROPOSED MODIFIED NUGAN FOOD PROCESSING PLANT</b>		<b>APPROVED PARLE FOOD PROCESSING PLANT</b>	
<b>Outputs (per annum)</b>		<b>Outputs (per annum)</b>	
Juice concentrates	15,200 tonne	Finished product output	40,000 tonne
Processed waste	40,000 tonne	Processed waste	Information not supplied in EIS
Process water waste	350 MGL	Process waste water	318 ML (Jan to April) 106 ML (rest of year) total = 425MGL
Packaging Waste	7 tonne	Packaging Waste	Information not supplied in EIS

Not only will the total output of product be less, the amount of waste generated by the proposed modified processing plant will also be substantially less than that of the approved process.

The above comparisons between the approved and proposed modified processing plant provide a clear indication that not only will the manufacturing process be less intricate, the proposed input and outputs and well as quantities of waste produced will be much less than what would have resulted from the approved processing plant.

#### **4. STATEMENT OF ENVIRONMENTAL EFFECTS**

##### **4.1. Waste management system**

The proposed modified food processing plant will utilise the existing dams completed for the Parle plant as well as increase the size of the dams in the treatment process to improve and continue the management and treatment of waste water on site. The



proposed modified system will however treat less waste water than what was anticipated for the original approved plant for Parle Foods.

Three basic forms of waste will be created by the proposed modified plant similar to that of the approved plant, although in smaller volumes. These include sewerage effluent, wastewater and process waste. It is anticipated that the operation of the modified plant will result in 40,000 tonne of processed waste and 350 MGL of waste water per annum that will need to be effectively managed and treated.

#### *Sewerage Treatment Plant*

The sewerage treatment plant will continue as proposed by the EIS for the approved plant. All solids from the sewerage effluent will be collected in two primary treatment tanks. The tanks will allow gravity thickening of the sludge which will be then be pumped out and removed by a contractor every three to five years. The contractor will dispose of this thickened sludge at the Griffith Sewerage Treatment Plant.

#### *Waste Water Treatment*

The modified processing plant will utilise a total of 350MGL of waste water per annum which is 100MGL less than the quantity of waste water per annum proposed by Parle Foods in the approved development consent. The proposed trade waste system for the modified plant will utilise the existing waste water treatment dam that has been installed for the approved processing plant with some alterations to the process involved to allow for an improved environmental outcome. The proposed new waste water management system has been designed by PMP as a division of Gordon Services in accordance with the volumes and quality of the waste water.

The improved system will include enlarging Lagoon 1 (existing waste water treatment dam) and maintaining the two additional dams that was constructed by Parle Foods within the waste water treatment system. The usage of the three dams in the waste water treatment system allows for a primary and secondary treatment as well as a finishing lagoon. The proposed dam system will be improved under the modified proposal with the installation of geo-membrane system in Lagoons 1 and 2, to prevent any potential contamination of ground water. Lagoon 3, the existing snake dam, will remain unlined and function as the storage dam for treated waste water to be used in irrigated on-site. Lagoon 1 will be increased in size to a capacity of 18ML with Lagoon 2 with a capacity of 11ML and Lagoon 3 with a capacity of 24MGL. All process liquid waste will be pumped via a screening and filtration plant into treatment Lagoon 1.

Lagoon 1 will become a non-aerated, anaerobic digester pond with an increased size of 18ML. All waste water directed to this pond will go through a filter screen that will remove all suspended solids. This pond will be membrane lined with a lid made of HDPE, to limit the potential impact of odours. The design drawings for this lagoon are attached in Appendix C, with the soil tests and density ratio tests for the dam walls attached in Appendix D. The proposed long retention period within this enclosed Lagoon 1 will allow nearly all the required Biological Oxygen Demand (BOD) conversion. The design engineers and suppliers do not believe that an aerator will be



necessary in the processing of the waste water as the system will adequately allow for breakdown of material.

From Lagoon 1 waste water will be directed to Lagoon 2, which is an aerobic pond, which is also HDPE lined. When the BOD count in Lagoon 2 reach levels in accordance with the EPA requirements it will be pumped to Lagoon 3 as the finishing lagoon that will store the treated water to be used for irrigation purposes. Lagoon 3 with an approximately capacity of 24MGL will serve as an storage dam for treated water, with this water to be used for irrigation purposes on the woodlot and crops and pastures on the subject property as proposed in the EIS.

The proposed bio-reactor and facultative lagoon system will result in the treatment of waste water that will result in a very small quantity of residual sludge. In the short term this sludge to be removed from the lagoons and transported to a composting area where it will be left to decompose and dry out after which it will be spread over the subject land as pasture improver. The proposed modified waste water treatment system will result in minimal sludge which in term will have improved impacts on the environments as it will reduce the amount of waste products that will need to be accommodated.

The main difference between the approved waste water treatment system and the proposed modification is the use of Lagoons 1 and 2 for treatment, the lining of these two dams and the enlargement and the covering of Lagoon 1. The proposed waste water treatment plant will allow for better management of waste water and reduce the potential for contamination of ground water through seepage. The effective treatment of waste water in Lagoon 1 that will allow for BOD conversion which will reduce potential for odour from this treatment plant.

The treated waste water will be stored in Lagoon 3 and will be used for irrigation on the subject site with a pivot irrigator for the crops and irrigation to the woodlot on the site as per the approved development consent. The woodlot has been established on a 15ha area between the processing plant and the northern boundary of the subject property. The woodlot comprises Australian natives and will assist in the management of wastewater on-site. The woodlot will continue to be managed as per the approved EIS on a commercial basis with trees to be harvested in future. The irrigation of the property will be similar to that approved under the existing development consent.

#### *Process waste*

The 40,000 tonne of process waste resulting from the modified food processing plant will be removed off-site. Nugan Quality Foods currently has a contract with a local provider to collect all solid food waste from the existing location of the plant in Griffith, and this will continue when relocated to the subject site. Further discussions are also under way with other potential regional contractors, with potential for future delivery of process waste to these contractors. The food waste is mainly used in cattle food with some spread on the ground as soil improver. This removal of solid waste off-site was also proposed as part of the approved Parle Foods development. Although details on the amount of process waste from the approved development is not provided in the EIS, it could be anticipated that due to the larger input of product it is likely to have



been in excess of 40,000 tonne. The proposed modified food processing plant will therefore result in less process waste, and therefore less impact on the environment through its disposal off-site.

#### 4.2. Waste water management

The re-use of the recycled waste water from the proposed food processing plant will be similar to the irrigation system that was discussed in the Environmental Impact Statement of the current Development Consent for the Food Processing plant. It is anticipated the relevant ground water and soil testing that was done for the EIS is still relevant to this proposal and will have similar results.

Coffeys collected superficial soil samples at 33 locations on the subject site and incorporated them into five composite samples which were tested. Table 4 provides a summary of the results obtained from the test.

**Table 4: Soil test results**

Analysis	301	302	303	304	305	Average
pH (water)	6.0	6.9	6.8	6.5	7.4	6.7
EC (dS/m)	0.25	0.28	0.28	0.28	0.49	0.32
Olsen P (mg/kg)	23	20	8	12	3	13.2
Total P(mg/kg)	236	208	144	180	70	167.6
TKN (%)	0.12	0.11	0.15	0.14	0.04	0.11
Nitrate (mg/kg)	300	200	160	300	1	192.2
Exch Na (mg/kg)	525	473	805	704	877	676.8
Exch K (mg/kg)	570	513	334	427	455	459.8
Exch Ca (mg/kg)	2460	3300	3370	2890	5540	3512
Exch Mg (mg/kg)	778	466	1070	1000	1450	952.8
Total Organic C (%)	1.6	1.2	1.9	1.7	0.4	1.36

Source: Wastewater and Farm Management Issues as contained in Coffeys EIS for Parle Foods Pty Ltd

The test revealed that the pH of the topsoil on the subject land is neutral and can tolerate the application of wastewater that is slightly acid. The EC and P levels are both fairly low with P levels quite variable through the site. The need therefore exist to increase the P levels to around 20mg/k to insure that the crop growth is not limited. Nitrate levels are high except in site 305 where it is very low. The nitrogen was identified as being at the risk to loss through denitrification.

Subsoil samples were also taken in the same locations with the test result shown in Table 5 below.

**Table 5: Subsoil test results**

Analysis	306	307	308	Average
pH (water)	7.7	7.5	7.4	7.5
EC (dS/m)	0.37	1.51	1.06	0.98
Olsen P (mg/kg)	3	2	4	3
Total P(mg/kg)	88	52	88	76
TKN (%)	0.03	0.03	0.04	0.03
Nitrate (mg/kg)	125	1	1	42.33
Exch Na (mg/kg)	815	199	1190	735
Exch K (mg/kg)	279	268	265	271
Analysis	306	307	308	Average
Exch Ca (mg/kg)	4230	4800	2910	3980
Exch Mg (mg/kg)	1100	1860	1430	1460
Total Organic C (%)	0.3	0.4	0.6	0.43

Source: Wastewater and Farm Management Issues as contained in Coffeys EIS for Parle Foods Pty Ltd

These subsoil test indicated that the Ph levels in the subsoil is higher that the topsoil and will also provide buffering for the application of slightly acidic wastewater.

The soils where the irrigation will be carried out were identified as transitional red-brown earths with low saturated hydraulic conductivities. These soil test results therefore indicated the general suitability of the site for irrigation purposes.

#### *Woodlot*

A 15ha woodlot was established under the current development consent between the processing plant and the northern boundary of the property. The woodlot was planted with Australian native eucalyptus including *Eucalyptus gradis* (Flooded Gum), *Corymbia maculate* (Spotted Gum), *Eucalyptus camaldulensis* (River Red Gum) and *Eucalyptus occidentalis* (Swamp Yate). These plants provided a mix of local and non-local indigenous species. The woodlot was planted 200 stems/ha and are currently well established. The wood from this lot will be commercially harvested once they area ready.

The irrigation of this woodlot will be via flood/furrow irrigation with the installation of an automatic drip irrigation system once the woodlot canopy reaches closure.

#### *Irrigation of crops*

The re-use of treated water on crops will be similar to that proposed in the original EIS. A 45ha area has been prepared for irrigation of summer crops and winter forage crops,



similar to that proposed in the EIS for Parle Foods. The proposed waste water system for the proposal will be a full re-use scheme whereby all waste water will be used for irrigation within the boundaries of the property. The irrigation areas have been divided into two blocks with one containing seven bays and the other with four bays. The water will be supplied to the bays by way of a supply channel with outlets to control the flow.

The irrigation of the bays will aim to apply water in 6-8 hours and drain the excess water from the bay and back to the supply channel or storage facility. The irrigation of crops will depend on the soil observation and the soil water balance at the state.

The calculations for the water balance used in the EIS for the existing Development Consent are still relevant to this modified proposal. The relevant water balance calculations as contained in the EIS prepared for Parle foods are included in Appendix D. The mean annual rainfall (over a 37 year period) is 423mm and the mean annual potential evapotranspiration (ETp) is 1,815mm. The mean and median yearly hydraulic loading (YHL) for this period are very similar at 1,391mm. The 60 percentile value for the YHL is 1,457mm. Based on the above it was calculated that the minimum area that was required to manage the waste water from the Parle food processing plant (with a annual quantity of 424ML/y and potential ETp of 13.91ML/ha/y) during an average rainfall is 31ha and 39ha in a 10 percentile wet year.

The quantity of waste water to be produced by the modified food processing plant will be 350ML/day, which is considerably less than that produced by the Parle food processing plant, with the identified irrigation area of 39ha therefore adequate also to facilitate the waste water requirements from the modified food processing plant. The calculations for the Parle food processing plant indicated that the effluent was classified as 'low strength' with the calculations using a 60 percentile storage requirements to establish the storage area required. The waste water volume of Parle food processing plant was 3ML per day during summer with the remainder of the year 0.5ML per day. The required size of the waste water storage facility was calculated with a holding capacity of 4ML, which will hold more than a days supply in peak season and nine days supply in off-season.

The modified waste water system proposes to increase the holding capacity of Lagoon 1, as the fully lined and covered anaerobic digester pond, to 18ML with the addition of an aerobic lagoon with a holding capacity of 11ML. In order to provide an overview of the potential quality and quantity of waste water that can be expected from the proposed Nugan food processing plant a sample of the trade waste records of the existing Nugan plant at Collier Street was summarized. The liquid trade waste records of an 8 month period from January 2005 to August 2005 (attached in Appendix F), was used to identify potential trends in the quality and quantity of potential waste water that can be expected from the proposed modified plant.



**Table 6: Quantity and quality of trade waste output for the Nugan's Colliers Road site, Griffith.**

Months in 2005	Average mg/L							Outflow kL/day
	BOD	Suspended Solids	Phosphorus	Sulphate	Sulphide	Nitrogen	pH	
January	956	197	2	-	-	-	-	894
February	1981	260	9	-	-	-	-	852
March	2060	317	6	54	0	13	9.7	1071
April	2356	372	6	28	0	19	5.65	955
May	1308	243	5	28	0	13	8.7	1232
June	1141	244	5	18	0	12	6.9	904
July	1341	257	7	32	0	18	8.3	856
August	1470	335	6	35	0	8	8.6	1442
<b>Average</b>	<b>1576.6</b>	<b>278.1</b>	<b>5.75</b>	<b>32.5</b>	<b>0</b>	<b>13.8</b>	<b>7.97</b>	<b>1025.75</b>

Source: Griffith City Council Liquid Trade Waste charges records for Nugan Processing plant at Colliers Road, Griffith.

The above tests samples of typical **untreated** waste water from the processing line of the existing Nugan plant indicated average Nitrogen level of 13.8mg/L, average Phosphorus levels of 5.75 mg/L and average BOD levels of 1,576.6mg/L. This waste water sample therefore indicates a low strength of untreated effluent in terms of nitrogen levels and phosphorus levels and a lower range of medium strength effluent in terms of the BOD levels. The nitrogen levels that were anticipated for the Parle Food Processing plant waste water had an average count of 62mg/L which is significantly higher than the levels tested at the existing Nugan Food Processing plant.

The quality of the waste water from the modified plant will be further improved through the proposed waste water treatment system that was designed for the proposed modified plant, before it is used for irrigation on the subject land. The waste water system will discharge water to the storage dam when the waste water has a BOD reading of 30mg/L, which is classified as a 'low strength' effluent and will be well below the average BOD levels of 300mg/L that was anticipated for the Parle food processing plant.

The EIS for the Parle food processing plant clearly indicated that the even with Nitrogen levels of 62mg/L and BOD levels of 300mg/L the subject site, which include a woodlot (15ha), proposed forage maize summer crop and a pasture winter crop (on 45ha), will be adequate to manage the nutrient levels contained in the Parle plant's waste water efficiently. It can therefore be anticipated that the subject site, which will maintain the woodlot and cropping proposed as per the EIS, will be more than adequate to accommodate the waste water from the modified plant that contain reduced levels of nitrogen and BOD.

The daily discharge of waste water at the existing Nugan Food Processing plant located at the Collier Street site in Griffith indicate that there is a reasonably constant monthly discharge throughout the year with no particular increase that is experienced



over a certain time. The daily average waste water discharged from the existing Nugan Plant was calculated at 1025.75 kL per day which represent 1.026 ML per day. It is anticipated that the proposed modified plant on the Crawford Road site will have a similar waste water output, since the same processing lines will be relocated to this proposed site. From these calculations it is therefore evident that Lagoon 1 with a capacity of 18ML will have adequate capacity to hold on average 17 days supply of waste water. The improved waste water treatment system therefore will provide for adequate storage capacity for waste water. After treatment in Lagoon 1 and 2 the treated waste water will be released into the waste water storage dam, Lagoon 3, with a capacity of 24MGL, from where it will be used for irrigation purposes on the subject property.

*But it is  
unusually high!*

It should be reiterated that the volume of waste water produced by the modified plant will be less and will have an improved quality through the proposing waste water treatment system consisting of two fully lined treatment ponds that will assist in the treatment of the water to an acceptable level before it is used in the irrigation of the woodlot and crops on the subject land.

#### 4.3. Air quality

An air quality study was carried out for the Parle EIS by Coffeys. It could be argued that due to the similar use proposed as part of the modification of the food processing plant, the supporting documentation for the modification application could still rely on the findings of the original air quality study. The finding of the study as per the EIS and the potential changes to the modification application that will result in a reduction of impact of air quality is discussed below.

This study identified that there was no air quality data available from this area since no monitoring stations operated in the Griffith region. Background studies did however reveal that surrounding Hanwood residents have lodged complaints with Griffith Council relating to odour. It is possible these complaints relate to odours from the nearby Bartter poultry operations located approximately two kilometers from the site of the food processing plant.

The investigation around the potential impact of the operation of the approved plant on the air quality in the area stems from o the boiler and heat plant operation. The main energy source for these boilers was identified as natural gas. The process of combustion during the operation will result in pollutants such as sulphur dioxide, nitrogen dioxide, carbon monoxide, volatile organic compounds and particular matter. In order to estimate potential pollutants emission from the operations results of boiler and stack testing undertaken by Tomlinson Boilers were used. The potential emissions from particular matter from the boilers were estimated by using emission factors that was recommended by the United States Environmental Protection Agency.

In regards to the proposed plant, the evaporation system utilised in the juice extraction is also a closed system with any aromatic esters entrained in the water evaporators to go to the trade waste system.

Smaller forms of potential air pollutants have been identified as the fuel storage on site, forklift operation and truck movement as well as dust generated during operation.

The air quality study in the EIS expected that the most significant odour source within the plant would be food processing effluent, which may have a high Biological Oxygen Demand (BOD) with potential high odour producing potential.

The air quality study made the following conclusions:

- *Air pollutants emissions resulting from normal plant operations are not expected to have a significant impact on ambient air quality in areas adjacent to the plant;*
- *The proposed air quality monitoring program will be used to verify that the plant construction and operation does not degrade local air quality;*
- *Control of dust emissions will be achieved by wetting/covering of material stockpiles and paving of handling areas and access roads. Regular monitoring and auditing of wastewater treatment and disposal processes will be undertaken to ensure that the potential for odour impacts are minimised.*

These findings and potential emission of odour that could result in the impact on the air quality on-site and in the surrounding area was estimated primarily on the operation of the boilers and heat processes. The proposed modification of the plant will allow for a similar process that includes a boiler and three evaporators that will assist in concentration of juices. The operation process involved is similar to that approved.

The limiting of improper disposal of wastewater containing high levels of organic matter will substantially reduce the potential odour issues. The most significant source of odour from the site will be from the food processing effluent. The fact that Lagoon 1 will be a non-aerated, anaerobic, long-term covered retention pond that will allow for nearly all BOD conversion. As part of this modification the main odour source will be substantially marginalised by the fully lining and enclosure of the pond with a cover to effectively manage the BOD conversion and limit odour release into the air.

By enclosing this anaerobic digester pond it will substantially limit the local impacts of odour on the surrounding areas. The treated waste water from the system will have a BOD count of 30 before it is pumped to the treated waste water storage dam.

Other potential sources of pollutants for the proposed plant are similar to that discussed in the EIS, which include traffic movement and dust.

The proposed modified plant will therefore result in an anticipated reduction in potential odour generation through an improved waste water treatment system that will be put in place, with improvements including the lining and enclosure of Lagoon 1 as the anaerobic digester pond. It is therefore anticipated that similar conclusions could be made for the modified plant with its operation not having a significant impact on the air quality in the surrounding area.

It should also be noted that the modification application allow for the internal access road and all road surrounding the processing plant to be sealed, which will result in limited dust generation by trucks and will further limit the potential for dust pollution in the surrounding area.



#### 4.4. Noise

A Noise Impact Statement (NIS) was carried out for the food processing plant of Parle Food as part of the approved EIS. The NIS identified that the majority of surrounding farms was owned by Batters Poultry farms. All the neighbouring residences were recorded in the NIS with distances from these residents and the proposed development varying between 800 metres and 1,500 metres. The approved processing plant included three boilers (5,000kW; 10,000kW and 15,000kW) located inside a building with evaporators and cooling towers to be located outside under the awning. Other potential noise sources included compressors for refrigeration and the traffic generated by the proposal. The proposed modified process only includes two boilers of 1,000kW and 500kW which is substantially smaller than those that formed part of the approved plant.

The NIS anticipated that during the period January to April the Parle food processing plant would have generated a total of 3,000 incoming road trains with raw material and a total of 2,000 outgoing semi trailers and B-doubles transporting product. It was also anticipated there would be an occasional courier truck delivery and forklifts operating between different areas of the site. The NIS identified that the site was not specifically undulating with the topography not to have a particular effect on noise propagation. Therefore the determination of noise contours was not considered necessary, with the effects of temperature inversions, air and ground absorption have been taken into account in the noise modelling.

**Table 7: Recommended Noise levels from Industrial Noise Sources**

Type of Receiver	Indicative Noise Amenity Area	Time of Day	Recommended $L_{Aeq}$ Noise Level (dBA)	
			Acceptable	Extreme
Residence	Rural	Day	50	55
		Evening	45	50
		Night	40	45
Residence	Suburban	Day	55	60
		Evening	45	50
		Night	40	45
Residence	Urban	Day	60	65
		Evening	50	55
		Night	45	50
Residence	Urban/Industrial Interface for existing situations only	Day	65	70
		Evening	55	60
		Night	50	55
Commercial site	All	When in use	65	70
Industrial site	All	When in use	70	75

Source: Noise Impact Statement May 2000 by Noise and Sound Services as contained in Coffeys EIS for Parle Foods Pty Ltd

This NIS was based on the EPA's *Industrial Noise Policy* (2000) and contained two components being controlling intrusive noise impacts and maintaining noise level amenity. It is considered that the existing NIS could also assist in the modification application since the processing involved is similar to that for which the NIS was completed. In effect the modified process as proposed by the modification will involve the processing less produce than that approve by the current EIS. The existing background noise level assumed within this rural environment was 30dBA. To protect the amenity in the area the NIS used the relevant parts of the EPA recommended levels shown in Table 6.

From Table 6 the acceptable noise levels in a rural area is **50 dBA** during **day** time (defined as 0700 hours to 1800 hours), **45dBA** in the **evening** (with evening defined as 1800 hours to 2200 hours) and **40dBA** at **night** time (night time from 2200 hours to 0700 hours). Allowance for modification to these limits can be made to account for the existing level of industrial noise. The EPA criteria for land use development with the potential to create additional traffic on local roads in this proposal is 55L<sub>Aeq,1hr</sub> for night time.

The NIS measured the existing background and ambient noise levels on the site over a two week period during April 2000, as well as the major existing noise sources. Table 7 indicates the existing noise levels of all locations measures.

**Table 8– Summary of Existing Noise Levels –All locations**

Location	Time of Day	Rating Background Noise Levels (L <sub>Aeq</sub> )	Log Average Existing Ambient Noise Levels (L <sub>Aeq</sub> )
Bartters Farm No. 13	Day	37	54
	Evening	37	47
	Night	35	49
Ross Mantarro Farm	Day	30	50
	Evening	31	51
	Night	30	47
Roy Dussin Farm No. 1060	Day	31	49
	Evening	30	41
	Night	30	43
Dick Thompson Farm No. 1054	Day	36	55
	Evening	30	51
	Night	30	50

Source: Noise Impact Statement May 2000 by Noise and Sound Services as contained in Coffeys EIS for Parle Foods Pty Ltd



The levels of potential noise sources were also measured during the NIS. These potential noise sources included compressors, cooling towers, freezer fans, boilers, evaporators, trucks, B-doubles and road trains which are similar noise sources in the modified processing plant. The background noise levels measured as well as the noise levels of the identified noise sources assisted the NIS to identify noise goals for the Parle plant at the different location of surrounding farms.

The noise assessment that was done as part of the EIS indicated that the Parle facility would generally meet the EPA noise criteria for continuous noise, with only some minor exceedances expected at the northern residence with the effect of the road trains at night also expected to cause a night time noise impact at one residence.

Since the proposed modification includes similar noise sources as discussed and analysed by the NIS it can be anticipated that the proposed noise levels generated by the modified plant will be similar to that measured for the approved Parle plant. It should also be mentioned that the current approved plant of the Nugan Group located in Griffith is located in an urban environment with the closest residence located only 200 metres away. This site does not generate any complaints with regards to noise. The current EPA license for the juice extraction plant in Griffith also does not require any monitoring of noise levels.

The traffic movements anticipated by the approved Parle plant was 3,000 incoming road trains during the three month period from January to April and an additional 2,000 for the balance of the year. This equates to a total of 1000 road trains per month during the busy period which is much more intense than the proposed 490 truck movements per month that is anticipated for the proposed modified plant.

The modified processing plant proposed by the Nugan Group will be contained within the constructed main shed building. The current facility that is located in an urban environment in Griffith meets current statutory requirements with no problems in regards to noise pollution. Due to the distances from the existing dwellings and experience at the current operations at the Griffith plant it is not expected that noise will be an issue in the proposed modified food processing plant.

#### **4.5. Traffic & transport**

The modified processing plant for juice extraction will have a total of 490 truck movements per month inward with an equivalent amount outgoing. The proposed traffic movement system on the site is similar to that as approved under the existing development consent for Parle. All internal roads between the existing buildings have been constructed and sealed to limit dust generation and improve the movement of vehicles. The raw material deliveries to the plant are accepted 24 hours a day, 7 days per week during the busy harvesting period. It should however be noted that predominantly produce is received during day time hours with limited after hours intake.

All incoming traffic will enter the site via Crawford Road and Kidman Way as per the approved consent for Parle. Traffic will enter the site by way of the access road with the first stop at the weighbridge and then onto the receivable area. The traffic

generated by the proposed modified plant will be less than that anticipated under the approved development, resulting in a reduction of monthly traffic movements and a better distribution of the movements through the year. The attached amended site plan identifies the movement network around the proposed facility.

The proposed modified food processing plant will employ 40 persons which is significantly less than 120 proposed by Parle and approved in the development consent. This will also result in fewer vehicles movement to and from the site.

The modification includes the relocation of the parking area to two different locations. The management and visitor parking area will be located to the north of the main processing plant building with the employee parking area to be located to the south east of the cold storage shed. These parking areas will be accessed from the existing internal sealed internal road network.

#### **4.6. Water quality & soils**

Coffey's established four shallow monitoring bores as part of information gathering for the EIS report. Samples taken and analysed in March 2000 indicate that the water is slightly alkaline with an average salinity of 9.6dS/m. The tests concluded that the shallow quivers on the site vary between one and two metres below surface with the water tables saline and very variable in concentration, which suggest potential intake and discharge areas on the site. The salinity is proposed to be managed with the removal of the rice bays from the property and the irrigation to achieve a more even intake of water throughout the site. The woodlot to the north of the proposed plant will also assist in the reduction of the water table and salinity on the property over time. The research done as part of the approved food processing plant also indicated that that a woodlot will assist in the management of treated waste water through irrigation.

The improvements of the waste water management system proposed as part of the modification application include the installation of a geo-membrane system in Lagoons 1 and 2 that will prevent any potential contamination of the ground water.

The landscape characteristic of the site can be described as gentle sloping to the west with a gradient less than 1 in 3,000. The site is located on an extensive alluvial fan of low relief, which has formed where the Murrumbidgee River enters the open riverine plain.

According to the EIS, sedimentary deposits are approximately 100 metres deep with deposits consisting of various layers of sands and clays. The surface soils on the current landscape are mainly red brown earths or transitional red-brown earths. The majority of the soils are described as having a dense to dense plastic clay sub-soils.

The soil study that was done by Coffey's as part of the EIS identified that the pH of the topsoil is near neutral and can tolerate the application of waste that is slightly acid. The EIS found that the soils on the property where irrigation will be carried out are transitional red-brown earths with low saturated hydraulic conductivities and classified suitable for rice culture. The pH was found to be neutral with phosphorus medium to low for optimum crop growth. The nitrogen and organic matter in the soils is low with the exchangeable sodium percentage in the topsoil high with the risk of dispersion and



crusting with rain and irrigation. This can however be ameliorated in the short term with gypsum and in the longer term by building the organic matter in the soil.

The capacity of the waste water storage dam for irrigation will be similar to that approved in the existing development consent. As stated previously, the amount of treated waste water is to be reduced as part of the modified process. Process waste water generated from the approved Parle development was to be 424MGL per annum with only 350MGL of process waste water anticipated from the modified plant.

#### 4.7. Social & economic impacts

The proposed modification of the Parle food processing plant will provide for a total of 40 jobs requiring a diversity of skills. The modified plant represents a rural industry in a suitable location that will not only provide employment opportunities within this rural area but will also have the potential to support and create additional jobs in the supporting services that will be involved in the completion of work at the site to bring it to full production potential. This include tenders to existing local companies within the surrounding area for all contract works required, including works to finalise the plant as well as ongoing work in maintenance and transport that will be required for the day-to-day operations.

### 5. STATUTORY REQUIREMENTS

The subject site is included in the 1(c) Rural (General) zone of the Griffith Local Environmental Plan 2002.

#### 5.1. Environmental Planning & Assessment Act 1979

Section 79(c) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) stipulates the following requirements that need to be taken into account when considering an application:

- (a) *the provision of;*
  - (i) *any environmental planning instrument, and*
  - (ii) *any raft environmental planning instrument that is or has been placed on public exhibition and details of which have been notified to the consent authority, and*
  - (iii) *any development control plan, and*
  - (iv) *any matters prescribed by the regulations,**that apply to the land to which the development application relates.*
- (b) *The likely impacts of the development, including the environmental impacts on both the natural and built environments, and social and economic impacts on the locality.*

*(c) the suitability of the site for the development;*

All these matters have been addressed either in the section above or will be addressed by the following section. It should also be noted that the application is made under Section 96(1A) of the EP&A Act which is for modification of consents involving minor changes to an approved proposal resulting in minimal environmental impact. The original development application for the food processing plant was by Parle Foods Pty Ltd and included an EIS addressing all the potential environmental impacts resulting from a food processing plant not dissimilar in operation to that proposed by the Nugan Group but definitely on a smaller scale.

The modified plant proposes only minor changes to the food processing plant as well as the proposed waste water treatment plant. The proposed modified plant will also source fewer raw materials and generate less waste than the process approved for Parle. The proposed changes as discussed in previous sections of this report will result in development that will ultimately have reduced impacts on the environment and therefore should be considered favorably for modification.

## **5.2. Griffith Local Environmental Plan 2002**

The subject land is located within the 1(a) Rural Zone of the *Griffith Local Environmental Plan 2002* for which the objectives are:

- (a) To retain prime crop and pasture land where possible for the purpose of agriculture, and*
- (b) To retain viability and productivity whilst permitting diversity and flexibility in the management of agricultural land, and*
- (c) To prevent fragmentation of rural land and facilitate farm adjustment by permitting the orderly subdivision and other development of rural land and controlling the erection of dwellings so as to ensure the economic base of the City of Griffith is protected, and*
- (d) To facilitate rural adjustment by permitting the orderly subdivision and other development of rural land and controlling the erection of dwellings so as to ensure the economic base of the City of Griffith is protected, and*
- (e) To conserve, enhance and promote rural areas of scenic, tourist or agricultural significance to the benefit of the City of Griffith, and*
- (f) To prevent the degradation of rural and natural resources, and*
- (g) To protect, enhance and conserve the water resources for use in the public interest, and*
- (h) To enable the development of the land within this zone for the purpose of land use that do not reduce the long term agricultural production potential of the land, and*
- (i) To enable the development of the land for the purpose of rural industries and associated activities where the Council is satisfied that those industries and activities will not detrimentally affect, or be affected by, nearby agricultural activities, and*



- (j) *To enable other development of land in the zone that is compatible with agricultural practices in the area where the Council is satisfied that the development will not detrimentally affect, or be affected by, nearby agricultural activities.*

The proposed modified food processing plant is considered to be generally compliant with these objectives and will benefit the area by:

- retaining the majority of the land for agricultural production;
- retaining productivity of the remainder of land as well as allow for diversity in proposing an activity that supports agricultural production;
- not resulting in the fragmentation of agricultural land;
- enhancing the agricultural significance and ensure protection of the agricultural economic base within Griffith by allowing for facility that will process the local products produced at a location close to the production areas; and
- assisting in the conservation of water by treatment and re-use of water on site.

The proposal supports the development of the land for a rural industry and is not considered to have a detrimental effect the surrounding agricultural activities, include poultry farms. The proposed is also allowed for by the LEP and supported by the existing zoning in place for the subject land. The location of the proposed food processing plant in a central location on the subject land provides for adequate setbacks from the site boundary to limit potential impacts of the proposal on the surrounding area.

The proposal will utilise the existing building constructed under the current development consent, with minor modifications to the internal processes and waste water treatment plant. The proposal, as submitted, is considered to be compliant with all the relevant objectives referred to in the LEP.

### **5.3. Justification for modification under Section 96(1A)**

Application is made for the modification of the development consent for the Parle food processing plant. The consent was issued in December 2000 by the then Minister of Urban Affairs and Planning. The application for modification is made under Section 96(1A) of the EP&A Act which allows for modifications involving minimal environmental impacts.

The modification application is for substantially the same type of development utilising the constructed buildings and utility services proposed for the original Parle food processing plant. The modification will result in a food processing plant having similar raw material inputs with slightly different outputs (replacing canned products with concentrated juice in bulk format). The processing and equipment involved is similar to that approved. The modified proposal will make use of the same site plan and buildings with internal changes to install the three processing lines for juice extraction. It should be noted that the input of fresh products (84,500 tonne) at this initial stage will be substantially less than the quantity approved under the original development consent (200,000 tonne) with the output of waste material (424MGI waste water in

approved consent vs 350MGL waste water under modified plant) and products (output approved 40,000 tonne vs 15,200 tonne under modified app) also less.

The overall environmental impact of the development will therefore be less than that approved under the original development consent and could therefore be considered under Section (961A).

#### 5.4. Conditions of consent to be modified

The tables below set out the relevant conditions of consent for the existing Parle facility with recommendations for those that should be retained, deleted or modified. These recommendations are based on an assessment of the modified proposal against the existing Parle operation.

**Table 9: Assessment of proposed operation against current conditions of consent**

EXISTING CONDITION IN DA NO.303-08-00	CONSIDERATION AGAINST PROPOSAL	RECOMMENDATION
<b>GENERAL</b>		
1. Obligation to minimise harm	This is an objective of the consent rather than a condition. Does not provide any relevance in consent.	Delete
2. Terms of approval	Amend references to reflect new documentation (e.g. SEE).	Modify
3. Restriction on operations	The quantities proposed to be processed by Nugans will not exceed the 200,000 tonne limit (at this stage).	Retain
4. Construction certificate	No longer relevant as building has been constructed.	Delete
5. Occupation certificate	Standard condition.	Retain
<b>COMPLIANCE &amp; COMPLIANCE REPORTS</b>		
6. Approvals	Standard condition.	Retain
7. Contractors awareness	Standard condition.	Retain
8. Dir-Gen notification of construction	No longer relevant as building has been constructed.	Delete
9. Dir-Gen notification of use	Standard condition. Particularly relevant having regard for history of the development.	Retain
<b>ENVIRONMENTAL MANAGEMENT PLANS</b>		
10. Prepare Construction Management Plan (CMP)	Mostly irrelevant as building has been constructed. Elements beyond construction such as Stormwater Management Scheme, Landscape Management Plan and details of sewage treatment system can be picked up elsewhere in the consent (e.g. Condition 66 for Landscape Management Plan).	Delete
11. Approved CMP by Dir-Gen	No longer relevant as building has been constructed.	Delete



EXISTING CONDITION IN DA NO.303-08-00	CONSIDERATION AGAINST PROPOSAL	RECOMMENDATION
12. <b>Environmental Management Plan (EMP)</b>	An important requirement for a development of this type and scale.	Retain
13. EMP to be publicly available	Standard condition.	Retain
14. EMP review	Standard condition. The use of the term "regularly" should be quantified or deleted.	Modify
15. Approved EMP by Dir-Gen	Standard condition.	Retain
<b>ENVIRONMENTAL MONITORING PROGRAM</b>	<p>Conditions 16 through 26 essentially duplicate the monitoring and reporting requirements of the EPA licence and therefore are unnecessary. It also creates the potential for conflict between the conditions on a consent and those on a licence, as is demonstrated below.</p> <p>The EPA Griffith office is considered to be in a superior position than the Director-General of DoP in Sydney to assess the results of monitoring and respond if necessary. The EPA has an established system of checks and balances for monitoring and reporting – all of which can be accessed on the web.</p>	
16. Prepare <b>Environmental Monitoring Program (EMP)</b>	See above.	Delete
17. Wastewater monitoring	Covered by Conditions O3.1 & O3.2 of the EPA licence.	Delete
18. Wastewater holding dam	Reference to EPA licence condition in the consent (M3.1) is invalid. Correct reference is M6.1.	Delete
19. Wastewater irrigation	Covered by Condition M6.1 of the EPA licence.	Delete
20. Groundwater monitoring	Covered by Condition M2.1 of the EPA licence.	Delete
21. Piezometers	Reference to EPA licence condition in the consent (O7.1) is invalid. Correct reference is P1.3.	Delete
22. Soil monitoring	Covered by Condition M2.1 of the EPA licence.	Delete
23. Noise monitoring	Noise monitoring at the Thompson farmhouse should be undertaken if directed rather than as an ongoing requirement (i.e. there might not be a noise issue since traffic movement and operation will be reduced by modification).	Modify
24. Approved EMP by Dir-Gen	See overall comments relating to this section above.	Delete
25. Dir-Gen to direct works arising	See overall comments relating to this section above.	Delete
26. EMP in Ann Env Mgt Report	See overall comments relating to this section above.	Delete



EXISTING CONDITION IN DA NO.303-08-00	CONSIDERATION AGAINST PROPOSAL	RECOMMENDATION
<b>ANNUAL ENVIRONMENTAL MANAGEMENT REPORT</b>		
27. Prepare <b>Annual Environmental Management Report (AEMR)</b>	To avoid duplication and unnecessary work for the applicant, this condition should just require the lodgement with the Director-General a copy of the Annual Return to the EPA which covers all of the monitoring matters. Details of the Annual Return are specified in Conditions R1, R2 and R3 of the EPA licence.	Modify
28. Dir-Gen to direct works arising	Allows the Director-General to respond to issues arising in the annual return.	Retain
<b>INDEPENDENT ENVIRONMENTAL AUDIT</b>		
29. Prepare <b>Independent Environmental Audit (IEA)</b>	Arguably this requirement is already being met by the annual reporting requirements of the EPA. The condition does not seem to add anything to the environmental monitoring requirements already required. For all intents and purposes, the EPA is already fulfilling the role of the independent auditor.	Delete
30. Dir-Gen to direct works arising	See above.	Delete
<b>DISPUTE RESOLUTION</b>		
31. Dir-Gen/Minister to resolve	Procedural. I'm not sure of the legality of this condition in the context of the EP&A Act.	Retain
<b>ENVIRONMENTAL STANDARDS &amp; CONDITIONS</b>		
32. Noise control	Duplicates Condition L6.1 of the EPA licence. Reference to Condition L4.1 in the consent is invalid.	Delete
33. Noise mitigation measures	Provides amenity protection (if required) to nearby residents.	Retain
34. Potable water supply	Valid condition.	Retain
35. Wastewater treatment system	Plant is already commissioned. Details of the wastewater treatment system is provided in the modified SEE report.	Delete
36. Limits on irrigation of wastewater	Despite a reference in this condition to the EPA licence, there appears to be no restriction on the quantity of wastewater that can be irrigated. Consequently this condition should be retained.	Retain
37. Bunding for wastewater	Plant is already commissioned. Condition should be amended reflect this.	Modify
38. Bunding for flooding		Retain
39. Pollution control device		Retain
40. Holding dams	Holding dams modified as part of proposal. This should be reflected in the condition.	Modify
41. Dam construction		Retain
42. No disposal to Council sewer	Plant is understood to be nowhere near Council's	Delete



EXISTING CONDITION IN DA NO.303-08-00	CONSIDERATION AGAINST PROPOSAL	RECOMMENDATION
	sewer.	
43. On-site effluent disposal		Retain
44. Storage tank bunding		Retain
45. Storage tank inspection		Retain
46. Minimise dust from activities	Covered by Conditions O3.1 & O3.2 of the EPA licence.	Delete
47. Minimise dust areas	Covered by Conditions O3.1 & O3.2 of the EPA licence.	Delete
48. Car parking	Condition needs to be modified to acknowledge plant is already commissioned. Wording would be improved by just requiring compliance with Council's car parking code rather than specifying a number.	Modify
49. Construct Crawford Road	This work is understood to have been completed.	Delete
50. Kidman Way intersection	This work is understood to have been completed.	Delete
51. Road pavement	This work is understood to have been completed.	Delete
52. Traffic Control Plan (TCP)	Road works are completed and therefore TCP is not required.	Delete
53. Road design plans	Road works are completed and therefore presumed to be in accordance with the requirements of this condition.	Delete
54. No processing outside wastes	Reference to EPA licence condition in the consent (L4.1) is invalid and in fact there is no longer a requirement for this in the current licence. Condition states the obvious.	Modify
55. Disposal to Council landfill	Plant has been commissioned. Condition should be amended to reflect this.	Modify
56. Chemical storage		Retain
57. Water for fire fighting		Retain
58. External lighting		Retain
<b>WASTEWATER IRRIGATION MANAGEMENT PLAN</b>		
59. Prepare <b>Wastewater Irrigation Management Plan (WIMP)</b>	Arrangements for the irrigation of wastewater likely to change with the new proposal. Consequently this condition remains valid.	Retain
60. Approved WIMP by Dir-Gen	Plant is already commissioned so condition will need to be amended to reflect.	Modify
61. Dir-Gen to direct works arising	Allows the Director-General to respond to issues arising in the WIMO.	Retain
62. Review of WIMP	Requires regular update of the WIMP.	Retain
<b>FOOD WASTE MANAGEMENT PLAN</b>		
63. Prepare <b>Food Waste Management Plan (FWMP)</b>	Arrangements for treatment of food waste is likely to change with the new proposal. Consequently this	Retain

5.8.12

1090  
1150  
1150  
1150



EXISTING CONDITION IN DA NO.303-08-00	CONSIDERATION AGAINST PROPOSAL	RECOMMENDATION
	condition remains valid.	
64. Approved FWMP by Dir-Gen	Plant is already commissioned so condition will need to be amended to reflect.	Modify
65. Dir-Gen to direct works arising	Allows the Director-General to respond to issues arising in the FWMP.	Retain
<b>LANDSCAPE MANAGEMENT PLAN</b>		
66. Prepare <b>Landscape Management Plan</b> (LMP)	A LMP has been prepared for the existing plant and the condition remains valid.	Retain
67. Approved LMP by Dir-Gen	A Construction Certificate has already been issued and so condition will need to be amended to reflect this.	Modify
68. Dir-Gen to direct works arising	Allows the Director-General to respond to issues arising in the LMP.	Retain
<b>SLUDGE MANAGEMENT PLAN</b>		
69. Prepare <b>Sludge Management Plan</b> (SMP)	It is possible there will be no sludge generated within the water storages and consequently no need for a SMP. This issue will be addressed in the SEE.	Delete
70. Approved SMP by Dir-Gen		Delete
71. Dir-Gen to direct works arising		Delete

### 5.5. Agency consultation

Contact was made with the Griffith City Council as well as the regional office of the Department of Environmental and Conservation (incorporating the EPA) in Griffith, via email and telephone during the week of 20 February 2006. The purpose of these consultations was to establish if these authorities required any other additional issues to be addressed in the modification application. It should be noted the applicants have also had various discussions with the local DEC office (EPA) during the planning and consideration of the modification of the food processing plant to accommodate the proposed lines of juice extraction.

With the printing of this report, despite regular attempts, no response was received from City of Griffith. The local EPA officer supported the requirements as set out by the Department of Planning particularly with regards to the potential noise and odour impacts and also expanded on the need for adequate storage area for waste water especially during wet weather. A suggestion was also made that a contingency plan needs to be investigated with the disposal of solid waste in order for the plant to have alternative solutions should the current contract terminate.



## 6. SUMMARY & CONCLUSIONS

The purpose of this development application is to adapt an existing building and food processing plant near Griffith to establish a food processing plant for juice extraction as part of the operations of Nugan Quality Foods. The proposed modified plant will be substantially the same as that approved for Parle Foods, with improved systems to be put in place to better manage the waste that will result from the food processing plant.

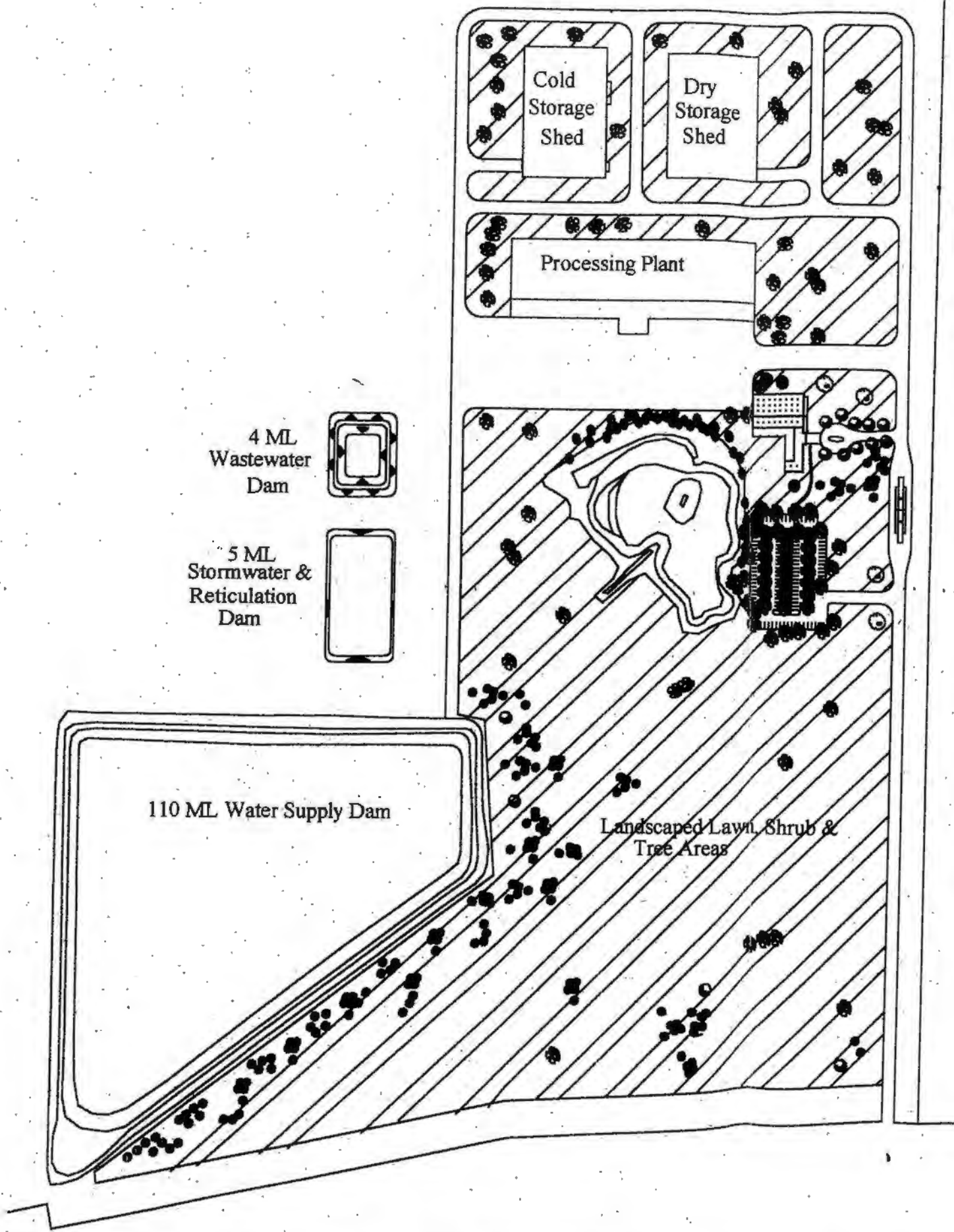
The development will help to enhance the agricultural industry in the City of Griffith at a location already approved for a similar operation. The information supplied indicates the proposed modification will have similar and reduced environmental impact to the approved food processing plant considered as part of the original EIS.

In conclusion, the modification application as submitted deserves the support of the Department of Planning because:

- it is consistent with Griffith Council's statutory planning instruments;
- is for substantially the same use as what was approved;
- will result in similar and reduced environmental impacts;
- it will generate no additional detrimental environmental impacts;
- improved waste water management system will allow for reduced environmental impact;
- it will allow for a expansion of rural industry to support the local economy within the City of Griffith.

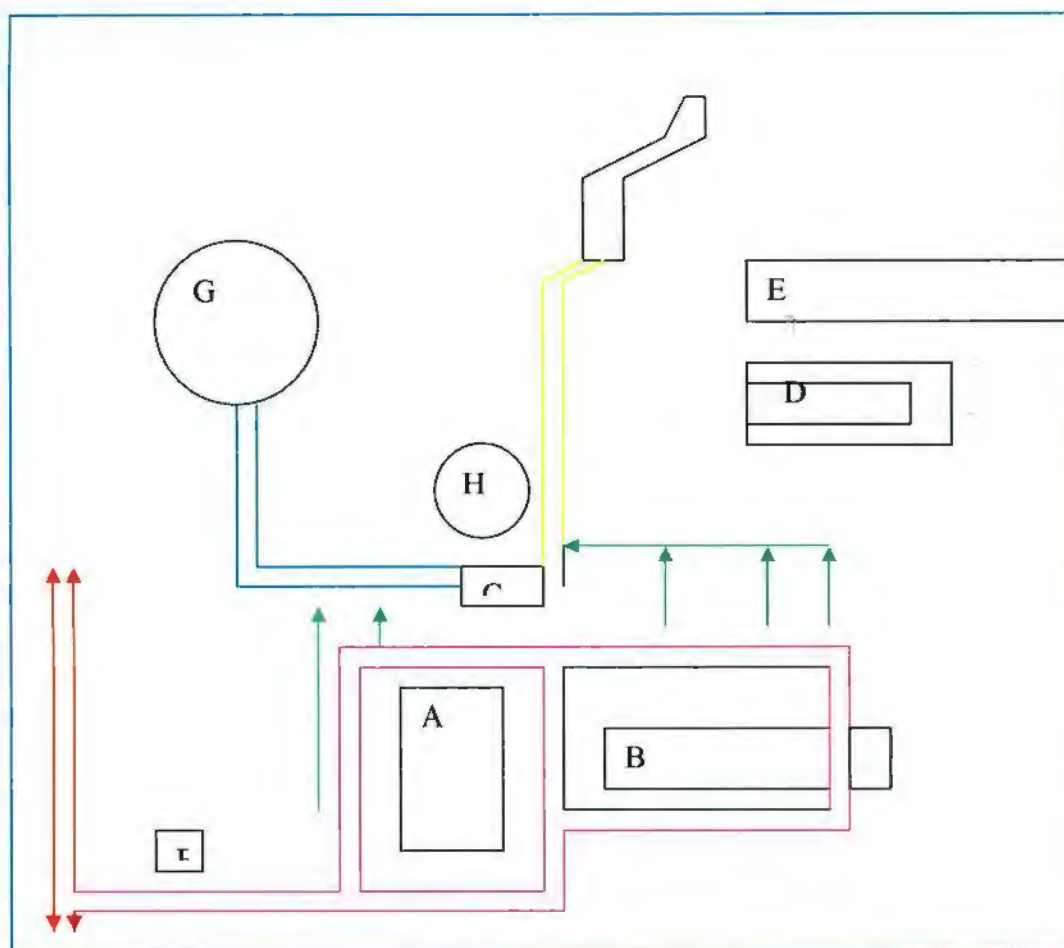
**FIGURE 1**  
**Approved Site Plan for Parle Foods**





**FIGURE 2**  
**Proposed Modified Site Plan for Nugan Quality Foods**





Prepared by Nugan Quality Foods

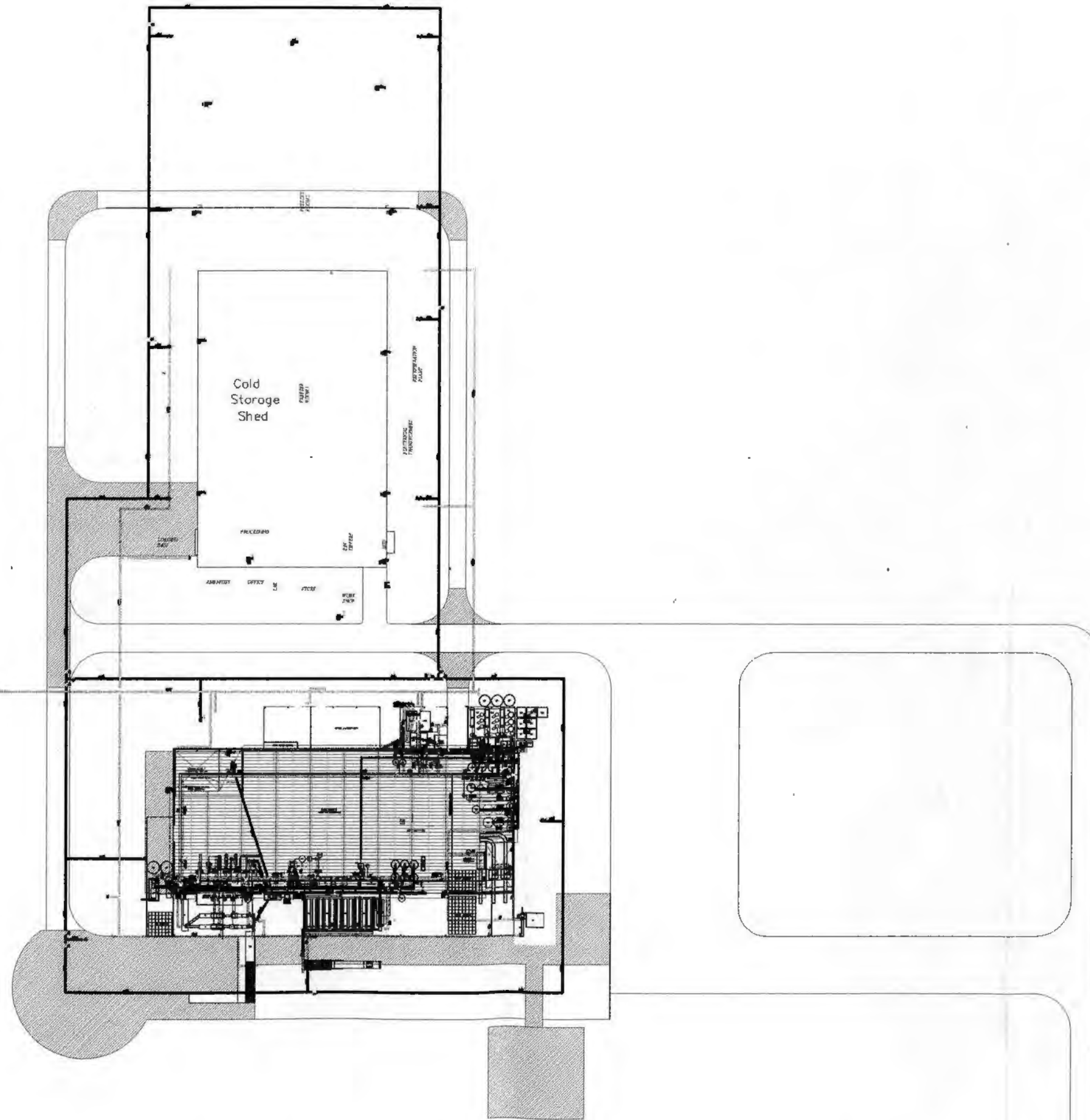
Not to scale  
North →

## SITE PLAN

- A = Food Hall
- B = Freezer Complex
- C = Potable Water Pump Shed
- D = Anaerobic Lagoon 1 (18ML)– Trade Waste System
- E = Aerobic Lagoon 2 (11ML)– Trade Waste System
- = Snake dam – Lagoon 3 (100 ML)– Holding Dam Trade waste System
- F = Weighbridge
- G = Raw water Supply Dam
- H = Fire Water & Stormwater Dam (5Mgl)
- Pink Line section past weighbridge and in/around Food hall & Freezer = sealed road
- Red Line section is Crawford Road
- Blue Line section is feed channel to Potable Water System
- Green line shows stormwater flow
- Yellow line shows stormwater channel

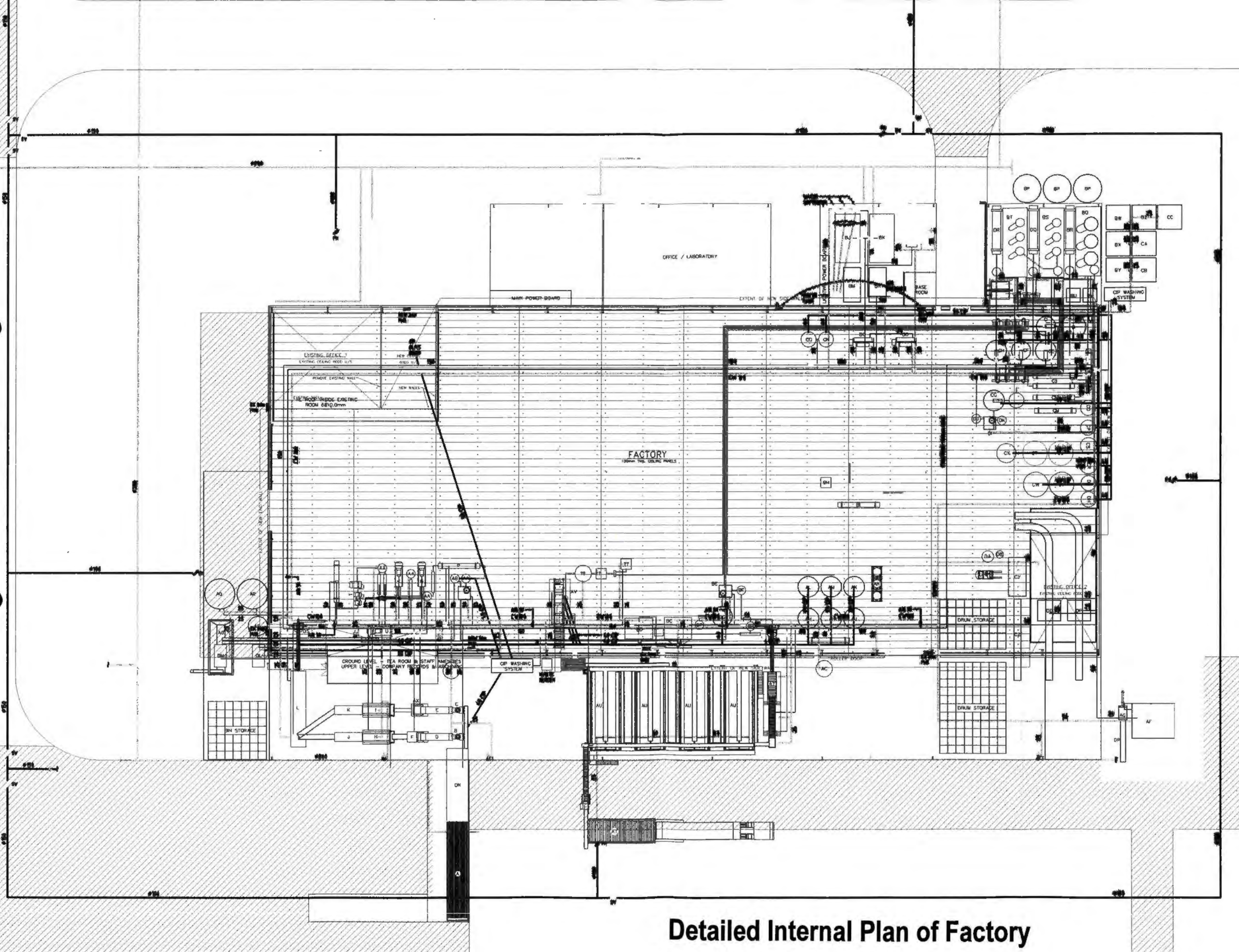
**FIGURE 3**  
**Detailed Plan of Modified Food Processing Plant**





**Detailed Site Plan of Food Processing Plant**





Detailed Internal Plan of Factory



## APPENDIX A



NSW GOVERNMENT  
Department of Planning

RECEIVED

30 JAN 2006

24 January 2006

Contact: Ann-Maree Carruthers  
Phone: 02 9228 6550  
Fax: 02 9228 6466  
Email: Ann-Maree.Carruthers@dipnr.nsw.gov.au

Our ref: S99/01625

Mr Warwick Horsfall  
Habitat Planning  
609 Olive Street  
ALBURY-WODONGA NSW 2640

Dear Mr Horsfall

**Proposed Modification of a Food Processing Plant, Crawford Road, Willbriggie**

I refer to your correspondence and supporting documentation seeking advice as to the appropriate assessment process for a modification to the development consent for a Food Processing Plant issued by the then Minister for Urban Affairs and Planning on 1 December 2000 and the requirements for the preparation of the relevant supporting documentation.

Further to your discussions with Chris Ritchie of this office regarding the appropriate assessment process for the application and based on the information you have provided, the Department considers the proposal is substantially the same development and is of minimal environmental impact. Therefore, a Section 96(1A) modification application under the *Environmental Planning and Assessment (EP&A) Act 1979* will be required. A statement of environmental effects (SEE) will need to be prepared to support the modification application and the SEE is required to address the matters outlined in Attachment 1.

The Department must be consulted at least one week prior to the lodgement of the modification application. This consultation is necessary to confirm the number of SEE required for the assessment of the application, applicable modification application fees, and any other relevant arrangements for lodgement of the application. Please note that clause 258 of the *Environmental Planning and Assessment Regulation 2000* prescribes the application fee for modifications.

If you have any queries in relation to this matter please contact Ann-Maree Carruthers on 9228 6550.

Yours sincerely,

Scott Jeffries  
Manager – Manufacturing and Rural Industries  
Major Development Assessment



## ATTACHMENT NO. 1: REQUIREMENTS FOR THE PREPARATION OF THE SEE

The SEE must include an assessment of the following issues:

### Statutory requirements

- identification of the conditions of consent that are required to be modified by this Application;
- consideration of relevant Environmental Planning Instruments, particularly the *Griffith Local Environment Plan 2002*. The consideration of the proposal and the LEP shall include an assessment of the permissibility of the proposed development, and a consideration of the zone objectives that apply to the DA area; and
- justification for the use of section 96(1A) to modify the consent, by demonstration that the development as modified would be substantially the same development as the approved development and of minimal environmental impact.

### Site details

- a description of the environment of the area;
- a detailed description of all elements of the development and the land on which these elements are to be located;
- a clear map describing the original development as approved and the proposed development; and
- a schedule of property descriptions to which this application applies, together with ownership details. This must clearly identify any additional parcels of land which were not previously included as land to which the Development Consent granted by the Minister on 1 December 2000, and any subsequent modifications to that consent, applied.

### Functions of the plant

- a detailed description of how the plant will be operated and how this will differ from the already approved plant.

### Waste management

- a detailed waste assessment of the proposal, which describes the proposed waste management system and how that differs from the existing system and identifies all waste, including wastewater and food wastes, generated by the proposal and describes any proposals to store, treat, reuse, or dispose of this waste.

### Air and Noise

- an air quality assessment of the proposed modification, particularly with regards to odour and particulate matter. The air quality assessment for odour and particulate matter must be carried out in accordance with the EPA's *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW (2005)*. Potential impacts on any nearby private properties or sensitive receptors must be considered;
- a noise impact assessment of the proposed modification, particularly resulting from all noise sources associated with the proposal in accordance with the EPA's *Industrial Noise Policy (2000)*. Potential impacts on any nearby private properties or sensitive receptors must be considered.

### Traffic and Transport

- details of any additional transport movements that will be generated by the proposed modification, including details of the types of vehicles generated by the application.

### Water quality and soils

- details of the potential impacts of the proposal on local and regional groundwater and surface water quality and quantity, including any impacts on surrounding irrigation supply channels, and any measures to mitigate these impacts.

### Agency consultation

- details and documentation of consultation undertaken with key government agencies concerning the proposed development, including with Griffith City Council, Department of Environment and Conservation, and any other relevant local, State, and Commonwealth government authorities, and address any issues they may raise in the SEE.

#### Miscellaneous

- an assessment of all other potential environmental impacts of the proposed modifications, by reference to the relevant matters in section 79C of the *Environmental Planning and Assessment Act, 1979*.

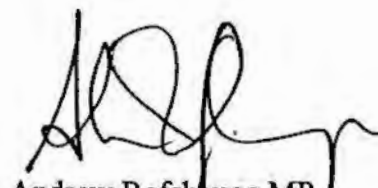


**DETERMINATION OF A DEVELOPMENT APPLICATION  
FOR STATE SIGNIFICANT, DESIGNATED & INTEGRATED DEVELOPMENT  
UNDER SECTION 80 OF THE ENVIRONMENTAL PLANNING AND  
ASSESSMENT ACT 1979**

I, the Minister for Urban Affairs and Planning, determine the Development Application referred to in Schedule 1 - under Sections 76A, 80, 80A, 91 & 92 of the Environmental Planning and Assessment Act 1979 and Clause 8 of State Environmental Planning Policy No. 34 - Major Employment Generating Industrial Development - by granting consent to the application subject to the conditions set out in Schedule 2.

The reasons for imposing these conditions are to:

- (i) minimise any adverse environmental effects of the development;
- (ii) provide for the on-going environmental management of the development; and
- (iii) provide for regular environmental monitoring and reporting on the future performance of the development.



Andrew Refshauge MP  
Minister for Urban Affairs and Planning

Sydney

1 Dec

2000

File No. S99/01625

**SCHEDULE 1**

Application made by:

Parle Foods Pty. Ltd. ("The Applicant")

To:

The Minister for Urban Affairs and Planning ("the Minister")

In respect of:

Lots 76 and 77, DP 751686

For the following  
development:

The construction and operation of a food processing plant, a dry storage shed, a cold storage shed, a water storage dam (110ML), a wastewater storage and treatment dam (4ML), a stormwater retention pond (5ML), an ornamental lake, landscaping, and a range of support infrastructure, such as an administration building, weighbridge, a product handling and hardstand area, a package sewerage treatment system, and a car park.

<b>Development Application:</b>	DA No. 303-08-00 lodged with the Department of Urban Affairs and Planning on 25 August 2000, accompanied by an EIS prepared for Parle Foods by Coffey, dated 3 August 2000.	
<b>State Significant Development:</b>	Under Section 76A(7) of the Act, the proposed development is classified as State Significant development because it satisfies the criteria in Schedule 1 of <i>State Environmental Planning Policy No. 34 - Major Employment Generating Industrial Development</i> as it is a "food or beverage processing facility that will employ over 100 people full-time.	
<b>Integrated Development:</b>	Under Section 91 of the Act, the proposed development is classified as Integrated development because it requires separate approvals from the Environment Protection Authority under <i>Protection of the Environment Operations Act 1997</i> ; and Griffith City Council under Section 138 of the <i>Roads Act 1993</i> . Both the EPA and Council have granted their General Terms of Approval for the proposed development.	
<b>BCA Classification:</b>	Cold Storage Shed:                      Class 7 Dry Storage Shed:                      Class 8 Processing Plant:                      Class 8 Administration Building:              Class 5	
<b>NOTE:</b>	1) To work out when this consent becomes effective, refer to Section 83 of the Act; 2) To work out when this consent is liable to lapse, refer to Section 95 of the Act; and 3) If the Applicant is dissatisfied with this determination, Section 97 of the Act grants him or her a right of appeal to the Land and Environment Court, which is exercisable within 12 months of receiving notice of this determination.	

## SCHEDULE 2

### CONDITIONS OF DEVELOPMENT CONSENT

#### DEFINITIONS

The Act	Environmental Planning and Assessment Act 1979
The Applicant	Parle Foods Pty Ltd
BOD:	Biological Oxygen Demand
Council	Griffith City Council
DA	Development Application



The Department  
The Director-General

DLWC  
EIS  
EMP  
EPA  
GTA  
L<sub>AEQ15min</sub>

M  
MI  
ML

The Department of Urban Affairs and Planning  
The Director-General of the Department of Urban  
Affairs and Planning, or her delegate  
The Department of Land and Water Conservation  
Environmental Impact Statement  
Environmental Management Plan  
Environment Protection Authority  
General Terms of Approval  
Average noise level, when measured over a 15  
minute period.  
Metres  
Murrumbidgee Irrigation  
Megalitres

## GENERAL

### Obligation to Minimise Harm to the Environment

1. The Applicant must implement all practicable measures to prevent or minimise any harm to the environment that may result from the construction, operation, and where relevant, the decommissioning of the development.

### Terms of Approval

2. The Applicant must carry out the development generally in accordance with the:
  - (a) DA No. 303-08-00 submitted to the Department of Urban Affairs and Planning;
  - (b) Environmental Impact Statement, titled "Proposed Food Processing Plant", dated 3 August 2000, and prepared by Coffey for Parle Foods Pty Ltd;
  - (c) Additional information supplied to the Environment Protection Authority by Coffey on 18 September 2000<sup>1</sup>, and the Department of Urban Affairs and Planning by Coffey on 8 and 25 September 2000, 12 and 24 October 2000, and 9 November 2000;
  - (d) Relevant prescribed conditions in clause 78 of the *Environmental Planning & Assessment Regulation 1994*; and
  - (e) These conditions.

If there is any inconsistency between the above, these conditions must prevail.

### Restriction on Operations

3. The food processing plant must not process more than 200,000 tonnes of fruit and vegetables a year.

*Note: Any increase above 200,000 tonnes of fruit and vegetables a year will require further assessment under the Act.*

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<sup>1</sup> EPA GTA A1.1

### **Structural Adequacy**

4. Before any construction work starts, the Applicant must obtain a construction certificate for the proposed development from the Principal Certifying Authority.
5. Before commissioning the development, the Applicant must obtain an occupation certificate for the development from the Principal Certifying Authority.

### **COMPLIANCE & COMPLIANCE REPORTS**

6. Throughout the life of the development, the Applicant must secure, renew, maintain, and comply with all the relevant statutory approvals applying to the development.
7. The Applicant must ensure that all contractors and sub-contractors are aware of, and comply with, the conditions of this consent and the approved Construction Management Plan (see Conditions 10-11).
8. At least two weeks before construction starts, the Applicant must certify in writing to the Director-General that it has obtained all the necessary statutory approvals for the construction works, and complied with all the relevant conditions of this consent and/or any other statutory requirements for this development.
9. At least two weeks before commissioning the food processing plant, the Applicant must certify in writing to the Director-General that it has obtained all the necessary statutory approvals for operations, and complied with all the relevant conditions of this consent and/or any other statutory requirements for this development.

### **ENVIRONMENTAL MANAGEMENT PLANS**

#### **Construction Management Plan**

10. The Applicant must prepare and implement a Construction Management Plan for development. This plan must:
  - (a) Describe the proposed construction works;
  - (b) Outline the proposed construction work program;
  - (c) Identify all the relevant statutory requirements and conditions of consent that apply to the construction phase of the development;
  - (d) Set standards and performance measures for each of the relevant environmental matters associated with the construction work;
  - (e) Describe what actions and measures will be implemented to mitigate the potential impacts of the construction works, and to ensure that these works will comply with the relevant standards and performance measures;
  - (f) Describe in detail what measures and procedures will be implemented to:
    - Manage construction traffic;
    - Mitigate any potential dust impacts;
    - Prevent soil contamination;
    - Register and respond to complaints during the construction period;
    - Ensure the occupational health and safety of construction workers;



- Respond to any emergencies; and
  - Respond to the discovery of any archaeological relics or sites during site works.
- (g) Explain how the environmental performance of the construction works will be monitored, and what actions will be taken if any non-compliance is detected;
  - (h) Describe the role, responsibility, authority, accountability, and reporting of key personnel involved in the construction of the development;
  - (i) Include a Soil and Water Management Plan which describes what measures will be used to minimise soil erosion and the discharge of sediment and other pollutants to nearby land or water during construction activity. This plan must be prepared in accordance with the requirements for such plans in the Department of Housing's publication "*Managing Urban Stormwater: Soils and Construction*", which is available from the EPA<sup>2</sup>;
  - (j) Include a detailed Stormwater Management Scheme for the development, which has been prepared in consultation with Council, to mitigate the impacts of stormwater runoff from the development and its operations. This scheme must be consistent with any stormwater plans for the catchment or, in the absence of these plans, in accordance with the guidance in the publication "*Managing Urban Stormwater: Council Handbook*", which is available from the EPA<sup>3</sup>;
  - (k) Include the detailed design of the sewage treatment system that has been endorsed by Council; and
  - (k) Include a detailed Landscape Management Plan (see Conditions 66-68).
11. No construction work may occur before this plan has been approved by the Director-General.

#### Environmental Management Plan

12. The Applicant must prepare and implement an Environmental Management Plan for all future operations at the site. This plan must:
  - (a) Describe the proposed operations;
  - (b) Identify all the relevant statutory requirements that apply to the operation of the development;
  - (c) Set standards and performance measures for each of the relevant environmental issues;
  - (d) Describe what actions and measures will be implemented to mitigate the potential impacts of the development, and to ensure that the development meets these standards and performance measures;
  - (e) Describe what measures and procedures will be implemented to:
    - Register and respond to complaints;
    - Ensure the operational health and safety of the workers, and
    - Respond to potential emergencies, such as plant failure;
  - (f) Describe the role, responsibility, authority, and accountability of all the key personnel involved in the operation of the development;

<sup>2</sup> EPA GTA 05.1

<sup>3</sup> EPA GTA 06.1

- (g) Incorporate the detailed Environmental Monitoring Program (see Conditions 16-26); and
  - (h) Include the following:
    - An Wastewater Irrigation Management Plan (see Conditions 59-62);
    - A Food Waste Management Plan (see Conditions 63-65);
    - A Sludge Management Plan (see Conditions 69-71); and
    - A Bushfire Control Plan.
13. The Applicant must ensure that a copy of the Environmental Management Plan is publicly available.
14. The Applicant must review and update this Environmental Management Plan regularly, or as directed by Director-General.
15. The Environmental Management Plan must be approved by the Director-General before the food processing plant may be commissioned.

#### **ENVIRONMENTAL MONITORING PROGRAM**

16. The Applicant must prepare and implement a detailed Environmental Monitoring Program for the development in consultation with the DLWC, the EPA, and Griffith City Council. The program must:
- (a) Identify what environmental issues will be monitored;
  - (b) Set standards and performance measures for these environmental issues;
  - (c) Describe in detail how these issues will be monitored, who will conduct the monitoring, how often the monitoring will be conducted, and how the results of this monitoring will be recorded and reported to the Director-General and other relevant authorities;
  - (d) Indicate what actions will be taken, or procedures followed, if any non-compliance is detected; and
  - (e) Include the following:
    - A Potable Water Monitoring Program to ensure that the drinking water meets WHO and NHMRC standards;
    - A Noise Compliance Monitoring Program to determine the level of compliance with the noise criterion in Condition 32;
    - A Stormwater Quality Monitoring Program to determine the concentration of each pollutant in the stormwater that is used for irrigation; and
    - Wastewater, Groundwater, Soil, and Noise Monitoring (see below).

#### **Wastewater Monitoring**

17. The Applicant must monitor the quality of the wastewater used for irrigation<sup>4</sup> to determine the concentration of each pollutant, using the units of measure, frequency, and sampling method specified in the table below:

---

<sup>4</sup> EPA GTA P1.1 and M2.1



Pollutant	Units of Measure	Frequency	Sampling Method
Ammonia Nitrogen	mg/L	Every 6 Months	Grab Sample
BOD	mg/L	Every 6 Months	Grab Sample
EC	US/cm	Every 6 Months	Grab Sample
Nitrate + Nitrite	mg/L	Every 6 Months	Grab Sample
Potassium	mg/L	Every 6 Months	Grab Sample
Total Kjeldah Nitrogen	mg/L	Every 6 Months	Grab Sample
Total Phosphorous	mg/L	Every 6 Months	Grab Sample
Total Suspended Solids	mg/L	Every 6 Months	Grab Sample
pH	pH	Every 6 Months	Grab Sample

18. The Applicant must monitor the volume of wastewater entering the wastewater holding dam each day<sup>5</sup>.
19. The Applicant must monitor the volume of wastewater being used for irrigation continuously, in KL/day, using a flow meter and continuous logger.

#### Groundwater Monitoring

20. The Applicant must monitor the quality of the groundwater at a number of locations<sup>6</sup>, to be determined in consultation with DLWC and the EPA, to determine the concentration of each pollutant, using the units of measure, frequency, and sampling method specified in the table below:

Pollutant	Units of Measure	Frequency	Sampling Method
pH	pH	Yearly	Grab Sample
EC	dS/m	Yearly	Grab Sample
Total Suspended Solids	mg/L	Yearly	Grab Sample
Total Phosphorous	mg/L	Yearly	Grab Sample
Total Kjeldah Nitrogen	mg/L	Yearly	Grab Sample
Nitrate	mg/L	Yearly	Grab Sample
BOD	mg/L	Yearly	Grab Sample
Total Dissolved Solids	mg/L	Yearly	Grab Sample

21. The Applicant must install piezometers in the wastewater irrigation areas. The number and specific location of these piezometers must be approved in writing by the EPA<sup>7</sup>.

#### Soil Monitoring

22. The Applicant must monitor the quality of the soil in the area used for wastewater irrigation<sup>8</sup> to determine the concentration of each pollutant, using the units of measure, frequency, and sampling method specified in the table below:

<sup>5</sup> EPA GTA M3.1

<sup>6</sup> EPA GTA P1.1 and M2.1

<sup>7</sup> EPA GTA O7.1

<sup>8</sup> EPA GTA P1.1 and M2.1

Pollutant	Units of Measure	Frequency	Sampling Method
pH	pH	Yearly	Special Frequency 1
EC	dS/m	Yearly	Special Frequency 1
Phosphorous	ppm	Yearly	Special Frequency 1
Nitrate	ppm	Yearly	Special Frequency 1
Exchangeable Sodium	ppm	Yearly	Special Frequency 1
Exchangeable Potassium	ppm	Yearly	Special Frequency 1
Exchangeable Calcium	ppm	Yearly	Special Frequency 1
Exchangeable Magnesium	ppm	Yearly	Special Frequency 1
Total Organic Carbon	%	Yearly	Special Frequency 1

**Notes:**

- *Special frequency 1 means the collection of representative samples from surface soils (0-15cms) and sub-soils (45-60cms).*
- *The monitoring required in Conditions 17,20, and 22 must be conducted in accordance with the methodology in the Approved Methods Publication, or in accordance with a method approved in writing by the EPA before any tests are conducted.*

**Noise Monitoring**

23. The Applicant must monitor noise levels at the Dick Thompson farmhouse (see Figure 1 on page 44 of the EIS) from December to April each year unless directed otherwise by the Director-General.

**General**

24. The Environmental Monitoring Program must have been approved by the Director-General before the plant may be commissioned.
25. After reviewing the Environmental Monitoring Program, the Director-General may require the Applicant to address certain matters identified in the program. The Applicant must comply with any reasonable requirements of the Director-General.
26. The Applicant must include the detailed results from the Environmental Monitoring Program in the Annual Environmental Management Report to the Director-General.

**ANNUAL ENVIRONMENTAL MANAGEMENT REPORT**

27. Twelve months after commissioning the food processing plant, and annually thereafter for the duration of the development, the Applicant must submit an Annual Environmental Management Report to the Director-General and EPA. This report must:
  - (a) Identify all the standards, performance measures, and statutory requirements the development is required to comply with;
  - (b) Review the environmental performance of the development to determine whether it is complying with these standards, performance measures, and statutory requirements.



- (c) Identify all the occasions during the previous year when these standards, performance measures, and statutory requirements have not been complied with;
  - (d) Include a summary of any complaints made about the development, and indicate what actions were taken (or are being taken) to address these complaints;
  - (e) Include the detailed reporting from the Environmental Monitoring Program (see Conditions 16-26), and identify any trends in the monitoring over the life of the project; and
  - (f) Where non-compliance is occurring, describe what actions will be taken to ensure compliance, who will be responsible for carrying out these actions, and when these actions will be implemented.
28. After reviewing the Annual Environmental Management Report, the Director-General may require the Applicant to address certain matters identified in the report. The Applicant must comply with any reasonable requirements of the Director-General.

#### INDEPENDENT ENVIRONMENTAL AUDIT

29. Within 12 months of commissioning the food processing plant, and every three years thereafter, unless the Director-General directs otherwise, the Applicant must commission and pay the full cost of an Independent Environmental Audit. The Independent Environmental Audit must:
- (a) Be conducted by a suitably qualified, experienced, and independent person whose appointment has been endorsed by the Director-General;
  - (b) Be consistent with *ISO 14010 – Guidelines and General Principles for Environmental Auditing*, and *ISO 14011 – Procedures for Environmental Auditing*, or updated versions of these guidelines/manuals;
  - (c) Assess the environmental performance of the development, and its effects on the surrounding environment;
  - (d) Assess whether the development is complying with the relevant standards, performance measures, and statutory requirements;
  - (e) Review the adequacy of the Applicant's Environmental Management Plan, and Environmental Monitoring Program; and, if necessary,
  - (f) Recommend measures or actions to improve the environmental performance of the plant, and/or the environmental management and monitoring systems.
30. Within 2 months of commissioning the audit, the Applicant must submit a copy of the audit report to the Director-General. After reviewing the report, the Director-General may require the Applicant to address certain matters identified in the report. The Applicant must comply with any reasonable requirements of the Director-General.

#### DISPUTE RESOLUTION

31. If the Applicant, Griffith City Council, and/or any NSW Government agency, other than the Department of Urban Affairs and Planning, cannot agree on any aspect of this consent, other than a General Term of Approval, the matter may be

referred by any of these parties to the Director-General or, if necessary, the Minister, whose determination on the dispute shall be binding on all parties.

## ENVIRONMENTAL STANDARDS AND CONDITIONS

### Noise

32. Noise emissions from the operation of the food processing plant must not exceed the following criterion<sup>9</sup>:

Time	L <sub>Aeq</sub> , (15 minute)
Daytime (7am to 6pm)	40 dB(A)
Evening (6pm to 10pm)	40 dB(A)
Nighttime (10pm to 7am)	35 dB(A)

#### Notes:

- For the purpose of noise measurements required for this condition:
    - a) the L<sub>Aeq</sub> noise level must be measured or computed over a period of 15 minutes using "FAST" response on the sound level meter.
    - b) 5dBA must be added to the measured level if the noise is substantially tonal or impulsive in character. The location or point of impact can be different for each development, for example, at the closest residential receiver or at the closest boundary of the development. Measurement locations can be:
      - 1 metre from the facade of the residence for night-time assessment;
      - at the residential boundary;
      - 30 metres from the residence (rural situations) where boundary is more than 30 metres from residence.
  - Noise from the premises is to be measured at the nearest sensitive receiver or at any other impacted residential premises to determine compliance with this condition.
  - The noise emission limits identified in this condition apply for prevailing meteorological conditions (winds up to 3m/s), except under conditions of temperature inversions. Noise impacts that may be enhanced by temperature inversions must be addressed by:
    - (a) documenting noise complaints received to identify any higher level of impacts or patterns of temperature inversions;
    - (b) where levels of noise complaints indicate a higher level of impact then actions to quantify and ameliorate any enhanced impacts under temperature inversions conditions should be developed and implemented.
33. The Applicant must provide noise mitigation measures to the residences surrounding the intersection of Crawford Road and Kidman Way if it receives a written request from the owner/s of these residences and the noise levels at these residences exceed the relevant road noise criteria in the EPA's publication *Environmental Criteria for Road Traffic Noise*. If required, these mitigation measures must be implemented to the satisfaction of the Director-General.

### Water Supply

34. The Applicant must ensure that the potable water supply of the development complies with the relevant WHO and NHMRC standards at all times.

<sup>9</sup> EPA GTA L4.1



## Surface Water and Groundwater

35. The wastewater treatment system described in the EIS must be constructed and fully operational before the food processing plant may be commissioned.
36. The amount of wastewater applied to the land via irrigation must not exceed 3,000 ML/day<sup>10</sup>.
37. Before commissioning the food processing plant, the Applicant must install earthen bunds around the areas used for wastewater irrigation to ensure that no stormwater or wastewater from this area will enter the MI supply or drainage channels during a 1 in a 100 year flood event.
38. The Applicant must install bunds around the processing plant area, which are capable of retaining all water on-site during a 1:100 year flood event.
39. The Applicant must install a pollution control device in the drainage system for the development to remove any oil, fuel, or chemical deposits from the stormwater which will be stored in the stormwater retention pond.
40. All dams and ponds must be designed and constructed in accordance with the considerations and recommendations in Appendix D of the EIS.
41. The walls and base of the wastewater storage dam must be constructed with compacted clay liner with a permeability coefficient of less than  $1 \times 10^{-9}$  m/sec to ensure that an impervious barrier is maintained between the effluent and surrounding groundwater<sup>11</sup>.
42. The Applicant must not direct any sludge from food processing activities to Council's sewerage treatment plant for disposal.

## Sewerage

43. The Applicant must design and install the in-ground sewage treatment tanks so that no stormwater can enter the tanks during a 1 in 100 year flood event.
44. The Applicant must install bunds around the storage tank/s for the treated wastewater from the sewerage which will be able to accommodate 110% of the volume of the tank/s.
45. The Applicant must inspect and maintain the underground sewage storage tanks and lines regularly to ensure that no leaks are occurring.

## Dust

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<sup>10</sup> EPA GTA L3.1

<sup>11</sup> EPA GTA O7.3

46. All activities in or on the premises must be carried out in a manner that will minimise the generation, or emission from the premises, of wind-blown or traffic generated dust using the measures proposed in the EIS<sup>12</sup>.
47. All areas in or on the premises must be maintained in a manner that will minimise the generation, or emission from the premises, of wind-blown or traffic generated dust, using the measures proposed in the EIS<sup>13</sup>.

#### **Parking**

48. Before the plant may be commissioned, the Applicant must design and construct at least 120 new car parking spaces on the site in accordance with Council's Car Parking Code.

#### **Road Works<sup>14</sup>**

49. Crawford Road must be reconstructed and sealed from the Kidman Way intersection to a distance of 50 metres past the main access to farm 1059 before the new plant is commissioned. The total construction width of the road is to be 10 metres, comprising an 8 metre wide carriageway with 1 metre wide shoulders. The bitumen sealing must be 8 metres wide and conform to Council's Development Manual and the RTA's standards.
50. The intersection of Kidman Way and Crawford Road must be upgraded to include a type CHR (Right Turn Treatment) treatment with painted islands and a type AUL (Auxiliary Land Left Turn) treatment. The design of these treatments must comply with the RTA's Road Design Guide, and take into account existing and proposed traffic movements.
51. Pavement design and sealing treatment must conform with the provisions in Council's Development Manual, draft Development Control Plan No. 23, and the RTA's standards.
52. A traffic control plan must be submitted to – and approved by – Council before any road works may start. This plan must satisfy the provisions of Australian Standard 1742.3, and must be complied with during the road works.
53. Detailed road design plans must be submitted to – and approved by Council's Director of Engineering Services before any road works may start. The plans must include the designs, calculations, and specifications for all proposed works, and must conform with Council's Development Manual, draft Development Control Plan No. 23, and the RTA's specifications and guidelines.

#### **Waste**

54. The Applicant must not cause, permit, or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing,

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<sup>12</sup> EPA 03.1

<sup>13</sup> EPA GTA 03.2

<sup>14</sup> Griffith City Council GTAs



reprocessing, or disposal; or any waste generated at the premises to be disposed at the premises, except as expressly permitted by a licence under the Protection of the Environment Operations Act 1997<sup>15</sup>.

*Note: This condition only applies to the storage, treatment, processing, reprocessing or disposal of waste at the premises if it requires an environment protection licence under the Protection of the Environment Operations Act 1997.*

55. Before the processing plant may be commissioned, the Applicant must obtain the Council's approval for the disposal of solid wastes to Council's landfill.

#### **Storage of Chemicals and Fuels**

56. Chemicals, fuels and oils must be stored in concrete lined, covered and bunded areas. Spill cleanup kits and procedures must be made available and used in the event of a spill.

#### **Fire Water**

57. The Applicant must ensure that there is sufficient water in the water storage dam at all times to supply the maximum water requirements of the development's firefighting system.

#### **Lighting**

58. The Applicant must ensure that any external lighting associated with the development is mounted, screened, and directed in such a manner so as not to create a nuisance to surrounding land uses. The lighting must be the minimum level of illumination necessary.

#### **WASTEWATER IRRIGATION MANAGEMENT PLAN**

59. The Applicant must prepare and implement a Wastewater Irrigation Management Plan for the irrigation areas in consultation with the EPA, DLWC, MI, and NSW Agriculture. This plan must:
- (a) Describe the wastewater irrigation system in detail, including the proposed crop and woodlot management scheme, the proposed irrigation recirculation system, the location of the proposed bunds and buffer areas, and the proposed sludge management scheme;
  - (b) Identify the standards and performance measures that will be used to evaluate the performance of the wastewater irrigation system;
  - (c) Describe what actions and measures will be implemented to minimise any adverse environmental impacts associated with the wastewater irrigation system, particularly the potential surface water, groundwater and soil impacts;
  - (d) Describe how the wastewater irrigation system will be managed and maintained over the life of the development;
  - (e) Explain how the performance of the irrigation system will be monitored; and
  - (f) Describe what actions or procedures will be implemented if the system fails or during rain periods.

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<sup>15</sup> EPA GTA L4.1

60. The Wastewater Irrigation Management Plan must have been approved by the Director-General before the food processing plant may be commissioned.
61. After reviewing the Wastewater Irrigation Management Plan, the Director-General may require the Applicant to address certain matters identified in the plan. The Applicant must comply with any reasonable requirements of the Director-General.
62. Three years after the plant is commissioned, or as directed by the Director-General, the Applicant must conduct a detailed review of the Wastewater Irrigation Management Plan. Within two months of commissioning the review, the Applicant must submit a copy of the report on the review to the Director-General. After reviewing the report, the Director-General may require the Applicant to address certain matters identified in the review, and the Applicant must comply with any reasonable requirements of the Director-General.

#### **FOOD WASTE MANAGEMENT PLAN**

63. The Applicant must prepare and implement a Food Waste Management Plan for the development in consultation with the EPA, Council, and DLWC. This plan must:
  - (a) Describe in detail the food waste management system, including how the food waste will be stored on-site, transported, and disposed of off-site;
  - (b) Identify standards and performance measures for evaluating the effectiveness of this system;
  - (c) Describe what actions and measures will be implemented to minimise the adverse environmental impacts associated with the disposal of food waste from the plant, both on and off-site;
  - (d) Describe how the food waste management system will be managed and maintained over time;
  - (e) Explain how the performance of the food waste management system will be monitored over time; and
  - (f) Describe what actions or procedures will be implemented if the food waste management system is not complying with the relevant standards and performance measures.
64. The Food Waste Management Plan must have been approved by the Director-General before the food processing plant may be commissioned.
65. After reviewing the Food Waste Management Plan, the Director-General may require the Applicant to address certain matters identified in the plan. The Applicant must comply with any reasonable requirements of the Director-General.

#### **LANDSCAPE MANAGEMENT PLAN**

66. The Applicant must prepare and implement a Landscape Management Plan for the development, in consultation with Council. This plan must:
  - (a) Describe in detail the existing and proposed future landform of the site;
  - (b) Describe in detail how the site will be landscaped, including the location and species of all planting; and



(c) Explain how this landscaping will be managed and maintained over time.

67. The Landscape Management Plan must have been approved by the Director-General before construction certificate/s may be issued.
68. After reviewing the Landscape Management Plan, the Director-General may require the Applicant to address certain matters identified in the plan. The Applicant must comply with any reasonable requirements of the Director-General.

#### SLUDGE MANAGEMENT PLAN

69. The Applicant must prepare a Sludge Management Plan in consultation with the EPA and DLWC for the development. This plan must:
  - Describe in detail the sludge management system for all the dams and ponds on the property;
  - Demonstrate that the sludge from these dams and ponds will not damage the environment if it is used as fertiliser on the property; and
  - Describe what actions and measures will be implemented to minimise any adverse environmental impacts associated with the sludge management scheme.
70. The Sludge Management Plan must have been approved by the Director-General before any sludge from the dams on the property may be used as fertiliser.
71. After reviewing the Sludge Management Plan, the Director-General may require the Applicant to address certain matters identified in the plan, and the Applicant must comply with any reasonable requirements of the Director-General.

## APPENDIX B



## Carrot Juice Process Flow Sheet

Process Flowsheet for the production of Carrot Juice Concentrate	Process description
1. Harvest	remove from ground; cut of green top to crown
2. Wash	wash off soil
3. Sort	remove defective material
4. Weighbridge	record mass of product delivered
5. Receival Elevator	intake line to process stream
6. Weigh Controller	control flowrate of feed material
7. Destoner	remove any stones or foreign objects
8. Steam Peeler	loosen and partial removal of skin of carrot
9. Deskinner	remove skin of carrot
10. Washer	wash off any skin remnants
11. Sort	removal of any defective carrots
12. Water Blancher	preheat of carrot mass
13. Hammer Mill (2)	coarse size reduction of whole carrot
14. Mash Heat Exchanger	heat carrot mash to extraction temperature
15. Metal Detector	removal of any metallic objects
16. Fine milling	small particle size reduction for juice extraction
17. Juice Extraction	juice extraction by decanter
18. Juice Heat Exchanger	inactivate enzymes
19. Centrifugation	control of insoluble solids level
20. Pasteurization	Control of microbial status
21. Concentration	removal of water to required Brix level
22. Cooling	cooling of concentrate
23. Quality Control Analysis	standardize to specification; other QC checks
24. Filling	fill by weight to specification
25. Freezing	freezing of product
26. Quality Control Analysis	check of microbiological status, other parameters
27. Despatch	Pallet, containerize for export, etc

Prepared by:

Kelvin Kajewski (Technical Manager)  
8<sup>th</sup> July, 2002.



## Apple Juice Process Flow Sheet

Process Flowsheet for the production of Cloudy Apple Juice Concentrate		Process description
1. Weighbridge		Record mass of product delivered
2. Unloading Elevator		Transfer apples away from delivery transport
3. Cross conveyor		Transfer apples to de-leafer
4. De- Leafer		Removal of leaves from fruit
5. Cleated Incline Elevator/Cross conveyor		Transfer apples to storage bins
6. Storage Bins		Bulk storage of raw material (8 x 30 tonne)
7. Discharge conveyor/cross conveyor		Removing apples from storage bin
8. Destoner/pre wash hopper		Removal of stones or heavy metals, initial pre wash station
9. Incline elevator/high pressure wash station		High pressure wash to remove soil, etc
10. Incline elevator cont./detergent application		Application of detergent to wash fruit
11. Sort		Removal of any defective raw material
12. Brush washer		<ul style="list-style-type: none"> <li>• Pre rinse</li> <li>• Rinse</li> <li>• Final rinse</li> </ul>
13. Disintergration		<ul style="list-style-type: none"> <li>• Mashing of apples (Bellmer Hammermill x 2)</li> <li>• Addition of ascorbic acid</li> </ul>
14. Mash Tank		Feed tank to Belt Press (4.5kl)
15. Juice Extraction		Juice extraction by Belt Press (Bellmer)
16. Storage Tank		Feed tank to centrifuge (20kl)
17. Centrifugation		Control of pulp level (Alfa Laval BRPX 417)
18. Storage Tank		Feed tank to pasteurizer / evaporator (10kl)
19. Pasteurization		<ul style="list-style-type: none"> <li>• Heat stabilization of product (Spiroflo Heat Exchanger; 98°C/30 secs)</li> <li>• Stainless steel Duplex filter 100 mesh</li> </ul>
20. Concentration		Removal of water to required Brix level (De Ploeg Tubular evaporator)
21. Cooling		Cooling of concentrate (0°C ~ -5°C) <ul style="list-style-type: none"> <li>• Spiroflo</li> <li>• Tube in tube</li> <li>• Contherm (x2) – optional if required</li> </ul>



22. Batch Tanks	2 x 15500 and 2 x 16000 litre
23. Quality Control Analysis	Standardize to specification; other QC checks
24. Filling	<ul style="list-style-type: none"> <li>• Stainless steel Filter 60 mesh plus nylon stocking</li> <li>• Fill by weight to specification (236 kg nett)</li> <li>• Snorkel type drum filler (Neumo Packaging)</li> <li>• 100 micron closed head liner/60 micro open head liner</li> <li>• reconditioned steel drum (red/yellow); new lid; new locking ring</li> </ul>
25. Blast Freezing	Rapid freezing of product (min. 48 hours/-25°C)
26. Frozen Storage	General storage conditions (-18°C)
27. Despatch	Containerize for export (ship -18°C)

Prepared by:

Kelvin Kajewski (Technical Manager)

23<sup>rd</sup> March, 2001

## Orange Juice Process Flow Sheet

Process Flow sheet for the production of Orange Juice Concentrate - Citrus sinensis		Process description
1.	Weighbridge	record weight of product delivered
2.	Storage Bins	bulk storage of raw material
3.	Washer	removal of dust, scale etc.
4.	Sort (if required)	removal of any defective raw material
5.	Size grader	size fruit to suit extractor cup size
6.	Juice Extraction	juice extraction by Brown Citrus Extractors
7.	Finisher (primary)	removal of coarse pulp solids, rag, seeds, etc
8.	Hydroclone	removal of immature seeds, specks, etc.
9.	Finisher (secondary)	removal of pulp solids greater than 0.050 mm
10.	Pasteurization	enzyme inactivation – minimum 98°C for 30 secs
11.	Concentration	removal of water to required Brix level under vacuum
12.	Cooling	cooling of concentrate – below 5°C
13.	Quality Control Analysis	standardize to specification; other QC checks
14.	Filling	fill by weight to specification
		includes filter screen 60 mesh and metal magnet
15.	Frozen Storage	general storage conditions -18°C
16.	Despatch	pallet, container, etc.

8<sup>th</sup> March, 2005.

Prepared by:

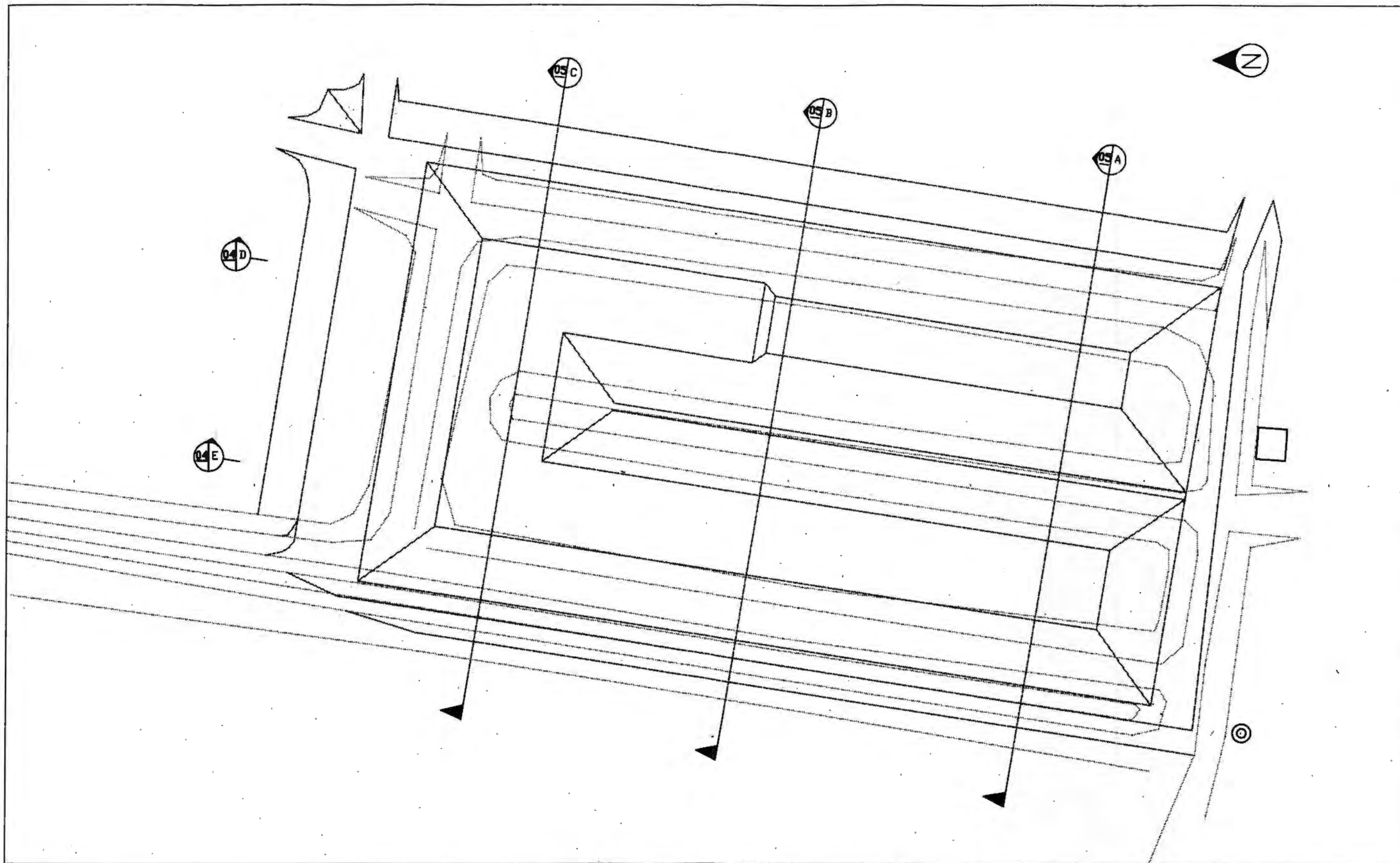
Kelvin Kajewski  
(General Manager)





## APPENDIX C

## APPENDIX D



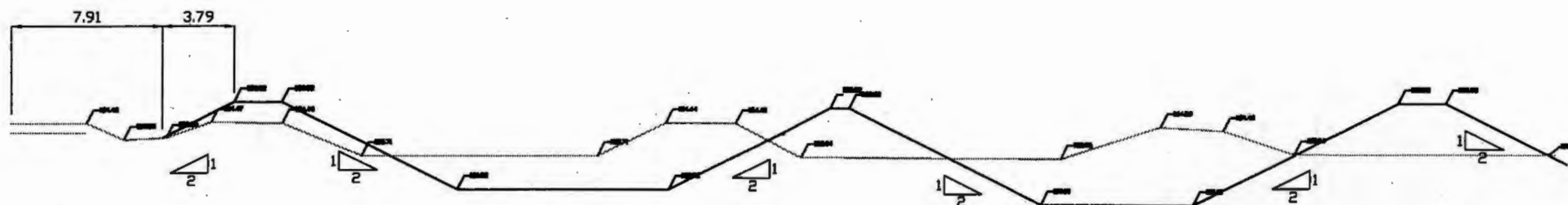


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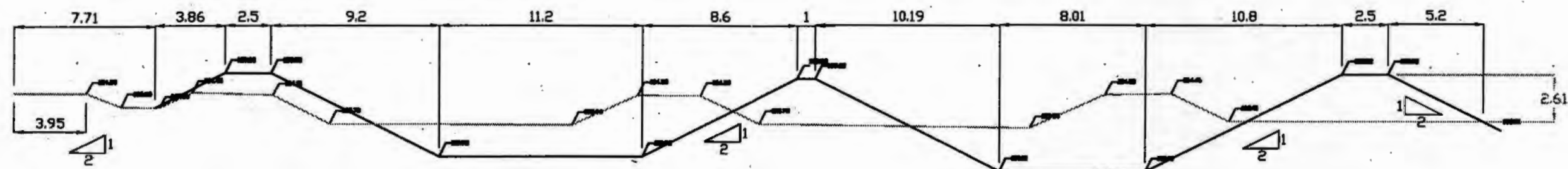




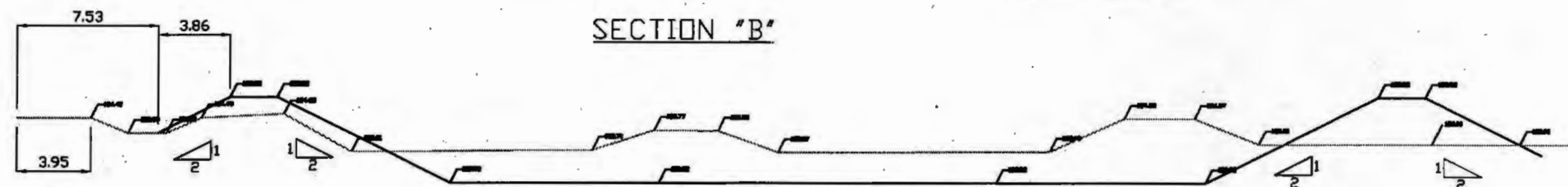






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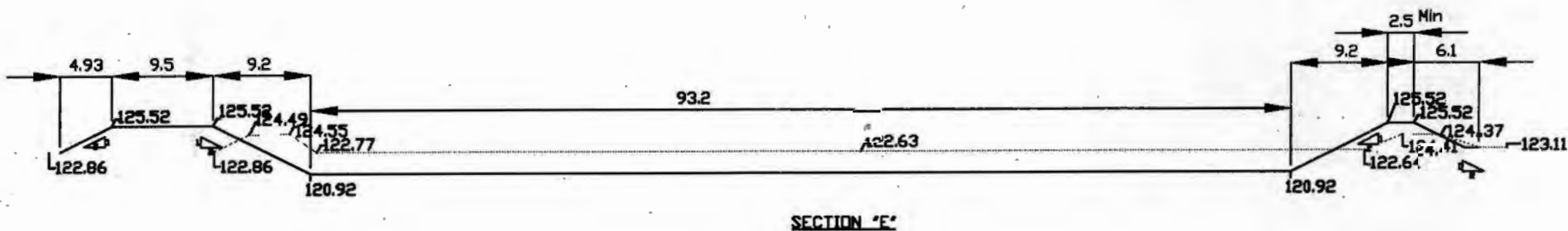
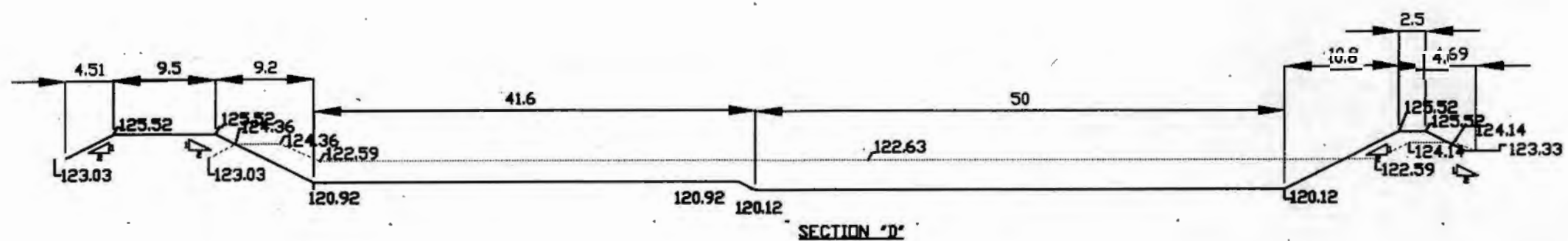




SECTION "B"



SECTION "C"

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B	9/02/06	PD	MMcJ	CHANGE HEIGHTS	MMcJ	SCALE 1:250	A Division of Gordon Services Pty Ltd			
A	20/12/05	PD	MMcJ	FOR APPROVAL						
REV	DATE	DRAWN	CHECKED	DESCRIPTION	APPROVED	THIRD ANGLE PROJECTION 	This work is the property of PMP Pty Ltd and is protected by copyright. The work and information contained herein is confidential and may not be copied, used or disclosed except with the current written authority of and in a manner permitted by PMP Pty Ltd.	JOB No: 083-06	Drg. No: 211105-083-05	



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B	9/02/06	PD	MMcJ	CHANGE HEIGHTS	MMcJ	SCALE 1:500	A Division of Gordon Services Pty Ltd			
A	19/12/05	PD	MMcJ	FOR APPROVAL						
REV	DATE	DRAWN	CHECKED	DESCRIPTION	APPROVED	THIRD ANGLE PROJECTION 	This work is the property of PMP Pty Ltd and is protected by copyright. The work and information contained herein is confidential and may not be copied, used or disclosed except with the current written authority of and in a manner permitted by PMP Pty Ltd.		JOB No: 083-06	Drg. No: 211105-083-04



## APPENDIX D

Coffey Geosciences Pty Ltd ACN 056 335 516

20 FEB 2006

## Engineering Log - Borehole

Client: **Nugan Quality Foods Pty Ltd**

Principal:

Project: **Effluent Dam, Crawford Road, Hanwood, NSW.**Borehole Location: **Centre of Dam 1, Floor Level.**Borehole No. **BH1**

Sheet 1 of 1

Office Job No.: **AWL8823/1**Date started: **7.2.2006**Data completed: **7.2.2006**Logged by: **LMc**Checked by: **RB**

Coffey

drill model and mounting:				Hand Auger		Easting:		slope: -90°		R.L. Surface: ESL			
hole diameter:				75 mm		Northing		bearing:		datum:			
drilling information						material substance							
method	penetration	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material  soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations
1	2	3											
HA		N						CH	CLAY: High plasticity, grey, traces of fine to medium grained sand.	D	Fb		ALLUVIUM
						0.5		CH	CLAY: High plasticity, brown, orange, traces of fine to medium grained sand.	M	St		
								CH	CLAY: High plasticity, brown, yellow, traces of fine to coarse grained sand.		VS		
						1.0		CL	CLAY: Medium to high plasticity, light brown, yellow, traces of fine to medium grained sand.		St		
						1.5							
						2.0		CH	CLAY: Medium to high plasticity, yellow, grey, some fine to coarse grained sand, traces of fine to medium grained gravel (Calcite).		SVst		
						2.0		CH	CLAY: High plasticity, yellow, grey, traces of fine to coarse grained sand.				
						2.5			Borehole BH1 terminated at 2.2m				
						3.0							
						3.5							
						4.0							

method	support	notes, samples, tests	classification symbols and soil description based on unified classification system	consistency/density index
AS AD RR W CT HA DT B V T *bit shown by suffix e.g. ADT	auger screwing* auger drilling* roller/tricone washbore cable tool hand auger diatube blank bit V bit TC bit 10/1/98 water level on date shown water inflow water outflow	M mud C casing penetration 1 2 3 4 no resistance ranging to refusal water 10/1/98 water level on date shown water inflow water outflow	U <sub>u</sub> undisturbed sample 50mm diameter U <sub>u</sub> undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Ba bulk sample E environmental sample R refusal	VS very soft S soft F firm St stiff VS <sub>t</sub> very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

BOREHOLE AB823.GPJ COFFEY.GDT 18.02.06

Form GEO 5.3 Issue 3 Rev.2



**Coffey**

20 FEB 2006

Albury Lab  
Coffey Geosciences Pty Ltd

1/314 Kiewa Street  
Albury NSW 2640

Telephone: (02) 6023 3799  
Facsimile: (02) 6023 3644

Report No: HDR:AWW06-0485

Issue No: 1

**Field Density: Hlf Density Ratio**

Client: Nugen Quality Foods Pty Ltd

Job No: AWL08823/01

Project: Effluent Storage Pond



The tests, calibrations or measurements covered by this document have been performed in accordance with NATA requirements which include the requirements of ISO/IEC 17025 and are traceable to national standards of measurement. This document may not be reproduced except in full.

Approved Signatory: Herbert Kaiserseder  
(Laboratory Manager)  
NATA Accredited Laboratory Number: 431  
Date of Issue: 13/02/2006

**Sample Details**

Field Test Procedure: AS1289.5.8.1  
Laboratory Test Procedures: AS 1289.5.7.1 (Standard Compaction), 2.1.1  
Client Request ID:  
Location: Crawford Road, Hanwood, NSW

Sample ID:	0001	0002	0003	0004
Date Tested:	7/02/2006	7/02/2006	7/02/2006	7/02/2006
Location Description:	Dam 1, Bottom of Bank, Southern End of Internal Wall, Dam Fill	Dam 1, Middle of Bank, Centre of Internal Wall, Dam Fill	Dam 1, Top of Bank, Northern End of Internal Wall, Dam Fill	Dam 1, Bottom of Bank, Southern End of Western Wall, Dam Fill

Depth of Test (mm):	250	250	250	250
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**Field and Laboratory Data**

	0001	0002	0003	0004
Percent Oversize on Wet Basis:	0	0	0	0
AS Sieve Used (mm):	19	19	19	19
Field Moisture Content (%):	17.5	14.5	16.0	7.0
Field Wet Density ( $\text{t/m}^3$ ):	1.46	1.37	1.46	1.61
Peak Converted Wet Density ( $\text{t/m}^3$ ):	1.80	1.83	1.71	1.59
Optimum Moisture Content (%):	22.5	20.0	25.0	22.0
Hlf Density Ratio (%):	81.0	74.5	85.0	101.0
Moisture Ratio (%):	78.0	73.0	63.5	31.5
Moisture Variation (%):	5.0 dry	5.5 dry	9.0 dry	15.5 dry

**Specification Requirements**

MINIMUM HLF DENSITY RATIO OF 98% of Standard Compaction (as advised by client)

Comments

**Coffey**

20 FEB 2006

Albury Lab  
Coffey Geosciences Pty Ltd1/314 Kiewa Street  
Albury NSW 2640Telephone: (02) 6023 3799  
Facsimile: (02) 6023 3644

Report No: HDR:AWW06-0485

Issue No: 1

**Field Density: Hlf Density Ratio**

Client: Nugen Quality Foods Pty Ltd

Job No: AWL08823/01

Project: Effluent Storage Pond



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Approved Signatory: Herbert Kaiserseder  
(Laboratory Manager)  
NATA Accredited Laboratory Number: 431  
Date of Issue: 13/02/2006**Sample Details**Field Test Procedure: AS1289.5.8.1  
Laboratory Test Procedures: AS 1289.5.7.1 (Standard Compaction), 2.1.1  
Client Request ID:  
Location: Crawford Road, Hanwood, NSW

Sample ID:	0005	0006	0007	0008
Date Tested:	7/02/2006	7/02/2006	7/02/2006	7/02/2006
Location Description:	Dam 1, Middle of Bank, Centre of Western Wall, Dam Fill	Top of Bank, Northern End of Western Wall, Dam 1	Dam 2, Top of Bank, Eastern End of Southern Wall, Dam Fill	Dam 2, Middle of Bank, Centre of Southern Wall, Dam Fill
Depth of Test (mm):	200	250	250	250

**Field and Laboratory Data**

Percent Oversize on Wet Basis:	0	0	0	0
AS Sieve Used (mm):	19	19	19	19
Field Moisture Content (%):	11.0	13.0	4.5	6.5
Field Wet Density (t/m <sup>3</sup> ):	1.46	1.55	1.68	1.62
Peak Converted Wet Density (t/m <sup>3</sup> ):	1.55	1.70	1.68	1.68
Optimum Moisture Content (%):	23.5	22.0	13.5	16.0
Hlf Density Ratio (%):	93.5	91.0	100.0	96.5
Moisture Ratio (%):	46.0	58.5	34.0	42.0
Moisture Variation (%):	14.5 dry	9.5 dry	10.0 dry	10.0 dry

**Specification Requirements**

MINIMUM HLF DENSITY RATIO OF 98% of Standard Compaction (as advised by client)

Comments



**Coffey**

20 FEB 2006

Albury Lab  
Coffey Geosciences Pty Ltd1/314 Kiewa Street  
Albury NSW 2640Telephone: (02) 6023 3799  
Facsimile: (02) 6023 3644**Field Density: Hlf Density Ratio**

Report No: HDR:AWW06-0485

Issue No: 1

Client: Nugen Quality Foods Pty Ltd

Job No: AWL08823/01

Project: Effluent Storage Pond



The tests, calibrations or measurements covered by this document have been performed in accordance with NATA requirements which include the requirements of ISO/IEC 17025 and are traceable to national standards of measurement. This document may not be reproduced except in full.

Approved Signatory: Herbert Kaiserseder  
(Laboratory Manager)  
NATA Accredited Laboratory Number: 431  
Date of Issue: 13/02/2006**Sample Details**

Field Test Procedure: AS1289.5.8.1  
 Laboratory Test Procedures: AS 1289.5.7.1 (Standard Compaction), 2.1.1  
 Client Request ID:  
 Location: Crawford Road, Hanwood, NSW

Sample ID:	0009	0010	0011	0012
Date Tested:	7/02/2006	7/02/2006	7/02/2006	7/02/2006
Location Description:	Dam 2, Bottom of Bank, Western end of Southern Wall, Dam Fill	Dam 2, Top of Bank, Southern End of Western Wall, Dam Fill	Dam 2, Middle of Bank, Centre of Western Wall, Dam Fill	Dam 2, Bottom of Bank, Northern End of Western Wall, Dam Fill

Depth of Test (mm):	250	250	250	250
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**Field and Laboratory Data**

Percent Oversize on Wet Basis:	0	0	0	0
AS Sieve Used (mm):	19	19	19	19
Field Moisture Content (%):	7.0	5.5	6.0	8.0
Field Wet Density (t/m <sup>3</sup> ):	1.54	1.57	1.54	1.45
Peak Converted Wet Density (t/m <sup>3</sup> ):	1.55	1.56	1.56	1.59
Optimum Moisture Content (%):	17.0	17.5	18.5	19.0
Hlf Density Ratio (%):	99.0	100.5	99.0	91.0
Moisture Ratio (%):	39.5	30.5	33.0	42.0
Moisture Variation (%):	13.0 dry	14.0 dry	14.5 dry	12.5 dry

**Specification Requirements**

MINIMUM HLF DENSITY RATIO OF 98% of Standard Compaction (as advised by client)

Comments

**Coffey**

20 FEB 2006

**Albury Lab**  
 Coffey Geosciences Pty Ltd

 1/314 Kiawa Street  
 Albury NSW 2640

 Telephone: (02) 6023 3799  
 Facsimile: (02) 6023 3644
**Report No: HDR:AWW06-0485****Issue No: 1****Field Density: Hlf Density Ratio****Client:** Nugen Quality Foods Pty Ltd**Job No:** AWL08823/01**Project:** Effluent Storage Pond

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Approved Signatory: Herbert Kaiserseder  
 (Laboratory Manager)  
 NATA Accredited Laboratory Number: 431  
 Date of Issue: 13/02/2006

**Sample Details**

**Field Test Procedure:** AS1289.5.8.1  
**Laboratory Test Procedures:** AS 1289.5.7.1 (Standard Compaction), 2.1.1  
**Client Request ID:**  
**Location:** Crawford Road, Hanwood, NSW

Sample ID:	0013	0014	0015	0016
<b>Date Tested:</b>	7/02/2006	7/02/2006	7/02/2006	7/02/2006
<b>Location Description:</b>	Dam 2, Top of Bank, Western End of Northern Wall, Dam Fill	Dam 2, Middle of Bank, Centre of Northern Wall, Dam Fill	Dam 2, Bottom of Bank, Eastern End of Northern Wall, Dam Fill	Dam 2, Top of Bank, Northern End of Eastern Wall, Dam Fill
<b>Depth of Test (mm):</b>	250	250	250	250

**Field and Laboratory Data**

<b>Percent Oversize on Wet Basis:</b>	0	0	0	0
<b>AS Sieve Used (mm):</b>	19	19	19	19
<b>Field Moisture Content (%):</b>	12.5	11.0	11.5	13.5
<b>Field Wet Density (t/m³):</b>	1.55	1.54	1.54	1.72
<b>Peak Converted Wet Density (t/m³):</b>	1.68	1.60	1.63	1.69
<b>Optimum Moisture Content (%):</b>	22.0	19.5	22.5	20.5
<b>Hlf Density Ratio (%):</b>	92.5	96.0	94.5	101.5
<b>Moisture Ratio (%):</b>	56.0	56.0	50.5	65.0
<b>Moisture Variation (%):</b>	10.0 dry	10.0 dry	11.5 dry	7.5 dry

**Specification Requirements**

MINIMUM HLF DENSITY RATIO OF 98% of Standard Compaction (as advised by client)

**Comments**



**Coffey**

20 FEB 2006

Albury Lab  
Coffey Geosciences Pty Ltd1/314 Kiewa Street  
Albury NSW 2640Telephone: (02) 6023 3799  
Facsimile: (02) 6023 3644**Field Density: Hlf Density Ratio**

Report No: HDR:AWW06-0485

Issue No: 1

Client: Nugen Quality Foods Pty Ltd

Job No: AWL08823/01

Project: Effluent Storage Pond



The tests, calibrations or measurements covered by this document have been performed in accordance with NATA requirements which include the requirements of ISO/IEC 17025 and are traceable to national standards of measurement. This document may not be reproduced except in full.

Approved Signatory: Herbert Kaiserseder  
(Laboratory Manager)  
NATA Accredited Laboratory Number: 431  
Date of Issue: 13/02/2006

**Sample Details**

Field Test Procedure: AS1289.5.8.1  
Laboratory Test Procedures: AS 1289.5.7.1 (Standard Compaction), 2.1.1  
Client Request ID:  
Location: Crawford Road, Hanwood, NSW

Sample ID:	0017	0018
Date Tested:	7/02/2006	7/02/2006
Location Description:	Dam 2, Middle of Bank, Centre of Eastern Wall, Dam Fill	Dam 2, Bottom of Bank, Southern End of Eastern Wall, Dam Fill

Depth of Test (mm):	250	250

**Field and Laboratory Data**

Percent Oversize on Wet Basis:	0	0
AS Sieve Used (mm):	19	19
Field Moisture Content (%):	9.0	8.0
Field Wet Density (t/m <sup>3</sup> ):	1.62	1.60
Peak Converted Wet Density (t/m <sup>3</sup> ):	1.66	1.66
Optimum Moisture Content (%):	20.0	19.0
Hlf Density Ratio (%):	98.0	96.5
Moisture Ratio (%):	44.5	42.5
Moisture Variation (%):	11.5 dry	11.5 dry

**Specification Requirements**

MINIMUM HLF DENSITY RATIO OF 98% of Standard Compaction (as advised by client)

Comments

## APPENDIX E



Wastewater and Farm Management Issues – Mr Warren Muirhead

**Coffey** 

## WATER BALANCE

### **Rainfall and Evaporation**

The rainfall and evaporation data used was collected at CSIRO, Griffith Laboratory that is located about 10 km from the site. The data was collected between January 1962 and December 1999 and the monthly totals are shown in Appendix 1. The potential evapotranspiration was calculated using a modified Penman equation that is described by Meyer (1999).

The average yearly rainfall for the 38 years was 4% higher than recorded by the Bureau of Meteorology for the period from 1914 to 1989 (Table 1).

Table 1. Comparison of the rainfall for the period used (1962 to 1999) and 1914 to 1989.

Month	1962 - 1999	1914 - 1989
January	37.2	29.6
February	26.3	27.8
March	35.5	34.4
April	34.4	33.0
May	39.9	37.8
June	35.6	37.2
July	35.2	33.2
August	37.4	40.4
September	39.7	32.6
October	44.0	41.3
November	27.2	28.5
December	30.9	30.7
Total	423.3	406.5

### **Maximum Hydraulic Loading**

The maximum hydraulic loading was calculated for the 37 years as outlined in EPA NSW (1995). The value for each year is shown in Attachment 1 and the mean, median and 60 percentile values are summarised in Table 2.

The mean annual rainfall for the period is 423 mm and the mean annual potential evapotranspiration is 1815 mm. The mean and median yearly maximum hydraulic loading (YHL) for the period are very similar at 1391 mm. The 60 percentile value for YHL is 1457 mm.

The minimum area that is required to manage the effluent is 31 ha (424ML/y) wastewater and potential ETp of 13.91ML/ha/y) in a year of average rainfall and 39 ha in a 10 percentile wet year.



Table 2. The mean, median and 60 percentile values for the monthly and total rainfall, evapotranspiration (ETp) and maximum hydraulic loading (MHL) for the period from 1962 to 1999.

Month	Rainfall (mm)			ETp (mm)			MHL (mm)		
	Mean	Median	60 Percentile	Mean	Median	60 Percentile	Mean	Median	60 Percentile
January	37.2	26.8	33.9	275	274.1	281.9	237.8	252.1	262
February	26.3	11.8	23.6	229	228.8	236.7	202.7	215.7	228.3
March	35.5	29.6	36.2	187.4	188.3	195.4	151.9	163.8	172.4
April	34.4	19.9	33.3	112	111.8	115.8	77.6	91.7	97
May	39.9	34.8	39.8	65.2	64.7	66.6	25.3	35	41.1
June	35.6	27.8	37.1	43.3	44.7	46	7.7	11.2	16.1
July	35.2	34.5	37	48.9	47.4	52	13.8	14	24.8
August	37.4	38.3	41.4	74.4	74.6	76.6	36.9	37.2	40.9
September	39.7	32.5	37.5	111.8	111.3	115.2	72.1	81.5	87.2
October	44	32.8	41.2	172.5	177.9	181.8	128.5	143.9	160.9
November	27.2	23	29.9	225.2	231.7	233.4	198	200.3	215.5
December	30.9	21.5	30.9	270.1	269.9	279.7	239.2	243	257.6
Total	423.2	405.8	449.3	1814.7	1831.8	1855.8	1391.5	1390.8	1456.8

### Storage Facility

The wastewater is classified as a low strength effluent for nitrogen and phosphorus, but at the low end of the intermediate strength for BOD (Parle wastewater BOD 303 mg/L and intermediate strength effluent 40 to 1500 mg/L). Consequently, the 60 percentile storage requirement is used to establish the storage area.

The analysis of the nutrient loading concluded that 15 ha of wood lot and 45 ha of summer forage maize followed by winter grass/clover pasture would be sufficient area to manage the nutrients in the wastewater. This area of irrigated crop will be used in the calculations of wastewater application in excess of evapotranspiration losses.

The monthly crop factors for the wood lot (Table 3) are those recommended at Wagga by Myers et al (1999). It is assumed that the wood lot will reach canopy closure in 3 years when these figures are applicable. When the trees are young, pasture will be sown between the tree rows to maintain evapotranspiration losses and when necessary, removed with a forage harvester. In the first and possibly second year, the factory will not be operating at the potential and the quantity of wastewater will be less than used in the calculations.

The crop factors for the forage maize and winter pasture (Table 3) are based on the values in the MIA and District Land and Water Management Plan (Meyer 1996). The forage maize will be harvested with a forage harvester in late April and the winter pasture harvested in October.

Table 3. Monthly crop factors for the irrigated wood lot and cropped areas.

Month	Wood lot	Crop	Comments
January	0.78	0.7	
February	0.84	0.85	
March	0.94	0.85	
April	1.17	0.6	Forage maize harvested
May	1.21	0.4	Winter pasture established
June	1.15	0.6	
July	1.13	0.7	
August	1.33	0.8	
September	1.33	0.8	
October	1.26	0.6	Winter pasture harvested
November	0.99	0.4	Forage maize sown
December	0.83	0.5	

The 4 years with YHL closest to the median (1457 mm) were 1966 (1428 mm), 1996 (1455 mm) 1998 (1465 mm) and 1962 (1479 mm).

When the monthly evapotranspiration is subtracted from the monthly wastewater for these years, there is no month when the volume of wastewater exceeds the evapotranspiration (Attachment 2 & 3). Consequently, there is no need for a large storage.

The volume of wastewater in summer (January to April) is just under 3 ML per day with the remainder of the year being just under 0.5 ML per day (Attachment 2). Therefore a storage facility of 4 ML holds more than a days supply in peak season and more than 9 days supply in the off season (May to December).

Rain days during the peak processing season will necessitate termination of crop harvesting and delivery to the plant. Due to the method of harvest and the crops involved, harvested product will not be stored therefore once harvesting stops processing will also cease. Wastewater outflow will then decrease to the off season volume until harvesting again resumes once the paddocks have dried out.

### Conclusion

This analysis demonstrates that the planned 15 ha wood lot and 45 ha of summer and winter forage crops will be sufficient to manage the wastewater in years similar or drier than the 60 percentile year. Under these conditions, there is no need for a storage larger than that designed.



## WASTEWATER QUANTITY AND QUALITY

### Quantity

The wastewater will come from several processing operations with the majority (318 ML) produced in a 105 day period (January to mid April) and the remaining 106 ML produced during the rest of the year. The anticipated quantities are shown in Table 1.

Table 1. Anticipated quantity of wastewater produced.

Product	Volume (ML/yr)	Period of production
Corn	53	January to mid April
Tomato	212	January to mid April
Pickles washings	3.2	Equally during year
Other products	156	Equally during year
Total	424.2	

### Composition of the Wastewater

#### Sweet Corn

The Heinz Wattie plant in New Zealand is similar to that being installed at Parle Foods, Hanwood. The press effluent waste produced is stored in a tank in New Zealand. The composition of this wastewater is used as an estimate of the concentration of nutrients in the wastewater at the Parle Foods factory. However, at Parle Foods, the equivalent to the press effluent will be diluted 10 fold.

The average nutrient composition of the tank effluent sampled on 8 occasions from 26 January 1999 to 23 March 1999 is shown in Table 2.

Table 2. Average composition of the New Zealand tank effluent and estimated corn wastewater composition at Parle Foods factory, Hanwood.

Nutrient	New Zealand Tank	Parle Foods (diluted)
Nitrogen (mg/L)	1742	174
Phosphorus (mg/L)	362	36
Potassium (mg/L)	1307	131
Calcium (mg/L)	101	10
Magnesium (mg/L)	156	16

The BOD of the tank effluent was measured on a number of occasions and using a range of production processes. The measurements are shown in Table 3.

Table 3. Corn wastewater BOD (mg/L) results derived from various production processes and crop varieties in 1999 in New Zealand.

Parameter	New Zealand Tank	Parle Foods (diluted)
Hot cob	1530	
Conventional	3397	
Shallow cut	1605	
Sweetened	2948	
Unsweetened	4533	
Average	2803	280

### Tomatoes

Wastewater samples were collected on 9<sup>th</sup> May 2000 from the tomato processing line at the Parle Foods factory in Griffith and analysed by ANCO Australasia Pty Ltd. Sample "A" came from the shaker table, Sample "C" from the spray/roller table and Sample "D" from the cooling tower.

The analytical results and the calculated wastewater composition is shown in Table 4. The wastewater composition assumes that 70 ML/yr originates from the processing line and 130 ML/yr from the cooling tower.

Table 4. Characteristics of the water samples from the tomato processing line and estimated composition of the wastewater at Parle Foods factory, Griffith.

Analysis	Sample A	Sample C	Sample D	Tomato W/water
Volume (ML/yr)	35	35	130	200
BOD (mg/L)	188	774	216	309
TDS (mg/L)	180	450	130	195
EC (dS/m)	0.286	0.735	0.208	0.314
pH	5.7	4.9	5.8	5.6
Total N (mg/L)	1.4	5.2	1.5	2.1
P (mg/L)	2.7	5.9	2.4	3.1
K (mg/L)	66	155	42	66

### Pickles

The quantity of wastewater originating from the pickle line is quite small at less than 1% of the total. The wastewater from the pickle line has a salinity of 1000 mg/L (1.6 dS/m).

### Other Products

Other products that will be processed include capsicum, celery, carrot, rice and onion. No information is available on the composition of the wastewater produced by these



products and it is assumed that it will be similar to the average composition for sweet corn and tomato wastewater (Table 5).

Table 5. Estimated composition of wastewater from the pickles and other products processed at Parle Foods, Hanwood processing plant.

Analysis	Corn	Tomato	Estimated
Volume (ML/yr)	53	212	265
BOD (mg/L)	280	309	303
EC (dS/m)		.31	0.33
PH		5.6	
TN (mg/L)	174	2.1	36
P (mg/L)	36	3.1	9.7
K (mg/L)	131	66	79

Assuming that the composition of the wastewater produced by the other products is similar to the major wastewater producers - tomatoes and sweet corn, then the nutrient level would be classified as low (Table 4.7 EPA NSW 1995). However, the BOD (303 mg/L) is at the low end of the intermediate strength range 40 - 1500 mg/L).

#### Quantity of BOD Nutrients in Wastewater

The quantity of BOD and nutrients in the wastewater is shown in Table 6. The annual wastewater production contains 129 tonnes of BOD, 15.4 tonnes of nitrogen and 4.11 tonnes of phosphorus.

Table 6. Quantity of BOD, nitrogen and phosphorus in the wastewater streams and total content.

Component	Sweet corn		Tomatoes		Pickles		Other		Total	
	Conc mg/L	Amount kg/y	Conc mg/L	Amount kg/y	Conc mg/L	Amount kg/y	Conc mg/L	Amount kg/yr	Conc mg/L	Amount Kg/y
Volume (ML)	53		212		3.2		156		424	
BOD	280	14840	309	65508	303	970	303	47268	303	128.6
Nitrogen	174	9222	2.1	445	36	115	36	5616	36	15.4
Phosphorus	36	1908	3.1	657	9.7	31	9.7	1513	9.7	4.11

It is generally accepted that 10,000kg/ha/yr of BOD can be applied in surface irrigation without adverse effects (Meat Research Corporation 1995). The BOD applied here is estimated to be 129 t/yr (Table 6). Therefore, providing the effluent is applied to more than 13 ha, there should be no detrimental effect to the environment. Furthermore, Bowmer and Laut (1992) concluded that a BOD:N:P ratio of the order of 20:5:1 is ideal for successful stabilisation by microorganisms. The ratio here is 31:3.7:1, close to the ideal.

## Management of Nutrients

A number of alternatives have been evaluated to determine the most appropriate crops to manage the volume of wastewater and nutrients it contains. The strategy that will be adopted is to establish a wood lot for saw logs that will have a life of at least 16 years. On a separate area, forage maize will be grown during the summer and winter pasture during the winter. The above ground biomass of both crops will be removed with a forage harvester at the appropriate time.

### *Wood lot*

A 15 ha wood lot will be established on the site and wastewater applied with drip irrigation.

Extensive research at Wagga has led to the development of guidelines for the management of sustainable effluent-irrigated plantations (Meyers et al 1999). Table 7 shows the estimated rate that nitrogen accumulation in the above ground parts of gum trees. The average nitrogen uptake for the first 8 years is 70 kg/ha/yr and will be used in the calculations.

The average phosphorus uptake varies from 8 to 12 kg/ha/yr and an average of 10 will be used in the calculations.

Table 7. Above ground accumulation rate of nitrogen in relation to stand age.

Interval (yr)	0 - 2	2 - 4	4 - 8	8 - 12	12 - 16	Average
Nitrogen (kg N /ha/yr)	79	84	57	35	17	48

The annual quantity of nutrients taken up by the 15 ha of wood lot in the 8 years after establishment is shown in Table 8.

Table 8. Quantity of nutrients taken up by the 15 ha wood lot.

Element	Concentration (kg/ha)	Quantity (kg/yr)
Nitrogen	70	1050
Phosphorus	10	150

### *Forage Maize*

The crop that will be grown during the period of maximum wastewater production will be forage maize. The projected yield is 14 t dry matter/ha/y (Meat Research Council 1995).



In the FILTER project at Griffith (Blackwell et al 1999), 25 t dry matter /ha was produced with maize grown on border check with subsurface drainage but with irrigation water containing 4 times the quantity of salt. Therefore, the yield of forage maize of 14t dry matter/ha is considered realistic. The composition of the forage maize is based on Meat Research Corporation (1995) recommendations for plant nutrient removal in the harvested part of forage crops. The concentration and quantity of nitrogen and phosphorus taken up by this crop is shown in Table 9.

Table 9. Concentration of nutrients in the forage maize (Meat Research Corporation 1995) and winter pasture (Glendenning 1981) and nutrient uptake by the crops.

Element	Forage Maize		Winter Pasture		Total (kg/ha/y)
	Conc (mg/kg/)	Quantity (kg/ha/y)	Conc (mg/kg/)	Quantity (kg/ha/y)	
Nitrogen	110	154	260	130	284
Phosphorus	25	35	32	16	51

#### *Winter Pasture*

After the maize is harvested for silage in late April, a winter pasture containing annual ryegrass and sub clover will be sod seeded into the maize stubble. The pasture will be harvested with a forage harvester in late spring. The yield is estimated to be 5 t dry matter/ha, the composition of the pasture Glendenning (1981) and quantity of nutrients removed is shown in Table 9.

The nutrient balance and crop area required to achieve no net gain in nitrogen and phosphorus when applied to 10 ha of wood lot and 45 ha of crop is shown in Table 10.

Table 10. Quantity of nutrients removed by the summer and winter crops and area required for sustainable application.

Element	In Wastewater (t/yr)	Uptake Wood lot (t/yr)	Remainder (t/yr)	Crop Removal (kg/ha)	Crop Area Required (ha)
Nitrogen	15.4	1.0	14.4	284	51
Phosphorus	4.1	0.1	4.0	51	78

The estimated area required is 51 ha of crop to manage the nitrogen and 78 ha of crop to manage the phosphorus. The area required for nitrogen assumes no losses through volatilisation and denitrification will occur. A Canadian study (Bole et al 1985) showed that 45% of the labelled nitrogen applied in the wastewater was lost through denitrification and volatilisation. They attributed the high loss to the high levels of oxidizable carbon in the wastewater that enhanced denitrification. An area of 45 ha should be more than adequate to manage the nitrogen. The losses to achieve a nitrogen balance for this area is 13%.

The irrigation site now has available phosphate levels lower than desirable. The average value for the Olsen available phosphate test in the topsoil was 13 mg/kg (range 3 to 23). To achieve a sufficiency level for the crops planned, at least 20 mg/kg is required in the topsoil. Consequently, the opportunity exists to increase the available phosphate in the soil without a detrimental impact on the environment.

The phosphorus nutrient balance ignores the phosphorus fixation capacity of the soil.

Meyer et al (1999) developed a method to calculate the P retention capacity (TPR) of the soil and the P retention time. They found that their method yielded more accurate predictions of vertical soil P movement at the Wagga research site than other methods.

This method has been applied to the Parle Foods site. Here, the wastewater (424 ML/y) will be applied to 15 ha of wood lot and 45 ha of forage crops. The application rate will be 7.1 ML/ha/y.

$$\text{TPR} = \text{P retained per kg} \cdot \text{BD} \cdot \text{ST}/100$$

Where BD = bulk density in  $\text{kg/m}^3$ , and  
ST = soil layer thickness (m).

The P retained value is 200 mg/kg (Meyer *et al* 1999). The average value of BD for transitional red-brown earth's is  $1400 \text{ kg/m}^3$  for the surface 20cm (Hornbuckle and Christen 1999). The soil layer thickness where the P accumulates is set at 0.2m. Therefore,

$$\begin{aligned}\text{TPR} &= 200 \cdot 1400 \cdot 0.2/100 \\ &= 560 \text{ kg/ha}\end{aligned}$$

The P retention time (PRT) is calculated as follows:

$$\begin{aligned}\text{PRT} &= \text{TPR} / \text{Pa} \quad \text{where} \\ \text{Pa} &= \text{annual P loading}\end{aligned}$$

Here, the Pa will be the difference between the P applied in the wastewater (70.7 kg/ha/y - derived from Table 6) and the P removed by the crop (40 kg/ha/y - derived from Table 8).

$$\text{PRT} = 560 / (71 - 51.0) = 18 \text{ y}$$

Thus, the prediction is that after 18 y of wastewater application and crop removal, the surface 20cm soil will reach saturation and P will begin to move out of this zone. This time is longer than the time to when the trees will be harvested.



## APPENDIX F

30 MAR 2005



PO Box 485  
GRIFFITH NSW 2680  
Phone (02) 6962 8100  
Fax (02) 6964 4369

## LIQUID TRADE WASTE CHARGES - MONTH ENDING:

31 January 05

The Manager  
Nugans  
PO Box 759  
Griffith NSW 2680

Total Charges

\$32,409.34

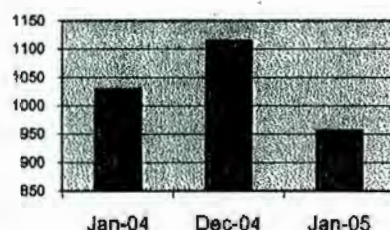
Date Due

31-Mar-05

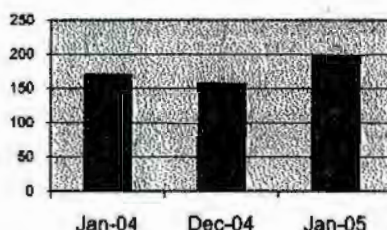
In accordance with Council's Trade Waste to Sewer Policy, and your  
Liquid Trade Waste Service contract, testing has given the following results:

	Average	Fee for Month
BOD	956 mg/L	\$15,222.32
Suspended Solids	197 mg/L	\$0.00
Phosphorus	2 mg/L	\$0.00
Outflow	894 kL/day	\$17,187.02
Total Charge		\$32,409.34

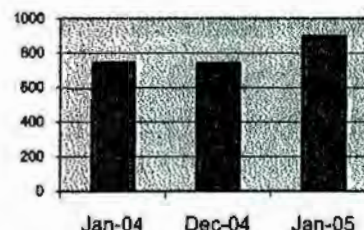
Average BOD (mg/L)



Average SS (mg/L)



Average Outflow (kL/day)





30 MAR 2005



PO Box 485  
GRIFFITH NSW 2680  
Phone (02) 6962 8100  
Fax (02) 6964 4369

## LIQUID TRADE WASTE CHARGES - MONTH ENDING:

31 January 05

## Testing Summary

Date	Outflow (kL)	P (mg/L)	BOD (mg/L)	SS (mg/L)	pH
5-Jan-05	2436.0	4.9	1100.0	320.0	7.8
12-Jan-05	6034.0	0.3	1700.0	310.0	10.2
18-Jan-05	5913.0	5.4	1400.0	290.0	10.1
25-Jan-05	7819.0	0.0	0.0	0.0	10.9
31-Jan-05	5519.0				
<b>Total/Ave:</b>	<b>27721.0</b>	<b>2.1</b>	<b>955.6</b>	<b>196.6</b>	<b>9.8</b>

Re-inspections necessary during the billing month: 0

## Trade Waste Charge Calculation Procedure

Load-based fees are calculated from the weighted average concentration for the month. Regardless of total concentration, no mass-based fees are applicable for the following:

- The first 300mg/L of Biochemical Oxygen Demand (BOD)
- The first 300mg/L of Suspended Solids (SS)
- The first 10mg/L of Phosphorus (P)

## Fees for 2003/2004:

Flow	\$0.62 /kL	
<b>Excess Mass Charges:</b>		<b>Concentration Range Applicable:</b>
P	\$12.09 /kg	Greater than 10 mg/L
SS	\$1.03 /kg	Greater than 300 mg/L
BOD	\$0.74 /kg	300 - 600 mg/L
	\$0.92 /kg	600-1500 mg/L
	\$1.10 /kg	1500-3000 mg/L
	\$1.26 /kg	Greater than 3000 mg/L



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30 MAR 2005

## LIQUID TRADE WASTE CHARGES - MONTH ENDING:

28 February 05

The Manager  
Nugans  
PO Box 759  
Griffith NSW 2680

Total Charges

**\$58,126.54**

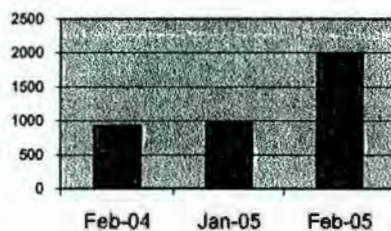
Date Due

**31 March 05**

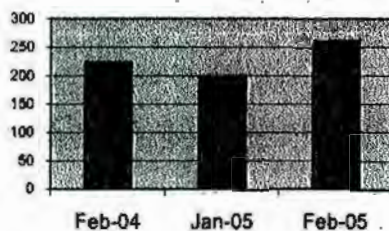
In accordance with Council's Trade Waste to Sewer Policy, and your Liquid Trade Waste Service contract, testing has given the following results:

	Average	Fee for Month
BOD	1981 mg/L	\$41,741.80
Suspended Solids	260 mg/L	\$0.00
Phosphorus	9 mg/L	\$0.00
Outflow	852 kL/day	\$16,384.74
Total Charge		<b>\$58,126.54</b>

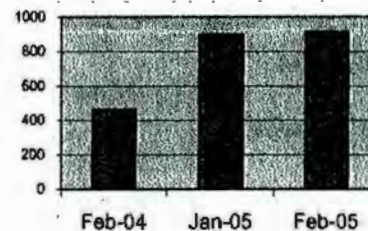
Average BOD (mg/L)



Average SS (mg/L)



Average Outflow (kL/day)







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## LIQUID TRADE WASTE CHARGES - MONTH ENDING:

28 February 05

## Testing Summary

Date	Outflow (kL)	P (mg/L)	BOD (mg/L)	SS (mg/L)	pH
3-Feb-05	3161.0	5.4	1100.0	200.0	10.3
9-Feb-05	6048.0	12.0	1700.0	280.0	10.0
16-Feb-05	6061.0	12.0	2000.0	330.0	7.0
24-Feb-05	7072.0	6.9	2600.0	210.0	10.0
28-Feb-05	4085.0				
<b>Total/Ave:</b>	<b>26427.0</b>	<b>9.5</b>	<b>1981.4</b>	<b>260.1</b>	<b>9.3</b>

Re-inspections necessary during the billing month: 0

## Trade Waste Charge Calculation Procedure

Load-based fees are calculated from the weighted average concentration for the month.  
Regardless of total concentration, no mass-based fees are applicable for the following:

- The first 300mg/L of Biochemical Oxygen Demand (BOD)
- The first 300mg/L of Suspended Solids (SS)
- The first 10mg/L of Phosphorus (P)

## Fees for 2003/2004:

Flow	\$0.62 /kL	
<b>Excess Mass Charges:</b>		<b>Concentration Range Applicable:</b>
P	\$12.09 /kg	Greater than 10 mg/L
SS	\$1.03 /kg	Greater than 300 mg/L
BOD	\$0.74 /kg	300 - 600 mg/L
	\$0.92 /kg	600-1500 mg/L
	\$1.10 /kg	1500-3000 mg/L
	\$1.26 /kg	Greater than 3000 mg/L



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10 MAY 2005

## LIQUID TRADE WASTE CHARGES - MONTH ENDING:

31 March 2005

The Manager  
Nugans  
PO Box 759  
Griffith NSW 2680

Total Charges

**\$77,453.83**

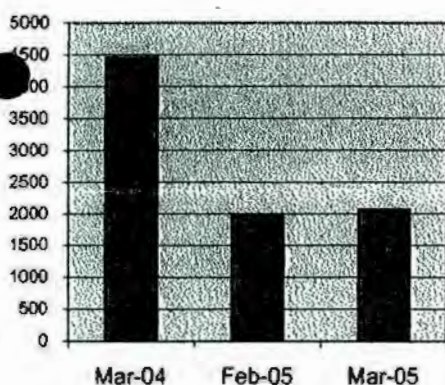
Date Due

**30 April 2005**

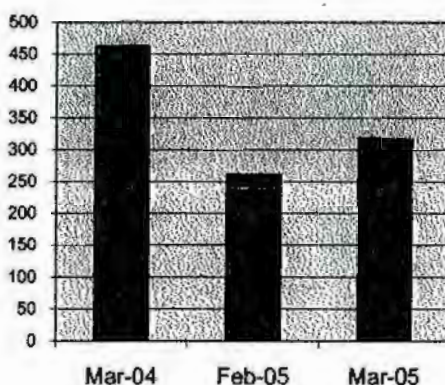
In accordance with Council's Trade Waste to Sewer Policy, and your Liquid Trade Waste Service contract, testing has given the following results:

	Average	Fee for Month
BOD	2060 mg/L	\$55,337.02
Suspended Solids	317 mg/L	\$1,470.47
Phosphorus	6 mg/L	\$0.00
Sulphate	54 mg/L	\$59.24
Sulphida	0 mg/L	\$0.00
Nitrogen	13 mg/L	\$0.00
pH	9.7	\$15,382.52 (pH charges not yet in place)
Outflow	1071 kL/day	\$20,587.10
<b>Total Charge</b>		<b>\$77,453.83</b>

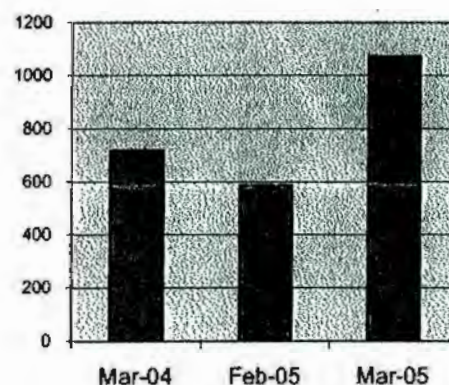
Average BOD (mg/L)



Average SS (mg/L)



Average Outflow (kL/day)





10 MAY 2005



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Fax (02) 6964 4369

## LIQUID TRADE WASTE CHARGES - MONTH ENDING:

31 March 2005

## Testing Summary

Date	Outflow (kL)	P (mg/L)	BOD (mg/L)	SS (mg/L)	pH	Nitrogen	Sulphate	Sulphide
2-Mar-05	7694.0	5.9	1700.0	240.0	9.9	29.0	170.0	0.0
9-Mar-05	6681.0	6.3	2000.0	370.0	10.3		34.0	0.0
15-Mar-05	8727.0	4.7	1800.0	410.0	8.8		22.0	0.0
23-Mar-05	10103.0	6.6	2600.0	260.0	9.9	21.0	7.0	0.0
<b>Total/Ave:</b>	<b>33205.0</b>	<b>5.9</b>	<b>2060.5</b>	<b>316.9</b>	<b>9.7</b>	<b>13.1</b>	<b>54.1</b>	<b>0.0</b>

Re-inspections necessary during the billing month: 0

## Trade Waste Charge Calculation Procedure

Load-based fees are calculated from the weighted average concentration for the month. Regardless of total concentration, no mass-based fees are applicable for the following:

- The first 300mg/L of Biochemical Oxygen Demand (BOD)
- The first 300mg/L of Suspended Solids (SS)
- The first 10mg/L of Phosphorus (P)
- The first 50mg/L of Nitrogen (N)
- The first 100mg/L of Sulphate
- The first 1mg/L of Sulphide

## Fees for 2004/2005:

Flow	\$0.62 /kL	
<b>Excess Mass Charges:</b>		<b>Concentration Range Applicable:</b>
P	\$12.09 /kg	Greater than 10 mg/L
SS	\$1.03 /kg	Greater than 300 mg/L
BOD	\$0.74 /kg	300 - 600 mg/L
	\$0.92 /kg	600-1500 mg/L
	\$1.10 /kg	1500-3000 mg/L
Per DEUS Formula		3000-5000 mg/L
	\$2.58 /kg	Greater than 5000 mg/L
Nitrogen	\$0.23 /kg	Greater than 50 mg/L
Sulphate	\$0.11 /kg	Greater than 100 mg/L
Sulphide	\$1.10 /kg	Greater than 1 mg/L



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7 JUN 2005

## LIQUID TRADE WASTE CHARGES - MONTH ENDING:

30 April 2005

The Manager  
Nugans  
PO Box 759  
Griffith NSW 2680

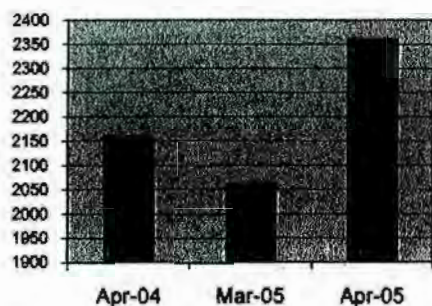
Total Charges  
**\$77,071.95**

Date Due  
**31 May 2005**

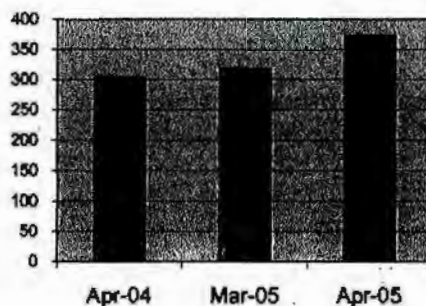
In accordance with Council's Trade Waste to Sewer Policy, and your Liquid Trade Waste Service contract, testing has given the following results:

	Average	Fee for Month
BOD	2359 mg/L	\$57,189.82
Suspended Solids	372 mg/L	\$2,112.31
Phosphorus	6 mg/L	\$0.00
Sulphate	28 mg/L	\$0.00
Sulphide	0 mg/L	\$0.00
Nitrogen	19 mg/L	\$0.00
pH	5.65	30353.73635 (pH charges not yet in place)
Outflow	955 kL/day	\$17,769.82
Total Charge		<b>\$77,071.95</b>

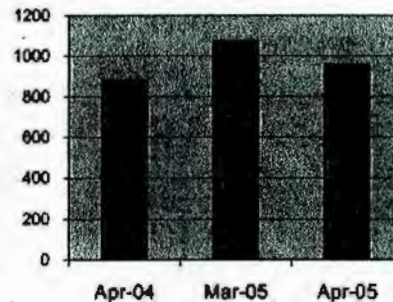
Average BOD (mg/L)



Average SS (mg/L)



Average Outflow (kL/day)





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## LIQUID TRADE WASTE CHARGES - MONTH ENDING:

30 April 2005

## Testing Summary

Date	Outflow (kL)	P (mg/L)	BOD (mg/L)	SS (mg/L)	pH	Nitrogen	Sulphate	Sulphide
5-Apr-05	11595.0	6.5	3000.0	410.0	5.6	21.0	31.0	0.0
15-Apr-05	3748.0	5.2	2600.0	421.0	5.9	21.0	10.6	0.0
19-Apr-05	8696.0	5.0	1800.0	320.0	5.8	15.0	34.0	0.0
28-Apr-05	4622.0	5.3	1610.0	332.0	5.3	18.7	20.7	0.0
0-Jan-00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total/Ave:</b>	<b>28661.0</b>	<b>5.7</b>	<b>2359.4</b>	<b>371.6</b>	<b>5.7</b>	<b>18.8</b>	<b>27.6</b>	<b>0.0</b>

Re-inspections necessary during the billing month: 0

## Trade Waste Charge Calculation Procedure

Load-based fees are calculated from the weighted average concentration for the month. Regardless of total concentration, no mass-based fees are applicable for the following:

- The first 300mg/L of Biochemical Oxygen Demand (BOD)
- The first 300mg/L of Suspended Solids (SS)
- The first 10mg/L of Phosphorus (P)
- The first 50mg/L of Nitrogen (N)
- The first 100mg/L of Sulphate
- The first 1mg/L of Sulphide

## Fees for 2004/2005:

Flow	\$0.62 /kL	
<b>Excess Mass Charges:</b>		<b>Concentration Range Applicable:</b>
P	\$12.09 /kg	Greater than 10 mg/L
SS	\$1.03 /kg	Greater than 300 mg/L
BOD	\$0.74 /kg	300 - 600 mg/L
	\$0.92 /kg	600-1500 mg/L
	\$1.10 /kg	1500-3000 mg/L
Per DEUS Formula		3000-5000 mg/L
	\$2.58 /kg	Greater than 5000 mg/L
Nitrogen	\$0.23 /kg	Greater than 50 mg/L
Sulphate	\$0.11 /kg	Greater than 100 mg/L
Sulphide	\$1.10 /kg	Greater than 1 mg/L





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8 - JUL 2005

## LIQUID TRADE WASTE CHARGES - MONTH ENDING:

31 May 2005

The Manager  
Nugans  
PO Box 759  
Griffith NSW 2680

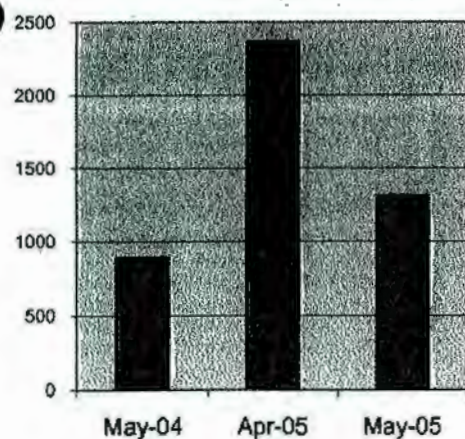
Total Charges  
**\$57,805.35**

Date Due  
**30 June 2005**

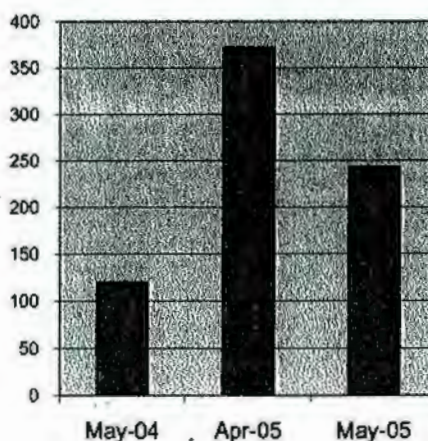
In accordance with Council's Trade Waste to Sewer Policy, and your Liquid Trade Waste Service contract, testing has given the following results:

	Average	Fee for Month
BOD	1308 mg/L	\$33,711.74
Suspended Solids	243 mg/L	\$417.05
Phosphorus	5 mg/L	\$0.00
Sulphate	28 mg/L	\$0.00
Sulphide	0 mg/L	\$0.00
Nitrogen	13 mg/L	\$0.00
pH	8.7	\$27,155.51 (pH charges not yet in place)
Outflow	1232 kL/day	\$23,676.56
<b>Total Charge</b>		<b>\$57,805.35</b>

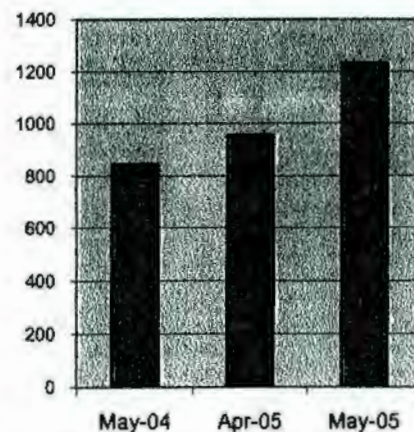
Average BOD (mg/L)



Average SS (mg/L)



Average Outflow (kL/day)





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8 - JUL 2005

## LIQUID TRADE WASTE CHARGES - MONTH ENDING:

31 May 2005

## Testing Summary

Date	Outflow (kL)	P (mg/L)	BOD (ma/L)	SS (mg/L)	pH	Nitrogen	Sulphate	Sulphide
3-May-05	10023.0	6.1	1700.0	250.0	9.8	11.0	10.0	0.1
11-May-05	8098.0	4.6	1500.0	350.0	7.0	13.0	26.0	0.1
18-May-05	7283.0	5.3	920.0	170.0	11.2	16.0	12.0	0.1
25-May-05	12784.0	3.2	1100.0	210.0	6.8	13.0	53.0	0.1
0-Jan-00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total/Ave:</b>	<b>38188.0</b>	<b>4.7</b>	<b>1308.0</b>	<b>242.6</b>	<b>8.7</b>	<b>13.0</b>	<b>28.2</b>	<b>0.1</b>

Re-inspections necessary during the billing month: 0

## Trade Waste Charge Calculation Procedure

Load-based fees are calculated from the weighted average concentration for the month. Regardless of total concentration, no mass-based fees are applicable for the following:

- The first 300mg/L of Biochemical Oxygen Demand (BOD)
- The first 300mg/L of Suspended Solids (SS)
- The first 10mg/L of Phosphorus (P)
- The first 50mg/L of Nitrogen (N)
- The first 100mg/L of Sulphate
- The first 1mg/L of Sulphide

## Fees for 2004/2005:

Flow	\$0.62 /kL	
<b>Excess Mass Charges:</b>		<b>Concentration Range Applicable:</b>
P	\$12.09 /kg	Greater than 10 mg/L
SS	\$1.03 /kg	Greater than 300 mg/L
BOD	\$0.74 /kg	300 - 600 mg/L
	\$0.92 /kg	600-1500 mg/L
	\$1.10 /kg	1500-3000 mg/L
Per DEUS Formula		3000-5000 mg/L
	\$2.58 /kg	Greater than 5000 mg/L
Nitrogen	\$0.23 /kg	Greater than 50 mg/L
Sulphate	\$0.11 /kg	Greater than 100 mg/L





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8 - AUG 2005

## LIQUID TRADE WASTE CHARGES - MONTH ENDING:

30 June 2005

The Manager  
Nugans  
PO Box 759  
Griffith NSW 2680

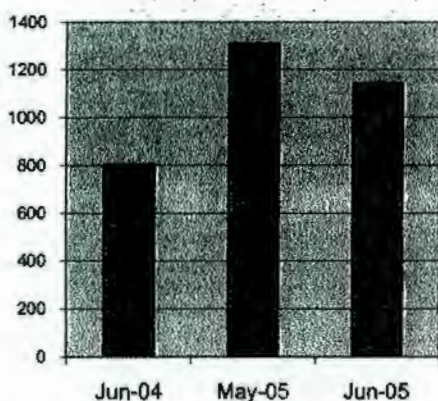
Total Charges  
**\$38,066.00**

Date Due  
**31 July 2005**

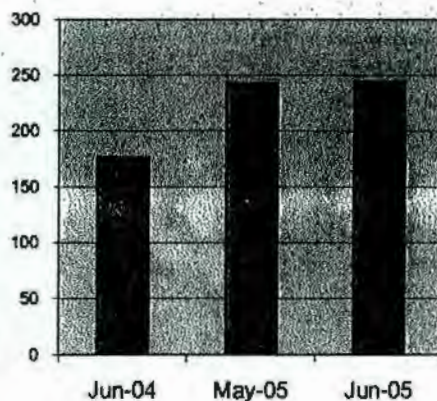
In accordance with Council's Trade Waste to Sewer Policy, and your Liquid Trade Waste Service contract, testing has given the following results:

	Average	Fee for Month
BOD	1141 mg/L	\$20,457.42
Suspended Solids	244 mg/L	\$233.70
Phosphorus	5 mg/L	\$0.00
Sulphate	18 mg/L	\$0.00
Sulphide	0 mg/L	\$0.00
Nitrogen	12 mg/L	\$0.00
pH	6.9	\$6,257.95 (pH charges not yet in place)
Outflow	904 kL/day	\$17,374.88
<b>Total Charge</b>		<b>\$38,066.00</b>

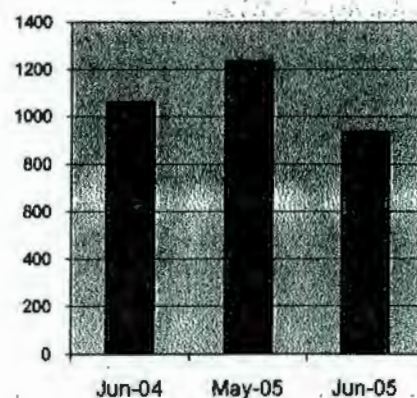
Average BOD (mg/L)



Average SS (mg/L)



Average Outflow (kL/day)







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## LIQUID TRADE WASTE CHARGES - MONTH ENDING:

30 June 2005

## Testing Summary

Date	Outflow (kL)	P (mg/L)	BOD (mg/L)	SS (mg/L)	pH	Nitrogen	Sulphate	Sulphide
8-Jun-05	5107.0	5.0	1100.0	260.0	7.5	11.0	22.0	0.1
15-Jun-05	7563.0	5.2	1100.0	330.0	6.5	16.0	29.0	0.1
22-Jun-05	7598.0	4.3	640.0	110.0	7.6	11.0	11.0	0.1
29-Jun-05	7756.0	5.1	1700.0	280.0	6.0	9.0	11.0	0.1
<b>Total/Ave:</b>	<b>28024.0</b>	<b>4.9</b>	<b>1141.3</b>	<b>243.8</b>	<b>6.9</b>	<b>11.8</b>	<b>17.9</b>	<b>0.1</b>

Re-inspections necessary during the billing month: 0

## Trade Waste Charge Calculation Procedure

Load-based fees are calculated from the weighted average concentration for the month. Regardless of total concentration, no mass-based fees are applicable for the following:

- The first 300mg/L of Biochemical Oxygen Demand (BOD)
- The first 300mg/L of Suspended Solids (SS)
- The first 10mg/L of Phosphorus (P)
- The first 50mg/L of Nitrogen (N)
- The first 100mg/L of Sulphate
- The first 1mg/L of Sulphide

## Fees for 2004/2005:

Flow	\$0.62 /kL	
<b>Excess Mass Charges:</b>		<b>Concentration Range Applicable:</b>
P	\$12.09 /kg	Greater than 10 mg/L
SS	\$1.03 /kg	Greater than 300 mg/L
BOD	\$0.74 /kg	300 - 600 mg/L
	\$0.92 /kg	600-1500 mg/L
	\$1.10 /kg	1500-3000 mg/L
Per DEUS Formula		3000-5000 mg/L
	\$2.58 /kg	Greater than 5000 mg/L
Nitrogen	\$0.23 /kg	Greater than 50 mg/L
Sulphate	\$0.11 /kg	Greater than 100 mg/L



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16 SEP 2005

## LIQUID TRADE WASTE CHARGES - MONTH ENDING:

31 July 2005

The Manager  
Nugans  
PO Box 759  
Griffith NSW 2680

Total Charges

\$40,762.45

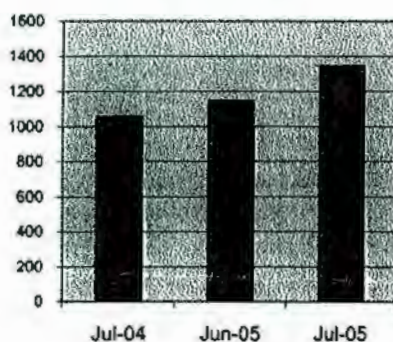
Date Due

31 August 2005

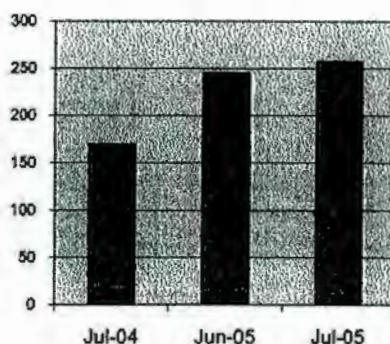
In accordance with Council's Trade Waste to Sewer Policy, and your  
Liquid Trade Waste Service contract, testing has given the following results:

	Average	Fee for Month
BOD	1341 mg/L	\$23,974.83
Suspended Solids	257 mg/L	\$342.12
Phosphorus	7 mg/L	\$0.00
Sulphate	32 mg/L	\$0.00
Sulphide	0 mg/L	\$0.00
Nitrogen	18 mg/L	\$0.00
pH	8.3	\$28,884.23 (pH charges not yet in place)
Outflow	856 kL/day	\$16,445.50
<b>Total Charge</b>		<b>\$40,762.45</b>

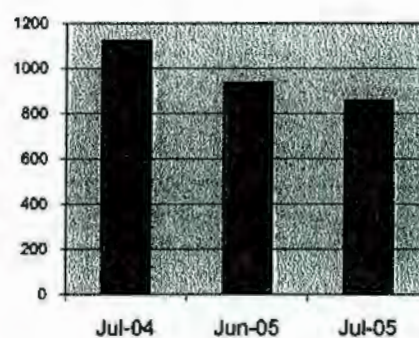
Average BOD (mg/L)



Average SS (mg/L)



Average Outflow (kL/day)





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Fax (02) 6964 4369

7 6 SEP 2005

## LIQUID TRADE WASTE CHARGES - MONTH ENDING:

31 July 2005

## Testing Summary

Date	Outflow (kL)	P (mg/L)	BOD (mg/L)	SS (mg/L)	pH	Nitrogen	Sulphate	Sulphide
6-Jul-05	5642.0	3.9	1100.0	230.0	9.0	14.0	28.0	0.0
14-Jul-05	4220.0	10.0	1300.0	200.0	6.8	19.0	35.0	0.0
19-Jul-05	11127.0	8.6	1400.0	240.0	11.0	20.0	24.0	0.0
28-Jul-05	5536.0	5.3	1500.0	360.0	6.3	17.0	50.0	0.0
<b>Total/Ave:</b>	<b>26525.0</b>	<b>7.1</b>	<b>1341.1</b>	<b>256.6</b>	<b>8.3</b>	<b>17.9</b>	<b>32.0</b>	<b>0.0</b>

Re-Inspections necessary during the billing month: 0

## Trade Waste Charge Calculation Procedure

Load-based fees are calculated from the weighted average concentration for the month. Regardless of total concentration, no mass-based fees are applicable for the following:

- The first 300mg/L of Biochemical Oxygen Demand (BOD)
- The first 300mg/L of Suspended Solids (SS)
- The first 10mg/L of Phosphorus (P)
- The first 50mg/L of Nitrogen (N)
- The first 100mg/L of Sulphate
- The first 1mg/L of Sulphide

## Fees for 2004/2005:

Flow	\$0.62 /kL	
<b>Excess Mass Charges:</b>		<b>Concentration Range Applicable:</b>
P	\$12.09 /kg	Greater than 10 mg/L
SS	\$1.03 /kg	Greater than 300 mg/L
BOD	\$0.74 /kg	300 - 600 mg/L
	\$0.92 /kg	600-1500 mg/L
	\$1.10 /kg	1500-3000 mg/L
Per DEUS Formula		3000-5000 mg/L
	\$2.58 /kg	Greater than 5000 mg/L
Nitrogen	\$0.23 /kg	Greater than 50 mg/L
Sulphate	\$0.11 /kg	Greater than 100 mg/L
Sulphide	\$1.10 /kg	Greater than 1 mg/L



16 SEP 2005



PO Box 485  
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## LIQUID TRADE WASTE CHARGES - MONTH ENDING:

31 August 05

The Manager  
Nugans  
PO Box 759  
Griffith NSW 2680

Total Charges

\$75,961.73

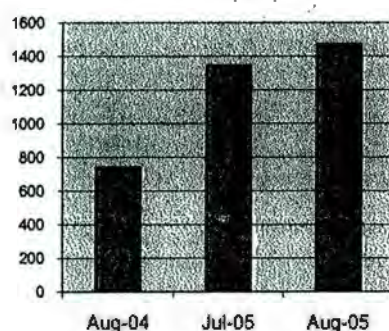
Date Due

30 September 05

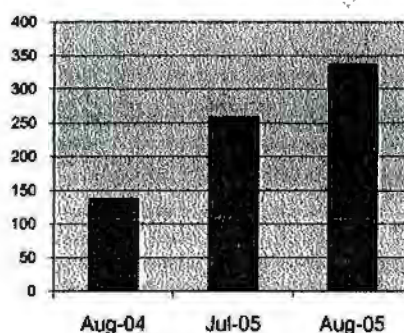
In accordance with Council's Trade Waste to Sewer Policy, and your  
Liquid Trade Waste Service contract, testing has given the following results:

	Average	Fee for Month
BOD	1470 mg/L	\$46,304.04
Suspended Solids	335 mg/L	\$1,948.65
Phosphorus	6 mg/L	\$0.00
Sulphate	35 mg/L	\$0.00
Sulphide	0 mg/L	\$0.00
Nitrogen	6 mg/L	\$0.00
pH	8.6	\$9,534.38 (pH charges not yet in place)
Outflow	1442 kL/day	\$27,709.04
<b>Total Charge</b>		<b>\$75,961.73</b>

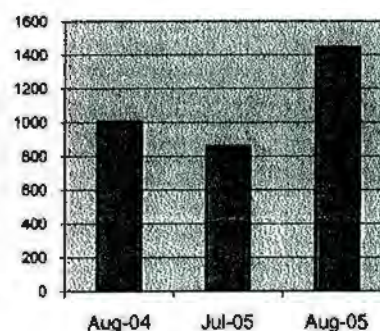
Average BOD (mg/L)



Average SS (mg/L)



Average Outflow (kL/day)



16 SEP 2005



PO Box 485  
GRIFFITH NSW 2680  
Phone (02) 6962 8100  
Fax (02) 6964 4369

## LIQUID TRADE WASTE CHARGES - MONTH ENDING:

31 August 05

## Testing Summary

Date	Outflow (kL)	P (mg/L)	BOD (mg/L)	SS (mg/L)	pH	Nitrogen	Sulphate	Sulphide
2-Aug-05	11528.0	4.7	1500.0	300.0	10.2	8.2	70.0	0.0
11-Aug-05	17199.0	8.6	1700.0	410.0	7.1	4.7	24.0	0.0
24-Aug-05	15965.0	5.0	1200.0	280.0	8.5	12.0	21.0	0.0
<b>Total/Ave:</b>	<b>44692.0</b>	<b>6.3</b>	<b>1469.8</b>	<b>335.2</b>	<b>8.6</b>	<b>8.5</b>	<b>34.8</b>	<b>0.0</b>

Re-inspections necessary during the billing month: 0

## Trade Waste Charge Calculation Procedure

Load-based fees are calculated from the weighted average concentration for the month. Regardless of total concentration, no mass-based fees are applicable for the following:

- The first 300mg/L of Biochemical Oxygen Demand (BOD)
- The first 300mg/L of Suspended Solids (SS)
- The first 10mg/L of Phosphorus (P)
- The first 50mg/L of Nitrogen (N)
- The first 100mg/L of Sulphate
- The first 1mg/L of Sulphide

## Fees for 2004/2005:

Flow	\$0.62 /kL	
<b>Excess Mass Charges:</b>		<b>Concentration Range Applicable:</b>
P	\$12.09 /kg	Greater than 10 mg/L
SS	\$1.03 /kg	Greater than 300 mg/L
BOD	\$0.74 /kg	300 - 600 mg/L
	\$0.92 /kg	600-1500 mg/L
	\$1.10 /kg	1500-3000 mg/L
Per DEUS Formula		3000-5000 mg/L
	\$2.58 /kg	Greater than 5000 mg/L
Nitrogen	\$0.23 /kg	Greater than 50 mg/L
Sulphate	\$0.11 /kg	Greater than 100 mg/L
Sulphide	\$1.10 /kg	Greater than 1 mg/L

## APPENDIX G





Department of  
Environment and Conservation (NSW)

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Our reference : Licence No. 11302  
Contact : Debbie Pittard 02 9995 5443

Mr Kelvin Kajewski  
General Manager  
Nugan Quality Foods Pty Ltd  
PO Box 759  
GRIFFITH NSW 2680

22 February 2006

Dear Mr Kajewski,

**NOTIFICATION OF TRANSFER OF ENVIRONMENT PROTECTION LICENCE 11302**

I refer to the application to transfer the Environment Protection Licence 11302, and would like to advise you that the Environment Protection Authority has approved the transfer from Parle Foods Pty. Limited to Nugan Quality Foods Pty Ltd. The effective date of the transfer was 18 February 2006.

Enclosed in your folder is a copy of the transferred licence and an annual return to be completed and submitted within 60 days after 19 December 2006.

Please contact Debbie Pittard from the Licence Administration and Revenue Unit on (02) 9995 5443 to discuss any issues relating to the transfer of the licence.

Yours sincerely

**DAVID FOWLER**  
Head Licence Administration and Revenue Unit  
Environment Protection & Regulation Division  
Department of Environment and Conservation (NSW)

*Please note that the Department of Environment and Conservation exercises certain statutory functions and powers in the name of the Environment Protection Authority (EPA).*