Limitations

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This report has been prepared in accordance with the usual care and thoroughness of the consulting profession. This document is based on generally accepted practices and standards at the time of preparation. No other warranty, expressed or implied, is made as to the professional advice provided in this document. This report has been prepared in accordance with the scope of work given in the OTE proposal and for the purpose described in this document. The methodologies adopted by OTE and sources of information supplied by ACM and subsequently used by OTE are outlined in this report.

This document was issued on 29 August 2018 and prepared based on the information supplied at the time by ACM and by the conditions encountered at the time of the relevant investigations. OTE disclaims responsibility for any changes that may have occurred after the time of issue of this report.

This Report (Volume 1) and all its attached Figures (Volume 2) and Appendices (Volume 3) should be read in full. No responsibility is accepted for use of any part of this document in any other context or for any other purpose or by third parties. This document does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners.
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1 Introduction

1.1 Company Legal Entity – The Applicant

Australian Consolidated Milk Pty Ltd (ACM) is a dairy company founded in 2008, based at 187-189 Allen Street Kyabram, Victoria. ACM sources raw milk from over 100 licensed dairy farms in the region and supplies dairy ingredients to end-user customers in the domestic and export markets. It supplies raw, whole, skim, pasteurized, homogenized and flavoured milks; milk powders; cream and butter.

ACM is establishing its own milk processing capabilities at Girgarre primarily for production of whole and skim milk powders. The factory will process up to 400 KL/day, or about 100 - 125 ML/Yr of raw milk. Raw milk will be standardised and processed through two milk dryers (1.2 tonne/hour each) to produce whole, skim and buttermilk powders. Butter is also produced, as well as small volumes of extended shelf life (ESL) box milk from time to time.

EPA Works Approval and Licensing requirements are triggered based on the above throughputs. Proposed milk process design and operations, emissions and discharges, and environmental impact assessments are documented in this report in support of ACM’s Works Approval Application (WAA).

Parent company ACM has formed 2 new companies for this project. ACM Processing Pty Ltd is the Works Approval applicant, future operator and EPA licence holder. ACM Processing will lease the factory from ACM Plant Pty Ltd (ACM Plant) who is the owner of the works. ACM Processing and ACM Plant are both fully owned subsidiaries of parent company ACM. Note that hereafter in this report, the acronym “ACM” is intended to mean both parent company Australian Consolidated Milk Pty Ltd and ACM Processing Pty Ltd.

The EPA WAA Company Legal Entity Form and ASIC Certificates of Registration for the Applicant and associated parent ACM and ACM Plant companies are provided in Appendix A (Volume 3 of this report).

1.2 Location of Works

ACM is establishing a new dairy processing facility at 506 Curr Road, Girgarre as shown in Figure 1.
ACM owns a total of 40.5 Ha of land between Curr Road and McColl Road as highlighted blue in Figure 1. The key operations to be established on this land for this project will be as follows:

(i) Milk tanker bay, milk storage silos, factory including wet processing, milk evaporators and dryers, cool store, warehouse and loadout dock;

(ii) Services including electrical supply, transformers, gas-fired boiler and cooling towers;

(iii) Raw water supply pumped from G-MW channel to raw water dam, water filtration plant, storage tank to supply treated water use in factory milk processes;

(iv) Wastewater collection and treatment in aerated ponds (WWTP), and winter storage pond;

(v) Recycled water pump station for supply offsite via pipeline to Dickman dairy farm; and

(vi) Onsite “reserve” farmland as backup recycled water irrigation area.

Figure 2949 P11 SH1 (D) (attached in Volume 2) shows the ACM landholdings that in total represent the “premises” upon which all the above described works are located for the purposes of this WAA. Appendix C provides the Title Search and Plan of Subdivision documents for ACM’s landholdings.

1.3 Need for Works Approval

Works Approval is triggered by the Environment Protection (Scheduled Premises) Regulations 2017, for the following premises activities:

   D07 – Milk processing or dairy product manufacturing works, which are designed to produce at least 200 tonnes per year of product(s).

Due to the milk processing facility being a Scheduled Premises, ancillary activities including milk dryer and boiler air emissions, wastewater treatment plant and recycled water scheme are also triggered by the Regulations. These activities will be considered in the works approval application as part of premises wide emissions and discharges to land and air segments of the environment.

1.4 This Works Approval Document

The structure and content of this report is in accord with EPA’s Licensing and works approvals – guidance for business website pages, “Works Approval Application Guideline” (Pub. 1658, June 2017), as well as State Environment Protection Policy and other dairy industry environmental guidance.

The format and content of this document has been prepared according to the tailored template produced from EPA’s Works approval application checklist page.

The Works Approval has also been prepared having regard to EPA’s letter of 22 November 2017 “Pathway outcome and application preparation guidance for ACM Plant Pty Ltd, which provided feedback on the Approvals proposal pathway form submitted to EPA in early November 2017.

This WAA report provides details of ACM’s Girgarre milk factory including milk production processes, wastewater treatment plant concept design, air (odour, dust, combustion, greenhouse gas) discharges, noise emissions, water balance calculations and offsite recycled water scheme for reuse of treated effluent and associated environmental impact assessments.

The EPA Supporting Information Form, signed by ACM Processing Pty Ltd is provided in Appendix B. Supporting technical information, plans, drawings, air quality, noise, wastewater, geotechnical, land capability and other specialist reports are provided in Volume 2 Figures and Volume 3 Appendices annexed to this report.
2 Description of the Proposal

2.1 Project Area – Factory Site and Recycled Water Scheme

This works approval application (WAA) is for ACM’s new milk factory and associated works onsite including milk dryers, boiler, wastewater treatment plant, treatment pond, winter storage pond and recycled water irrigation scheme.

ACM’s land between Curr Road and McColl Road as shown in Figure 1 is to be developed for the onsite works. Secondary treated recycled water and clean condensate will be supplied offsite to a private dairy farm located about 1.5 km north of ACM’s factory as shown in Figure 2. The recycled water will be used for pasture and fodder production on existing flood irrigation areas at Dickman dairy farm.

Figure 2 Location of ACM Factory and Recycled Water Irrigation Scheme (Dickman Farm)

The dairy factory and ancillary site works are within a 4.5 Ha industrial allotment east of Curr Road. The balance of ACM’s industrial land is occupied by the existing wastewater treatment and storage ponds. ACM also owns land immediately east of the industrial estate containing the existing raw water dam and flood irrigated farmland. The Overall Site Plan showing factory site, WWTP, water filtration plant and raw water dam is provided in Figure 2949 B01 SH1 (I) (Volume 2) – note this figure excludes the full extent of ACM’s farmland east of the factory site and wastewater ponds.

2.2 Overview of Proposed Operations

The factory will operate 24hrs/day, 365 days/year, processing up to 400 kl/d raw milk from local dairy farms. About 20 tanker (semitrailer, B-double) loads/day are expected. Raw milk is stored then separated into cream and skim milk, then standardised (with cream re-mix) to make skim milk and whole milk feedstocks for the evaporator/spray dryer lines. Skim and whole milk powders are produced for bulk bagging. Cream will be used for production of butter and subsequent buttermilk powder production. From time-to-time small volumes of milk may be processed and containerised as extend shelf life (ESL) products. General process flows are shown in Figure 3.
Figure 3 ACM Girgarre Milk Processing Facility – Milk Processes
The overall site layout of ACM’s Girgarre Milk Factory and associated works is shown in Figure 2949 B01 SH1 (I). The rest of ACM’s land east of the factory site and WWTP ponds comprising existing flood irrigation areas for potential backup recycled water use, is shown in Figure 2949 P12 SH1 (B).

The key works and associated activities for the proposed dairy factory are summarised in Table 1.

Table 1 Summary of Proposed Works – ACM Girgarre Dairy Factory

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk tanker deliveries</td>
<td>• Milk tanker - up to 15-20 loads/day, mostly semi-trailers, but also some B-doubles. Access 24hr/day via new entry driveway at 506 Curr Rd</td>
</tr>
<tr>
<td></td>
<td>• Truck and car hardstand, parking and turning areas around factory</td>
</tr>
<tr>
<td></td>
<td>• Truck movements generally as shown on Figure 2949 B01 SH1 (I)</td>
</tr>
<tr>
<td>Milk tanker bay</td>
<td>• Roofed and bunded area containing milk transfer systems, manifolds, pump-sets, hoses, valves, meters, etc</td>
</tr>
<tr>
<td></td>
<td>• Washdown, minor rainfall derived runoff to trade waste drains.</td>
</tr>
<tr>
<td></td>
<td>• Any unplanned spills contained in bunded area.</td>
</tr>
<tr>
<td>Milk storage silos</td>
<td>• Bunded area including raw milk (400kL), skim (390kL), cream (80 kL) and buttermilk (60 kL) silos</td>
</tr>
<tr>
<td></td>
<td>• Transfer systems, pump-sets, valves, meters, etc.</td>
</tr>
<tr>
<td></td>
<td>• Tank farm bunded and drained to trade waste drains.</td>
</tr>
<tr>
<td>Milk processing in factory</td>
<td>• Wet Wet processing area separates the raw milk into ingredient components and then recombines these components to produce the required</td>
</tr>
<tr>
<td></td>
<td>standardised milk composition for subsequent milk powder production</td>
</tr>
<tr>
<td></td>
<td>• Cream processing into butter and buttermilk production</td>
</tr>
<tr>
<td></td>
<td>• ESL (extended shelf life) box milk - small volumes produced from time to time</td>
</tr>
<tr>
<td></td>
<td>• SCADA controlled processing systems</td>
</tr>
<tr>
<td></td>
<td>• Washdown waters (and potential spills) to trade waste floor drains</td>
</tr>
<tr>
<td>Milk powder production</td>
<td>• Two x 1.2 tonne/hr powder production lines operating in parallel each comprising a multiple effect evaporator followed by a spray dryer</td>
</tr>
<tr>
<td></td>
<td>(designed by Food and Dairy Systems Australia)</td>
</tr>
<tr>
<td></td>
<td>• 50 t/d milk powder loaded into 1 tonne bulk bags, 1 day’s warehousing capacity</td>
</tr>
<tr>
<td></td>
<td>• Baghouse filter system located inside dryer building recovers 99.9% residual product (contained within the process returned to the drying</td>
</tr>
<tr>
<td></td>
<td>chamber/fluid bed). Air passing through the bag filters is exhausted to atmosphere.</td>
</tr>
<tr>
<td></td>
<td>• 2 x 24m high dryer stacks, total residual milk particulate mass rate ~25 kg/d</td>
</tr>
<tr>
<td></td>
<td>• Evaporator condensate (~400kL/d) recycled to raw water dam for factory reuse. Potential excess condensate recycled to Dickman farm in summer for</td>
</tr>
<tr>
<td></td>
<td>irrigation.</td>
</tr>
<tr>
<td>Cleaning-in-plant (CIP) systems</td>
<td>• CIP technology and SCADA controls used in wet processing area and powder plant for plant hygiene control, food safety quality assurance,</td>
</tr>
<tr>
<td></td>
<td>water use efficiency and reduced wastewater generation</td>
</tr>
<tr>
<td></td>
<td>• CIP cleaning and sanitising chemicals include caustic (NaOH, KOH), acid (Nitric, Phosphoric), and sanitiser (sodium hypochlorite),</td>
</tr>
<tr>
<td></td>
<td>• CIP final wastewater discharges to trade waste system</td>
</tr>
<tr>
<td>CIP Chemical Storage</td>
<td>• CIP tank farm including: acid (10kL), caustic (10kL), rinse recovery tank (10kL), transfer systems, pump-sets, valves, etc.</td>
</tr>
<tr>
<td></td>
<td>• Bunded area drained to trade waste drains (WWTP), designed as per EPA</td>
</tr>
<tr>
<td>Activity</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>bunding guidelines</td>
<td>(EPA Pub. No. 347.1, 2015)</td>
</tr>
<tr>
<td>Coolstore</td>
<td>• Packaged butter and ESL boxed milk held in cool store prior to loadout</td>
</tr>
<tr>
<td>Warehouse</td>
<td>• Milk powder stored in dry goods warehouse prior to loadout</td>
</tr>
</tbody>
</table>
| Product Loadout Bays           | • milk powder loadout bay from north side of warehouse under a canopy  
• butter and ESL loadout from north side of coolstore under a canopy  
• product dispatch via north, east and south hardstand areas  
• truck movements generally as shown on **Figure 2949 B01 SH1 (I)**  
• trucks depart via Curr Rd exit (daytime only)                                                                                                                                                                                                                     |
| Electrical Services            | • Grid supply (22kV, 2500 kVA) from Powercor to (ACM operated) dry type transformers for factory power supply  
• Short length low voltage cabling for reduced power loss  
• Master control centre and sub-metering for electricity use efficiency monitoring and control                                                                                                                                                                                  |
| Boiler                         | • Natural gas-fired boiler (10 MW, 40 Bar) for hot water and steam production  
• Air emissions: particulates, NOx, SOx and CO less than Works Approval triggers  
• Boiler blowdowns to WWTP                                                                                                                                                                                                                                               |
| Cooling Towers                 | • Three cooling towers - induced draught, counter-flow, cooling duty 750 kW (south east corner of factory building)  
• Steam/water mist emissions to air  
• Tower bleedwater and system draining flows to WWTP                                                                                                                                                                                                                   |
| Water filtration Plant         | • Water filtration and disinfection plant (1ML/day), 2 x 375kL storage tanks in south east corner of factory site to supply potable water to the factory  
• Raw supply pumped from G-MW channel system to existing 40ML raw water storage dam, as feed water to the filtration plant  
• Filter backwash to Winter Storage dam                                                                                                                                                                                                                             |
| Wastewater treatment and storage | • New trade waste drains to main trade waste sump (20kL capacity) for pumping to wastewater treatment pond system  
• Wastewater ponds comprise:  
  - Aerated Pond 1 (7.5ML), 3 aerators (total up to 60kW), pH/DO sensors  
  - Settling Pond 2 (7.5ML) with biomass (activated sludge) return to Pond 1 and clear water discharge to winter storage pond  
  - Contingency chemical dosing system for odour and pH control  
• Winter Storage Pond 2 (29ML) – capacity to hold all wastewater up to the 1-in-10 wet year as per EPA Wastewater Irrigation Guidelines (Pub. No. 168, 1991).                                                                                           |
| Recycled Water Scheme          | • Secondary treated recycled Water from the WWTP to be pumped ~1.5km to the north via the existing underground Curr Rd pipeline (150mm diameter) to Dickman dairy farm located as shown in Figure 2  
• Dickman Farm also contains a 20 ML turkey nest dam available for additional recycled water storage.  
• Dickman Farm also has a 4ML reuse sump for runoff collection and reuse as part of a whole farm plan.                                                                                                  |
<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
</table>
| Recycled water               | • Recycled water to be reused – up to ~183Ha of flood irrigation areas available. This farm was previously EPA licensed for irrigation of Heinz factory effluent up until about 2011/12.  
• Potential backup irrigation area (up to 22.8 Ha) is available on ACM land east of the factory (“Farm Property - Irrigation Area” as shown in Figure 1 and attached Figure 2949 P11 SH1 (D)). |
| Sewerage connection          | • Staff offices and amenities sewage and sullage discharged to GVW’s Girgarre sewerage system and Girgarre Sewage Treatment Plant.                                                                                                                      |
| Stormwater system            | • Stormwater collection from operational areas, hardstands, car parks and roofs treated via swale drains and 4.5 ML detention basin (north of winter storage pond) in accord with Campaspe Shire Council’s Infrastructure Design Manual.  
• Unplanned spills to be isolated and pumped to the WWTP.  
• Clean stormwater to be discharged to the Council/G-MW drainage system at north-west corner of the site at pre-development flow rates |
| Fire water Tanks             | • 2 x 375 kL CFA fire tanks and pumpsets in south west corner of site  
• Firewater pipe network to hydrants around site                                                                                                                                                    |
| Office and Amenities         | • Administrative offices, staff amenities and lunch room                                                                                                                                                     |
| Staff and visitor’s car parking | • Off-street staff bitumen paved car parking area (capacity of 50 spaces) on west boundary  
• Staff access from Curr Rd, most vehicle movements at change of day/night shifts at 6am and 6pm respectively                                                                 |
| Landscape Areas              | • Boundary tree planting, grassed areas and gardens around south, west and northern boundaries as shown on Figure 2949 B01 SH1 (I)                                                                 |

A conceptual site model illustrating the main operational elements of the project, raw material inputs, product outputs, air emissions and wastewater discharges is provided in Figure 4.

Further technical details and environmental assessments for the above works and operations are provided in the various Chapters to following in this works approval as well as the Figures (Volume 2) and Appendices (Volume 3) attached.
Figure 4 ACM Girgarre Milk Processing Facility Conceptual Site Model
2.3 Land Use

2.3.1 Choice of Location for New Premises

ACM selected this location for its new dairy factory for the following key reasons:

- the site is within a well-established dairy farming region and close to ACM’s own dairy farms as well as other partner dairy farms in the region
- current Industrial Zoning (INZ) for factory site and adjacent to the south (see Figure 5)
- good separation distances between factory and Girgarre township zone, and farm zones with very few houses to the north and east
- good site access from major road (Vic Roads asset) already extensively used by other milk tankers and other heavy agricultural/industrial traffic
- long history of onsite industrial uses most recently being the Heinz tomato processing operations that closed in 2012, and historic butter and milk factory operations going back to about 1915
- adequate electrical power and natural gas supply available from mains in Curr Rd
- existing infrastructure for GMW channel water supply, pump station and raw water dam
- availability of GW’s town water supply for factory drinking supply and sewerage system for site amenities sewage discharge
- availability of existing wastewater ponds and storage dam, which were previously EPA licensed to Heinz for its wastewater treatment system
- existing infrastructure for the recycled water scheme to Dickman Farm Close – previously approved and licensed by EPA for reuse of Heinz effluent
- available additional irrigation land onsite east of the factory site on ACM land as backup effluent reuse area if needed
- relatively deep watertables and clay substrata providing suitable underlying geological and hydrogeological conditions to ensure low risk to groundwater from wastewater pond operations
- ideal climate and topsoils at Dickman Farm and also on ACM owned irrigation land for sustainable recycled water irrigation
- no sensitive or natural waterways close by
- suitable flood control and drainage infrastructure including access to G-MW drainage system
- 100 years of support and acceptance for industrial uses by the local Girgarre community in terms of local employment and economic benefits
- Low environmental risks and minimal potential impacts from facility operations in terms of air quality, odour, noise, surface water, land and groundwater based on the above.

2.3.2 Planning and Other Approvals

The land use zoning for the Factory site and surrounds is shown in Figure 5. The ACM factory site, WWTP and water filtration plant are located within the Industrial 1 Zone (IN1Z), whilst the balance of ACM’s land including the raw water dam and backup irrigation area is within the Farming Zone (FZ1). The Campaspe Planning Scheme does not prohibit any of these proposed land uses associated with the ACM Girgarre facility.

ACM Plant Pty Ltd – Girgarre Milk Processing Facility Works Approval Application

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A planning permit (Pln325/2017) was issued by Campaspe Shire Council on 2 February 2018 for the use and development of the land for milk processing and associate works in the Industrial 1 Zone, subject to various permit conditions. Permit conditions 8a) to 8e) relate to control of noise, odours, nuisance dust, contaminated stormwater and construction/post construction activities as raised by EPA in response to referral of the permit application by Council to EPA.

The Notations section in the planning permit also states that the development requires a works approval. A copy of the planning permit is attached in Volume 3 Appendix D.

The land of the ex-Heinz factory site has been subdivided from the wastewater treatment plant allotment and is not part of ACM land nor in any way part of the ACM proposal of this works approval application.
ACM understands that an organic waste recycling facility incorporating a biodigestor is proposed on the ex-Heinz factory site subject to a Campaspe Shire planning permit and EPA Works Approval. At time of writing this WAA no permits or EPA approvals for the biodigester have been issued.

Note that at this time, the ACM wastewater treatment ponds and stormwater drainage system will only receive wastewater and stormwater (respectively) from ACM operations.

2.4 Community Engagement

The site is bordered by other industry, local farming families, and Girgarre township. Key stakeholders for this project include:

- Campaspe Shire Council: local planning permit and building permits, statutory referral authority for EPA works approval application
- GVW – permit to connect and discharge factory sewage and sullage to Girgarre sewers, potable water supply for factory office and staff amenities (toilets, lunchroom, etc)
- G-MW – licensing of channel water supply, drainage and groundwater bores onsite.
- Department of Health: statutory referral authority for EPA works approval application, responsible authority for public health, food safety, cooling tower risk, pest and vermin control.
- VicRoads: Curr Rd traffic management
- Powercor and APA – electrical power and piped gas supply respectively
- Local industry, businesses and residences

The landowner/operator of the Dickman dairy farms is also a key stakeholder in the project. A letter from Mr Dickman has been obtain confirming acceptance to take recycled water from the ACM Factory.

ACM and its consultants (CAF) conducted stakeholder engagement programs in 2017. A kickoff meeting was held at Girgarre Community Hall on 4 October 2017, as well as meetings with Council Planning staff. EPA’s Paul Connolly attended the meeting on 4 October 2017, where ACM and CAF presented to project stakeholders including Campaspe Shire Council, Regional Development Victoria, VicRoads, Powercor and EPA. ACM outlined the overall business strategy with CAF following up on the infrastructure development and process being adopted for Planning Permit Application.

Prior to this (~12 months prior), ACM held a public meeting at the Girgarre Community Hall where there was strong community support for the project. Furthermore, ACM received a letter of support from the Girgarre Development Group outlining the Girgarre Primary School, Girgarre Recreational Reserve and the Girgarre Community Cottage strongly endorsed the project.

The following pre-planning application meetings with council planners were also conducted:

- 1st August 2017 – preliminary meetings and initial discussions with stakeholders about ACM preferred development sites
- 4th October 2017 – as per above at Girgarre Community Hall
- 18th October 2017 – planning permit application pre-lodgement meeting.

Subsequent to the above, ACM held community meetings on 31 October 2017 immediately prior to formally lodging the planning permit application, and also in February 2018 meeting with the local community and prospective employees with around 350 in attendance.

ACM will continue to reach out to neighbouring landowners and may hold further local community group meetings once the works approval application is lodged with EPA.
In accordance with EPA’s Approvals proposal pathway guidelines (Publication 1560.2), Table A4.2, EPA may conduct information sessions and 20B conferences for standard works approval applications.

ACM is committed to participating in any EPA information sessions and potential EPA 20B conferences.

Based on consultation to date with the local community including public meetings held in 2017 and 2018, there is overall local community support for the project.

2.5 Track Record

2.5.1 ACM

ACM Processing Pty Ltd is a newly created legal entity that will operate the factory, leasing the site from ACM Plant Pty Ltd (owner of the plant assets) and buying milk from ACM Pty Ltd (the milk trading company). The Applicant: ACM Processing Pty Ltd has no prior history with the EPA.

ACM and its subsidiaries do not have any other operations in Victoria that require EPA works approval or hold EPA licences. Girgarre will be ACM’s first EPA approved/licensed activity.

ACM have no track record with EPA for its other operation in Kyabram and its dairy farms.

The land on which the new factory is located is on land previously used for agriculture and as a woodlot. There are no known legacy site contamination issues associated with this land.

2.5.2 Ex-Heinz Factory Site

The ex-Heinz factory site (not in any way part of the ACM land or proposal) has a long history of industrial activities beginning with a small butter factory in about 1915. Milk products and cheeses were made at the old factory under a succession of company names including Kyabram Butter Factory (1919) and Girgarre Cheese Factory which was closed down by Nestle in 1979. A few year later, Heinz then took over the site and processing tomatoes for production of tomato sauces and pastes. Heinz eventually closed down in January 2012.

Heinz previously held an EPA licence for its Girgarre operations, which at the time incorporated the now ACM owned wastewater pondage system. It is believed that the WWTP ponds were used by Heinz for over 20 years up until 2011-12.

EPA licences were also issued to the landowners of the now Dickman Farm properties for irrigation of treated effluent from the Heinz wastewater ponds.

At the time that Heinz factory closed down EPA and Heinz were negotiating licensing matters with a view to exempting the Dickman farm licences in favour of an EPA endorsed EIP for the recycled water reuse scheme at the Dickman farms. A working draft EIP was in preparation, but this EIP matter did not reach its intended conclusion because Heinz mothballed its operations resulting in cessation of recycled water supply.

The EPA licences for Heinz and Dickman Farms would have then been surrendered to EPA shortly after the closure of the Heinz factory in 2012.
3 Process and Integrated Environmental Assessment

3.1 Description of Proposed Works

An overview of proposed milk processing facility, associated WWTP and recycled water scheme was provided in Section 2.2.

The primary elements of the project that trigger works approval and licensing are:

1. Milk factory operations (100-125 ML/Yr throughput) including residual particulate dryer emissions
2. Wastewater treatment and storage ponds producing secondary treated recycled water; and
3. Recycled water scheme for irrigation of an offsite dairy farm.

Factory site location was provided in Figure 2, and overall site layout plan provided in Figure 2949 B01 SH1 (I). Plans showing 3-D images of the proposed factory are attached as Figures 2949 R01 SH1 (C) and 2949 R01 SH2 (A).

A further suite of civil drawings showing the factory floor plans, milk silo, CIP tank bunded areas is attached at end of this report as Volume 2 – refer to Figure List cover page.

Further details of the chosen process technologies, environmental and sustainability measures for the above proposed works are provided in the sections to follow, with supporting technical information also provided in Volume 3 Appendices.

3.2 Process and Technology

3.2.1 Choice of Process Technologies

ACM is establishing a state of the art manufacturing facility, capable of processing both organic and conventional milk products from its own milk pool as well as other contracted dairy farmers in the region. The chosen technologies across the various facility processes reflect the industry-wide eco-efficiency advancements made over the past few decades in Australia and overseas. This has resulting in improved water and energy use efficiency, higher milk solids recovery rates from spray dryers, lower milk particulate emissions, reduced wastewater loads and other initiatives.

The proposed milk factory process technology has been designed by Australian and New Zealand milk processing industry specialists. The milk plant will be of modern contemporary design reflecting industry best practice and the strict food safety and hygiene standards driven by food safety/quality management systems, organic product certifications, and domestic and export markets.

ACMs new factory is designed to achieve water, energy and wastewater eco-efficiencies at the lower end of the range of benchmarks reported by the industry and in accord with EPA and other industry guidelines.

3.2.2 Milk Processes

The milk processing flows were schematically shown in Figure 3. The milk process comprises wet processing and powder production involving the following key stages:

1. Raw milk separation into skim milk and cream
2. Standardisation to produce skim milk and whole milk as feedstock for powder plant
3. Evaporation and spray drying to produce whole milk, skim milk and buttermilk powders

ACM Plant Pty Ltd – Girgarre Milk Processing Facility Works Approval Application

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4. Production of butter and buttermilk (sent to powder plant) from cream
5. Production of extended shelf life milk (ESL) products using standardised milk from time to time
6. Product packaging and storage prior to loadout.

Floor plans of the factory including milk tanker bay, milk silos, wet processing, cream plant, butter and ESL, drying, packaging, coolroom and warehouse, etc are shown in the suite of figures in Volume 2. Refer to Figure P306-100 RevL (ACM Girgarre Milk Factory Layout) by Environmental Products International attached in Volume 2.

The factory will accept up to 400 kL/day of raw milk throughout the year, with milk processing expected to occur for at least 285 peak days per year. Daily quantities of milk products are as follows:

- WMP and SMP: 45 tonnes/day
- BMP: 5 tonnes/day
- Butter: 20 tonnes/day
- Milk: small ESL volumes from excess milk not utilised for the above.

Most of the milk will be processed through two milk dryers operating in parallel producing whole milk powder (WMP), skim milk powder (SMP), buttermilk powder (BMP) in different product runs. Powder production is expected to be at least 20,000 tonnes/year. Butter and ESL production are undertaken with excess cream/butter and milk streams respectively.

3.2.3 Evaporators and Dryers – FDS process description

Two powder production lines are proposed, operating in parallel each comprising a multiple effect evaporator followed by a spray dryer (designed by Food and Dairy Systems Australia). The powder plant will be housed inside a dryer building incorporating acoustic cladding. A 3-D image of the proposed dryer building is shown in Figure 6. Further technical description of the evaporator and spray dryer technology and operation including 3-D image and schematic process flow diagram is provided in Appendix E (Volume 3).

This milk drying technology is found in many modern plants in Australia and overseas including New Zealand and incorporates energy efficiency through heat recovery including:

- recovery of waste heat from the condensate stream to preheat incoming milk,
- recovery of dryer waste heat to pre-heat incoming dryer air
- incorporation of a thermo-compressor or ‘TVR’ as an energy saving device.

The dryers will achieve high milk dust recovery rates (99.9%) using filter baghouse technology with the captured milk fines returned to the drying process for product recovery.

Each milk dryer has a capacity to produce 1.2 tonne/hour of milk powder (at 96.6% total solids), running for 20 hrs per day, with 4hrs for CIP cleaning. Each dryer can produce up to 25 t/d, for total daily output of milk powder of about 50 t/d.

Air emissions from milk dryers will be treated via bag filters housed within the dryer building to capture residual milk particles prior to discharge via 22m high stacks. Total mass rate emissions of about 25kg/d of residual milk particulates are forecast across both dryers. Further discussion of dispersion of residual emissions from the dryers is provided in Section 7.3.
Two dryer stacks (post baghouse) pointing east away from town

12m high boiler stack (5m above services building roof)
Note boiler location to be moved ~ 10m south of where shown.

Figure 6 Proposed Dryer Building, Boiler, Cooling Towers and Stack locations (ACM)
Evaporator condensate (total of about 410 kL/D) will be recovered and recycled back to the raw water
dam for subsequent purification and use in the factory or sent to Dickman Farm for irrigation (see
Sections 5.1.2 and 6.2.2). Condensate is uncontaminated and better quality than GMW channel water.

### 3.2.4 Boiler

Steam and hot water for the factory will be provided by a 10 MW (40 Bar) natural gas-fired boiler
located on the east side of the factory in the Services building as shown in Figure 6. A 12m high stack
is provided for dispersion of combustion emissions comprising low levels of particulates, NOx, SOx and
CO (daily mass rates all less than EPA Works Approval/Licensing triggers). Further discussion of
assessment of particulate and combustion emissions from the boiler is provided in Section 7.3.3.

Boiler blowdowns of the order 1.1 KL/d are anticipated, discharging to the WWTP.

### 3.2.5 Cooling Towers

Three cooling towers are proposed on the Service building roof (east side of factory adjacent to the
dryer building) as shown in Figure 6.

The cooling towers (providing cooling for the evaporators) are B.A.C model PCT0505-P3-I, induced
draught, counter-flow, 750 kW cooling duty, design wet bulb Temperature 23.7°C (16 g/kg at 30°C).

Fan motors (4 kW each) meet MEPS2 2006 efficiency requirements as per AS1359.5. High efficiency low
sound axial fans as standard.

The towers will have water vapour/mist emissions to air (stack height about 10m above the roof),
bleedwater and system draining flows (1 – 10kL/d) discharging to the WWTP.

### 3.2.6 Cleaning-in-Place Systems

The factory will employ automated Cleaning-in-Place (CIP) systems in the wet processing and
evaporator/dryer lines.

CIP systems provide effective cleaning and sanitising methods to meet pre-requisite hygiene and food
safety standards, and at the same time reducing water and chemical consumption as well as effluent
flows when compared with manual and single pass cleaning methods.

CIP system operation will comprise bunded chemical tanks (acid, caustic and sanitiser), pumps and
pipework, auto-control system to regulate the circulation of cleaning and sanitation agents through the
milk processing equipment, and a rinse recovery tank. The CIP will recover some of the rinse water
cycles for re-use and recovery of chemicals for subsequent CIP cycles. This will ensure efficient water
and chemical use, and lower washwater volumes to the WWTP.

All raw and product milk silos and CIP chemical tanks are bunded in accord with EPA guidelines. These
bunded areas will drain to trade waste drains for treatment in the WWTP. Any unplanned spills are
contained within the bunds and subsequently cleaned and washed down to the WWTP.

### 3.2.7 Potable Water Treatment Plant

Water supply for the factory (~400 KL/d) will be from Goulburn-Murray Water’s channel system
(channel no. 4/12/9). Channel supply will be pumped into the 40 ML onsite raw water dam, where it
will be treated in an onsite water filtration and disinfection plant, prior to discharge to two covered
storage tanks (375kL each) for subsequent use in the milk factory for plant and equipment CIP systems
and washdown. Location of the water filtration plant is south east corner of wastewater settling pond 2
as shown in **Figure 2949 B01 SH1 (I)** (Volume 2).
The filtration plant backwash (5 - 10% of treated flows) will be directed to the raw water dam or wastewater winter storage pond. The backwash will contain inorganic silts and colloids, and potentially some minor residues of dosing chemicals and chlorine residues.

### 3.2.8 Wastewater Treatment Plant

#### Previous Heinz Operations and Existing Wastewater Ponds

The existing wastewater pondage system onsite was previously utilised by Heinz for its tomato processing works for more than 20 years, prior to closing down in 2012. The pondage system is shown in Figure 2949 B01 SH1 (I) (Volume 2), is clay lined and consists of two 7.5 ML surface aerated treatment ponds, followed by a 29 ML winter storage pond. Feature survey plan of the existing wastewater ponds is shown in Figure 2949 P10 SH1 (B).

These ponds were approved and licensed by EPA for wastewater treatment until Heinz ceased operations. The Environment Improvement Plan (EIP), Version, June 2009) required by the EPA licence issued to Heinz at the time, indicated that about 150-250 ML/Yr of tomato factory effluent discharged to the treatment ponds and winter storage. The water quality limits of the old EPA licence are in Table 2.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Unit</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biochemical oxygen demand</td>
<td>mg/L</td>
<td>NS</td>
<td>200</td>
</tr>
<tr>
<td>Suspended solids</td>
<td>mg/L</td>
<td>NS</td>
<td>300</td>
</tr>
<tr>
<td>Total Dissolved Solids</td>
<td>mg/L</td>
<td>NS</td>
<td>750</td>
</tr>
<tr>
<td>pH</td>
<td>pH units</td>
<td>6.0</td>
<td>9.0</td>
</tr>
<tr>
<td>Total Nitrogen</td>
<td>mg/L</td>
<td>NS</td>
<td>30</td>
</tr>
<tr>
<td>Total Phosphorus</td>
<td>mg/L</td>
<td>NS</td>
<td>7</td>
</tr>
<tr>
<td>Sodium Absorption Ratio</td>
<td>mg/L</td>
<td>NS</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 2 Previous Heinz Girgarre tomato factory effluent water quality (EPA licence ES543)

The treated effluent of this quality was then pumped from the winter storage to an EPA licensed (EX266 and EX267) wastewater irrigation scheme on two dairy farms (now both owned by Mr Dickman). The 2009 EIP stated that reuse on these dairy farms had occurred for more than 16 years.

The above concentrations were well above secondary treatment standards and the recycled water objectives specified in EPA’s “Guidelines for Reclaimed Water Use” (Publication 464.2, 2003). In contrast, ACM operations will generate lower wastewater volumes and the proposed aerator upgrades after commissioning will achieve significantly higher quality standards as discussed below.

#### ACM proposed upgrade of existing wastewater ponds

ACM milk factory operations is expected to generate about 100 – 125 ML/Yr of raw wastewater. This wastewater is expected to contain diluted milk residues (estimated 0.5 - 1% milk losses) and residues of CIP chemicals used by the CIP process to clean milk processing equipment, evaporators and dryers. A general process flow schematic of the proposed milk factory and associated works, WWTP, environmental emissions and discharges was provided in Figure 4.

A wastewater treatment assessment and concept design report has been prepared by Environmental Technology Solutions (ETS). This report is provided in Appendix F and discussed further in Section 5.

ACM propose to refurbish or replace the existing aerators in the first pond only for treatment of the dairy factory wastewater flows. Pond 1 has the three original aerators installed (60kW combined power) and Pond 2 the two original aerators (30kW combined). However, given the lower flows and BOD loads expected from ACM compared with previous Heinz operations, only two to three aerators in the first pond will be needed. The two aerators in the second pond will be removed, with this pond becoming a settling pond for biomass (activate sludge).
Since Heinz closed down, these aerators have been run from time to time to maintain their operation. The 3 aerators in the first pond will be fully serviced and refurbished to their original design function and efficiency prior to re-installation in Aerated Pond 1 in readiness to receive effluent from ACM. If any of the aerators are found to be unserviceable, new replacement aerators of similar design and capacity will be installed. Design specifications for potential replacement aerators are provided in the ETS report.

The new pondage system configuration is illustrated in the CSM in Figure 4, and will comprise:

1. Aerated Pond 2 to 3 surface aerators (power 20kW each), ETS process calculations (Appendix F) indicate at least 2 of the existing aerators are required for peak BOD loads
2. Settling Pond Settlement of biomass (activated sludge), transfer of clear water to the winter storage, activated sludge transfer back to Aerated Pond
3. Winter Storage Pond Receives clear water from the Settling Pond, capacity to contain treated recycled water for up to the 90th percentile wet year

The wastewater ponds will be provided with process monitoring controls including flow and quality (DO, pH and temperature) sensors, acid and caustic dosing facilities to ensure adequate DO levels and neutral pH is maintained to prevent offsite odour. Odour mitigation by dosing with hydrogen peroxide or other odour suppressant is proposed as part of contingency measures.

Process calculations and flow diagrams for the upgraded wastewater treatment ponds are provided in the ETS report in Appendix F.

The choice of the wastewater treatment process and technology is consistent with industry practice for the dairy processing industry. ACM effluent flows and loads will consist of diluted milk losses and CIP chemical residues only, and therefore organic and nutrient loads are expected to be relatively low compared to other existing milk factories with similar milk intakes. Therefore, it was not deemed necessary to provide a pre-treatment step to reduce insoluble/soluble (i.e. from milk solids) loads prior to aerobic digestion.

The existing aeration capacity (60kW) provided in pond 1 provides about 60% more than that needed to meet the expected oxygen demand from average BOD and ammonia loads in ACM’s raw effluent. Residence time in the aerated pond is almost double the minimum required to treat the expected BOD and nutrient loads to achieve secondary treated recycled water and without causing offsite odour.

Further technical details of the wastewater treatment concept design, including raw wastewater flows and loads, and expected recycled water quality for reuse at Dickmans farms are provided in the ETS report in Appendix F, and further discussed in Section 5 of this WAA report.

Condensate Water

In addition to the factory wastewater, about 116 ML/Yr of evaporator condensate will be generated, which will bypass the treatment ponds and instead be recycled to the raw water dam for reuse in the factory (after filtration/disinfection) as a water use efficiency measure. Excess condensate may be recycled to the winter storage for subsequent irrigation at Dickman farms.

Wastewater pond construction and clay liners

All treatment ponds and winter storage have at least 500mm freeboard, and are clay lined to meet permeability specification of $10^{-9}$ m/s. Clay liner material and permeability for all three ponds has been verified by soil bore logs and laboratory testing by geotechnical engineers. The geotechnical reports are provided in Appendix G.
3.2.9 Recycled Water Scheme

Secondary treated recycled water from the winter storage pond will be beneficial reused on the Dickman dairy farm. There is an existing irrigation pump station located on the south side of the treatment ponds, which will draw water from the winter storage and pump this to Dickman farms via the existing underground 150mm diameter pipeline located in the road reserve of Curr Rd over a distance of about 1.5km to the north of ACM factory site. The general pipeline route was shown in Figure 2.

The recycled water pipeline starts at the irrigation pump station and follows the route from the southern boundary of the ACM premises to Curr Rd as shown in Figure 10120-2018_08_27 - BS001-BP1-04 attached in Volume 2.

From ACM, the pipeline continues north starting on the east side of Curr Rd, then crosses over to the west side of the road reserve just north of the ACM site to avoid a GMW drain. The pipeline crosses back over to the east road reserve prior to reaching White Rd. The pipeline has been bored under GMW channel (4/12/9) and White Rd, entering the south west corner of Dickman South farm discharging into an on-farm open irrigation channel. The pipeline continues north along the east side of Curr Rd providing a second outlet to the south farm. The pipeline terminates at the south west corner of Dickman North Farm where there is a third outlet that supplies the north farm.

The recycled water will be used on existing dairy farm flood irrigation area. About 185 Ha of laser graded flood irrigation land is available. The Dickman farms were previously EPA approved and licensed for irrigation of Heinz treated effluent for over 20 years up until about 2011/12. Site plans of the Dickman farms including irrigation bays are provided in Appendix J.

Dickman farms have been extensively laser graded as part of a whole farm management plan. At Dickman farms there is a 20ML turkey nest dam, which is available for additional ACM recycled water storage. There is also a 4 ML reuse sump serving the south farm to collect irrigation runoff for subsequent pumping into the adjacent turkey nest dam for irrigation reuse onsite.

Also provided in Appendix J are results of previous soil testing undertaken at these farms by Heinz between about 2005 and 2009. Results of testing at the time indicate some increases in phosphorus on the farm but at manageable levels that would benefit pasture growth. Soil salinity and sodicity were reported within acceptable levels.

A Land Capability Assessment (LCA) was conducted by Ag-Challenge Consulting including soil agronomic soil testing at the end of the 2017-18 irrigation season. The LCA report is provided in Appendix K. The LCA report concluded that Dickman farms are suitable for use of recycled water irrigation based on March 2018 soil tests and also information previous use for irrigation of recycled water from Heinz. Ongoing success of ACM recycled water irrigation will be achieved with appropriate shandying with G-MW channel water, monitoring and management. The existing farm operators have previous success in recycled water irrigation management and possess appropriate farm operation skills to ensure effective use of ACM’s recycled water.

Water balance calculations have been undertaken to confirm adequate irrigation area and winter storage is available for the 90th percentile wet year. Calculations are provided in Appendix I.

A customer site management plan (CSMP) will be prepared consistent with EPA’s reclaimed water guidelines EIP checklist (Pub. No. 464.2). The CSMP will water use, soil, nutrient, runoff and livestock access checklist procedures and annual reporting programs, and responsibilities for the farmer and ACM.

There is also potential for future reuse on existing flood irrigation areas on ACM landholdings to the east of the factory site. There is up to 22.8 Ha of potential backup irrigation area available on ACM land (“Farm Property - Irrigation Area” as shown in Figure 1 and attached Figure 2949 P11 SH1 (D)).
Any future contingency or regular use of recycled water on ACM irrigation areas will be first subject to an LCA to demonstrate soil suitability and sustainability in accord with EPA’s reclaimed water guidelines.

Further discussion of ACM’s recycled water supply scheme and reuse at Dickman farms is provide in Chapter 6 of this WAA report.

### 3.3 Integrated Environmental Assessment

The ACM facility is a state of the art dairy processing facility incorporating water and energy use efficiencies, and low wastewater volume per unit volume of milk processed when compared with environmental performance benchmarks reported by the Dairy Industry.

The highest energy demands for the facility will be for milk powder production. This is offset by energy efficiencies built into evaporator and dryer design including waste heat recovery from condensate and dryer air and other energy saving devices.

The wastewater treatment plant will incorporate additional aeration capacity to ensure recycled water quality objectives are met and control of odour to make up for limited separation distances to sensitive receptors.

The facility will typically use about 400kL/day of water from G-MW channel supply. Therefore, ACM will not need to access this demand for process water from the GVW Girgarre potable supply system. Channel supply demands can also be reduced by recycling of condensate from the milk evaporators for factory process uses after purification and disinfection in the water filtration plant.

The use of CIP systems will ensure high cleaning standards for milk processing plant and equipment and assurance of export quality milk products, and at same time incorporating reduced water use and wastewater generation compared to sites employing manual washdown methods.

In addition, the supply of recycled water to Dickman farms also helps to offset demands on G-MW channel supply by supplying and alternative water source for irrigation. The nutrient value in the recycled water also provides a supplementary source of nutrients for farm pastures at Dickman farm, thereby helping to reduce the farmers inorganic/organic fertiliser costs.

The overall environmental outcome for the ACM Girgarre is a modern facility operating to industry best practice conforming to State Environment Protection Policy, EPA approvals and licensing requirements and relevant EPA guidelines for the milk processing industry.

Further assessment of the discharges and emissions to air, water and land and associated environmental impacts, eco-efficiencies, pollution prevention and management plans are discussed in the Chapters to follow.
4 Water Use

4.1 Water uses in process
ACM’s milk factory water use is expected to be around 100 – 125 ML/Yr, based on a water use efficiency of about 1 ML per 1 ML of raw milk throughput.

Most of the factory water use will be for CIP cleaning of milk processing plant and equipment, evaporators, etc. Other water uses will comprise:

- Manual washdown activities for factory floor and equipment if required eg. spills clean-up
- Washdown (eg. in case of any milk spills) of milk tanker bay, milk silo bunded areas and other hard stand areas draining to the trade waste system
- Cooling towers and boiler makeup water
- Fire services, testing and top-up
- Landscape garden watering (NB: this might instead involve GVW town water supply)
- Other minor uses.

4.2 Water use efficiency
The key water-use efficiencies of the ACM project and resultant reduced G-MW channel demand by both ACM and Dickman Farms include:

- milk powder production facilities use less water per unit milk volume than liquid milk production facilities, mainly due to evaporator milk condensate recovery for factory uses, boiler and cooling tower makeup
- use of CIP systems with rinse recovery reduces water demand for washdown
- water efficient cooling towers and boiler including use of recycled condensate as makeup water
- water filtration plant backwash to the raw water dam or winter storage pond for reuse
- recycling of condensate to the raw water dam in non-irrigation season (late autumn to early spring)
- supply of treated wastewater and excess condensate to Dickman farms for subsequent irrigation reuse in summer
- use of G-MW channel water for ACM factory uses rather than GVW potable water as a legitimate potable water substitution initiative by using a lower hierarchical value water source.

4.3 Potable Water Reticulation
There is an existing GVW 100mm diameter water main located close to the south-west corner of the ACM site, which runs south on the eastern side of the Girgarre – Rushworth Road and appears to service a redundant office which was once utilised by the Heinz Factory. A connection (~100m new line) will be made this existing water main to supply potable water connection to the ACM site.

Reticulated town water will supply ACM offices, kitchens, toilets, showers, hand basins, etc. Water efficient fixtures will be installed to optimise GVW potable water demands for these amenities. Potable water demand is estimated to be around 1250 kl/d (i.e. for 50 staff at 25 l/day per person, based on EPA Publication 500) plus potential garden watering (but this may come from G-MW channel supply).
As discussed earlier the potable water supply to the milk processing facility will utilise raw water from the GMW Channel system, which will be subject to storage (raw water dam) and purification/disinfection by a new potable water filtration plant on site.

4.4 Dairy industry water efficiency benchmarks

The Australian Dairy Manufacturers Sustainability Council (DMSC) regularly surveys the dairy processing industry and publishes Environmental Sustainability Scorecards for a number of sustainability indicators. The most recent Environmental Sustainability Scorecard 2016–17 (representing about 75% of the industry in terms of milk processed nationally) reported the following water efficiency benchmarks:

- average 1.85 ML (range 0.9 – 3.1) of water consumed for every ML of milk processed,
- average 1.7 ML (range 0.8 – 3.1) of wastewater per ML of milk processed (NB: only 46% of industry represented).

The DMSC year 2020 water use target is: 1.4 ML of water consumed per ML of milk processed using the 2010/11 as the baseline year.

EPA Victoria “Environmental Guidelines for the Dairy Processing Industry” (Pub. No. 570, 1997) suggests a range of 0.5 - 2.5 ML of wastewater per ML of milk processed, with the lower end considered world’s best practice.

DMSC reported a wide range of values across the surveyed sites. This is due to sites producing multiple products such as Cheese, Yoghurts and Retail milk require more water to flush processing equipment and pipework.

The 2017 DMSC scorecard report states that: “milk powder production generally makes water available which can be recovered and re-used within the site, thereby decreasing the need for freshwater consumption”. Sites with less product mixes like ACM use less water and the focus will be more on process optimisation and reuse of condensate water where practicable.

ACM assumed a low-end of range water use factor of 1.0 because it is a milk drying facility. ACM proposes to recover condensate from the evaporators for reuse (after purification if required) in the factory thereby reducing channel water consumption.

ACM’s milk factory is anticipated to generated 1 ML of wastewater per 1 ML of raw milk throughput (excluding condensate). After commissioning and commencement of operation, ACM expects greater water use efficiency gains and reductions in wastewater generation rates over time as process improvement are made. The focus on powder production and condensate reuse at ACM are expected (after full commissioning) to result in water use and wastewater generation lower than the DMSC targets and benchmarks.
5  Wastewater and Stormwater Management

5.1  Wastewater Treatment System

5.1.1  Wastewater Sources

The sources of wastewater from the factory and associated operations, and discharge route to trade waste pit or otherwise are provided in Table 3.

Table 3  Trade waste sources and typical (average peak day) flows

<table>
<thead>
<tr>
<th>Wastewater source</th>
<th>Discharged to</th>
<th>Typical Flow rate (kL/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factory CIP wastewaters from cleaning of milk processing plant and equipment, evaporators, dryers, etc Above includes small flows from scheduled manual washdown and potential spill clean-ups for: • Internal factory floor and equipment if required • External areas including tanker bay, milk silo bunded areas and other hard stand areas draining to the trade waste system</td>
<td>Trade waste pit</td>
<td>365</td>
</tr>
<tr>
<td>Stormwater runoff from external areas such as milk silo and CIP tank bunded areas (total ~1000m²), and other hard stand areas exposed to rainfall but drained to the trade waste pit</td>
<td>Trade waste pit</td>
<td>(~0.5ML/Yr rainfall dependant)</td>
</tr>
<tr>
<td>Boiler blowdown</td>
<td>Trade waste pit</td>
<td>1.1</td>
</tr>
<tr>
<td>Cooling tower bleeds, draining/disinfection flows</td>
<td>Trade waste pit</td>
<td>1 – 10</td>
</tr>
<tr>
<td>Water filtration plant backwash (5-10% of typical 0.4 ML/d, design max. 1 ML/d)</td>
<td>Raw water dam, winter storage dam</td>
<td>20 – 40 (max. 50 – 100)</td>
</tr>
<tr>
<td><strong>Daily Total Factory Wastewater (Peak Day Average) kL/d</strong></td>
<td>~400</td>
<td></td>
</tr>
<tr>
<td>Evaporator Condensate</td>
<td>Raw water dam, winter storage dam</td>
<td>410</td>
</tr>
<tr>
<td><strong>Daily Total Factory Wastewater + Condensate (Peak Day Average) kL/d</strong></td>
<td>~810</td>
<td></td>
</tr>
</tbody>
</table>

The ETS report assumed an average 365 KL/d factory wastewater containing all the BOD load, most of this generated from the factory CIP washwater system. All other wastewater flows in the above table have low BOD and no additional oxygen demand on the WWTP. Based on Table 3, the typical average factory wastewater flows to the WWTP are forecast to be about 400 KI/D.

Condensate will normally be piped to the raw water dam for reuse in the factory after treatment in the water filtration plant. ACM are also considering use of clean condensate for makeup water for the boiler and cooling towers. There may be times when condensate would be used to dilute flows to the treatment or winter storage ponds for process, odour or algae control purposes. Excess clean condensate may also be discharged directly to Dickman farms for reuse during summer only.

In addition, there is potential for water filtration plant backwash to be (i) recycled to the raw water dam for potable reuse and/or (ii) to winter storage dam for Dickman farm reuse.
The above trade waste sources and flow paths to the WWTP and other wastewater management works were shown conceptually in Figure 4. The Factory effluent trade waste drainage system is shown in the Hydraulic/Services Plans (Figures 10120-2018_07_12-BS001-BP1-04, BS002-BP1-06 and H001-BP1-03, attached in Volume 2).

### 5.1.2 Wastewater Characteristics

Raw factory wastewater and condensate quality is shown in Table 4, based on ACM’s milk loss target 0.5 - 1% and ACM’s industry experience with milk powder plants. These water quality characteristics were adopted by ETS in agreement with ACM for the WWTP concept design report (see Appendix F).

**Table 4 Trade waste flows and quality characteristics**

<table>
<thead>
<tr>
<th>Wastewater Source &amp; Parameter</th>
<th>Concentration (mg/L or as stated)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factory – raw wastewater (peak day)</strong></td>
<td></td>
</tr>
<tr>
<td>Chemical Oxygen Demand (COD)</td>
<td>1744</td>
</tr>
<tr>
<td>Biological Oxygen Demand (BOD₅)</td>
<td>1134</td>
</tr>
<tr>
<td>Suspended Solids (SS)</td>
<td>500</td>
</tr>
<tr>
<td>Total Nitrogen (TN)</td>
<td>66</td>
</tr>
<tr>
<td>Total Phosphorus (TP)</td>
<td>20</td>
</tr>
<tr>
<td>Free Oil &amp; Grease (FOG)</td>
<td>100</td>
</tr>
<tr>
<td>Electrical Conductivity (EC)</td>
<td>&lt; 1500 µS/cm</td>
</tr>
<tr>
<td>pH</td>
<td>6.5 – 7.5</td>
</tr>
<tr>
<td><strong>Evaporator Condensate</strong></td>
<td></td>
</tr>
<tr>
<td>Biological Oxygen Demand (BOD₅)</td>
<td>&lt; 5</td>
</tr>
<tr>
<td>Suspended Solids (SS)</td>
<td>&lt; 2</td>
</tr>
<tr>
<td>Total Nitrogen (TN)</td>
<td>&lt; 5</td>
</tr>
<tr>
<td>Total Phosphorus (TP)</td>
<td>&lt; 5</td>
</tr>
<tr>
<td>Free Oil &amp; Grease (FOG)</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Electrical Conductivity (EC)</td>
<td>&lt; 20 µS/cm</td>
</tr>
</tbody>
</table>

Cooling tower bleed water may contain moderate salinity levels (typically 1500-2500 mg/L TDS), and trace levels of corrosion/scaling inhibitors and biocides. Boiler blowdowns may also contain moderate salt levels and trace levels of corrosion/scaling inhibitors. Water filtration plant backwash will contain inorganic silts and residues of treatment/disinfection chemicals. The higher volume factory wastewater will dilute these ancillary wastewater flows (having low pollutant levels) and therefore assure acceptable levels of overall salinity and other contaminants in the final recycled water supplied to Dickman Farm.
5.1.3 Wastewater treatment process

The ETS report (Appendix F) provides the design concept and specification for the proposed new aerator configuration to handle ACM’s expected wastewater flows and loads. An overview of the wastewater pond configuration and operations was also provided in Section 3.2.8.

ETS found that the existing ponds and aerators are appropriate in size, dimension and aeration load delivery to treat the expected waste water quality from the proposed site. A total of 60kW of aerator duty is available in the first pond (7.5ML), and 30kW in the second pond (7.5ML).

ETS has proposed a new wastewater treatment process to utilise the existing pond infrastructure and to give ACM the flexibility to use the existing aerators. The expected general wastewater flows and loads for the proposed ACM facility are relatively low compared to other existing milk processing and powder production facilities of this scale. As a result, not all aerators will be required for the new configuration. New replacement aerators are only necessary if existing aerators are unserviceable.

The proposed biological treatment train comprises an Aerated pond 1, followed by a Settling Pond 2 and Winter Storage 3 designed to produce secondary treated water quality suitable for offsite irrigation at Dickman Farms. The WWTP process flow diagram is provided in the ETS report and conceptually shown within the CSM in Figure 4.

ETS has recommended a minimum 41 kW of aerator duty to satisfy the oxygen demand from average BOD and ammonia loads, and at least 10 days hydraulic residence time (HRT) to achieve secondary treatment objectives.

The existing 7.5 ML volume and 60kW total duty from the three aerators in Pond 1 provide approximately twice the minimum required residence time and 60% over and above the minimum aeration required to functionally treat ACM’s organic and ammonia loads. Supporting engineering process calculations are provided in the ETS report.

The three existing aerators in Pond 1 will be retained, whilst the two existing aerators in Pond 2 will be removed to enable Pond 2 to function as a biological sludge settling pond. The suggested layout of the aerators in Pond 1 is provided in the ETS report.

If any need to be replaced, ETS has suggested new 22kW aerators should be chosen based on current commercial availability at capacities that are similar to the existing units. If this occurs then only 2 new 22 kW aerators may need to be in operation at any one time.

The operation of the treatment system relies on extended aeration biological treatment in Pond 1, followed by sufficient settling time in Pond 2 to enable clear water to be discharged to Winter Storage Pond 3, and return of activated sludge to Pond 1. Aeration will operate 24hrs per day, with aeration rates matching organic loads and maintaining positive dissolved oxygen (DO > 0.5 - 2 mg/L).

Aerated Pond 1 will overflow by gravity to the Settling Pond 2. Sufficient settling will occur by plug flow across the Pond 2. If required to facilitate batch settling, the flows from the Aerated Pond can be isolated via an infeed isolation valve. This will require sufficient freeboard to be maintained in the Aerated Pond for the scheduled batch settling time (typically 6 to 24 hours).

At or near completion of each batch settling phase, activated sludge will be pumped back to the Aerated Pond. A new transfer pump and pipeline will be provided for this purpose. Within 18-24 months of commencement, excess biomass will build up in the ponds requiring activated sludge pump-out and offsite transport to EPA approved disposal or beneficial re-use sites.

Clear water from the Settling Pond 2 shall flow to Winter Storage Pond 3 under gravity, entering at the north-east corner. A portable submersible pump can facilitate discharge from either the Aerated or Settling Ponds if required.
Water quality exiting the Settling Pond is expected to meet the median values given in Table 5.

**Table 5 Quality of Treated Wastewater from Settling Pond 2 to ACM Winter Storage Pond 3**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Concentration (mg/L or as stated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological Oxygen Demand (BOD$_5$)</td>
<td>&lt; 60</td>
</tr>
<tr>
<td>Suspended Solids (SS)</td>
<td>&lt; 50</td>
</tr>
<tr>
<td>Total Nitrogen (TN)</td>
<td>&lt; 20</td>
</tr>
<tr>
<td>Total Phosphorus (TP)</td>
<td>&lt; 16</td>
</tr>
<tr>
<td>Free Oil &amp; Grease (FOG)</td>
<td>&lt; 5</td>
</tr>
<tr>
<td>Electrical Conductivity (EC)</td>
<td>&lt; 1500 µS/cm</td>
</tr>
<tr>
<td>pH</td>
<td>6 - 9</td>
</tr>
</tbody>
</table>

Further biological processes under aerobic and facultative conditions and settling of residual solids and precipitation of phosphorus will occur within detention in the Winter Storage Pond. The final recycled water from the winter storage is expected to meet the following water quality objectives (12-month medians) as follows:

- BOD 20 mg/L
- SS 30 mg/L
- TN 20 mg/L
- TP 16 mg/L
- pH 6 – 9 (90th percentile range).

Water quality is expected to be better than that indicated above (and in Table 5) during periods when condensate and/or filtration plant backwash is discharged into the winter storage pond, depending on the amount of dilution.

In time, algae are expected to grow in the wastewater treatment and winter storage ponds – with higher risk of algal growth and potential blooms during the warmer months. The above water quality objectives may not be met during periods of significant algal growth, which can temporarily increase BOD, SS and pH levels. Algal growth in irrigation water supplies is very common particularly in open channel systems like G-MW's but is routinely managed by flood irrigators. Any blue-green algal (BGA) blooms will be managed in accord with BGA guidance from G-MW and Agriculture Victoria including the Victorian Government's Blue-Green Algae Circular (2016-17). This may include temporarily restricting livestock from irrigation areas until water is fully soaked into the soil.

The discharge of condensate and backwash water to flush or dilute the winter storage may also be part of the algae management strategy.

The expected final recycled water quality to be supplied to Dickman farms is consistent with secondary treatment standards as per EPA guidelines (Publication 464.2), even with inherent algal growth. Note that ACM's wastewater is not expected to contain any human or animal pathogens given all wastewater is from milk processing equipment washdown and potential evaporator condensate.

The recycled water nutrients and salinity levels and suitability for irrigation have been assessed in the LCA report by Ag-Challenge – see Appendix K. The nutrient and salinity loads from application of 100%
(undiluted) recycled water are not expected to cause soil or pasture productivity problems. In any case, Ag-Challenge considers that the expected nutrient and TDS concentrations can be readily managed on the irrigation areas by shandying with channel water (and/or condensate).

In summary, ACM’s recycled water is considered fit-for-purpose for safe and sustainable irrigation reuse at Dickman farms in accord with EPA guidelines and SEPP (Waters of Victoria). Further discussion of the Dickman recycled water scheme is provided in Section 6.2.

### 5.2 Sewage Disposal

Girgarre is provided with a reticulated sewer system by Goulburn Valley Water (GVW). ACM have met with GVW to discuss requirements to service the ACM development. The basis of this service requirement was for provision of reticulated sewer to service drainage water from amenities including hand basins, showers, toilets and kitchens but not for trade waste from CIP wash down and other processing related activities.

#### 5.2.1 Existing Sewerage Infrastructure

There is existing gravity reticulated sewer infrastructure located to the south of proposed ACM site along the Girgarre – Rushworth Road immediately south of Progress Street. There is a 100 diameter UPVC sewer pipe which is understood to service the site south of ACM site with basic sewer requirements.

#### 5.2.2 Proposed Sewerage Infrastructure

A new sewer line (~150m extension along the Girgarre – Rushworth Road) will be provided to connect ACM’s sewage and sullage to the closest existing sewer.

On site plumbing separate from the trade waste drainage system will be provided to collect sewage and sullage from toilets, showers, hand wash basins, kitchen, etc. It is not anticipated significant volume of sewage will be discharged to the sewer system (of the order 1250 L/d, from forecast 50 staff). Refer to the Hydraulic and Building Services Plans (Figures 10120-2018_07_12-BS002-BP1-06 and 10120-2018_07_12-H001-BP1-03) in Volume 2 for the proposed onsite sewer pipelines and discharge pipe to GVW's sewerage system.

### 5.3 Stormwater Management

#### 5.3.1 Existing Stormwater Drainage

Stormwater runoff from the site is currently drained overland into the G-MW drainage system to the north-west corner of the site along Curr Road (Girgarre-Rushworth Road). The overland drainage across the property was previously rural in nature therefore generating runoff flow rates consistent with pervious environments where much of the stormwater is held in ground and not flowing off the property.

#### 5.3.2 Proposed Stormwater Drainage

ACM is developing most of the site for new buildings, structures and paved hardstand areas associated with factory operations, which will increase runoff from the site. The stormwater systems for the factory site are designed to incorporate best practice measures such as those contained in the Urban Stormwater Best Practice Environmental Management Guidelines, CSIRO 1999. The water sensitive design for post construction stormwater run-off is designed to remove 80% suspended solids, 45% total phosphorous and 45% total nitrogen of typical urban annual load and maintain discharges for the 1-in-5 year ARI at predevelopment levels. The design also incorporates litter controls to prevent carryover to
receiving waters. This includes design of waste enclosures and use of gross pollutant traps for areas that have potential to generate significant amounts of litter.

The Stormwater Management Plan is shown in Figure 2949 CO8 SH8 (D) (Volume 2). This shows the network of stormwater collection pits, grates and drains discharging to the large open crushed rock lined swales along on the east and north sides of the factory site. These swales outfall into the 4.5ML stormwater retention basin located in the northern section of the site immediately north of the existing 40ML winter storage pond as shown in the Stormwater Management Plan.

This basin has been designed consistent with Clause 18 Retardation Basins of the Campaspe Shire Council Infrastructure Design Manual (IDM) to keep discharge rates from the site to no more than predevelopment flow rates. The retention basin when full, will discharge (by pumping) to the existing legal point of discharge into the G-MW drainage system at Curr Rd in the north west corner of the site.

The 4.5ML basin has been conservatively sized assuming site fully covered in concrete / sheds and other impervious areas. The basin is therefore oversized for now but allows for future expansion including construction of additional impervious surfaces.

### 5.3.3 Spill Control

The onsite swales and retention basin provide the ability to contain any unplanned spills of milk, product, chemicals, fuels or other contaminated runoff that occurs outside the trade waste collection system. ACM operators will isolate any accidental spills close to the source to prevent discharge to the retardation basin.

Stormwater runoff from the tanker unloading bays and wash-down areas south of the site will be bunded and directed into the WWTP and ultimately for irrigation of farm land, therefore mitigating any risk of contamination of overland drainage systems with effluent should there be a spill in the tanker unloading bays.

Any spills caught in the stormwater system, swales and/or retention basin will be isolated and cleaned out with all recovered spill and flushing waters discharged into the trade waste system or pumped directly into aeration pond 1 for treatment.

Quality of stormwater leaving the site is expected to be equivalent or better than that of local rural and Girgarre township urban runoff, and the quality of the receiving G-MW drain.

### 5.3.4 Nearest Surface Waters

There are no natural waterways near the ACM site. G-MW operates an extensive network of manmade open drainage channels to provide drainage and flood controls across the irrigation district. The nearest G-MW drain is on Curr Rd along the western side of the ACM factory site. This open drain flows north (past Dickman farms) and ultimately connects with the Mosquito Creek Depression Drain located about 5km to the north, (just south of Kyabram).

The closest natural surface waterbody is Green Lake over 13 km away to the south west, and the Campaspe River about 25km to the west.

Therefore, the ACM operations pose negligible water quality risk to both manmade and natural receiving waters.
6 Land and Groundwater

6.1 Factory Site

The Overall Site Layout is provided in Figure 2949 B01 SH1 (I). The Factory site where the new works are proposed covers an area of about 4.5Ha. Breakdown of the percentage or total area covered by each of the main works elements are:

- New Factory and Office Buildings: ~10%
- Paved hardstand around buildings: ~40%
- Paved carpark, driveway and internal service vehicle tracks: ~5%
- Milk Silo, CIP bunded areas & tanker bay: ~3%
- Fire Tanks area: ~1%
- Water filtration Plant & Storage Tank compound: ~1%
- Balance of area, landscaping, drains, etc (pervious areas): ~50%

The above factory site excludes the existing WWTP and stormwater detention basin, which is on the adjacent 5.6Ha lot to the east.

As discussed in Section 5.3.3, the factory and office building roofs and clean external areas flow to the onsite drainage system, then into the gravelled open swales discharging to the detention basin. The Stormwater Management Plan Figure 2949 CO8 SH8 (D) shows the factory site surface flow pathways to the swales and detention basin.

There are three main bunded areas at the site outside the factory for the following:

- Milk silo tank farm
- CIP chemical tank farm
- CIP Chemical supply tanks – self bunded IBC units.

The design and layout of the bunded areas are shown in Figures 2949 B01 SH5 (A), 2949 B14 SH1 (G), 2949 B14 SH2 (D), and 2949 B14 SH3 (A). The tank farm bunded areas are designed in accordance EPA Bunding Guidelines (Pub No. 347.1, 2015) and have capacity to contain the largest tank plus 10% of the next largest tank accounting for displacement volumes inside the bunded area. The bunded areas are fully drained to the trade waste pit.

The self-bunded CIP chemical tanks are designed and operated as follows:

- Each bund is designed for 1 x 1kL IBC plus a small day tank of 200 L, total liquid capacity is 1.2kL
- Each bund is self-contained with a bund capacity of 1.35 KL.
- Each tank is self-bunded, there is a 1-inch external drain which will be fitted with a blank for draining the bund. This can be arranged to be fitted with a pad lock if necessary.
- Each bund will be tested for integrity and validated before any chemicals are installed.
- The plastic bund for the hypochlorite solution will be protected by addition of a suitably placed bollard to avoid vehicle impact if required.

The milk tanker bay is designed to hold one semi-trailer tanker (28-30kL) and one B-Double (up to 45kL). The bay is effectively bunded by employment of cut-off drain and rollover bunds and connection to the trade waste pit.

An inventory of tankage contained the above bunded areas and tanker bay and EPA bunding calculation checks are provided in Appendix H.
There will be a small maintenance workshops onsite which can contain small quantities of lubricating, hydraulic oils, cleaning chemicals, etc. These will be contained in a roofed and bunded room within the office and factory buildings.

To summarise, factory process areas, bunded areas and tanker bay where unplanned milk, product or chemical spills could accidently occur are fully paved and discharged to the trade waste system.

No milk, product or chemicals are stored on earthen or gravelled areas and consequently there is a negligible risk of contamination of land onsite. In the unlikely event that a spill reaches the stormwater system, then ACM operators would isolate the spill contents in stormwater pits, swales and ultimately the detention basin where it would be cleaned out and transferred to the WWTP.

There will be no wastewater, liquid waste, sludge or solid waste disposal to any land on the ACM factory site or farmland premises (Figure 1). Refer to discussion on waste management in Chapter 10.

Wastewater will be fully contained in the lined wastewater ponds, and recycled water pumped offsite to the Dickman Farm reuse scheme, to be discussed in Section 6.2 below.

### 6.2 Recycled Water Reuse Scheme

#### 6.2.1 Water Balance calculations

The operation of the wastewater system will rely on the offsite Dickman farms reuse scheme based on the principals of irrigation during warmer months (typically spring to autumn), scheduled watering to meet plant water and nutrient demands, and storage in the cooler non-irrigation periods.

Water balance calculations have been undertaken in accordance with EPA’s Guidelines for Wastewater Irrigation (Pub. No. 168, 1991). These calculations are provided in Appendix I.

The water balance calculations have relied on climate data available from the following Bureau of Meteorology weather stations:

- **Rainfall:** Stanhope (weather station no. 81046)
- **Evaporation:** Kyabram (weather station no. 80091)

Note that PAN evaporation data was only available for Kyabram for the years 1965 – 2009. Despite not having local evaporation data from 2009 onwards, this data is still representative of long term PAN evaporation for the Girgarre area given it represents the full range of climate conditions (from wet years to drought years). This data limitation is not considered to impact the accuracy of the water balance calculations.

A 20-year water balance model was run to assess performance of the existing ACM winter storage capacity (29ML) in combination with up to 185 Ha of irrigation land available at Dickman Farms. This model runs continuously covering the last 20 years and calculates the minimum required winter storage capacity required to contain all effluent in storage for at least 18 of the last 20 years.

The model predicts that for 114 ML/Yr wastewater volume, the 29 ML winter storage capacity would be adequate to contain all effluent for 90th percentile wet year conditions, provided at least 107Ha of the land at Dickman farms is utilised for irrigation. The model predicts for a typical (median rainfall year) winter storage of about 21 ML would be required, and only about 13 Ha of land is needed according to plant water demand. However, irrigation may be limited by TP loading on the land, so larger areas will need to be irrigated than estimated by the water balance calculations even during normal years (refer to LCA in Appendix K).
There is an additional 20 ML storage available in the existing turkey nest dam at the Dickman south farm. This can provide additional security for containment during extended wet periods.

The average year irrigation requirement is about 7.5 ML/Ha/Yr. This irrigation requirement is lower in wet years, higher in dry years. The 90th percentile year has an irrigation demand of about 6.8 ML/Ha/Yr.

### 6.2.2 Condensate Reuse

About 116 ML/Yr of condensate is forecast to be generated from the milk evaporators. This is proposed to be reused according to a hierarchical approach as follows:

1. Recycling to raw water dam for purification/disinfection in water filtration plant and reuse in factory. Other reuse schemes include direct reuse as boiler and/or cooling tower feed.
2. Excess condensate recycled to wastewater winter storage dam and pumping to Dickman Farms for irrigation reuse – during mid-late irrigation season only (typically January – March when winter storage dam is low).

As a contingency measure excess condensate may be pumped directly to Dickman Farms early in the irrigation season or during non-irrigation season, by-passing the winter storage in order to preserve its factory wastewater storage capacity. Alternatively, condensate could be irrigated on ACM irrigation land within the Premises – subject to a LCA and provision of water transfer infrastructure. Condensate Water Balance calculations for summer use at Dickman Farms is provided in Appendix I.

### 6.2.3 Dickman Farm Reuse Scheme Description

The recycled water supply distribution system is the same infrastructure as established by Heinz - last used in 2011/12. The pump station and pipeline are to be fully serviced and tested for leaks, and any required repairs undertaken prior to transfer of any ACM effluent to Dickman Farms.

The ACM winter storage pond outlet sump is located at the base of the pond at its south end. Recycled water of quality indicated in Table 5 flows to the irrigation pump station via an underground pipe within the shared embankment of Aerated Pond 1 and Settling Pond 2. The water is then pumped north up Curr Rd to Dickman Farm via the 1.5km long 150mm diameter underground pipeline (see Figure 2 and also Figure 10120-2018_08_27 - BS001-BP1-04 in Volume 2).

There are three recycled water supply points to Dickman farms as follows:

1. Water meter 3 (WM3): south west corner of Dickman south farm at White Rd, flows into an on-farm open channel, ~2.5ML/D capacity
2. Water meter 2 (WM2): west side of Dickman south farm, about 450m north of WM3
3. Water meter 1 (WM1): south west corner of Dickman north farm, about 320m north of WM2, ~2ML/D capacity.

Site plans of the Dickman south and north farms, delineated irrigation areas, and the above supply points are provided in Appendix J. There is about 89 Ha available on the south farm, and about 94 Ha available on the north farm.

The recycled water is supplied into on-farm open channels where it can be mixed with channel water supplied by G-MW. These on-farm channels then deliver the water to the selected flood irrigation paddock controlled by a series of channel weirs and outlet structures. Recycled water can also be delivered to the turkey nest dam (20ML capacity, built ~40 years ago, clay lined) via on-farm channels and reuse sump pump station if required. The sump pump station (250mm) is able to command all the irrigation areas.
Dickman Farms are licensed by G-MW for supply of about 1000 ML/Yr of G-MW channel supply, but this has been as high as 1200-1400 ML/Yr with additional water purchase. The farms also have a G-MW drainage diversion licence to extract water from local G-MW drains, which is usually pumped into the turkey nest dam in winter. Therefore, a dilution ratio of 10-to-1 is expected in the long term based on G-MW irrigation licence volumes to ACM’s recycled water volume (114ML/Yr excluding any condensate).

A runoff reuse collection system is provided as part of a whole farm plan, which can receive runoff from most of Dickman farm irrigated areas. The 4 ML reuse sump is pumped into the adjacent turkey nest dam, enabling reuse of farm drainage that may contain small quantities of recycled water runoff.

**6.2.4 Dickman Farm Land Capability Assessment**

This section provides an overview of the land capability, nutrient, salinity and sodicity management issues at Dickman Farms taken from the LCA report by Ag-Challenge. The LCA report is attached in Appendix K.

The LCA report confirmed the suitability of the irrigated soils at the Dickman Farms, with all nutrient, salinity and sodicity issues able to be readily managed by conventional farm practices. The key irrigation management issue is the phosphorus loading, which can be readily matched to plant nutrient demand by shandying with low-P channel water and also condensate (if available), and also by using the effluent across the whole farm as a P fertiliser.

Based on the expected recycled water concentrations entering the winter storage (Table 5), the annual average irrigation area mass loadings (100% recycled water use) would be as shown in Table 6.

**Table 6 Organic, nutrient, salinity loading rates on Dickman farm irrigation areas**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Concentration mg/L</th>
<th>Average Year Irrigation Demand ML/Ha/Yr</th>
<th>Irrigation area loading kg/Ha/Yr ³</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOD</td>
<td>&lt;20 ¹</td>
<td>7.5</td>
<td>&lt; 150</td>
</tr>
<tr>
<td>Total nitrogen</td>
<td>&lt;20</td>
<td></td>
<td>&lt; 150</td>
</tr>
<tr>
<td>Total phosphorus</td>
<td>&lt;16</td>
<td></td>
<td>&lt; 120</td>
</tr>
<tr>
<td>TDS</td>
<td>&lt;1000 ²</td>
<td></td>
<td>&lt; 7500</td>
</tr>
</tbody>
</table>

Notes to above table:  
1. During periods of no algal blooms  
2. TDS based on 0.64 x EC 1500 µS/cm  
3. Based on 100% recycled water use (no channel, condensate dilution)

**Nutrient loadings**

Based on the expected recycled water nitrogen concentration, and if 100% recycled water is used over the year on the same areas and with no dilution with channel water or condensate, the annual nitrogen load (Table 6) is expected to meet all or most of the nutrient uptake rates for most pasture mixes. Additional N fertiliser might in fact be needed for a ryegrass, fescue, lucerne, and 2:1 rye/clover mix

However, for phosphorus there is a limitation on the amount of recycled water that should be repeatedly used on the same area due to the high P loading. The Ag-Challenge LCA report (Appendix K) recommends shandying with low P water such as channel water in order to match pasture P uptake rates, and also ensuring nutrient export by a cut-and-carry pasture enterprise to reduce soil P levels.

As stated earlier the long-term ratio of channel water to recycled water is expected to be at least 10:1. On this basis the long term TP loading rates would be of the order 12 kg/Ha/Yr assuming low TP (<1mg/L) in G-MW’s channel water.
Salinity/Sodicity

The LCA also considered the salinity and sodicity issues associated with ACM recycled water and found that these are a moderate risk but readily managed by good irrigation practices, soil monitoring and management, and selection of appropriately tolerant pasture species.

The expected sodium absorption ratio (SAR) of ACM’s effluent is not yet known, but the LCA assumed a conservatively high SAR of 20. The LCA indicates there is a moderate risk of soil structure loss at this SAR, with potential soil treatments required – eg. gypsum. The SAR of ACM’s effluent is likely to be lower and will be determined with regular monitoring of the recycled water supply to Dickmans.

Previous Heinz Recycled Water Scheme

As discussed earlier, Heinz previously supplied recycled water to these farms for about 20 years controlled by EPA licences (one for the south farm and one for the north farm). EPA licence maximum nutrient limits for supply to Dickman Farms were: TN 30mg/L (higher than ACM’s), and TP 7 mg/L (lower than ACM’s).

Heinz effluent had an EPA licence maximum salinity limit of 750 mg/L TDS, which is similar to ACM’s expected salinity levels. The EPA licence also specified a maximum SAR of 4.

Soil testing was undertaken on the farms. Soil test data from 2005-09 (provided in Appendix J) indicated elevated soil phosphorus but this does not suggest agricultural productivity or environmental risks given the high phosphorus adsorptive capacity of the loams and clay loam subsoils at the site. These results did not indicate any other soil agronomic problems including salinity, sodicity or pH.

ACM is not aware of any reported incidents, complaints or other problems with the previous Heinz recycled water irrigation operations.

6.2.5 Dickman Farm Stormwater Management

Stormwater management at Dickman Farm is managed through its whole farm management plan design. The farms are served by onsite drainage network to collect irrigation runoff most of which can be collected in the 4ML reuse sump for reuse on the farm. This system can also be operated to collect first flush irrigation area runoff (containing recycled water residues) after high rainfall events consistent with the runoff guidelines described in EPA Publication 168.

The local GMW drainage system will receive excess drainage from the farm – likely during non-irrigation season, and as a result of high rainfall events and extended rainfall periods. These drains also receive runoff from other irrigated dairy farms in the area, as well as Girgarre township urban runoff. The offsite drainage from Dickman farms is expected to be no different to other farms in the area. GMW has regional monitoring programs for its channels and drains including for Blue-Green algae.

6.2.6 Dickman Farm Customer Site Management Plan (CSMP)

A CSMP for the Dickman Farm recycled water scheme will be prepared in accordance with the Environment Improvement Plan (EIP) Checklist for irrigation schemes >1 ML/D as described in EPA’s Guidelines for Reclaimed Water Use (Pub. No. 464.2). The CSMP will outline the recycled water use operations and controls, key procedures, monitoring programs (for water use, soils, nutrients and salinity), emergency notification and response, self-assessment annual performance checklist.

The CSMP will be prepared by ACM in consultation with the Dickman farm operators and be ready for implementation prior to commencement of ACM recycled water supply. The complete CSMP will be provided to EPA at time of licence application. An indicative table of contents of the proposed CSMP with key headings and structure as per EPA’s EIP Checklist is provided in Appendix L.
6.3 Groundwater Assessment

6.3.1 Groundwater Bore Search

A search for registered groundwater bores within a 1km radius of the ACM site was undertaken using the "Visualising Victoria's Groundwater" (VVG) internet data portal (via FedUni 2015, Centre for eResearch and Digital Innovation, Federation University Australia, Mt Helen, Ballarat, Victoria. Retrieved 31/07/2018, from: beta.vvg.org.au). The results of the search are presented in Appendix M.

The VVG indicates that there are thirty-three (33) registered groundwater bores within ~1km of the site, the digitised locations for which are shown in Appendix M (Figure 1). All 33 bores are registered as groundwater investigation/observation bores. Nine (9) of these bores are located onsite at the ACM factory site. Construction details were only available for twenty-nine (29) bores varying in depth from 2.23m to 17 m below ground level (bgl).

The nearest private registered extraction well is located ~1 km south of the site and described uses are as: domestic, groundwater investigation, observation. However, this well is inferred to be upgradient based on regional hydrogeological information from VVG (see Table 8). The nearest private registered extraction well considered to be down gradient of ACM is well no. WRK080353, described as domestic and stock approximately 1.3 km to the northeast from the ACM site - see Appendix M (Figure 1).

6.3.2 Onsite Bores at ACM Factory site

Nine (9) bores numbered sequentially 137520 to 137528 are located on the ACM Factory site including around the WWTP ponds. These bores were drilled during the time of the Heinz operation in about 1999. They were specified as monitoring bores in the EPA licence issued to Heinz at the time. A plan of onsite groundwater monitoring bores is provided in Figure 2949 P13 SH1 (D) (Volume 2).

Table 7 summarises bore construction details for the 9 onsite bores at ACM.

<table>
<thead>
<tr>
<th>Borehole ID</th>
<th>Coordinates</th>
<th>Elevation (mAH)</th>
<th>Constructed Depth (mbgl)</th>
<th>Screen interval (mbgl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>137520</td>
<td>139369.299</td>
<td>5970346.29</td>
<td>105.93</td>
<td>13.5</td>
</tr>
<tr>
<td>137521</td>
<td>139370.299</td>
<td>5970346.29</td>
<td>105.93</td>
<td>5</td>
</tr>
<tr>
<td>137522</td>
<td>139191.299</td>
<td>5970150.29</td>
<td>105.99</td>
<td>14.5</td>
</tr>
<tr>
<td>137523</td>
<td>139191.299</td>
<td>5970150.29</td>
<td>105.99</td>
<td>4.4</td>
</tr>
<tr>
<td>137524</td>
<td>139046.299</td>
<td>5970356.29</td>
<td>105.83</td>
<td>14</td>
</tr>
<tr>
<td>137525</td>
<td>139046.299</td>
<td>5970357.29</td>
<td>105.83</td>
<td>5.28</td>
</tr>
<tr>
<td>137526</td>
<td>139371.299</td>
<td>5970119.29</td>
<td>106.18</td>
<td>14.5</td>
</tr>
<tr>
<td>137527</td>
<td>139200.299</td>
<td>5970331.29</td>
<td>106.06</td>
<td>4.4</td>
</tr>
<tr>
<td>137528</td>
<td>139054.299</td>
<td>5970122.29</td>
<td>106.11</td>
<td>4.23</td>
</tr>
</tbody>
</table>

Notes to above table: 1. Bores highlighted in grey are destroyed
2. Elevation reference levels should be treated with caution as it has been digitised by VVG and could represent ground level rather than bore top of casing.

A bore condition survey was undertaken by OTE on 15 March 2018– refer to report in Appendix N. It was noted that bores 137520, 137521 and 137527 had been accidently destroyed or covered over during recent earthworks. The remaining six bores were in good condition. In situ standing water levels and salinity measurements were made of these remaining bores.
6.3.3 Geological and Hydrogeological Information

A summary of regional and local geological and hydrogeological information is presented in Table 8.

<table>
<thead>
<tr>
<th>Table 8 Geological / Hydrogeological Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Regional Geology</strong></td>
</tr>
<tr>
<td>Shepparton Formation typically comprises unconsolidated to poorly consolidated mottled clay and silty clay, with lenses of fine to coarse sand, gravel and silts; predominantly fluvial, locally lacustrine.</td>
</tr>
<tr>
<td><strong>Local Geology</strong></td>
</tr>
<tr>
<td>Red to brown to grey silty clay / clay with sand or sandy lenses from approximately 5 m bgl.</td>
</tr>
<tr>
<td><strong>Average Depth to Groundwater</strong></td>
</tr>
<tr>
<td>&lt; 5 m bgl</td>
</tr>
<tr>
<td><strong>Local Groundwater Flow Direction</strong></td>
</tr>
<tr>
<td>Northeast</td>
</tr>
<tr>
<td><strong>Likely Aquifer Quality</strong></td>
</tr>
<tr>
<td>Segment C of State Environment Protection Policy (SEPP) Groundwaters of Victoria (Groundwaters of Victoria) (GoV).</td>
</tr>
<tr>
<td><strong>Typical Aquifer Soil Types</strong></td>
</tr>
<tr>
<td>Alluvial silts, clays, sands / sandy clays.</td>
</tr>
</tbody>
</table>

Appendix M (Figures 2, 3 and 4) provides maps of groundwater beneficial uses, salinity and geology for the ACM site and surrounds.

Lithologies

Lithology details were provided for thirty-one (31) bores including all 9 onsite bores. Local geology was generally reported to comprise red to brown to grey silty clay / clay with sand or sandy lenses from approximately 5m bgl which is consistent with that of the regional shallow geological profile (Shepparton Formation) (see Figure 5 in Appendix M).

Water table levels

VVG monitored water level data was provided for twenty-nine (29) bores including all 9 site bores ranging from 1975 to 2011. Groundwater level data for all bores was generally ≤ 5.5 mbgl which is consistent with (FedUni, 2015) (see Figure 6 map in Appendix M).

For the 9 onsite bores, water level data was provided for the 1999 – 2011 period. Groundwater contour mapping for all 9 Site bores for one of the latest data sets (07/09/2011) suggests an inferred northeasterly flow direction (Figure 7 in Appendix M). The nearest waterway downgradient is G-MW's No. 8 Drainage Channel located ~4.2 km to the east. Based on the available data and groundwater contour mapping (Figure 7 in Appendix M), the wastewater ponds when in operation under Heinz tenure did not appear to have created a groundwater mound.

The available watertable data (1999 - 2011 period) for the 9 onsite bores have been plotted in the bore survey report in Appendix N. These plots show significant short-term variation in water levels in bores across the site but there some longer-term trends were evident. Water tables generally appeared to be shallowed (recorded at 1-2m bgl) between 2000-2003, increasing in depth to about 3-4 metres in 2011 when the data set stopped. Deeper water table depths appear to follow the pattern of drought from 1999 to 2010. A marginal rise in bore water levels coincided with the end of the drought in 2010-11.

In summary, the current watertables across the site appears to be >3-4m bgl, which is considered suitable for wastewater pondages. Minimum watertable depths >2m to clay lined pondages is suggested in the relevant EPA guidelines (Pub. No 168, and Pub No. 464.2).

Salinity

VVG data for Electrical conductivity (EC) between 1989 - 2002 was available for twenty-three (23) wells. EC values ranged 76 - 17,640 µS/cm with wide variations spatially and with depth, but generally
consistent EC values over the monitoring period. Shallower bores (drilled depths <10m bgl) predominantly reported lower salinities (<3,500 µS/cm), whilst deeper bores (drilled depths >10m bgl) reported the higher salinities (>3,500 – 13,000 µS/cm).

SEPP Segment

According to the VVG, Class C segment designation as per SEPP (GoV) generally applies in this region – as shown in VVG maps (Figures 3 and 4) in Appendix M.

OTE's in-situ watertable and EC measurements in onsite bores in March 2018 (see report in Appendix N) were consistent with historical salinity results reported in the VVG database. Salinities ranged from 749 µS/cm (137524, 11m deep bore) to 16,670 µS/cm (137522, 12m deep bore). The low salinity measured in the deep bore 137524 is unexpected compared to the 3000 – 5000 µS/cm range reported in the VVG dataset. Some inconsistency might be expected given that the in-situ sample data is not always representative of groundwater flowing through the bore screen zone in some cases.

With the exception of shallow bore 137525 (851 µS/cm), most of the water tests on 15 March 2018 from the shallower bores onsite (2100 – 2700 µS/cm) are consistent with SEPP (GoV) Segment B designation, whereas the deeper bore salinities are within Segment C. With water tables currently >3-4m bgl, there is a low risk of capillary rise of groundwater to the surface and any associated waterlogging and salinisation issues onsite.

6.3.4 Geotechnical Investigations

ACM have commissioned geotechnical reports for a range of civil and construction purposes including:

- Design of footings for buildings including deep footings for proposed spray drying tower
- Verification of clay liner materials and permeabilities for the existing wastewater treatment ponds and winter storage pond.

Copies of these geotechnical reports are provided in Appendix G.

Factory Buildings and Structures

The geotechnical report for the spray dryer indicated drilling to depths between 5 - 10m in December 2017. Clayey sands and sandy clays were found all the way down to 8m, and watertables at 3.5 - 3.8 m at completion of the boreholes.

Foundations and footings of building and dryer plant structures are above the groundwater depth. However, low excavation points for key works include:

- Trade waste pit at approximately 5.85m deep
- Stormwater retention basin 3.38m deep (bed at western end 102.80m elevation).

The trade waste pit might be below watertable, but it will be concrete lined and water tight, and designed to prevent hydraulic uplift and ingress by groundwater. There is potential for groundwater to intercept the bottom of the stormwater retention basin with watertable rise. Any potential salt accumulation from evaporation would be subsequently diluted by subsequent stormwater flows.

Wastewater Pond Liner

Geotechnical investigations for the wastewater ponds were undertaken to determine condition of existing pond liners. It is believed that the ponds were constructed over 30 years ago as part of Heinz EPA approval and licensing requirements at the time. ACM has spoken with the original constructor of the pondage system (now retired), who states that the ponds were clay lined. However, the original construction records are no longer available (original constructor advised they have been disposed of).
The recent geotechnical reports confirm all clay liners are still in place (clay liner down to at least 0.5m) and in a compacted state. Laboratory permeability testing of five undisturbed core samples was undertaken in the winter storage in September 2017. Very low permeability rates were reported ranging from $3 \times 10^{-11}$ to $9 \times 10^{-10}$ m/s. Laboratory testing of two undisturbed cores in each of the treatment ponds was conducted in April 2018. Results of testing confirmed very low permeabilities ranging $6 \times 10^{-11}$ to $4 \times 10^{-10}$ m/s. Therefore, all samples meet EPA specification of $<1 \times 10^{-9}$ m/s.

Before commencement of wastewater treatment operations ACM will cleanout and surface compact all ponds in accordance with the recommendations contained in the geotechnical reports.

All ponds will be wetted and/or partly filled with fresh water from G-MW channels to protect the liners from drying out prior to commencement of wastewater discharge into the ponds.

All ponds have 500mm internal freeboard, internal embankments have rock beaching above waterline for windwave erosion protection, and external embankments are grassed for erosion control.

### 6.3.5 Groundwater protection at ACM Factory and WWTP ponds

As discussed in section 6.1, there is low risk of spills and chemical contamination to land due to containment systems and bunding for milk deliveries and storage, CIP chemical tanks and wastewaters. Therefore, the factory operations also pose negligible risk of any negative groundwater quality impacts.

The existing wastewater ponds are provided with clay liners (at least 0.5m thickness) and very low permeabilities ($<1 \times 10^{-9}$ m/s) as verified by geotechnical investigations. Therefore, the amount of seepage from the ponds is regarded as low risk to groundwater quality and watertable rise.

To summarise, groundwater protection measures for the ACM project that ensure low groundwater risk include:

- underlying clayey soil subsoils and geology with low inherent permeability
- clay lined ponds meeting EPA minimum thickness and maximum permeability specifications
- wastewater only contains organics, nutrients and low salt levels, and no chemical contaminants
- current water tables >3-4m below ground surface, ensuring no capillary movement of groundwater and salts to the surface
- groundwater is SEPP Segment C brackish/high salinity, which has lower order beneficial uses
- there are no private bores in close proximity – nearest downgradient bore is ~1.3km away
- monitoring bores are in place onsite for water quality and watertable monitoring as part of the environmental monitoring program for the site.

### 6.3.6 Groundwater issues at Dickman Farm

Potential groundwater impacts at Dickman farms will be indistinguishable from that of any other irrigated dairy farm operation in the area having similar cattle stocking rates, dairy shed effluent application and fertiliser programs. The CSMP to be put in place for the recycled water scheme (refer to section 6.2.6, and Appendix L) will ensure irrigation rates match plant water and nutrient demands in accord with good agricultural practice.

Regional bore monitoring networks are established by the state government and G-MW. Data for any local observation bores close to Dickman farms could be reviewed for particular groundwater issues that may arise with the recycled water scheme.
7 Air Emissions

7.1 Air Quality Issues

The key air quality management issues for the ACM project that trigger works approval requirements and assessed in this chapter are as follows:

- Residual milk particles discharged from the milk spray dryers
- Combustion particulates from the boiler
- Odour from the wastewater treatment ponds.

The impact of industrial residual air emissions is assessed by the two approaches as follows:

1. Evaluation of compliance with EPA’s “Recommended separation distances for industrial residual air emissions” (Pub. No. 1518) for unintended, industry-generated odour and dust emissions; and
2. Assessment of residual air emissions and impacts associated with typical operations using the current EPA approved AERMOD plume dispersion modelling approach.

Air dispersion modelling has been undertaken for odour emissions from the wastewater ponds, and residual particulates from the two spray dryer stacks and boiler stack.

7.2 Separation Distance Assessment

Recommended separation distances for milk processing and wastewater treatment are provided in EPA’s Guideline: “Recommended Separation Distances for Industrial Residual Air Emissions” (IRAE, Pub. No. 1518, March 2013).

Definition of a “sensitive land use” is subject to interpretation but is typically regarded as a residential zone, school, hospital, or similar. An isolated farmhouse in a farming zone can also be regarded as a sensitive use and to include the footprints of the house, garage, carport, clotheslines, swimming pools, BBQ areas, etc. Depending on the zoning of the sensitive land use, there are two different methods of how to measure the recommended separation distances as per Table 2 of the IRAE guidelines:

1. Method 1: Distance measured from factory building/hardstand (i.e. the residual air emission source, not ACM boundary) to residential property boundaries (sensitive use) in Town Zone
2. Method 2: Distance measured from factory building/hardstand (source) to house building footprint (sensitive use) in Farm Zone.

The location of nearest sensitive land uses relative to the ACM factory and WWTP ponds is shown in Figure 7. The red arrows are the basis for measuring factory setbacks to nearest residences, whilst the pink arrows between wastewater pond edges and nearest houses. A summary of estimated separation distances is given in Table 9, with the IRAE guideline distances not fully met highlighted in orange.

The nearest private residence is located in the Farming Zone at 520 Curr Rd ~120m north of the factory building. Note however, that the private farmhouse at 404 Winter Rd is about 100m from ACM’s proposed water filtration plant. Note that EPA’s IRAE guidelines do include separation distances for water filtration plants (not an industry category in Table 1 of the guidelines).

Most of the separation distance to Girgarre Township is provided by Progress Park to the west of the factory. Therefore, encroachment by sensitive uses is unlikely from the west.
Figure 7 ACM Girgarre Milk Factory – location of sensitive land uses (source: AQM 2018)

Table 9 Approximate Separation Distances from Factory and WWTP Ponds to Residences

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Residence Location</th>
<th>Separation Distance (m) approx. from:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Milk Factory</td>
</tr>
<tr>
<td>R1 – R4</td>
<td>29 – 35 Station St</td>
<td>230</td>
</tr>
<tr>
<td>R14</td>
<td>520 Curr Rd</td>
<td>120</td>
</tr>
<tr>
<td>R9</td>
<td>2 – 8 Winter Rd</td>
<td>230</td>
</tr>
<tr>
<td>R10</td>
<td>404 Winter Rd</td>
<td>280</td>
</tr>
</tbody>
</table>

| IRAE Guideline – recommended distance (m) | 100 Note: see Section 7.2.1 | 190 Note: see Section 7.2.2 |

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7.2.1 Milk Factory Separation Distance Requirement

EPA's IRAE guidelines recommend a separation distance of 100m from milk or dairy production facilities with throughput >200 tonnes/year. This distance applies to the factory compound, which is taken to be at the edge of the hardstand (see Overall Site Plan Figure 2949 B01 SH1 (I) in Volume 2). All private residences are at least 100m from the factory compound.

7.2.2 Wastewater Ponds Separation Distance Requirement

EPA's IRAE guidelines do not specify distances specifically for dairy factory wastewater ponds. However, the guidelines do provide specific separation distance guidance for sewage treatment plants, which increases with the size of population that the treatment plant serves.

The method described in section 11 of the IRAE guidelines was used to estimate an indicative separation distance requirement for ACM's wastewater treatment plant based on estimated equivalent population (EP) calculated from typical BOD load discharged to the ponds. Table 6 of the IRAE guidelines below provides the formula for calculating the distance.

### Table 6: Separation distances for sewage treatment plants (in metres)

<table>
<thead>
<tr>
<th>Type of installation</th>
<th>Separation Distance (n = equivalent population)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical/biological wastewater plants</td>
<td>10n^{1/3}</td>
</tr>
<tr>
<td>Aerobic pondage systems</td>
<td>5n^{1/2}</td>
</tr>
<tr>
<td>Facultative ponds</td>
<td>10n^{1/2}</td>
</tr>
<tr>
<td>Disposal areas for secondary treated effluent by spray irrigation</td>
<td>200m</td>
</tr>
<tr>
<td>Disposal areas for secondary treated effluent by flood irrigation</td>
<td>50m</td>
</tr>
</tbody>
</table>

**Example of how to use this table:**

What is the recommended separation distance for an aerobic pondage system serving an equivalent population of 10,000 people?

Distance = 5n^{1/2} where n=10,000

Distance = 5(10,000)^{1/2}

Separation distance = 500m

BOD load factors for determination of Equivalent population (EP) are given in the following EPA Guidelines:

- “Code of Practice for Small Wastewater Treatment Plants” (Pub. No. 500, 1997), which states a typical BOD load of 50g BOD/person/day
- “Code of Practice Onsite Wastewater Management” (Pub. 891.4. July 2016), Table 4 suggests an organic material loading rate of 60g BOD/person/day.

The higher organic loading rate (60g BOD/person/day) has been assumed for this assessment.

From section 5.1.2 of this report, the peak day factory wastewater flow is 365 kL/d, and BOD concentration 1134 mg/L. Therefore, the BOD load would be 365 kL/d x 1134 mg/L = 414 kg BOD/d typical peak day load. Calculated EP = 414 / 0.06 = 6900 persons at peak day BOD load.

For ACM's proposed aerated pondage system (equivalent to a mechanical/biological wastewater plant), the indicative separation distance requirement would be:

\[ 10n^{1/3} = 10 \times (6900)^{1/3} = \sim 190 \text{ m.} \]
The expected peak BOD load on the proposed settling pond 2 (equivalent to an aerobic pondage system) would be about 22 kg/d (based on BOD of 60mg/L after settling of treated wastewater received from aerated pond). The separation distance requirement for settling pond 2, which would also apply to the Winter storage Pond 3) would be: 

\[ 5 \sqrt{n} = 5 \times (22)^{1/2} = \sim 24 \text{m}. \]

The private houses in the Farm Zones at 520 Curr Rd and 404 Winter Road are within the above indicative estimate of required separation distance for the WWTP – by a distance of about 30-40m.

EPA's IRAE guidelines state that the recommended separation distances aim to minimise impacts on sensitive land uses arising from the unintended, industry-generated odour and dust emissions. IRAE guidelines also provide flexibility for site specific variation to separation distances subject to specific criteria. For the WWTP, a site-specific variation is justified given that the existing separation distances are adequate to prevent offsite offensive odour based on the following factors:

1. The wastewater ponds will have best practice aerator control technology, monitoring and contingency plans (odour suppression and chemical dosing) to ensure aerobic conditions and positive dissolved oxygen levels are maintained in all ponds. Therefore, offsite odour is not anticipated from WWTP operations even under peak load conditions. Refer to Section 5.1, and ETS report in Appendix F.

2. Assessment and AERMOD modelling of conservatively high odour flux rates from the ponds predict that odour levels at sensitive uses would not be offensive nor cause odour complaint. Refer to Section 7.5.3 in this WAA and report by specialist odour consultant Air Quality Professionals (AQP) provided in Appendix P.

3. An environmental risk assessment (ERA) has been completed that demonstrates a variation is justified – refer to risk assessment of non-routine operations in Section 11.1 of this WAA.

4. The size of the ACM operation is smaller and the BOD on the WWTP is lower than comparative sites dairy factory sites.

5. The ponds have been in place for over 30 years within the industrial zone and operated previously without major incident for 20 years until 2011, and with industrial interface uses between the WWTP and sensitive land uses to the south and west.

7.2.3 Campaspe Shire Council Threshold Distances

Clause 52.10 of the Campaspe planning scheme indicates the following “threshold distances” for uses with potential for adverse amenity impacts, which are relevant to the ACM development:

- Manufacture of milk products: 300m
- Treatment of aqueous waste: 200m.

Under the planning scheme threshold distances are usually measured from source boundary to receptor boundary. If not met, these “thresholds” trigger the need for further consideration of the interface between industrial uses and sensitive land, as part of any variation to these minimum distances.

Several private houses fall within the above threshold distances. Campaspe Shire Council’s Planning Permit Pln325/2017 issued in February 2018 has granted a variation to the requirements of Clause 52.10, subject to conditions include for amenity and odour.
7.3 Particulate Emission Sources

7.3.1 Sources of particulates emissions

The two key sources of residual particulate emissions assessed in this WAA are the two milk spray dryers (D1 and D2) and the gas-fired boiler. SEPP (Air Quality Management) provides design ground level criteria for fine particulate emissions, specifically for: "PM\(_{10}\)" (defined as particles <10 microns in size), and PM\(_{2.5}\) (<2.5 microns). Emissions of PM\(_{10}\) and PM\(_{2.5}\) are assessed in this Chapter.

A 3-D image of the proposed dryer building and location of the two dryer stacks as well as the boiler stack was shown in Figure 6.

7.3.2 Milk spray dryers

Each milk dryer line will produce up to 1.2 tonne/day milk powder at 96.6 total solids. Dryer exhaust will pass through a baghouse to filter air recovering 99.9% of the particulates. The captured fines are returned to the dryer system for recovery as part of the milk powder product into the 1 tonne bulk bags. The bulk bag packing unit vents into the hopper and hence fines are contained within the process for recovery. There are no milk powder storage silos proposed onsite.

Dryer Emissions

When running on skim milk the powder is more readily carried over to the exhaust air streams. Whole milk powder recovery in the baghouse can be twice that for skim milk powder. The dryer emissions before baghouse treatment on whole milk powder will be about 10000 kg/day for each dryer line.

Emissions after dust treatment from each milk dryer are forecast to be: 30000 Nm\(^3\)/h x 20mg = 0.6 kg/h = 12 kg/day (based on 20hr operation per day and reflecting a 20% margin on air flow). Total anticipated daily emissions across both dryers will be of the order of 25 kg/day.

Dryer Stack height and orientation

Each dryer stack is 24m high (to top of duct) and has a 90\(^\circ\) elbow at the top of the duct to direct the final stack emissions east towards ponds and away from the town. Dryer building roof height is 20m, and the top of ducts are 4m above the roof. Duct diameters are 0.8 – 1.0m. The location, configuration and dimensions of the dryer stacks are shown in Figure 8.

The process description for the evaporators and dryers including baghouse particulate recovery was summarised in Section 3.2.3 – refer also to Appendix E.
Figure 8 Proposed Spray Dryer Stacks
7.3.3 Boiler

As discussed in section 3.2.4, the boiler is rated at 10 MW operating on natural gas from local piped gas supply. A 3-D image of the proposed boiler house and location of the stack was shown in Figure 6.

The estimated emissions from the boiler are given in Table 10, based on the manufacturers boiler specifications and NPI (2011) emission factors:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>kg/day 1</th>
<th>Tonnes/Year 2</th>
<th>EPA regulatory triggers (kg/day) 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM$_{10}$</td>
<td>3.7</td>
<td>0.46</td>
<td>10</td>
</tr>
<tr>
<td>PM$_{2.5}$</td>
<td>3.7</td>
<td>0.46</td>
<td>4</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>42.2</td>
<td>5.2</td>
<td>100</td>
</tr>
<tr>
<td>Oxides of Nitrogen</td>
<td>50.0</td>
<td>6.2</td>
<td>100</td>
</tr>
<tr>
<td>Sulphur dioxide</td>
<td>0.07</td>
<td>0.068</td>
<td>10</td>
</tr>
<tr>
<td>Total VOC</td>
<td>2.8</td>
<td>0.34</td>
<td>5</td>
</tr>
<tr>
<td>Lead and compounds</td>
<td>0.25 x 10$^{-3}$</td>
<td>3.1 x 10$^{-5}$</td>
<td>0.144 (0.1 g/min)</td>
</tr>
</tbody>
</table>

Table 10 Boiler (10MW, Natural Gas-Fired) Emissions

Notes to above Table:
1. Daily mass rates based on 24hr boiler operation and gas usage 1108 NM$^3$/hr or 42.9GJ/hr.
2. Annual estimates based on forecast production levels and annual gas usage 127540 GJ/year
3. Thresholds for EPA Works Approval and Licensing as per the Environment Protection (Scheduled Premises) Regulations 2017

The boiler stack details are as follows:
- Total stack height above ground: 12m
- Stack height above services roof: 5m
- Services building roof height: 7m
- Stack diameter: 0.9m

Nitrogen oxides ("NOx"), comprising both nitric oxide ("NO") and nitrogen dioxide ("NO2"), Oxides of Sulphur, Carbon Monoxide, Volatile organic compounds (VOC) are also products of combustion but mass rates of these parameters are normally low for natural gas burners. The mass emission rates for these parameters are below the regulatory thresholds for EPA works approval and licensing, and therefore not considered further (i.e. for AERMOD modelling) in this WAA. Only particulates from the boiler have been considered in the source inventory for AERMOD modelling purposes.

7.4 Odour Emission Sources

The upgraded wastewater treatment system is the primary source of potential odour from the ACM project. This assessment has considered the following potential odour sources:
- Trade Waste drains and pit, which are air sealed and regularly flushed so negligible odour assumed
- Aerated Pond 1, which is to be maintained at positive DO (>0.5 – 2 mg/L)
- Settling Pond 2, which will receive BOD <60mg/L and be maintained DO positive
- Winter Storage Pond 3, which with its large surface area will remain aerobic.
Note that sludge and solids handling from the pondage system could cause temporary odour issues if not managed properly. Desludging of Pond 2 is not expected to occur for at least 18 months, and sludge will be pumped out be a super-sucker truck and transported offsite to EPA licensed sites. There will be no onsite storage or stockpiling of pond sludges or other wastes from trade waste pit pump-outs.

The factory and milk dryer may produce a very low-level milk smell, considered negligible and therefore not included in the odour dispersion model.

Table 11 provides the odour source inventory for the wastewater treatment ponds, representing conservatively high estimates adopted for the AERMOD model.

<table>
<thead>
<tr>
<th>Odour Source</th>
<th>Surface Area at TWL (m²)</th>
<th>Odour Emission Rate (OU.m³/m²/s)</th>
<th>Basis, Reference Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerated Pond (1)</td>
<td>3,920</td>
<td>0.05</td>
<td>Golder 2014 Note 1</td>
</tr>
<tr>
<td>• 2 to 3 x 20kW aerators</td>
<td></td>
<td></td>
<td>MLA 2004 Note 3</td>
</tr>
<tr>
<td>• DO&gt; 0.5-2 mg/L</td>
<td></td>
<td></td>
<td>BECA 2007 (GHD 2004) Note 4</td>
</tr>
<tr>
<td>• Chemical odour suppression contingency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Settling Pond (2)</td>
<td>3,948</td>
<td>0.035</td>
<td>Golder 2014 Note 2</td>
</tr>
<tr>
<td>• 60mg/L BOD</td>
<td></td>
<td></td>
<td>ERM 2015, 2016 Note 5</td>
</tr>
<tr>
<td>• DO&gt; 0.5-2 mg/L</td>
<td></td>
<td></td>
<td>BECA 2007 Note 6</td>
</tr>
<tr>
<td>• Hydrogen Peroxide</td>
<td></td>
<td></td>
<td>SEW/YVW 1999 Note 7</td>
</tr>
<tr>
<td>dosing contingency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winter Storage Pond (3)</td>
<td>19,374</td>
<td>0.004</td>
<td>BECA 2007 Note 6</td>
</tr>
<tr>
<td>• 20mg/L BOD</td>
<td></td>
<td></td>
<td>SEW/YVW 1999 Note 7</td>
</tr>
<tr>
<td>• DO&gt; 0.5-2 mg/L</td>
<td></td>
<td></td>
<td>CEE 1999 Note 8</td>
</tr>
<tr>
<td>• Hydrogen Peroxide</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dosing contingency</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 11 Wastewater treatment system odour emission rates

Notes to above Table – reference sources and basis for adopted specific odour emission rates (SOER):

1. Golder Associates Separation Distance Assessment – Fonterra Dennington WWTP, 14 April 2014. VCAT expert witness statement providing measured SOERs for Dennington Dairy factory aeration tanks. SOER for ACM Aerated Pond (1) assumed 50% of Dennington aeration tank SOER (ACM BOD loads <50% of Dennington). Represents a conservatively very high SOER for ACM Pond 1 given that ACM BOD load (i.e. odour forming compounds) would be significantly diluted by the much greater water volume (~7.8ML) and surface area (~0.4Ha), which is >80 times that of the ~50m² Dennington aeration tank.

2. Golder 2014 VCAT expert witness statement providing measured SOERs for Dennington clarifier tanks (~64m²). SOER for ACM Settling Pond (2) assumed 50% of Dennington clarifier tank (based on lower ACM BOD loads).


The basis and reference sources for the high odour emission flux rates were provided in Table 11 and the table notes. There is very limited reliable published data for odour emissions from dairy factory wastewater treatment pond systems directly applicable to ACM’s milk powder facilities. Specific odour emission rates (SOER) for dairy factory wastewater systems are reported in various previous EPA Victoria works approval applications as well as applications and VCAT expert witness statements in other Australian states and New Zealand. The adopted SOER (or odour emission flux rates) are conservatively high and based on industry experience and the OTE, ETS and AQM knowledge base.

Potential fugitive emissions might include:

- Dust from loading of powder, controlled by the dryer baghouses and ACM’s internal factory floor hygiene and cleaning procedures
- Dust from hardstand, unsealed areas, but this is managed by site maintenance and clean-up programs (hire of street sweeper as required) and dust control procedures under an Operational EMP (to be developed prior to commencement of operations – refer to section 11).

Potential background odour sources might include:

- The organic materials recycling facility on the ex-Heinz site south of the ACM factory site, currently subject to a Campaspe Shire Council planning permit application
- GVW’s Girgarre wastewater treatment ponds located south of Winter Rd, opposite the farmhouse on 404 Winter Rd.

The above potential fugitive and background odour sources are considered low contributors to the sensitive receptors in question when compared to ACM sources, and therefore it was not considered necessary to include these in the odour model, which is to be discussed below.

7.5 AERMOD modelling

7.5.1 Model and met file used

The default model recommended by EPA Victoria for regulatory air quality assessments is AERMOD, and this was used for both the particulate and odour assessments.

Meteorology for the AERMOD model was prepared using the AERMET software and following EPA Victoria (2014) standard procedures. The methodology for the construction of the meteorological dataset for the AERMOD model is summarised in the AQP report in Appendix P. The modelling was conducted for five calendar years 2012-2016.

7.5.2 Particulate Modelling Results

The results of dispersion modelling of PM$_{10}$ and PM$_{2.5}$ emissions are provided in the AQP report in Appendix P, which found that:

1. **PM$_{10}$, 24-hour average and annual average concentrations**, the modelling results at potentially sensitive receptors are all lower than the Environment Quality Objective, and therefore the Project air discharges are consistent with EPA Victoria policy for PM$_{10}$ ambient air quality.

2. **PM$_{2.5}$, 24-hour average concentrations**, the modelling results at potentially sensitive receptors are all lower than the Environment Quality Objective, although only just. However, when the accumulated factors of conservatism built into the model predictions are taken into account, it is concluded that the Project air discharges are consistent with EPA Victoria policy for 24-hour average PM$_{2.5}$ ambient air quality. The conservative factors include the following assumptions:
• Discharges operate at maximum emission rates for 24 hours per day, 365 days per year.
• All of the particulate in the dryer baghouse emission is in the PM$_{2.5}$ size range.
• Traralgon ambient air quality data is applicable to the Girgarre area.

3. For PM$_{2.5}$ annual average concentrations, the modelling results slightly exceed the Environment Quality Objective, however this is due to the high assumed (Traralgon) background air quality concentration which is equal to 96% of the Environment Quality Objective. When considering the accumulated factors of conservatism built into the model results listed above, as well as the minor magnitude of Project-related incremental model results compared to background concentrations, it is considered that predicted cumulative PM$_{2.5}$ concentrations do not present a constraint for the Project.

Surfer plots showing particulate concentration contours are provided in the AQP report. Receptors R6 to 8 Station St commercial properties), R9 (8 Winter Rd Farm Zone house) and R14 and 15 (Curr Rd Farm Zone houses) were predicted to have the highest ground level particulate concentrations.

### 7.5.3 Odour Modelling Results

Results of odour dispersion modelling are provided in the AQP report (Appendix P), which found that:

1. At nearest residences in the Town Zone at 35 to 29 Station St, Girgarre (corresponding to receptors R1 – R4) the maximum odour levels predicted range 0.9 - 1.4 OU, with the residence at 29 Station St having the highest predicted OU values
2. At commercial premises in Station St (R5 – R8), maximum odour levels range 1.2 - 1.6 OU, with commercial receptors R7 and R8 having the highest predicted OU values
3. For Farm Zone residences adjacent to or close to ACM boundaries at R9 (8 Winter Rd), R10 (404 Winter Rd) and R14 (520 Curr Rd), the maximum odour levels range 1.8 – 4, with the highest predicted level at farmhouse receptor R10.

AQP report states that in reality, odour concentrations occurring at the EPA Victoria odour assessment threshold of 1 OU, 99.9th percentile are highly unlikely to be detected in the field. Even at 2 OU, and depending on how offensive the odour is, people may detect odour but are unlikely to find the odour objectionable until the concentration reaches at least the 5 OU level. Complaints are not likely unless odours exceed 10 OU, unless odours are particularly offensive.

In this case, the odour offensiveness potential is relatively benign because the organic loading is only from fresh milk (which has low content of sulphur-containing proteins), and the wastewater ponds will be maintained aerobic at all times. It is therefore considered that 2 OU, 99.9th percentile odour criteria is appropriate to apply for the ACM project as conservative basis for odour impact assessment for the houses in the Girgarre Town Zone. Similarly, the 5 OU, 99.9th percentile odour criteria would be appropriate for houses in the Farm Zone, consistent with numerous VCAT determinations and other published precedents.

The predicted odour concentrations at nearest residences are below the recommended assessment criteria of 2 OU for houses in the town zone, and 5 OU for houses in the farm zone recommended in Section 4.2.2 of the AQP report.

### 7.6 Air quality management practices

To summarise, the key air quality (particulate and odour) protection features and best practice measures to be implemented comprise:
- Establishment of new state of the art plant and equipment with built in milk powder recovery eco-efficiencies
- milk processing operations and dryers do not produce offensive odours due to inherent high standards of hygiene and cleaning to meet food quality and export licence quality standards
- ACM is installing relatively small dryers with lower residual particulate losses compared with other existing operations in the region
- dryer baghouses are design to industry best practice with 99.9% particulate recovery
- wastewater treatment ponds will only receive fresh process effluent containing diluted milk loss (ACM target is <0.5-1% loss), therefore receiving very low H₂S or ammonia loads
- best practice process and odour controls as well as contingency plans for the wastewater system
- natural gas boiler will have low emission rates of particulates as well as NOx, SOx, CO, VOC and other pollutants that are below EPA works approval and licensing triggers
- adequate buffers are in place around the new works, and given more than 100 years of factory dairy and tomato operations and 20-30 years of WWTP operations there is local acceptance of these uses in the Girgarre industrial zone
- Environmental risk management plans under the future Operational EMP will be implemented to ensure EPA licence compliance and no offsite nuisance particulate fallout or offensive odour (see Section 11).
8 Energy Use and Greenhouse Gas Emissions

8.1 GHG Issues
ACM milk processing and powder plant will produce energy related greenhouse gas (GHG) emissions from onsite gas and electricity usage. Non-energy related GHG emissions are negligible at ACM.

8.2 Gas Use & Associate GHG emissions

8.2.1 Gas Supply
Piped natural gas supply is available to the site, by connection to the gas line that supplied the previous Heinz operations. A high capacity natural gas underground distribution main is located on Curr Rd, approximately 50m from property boundary. APA will regulate the new gas supply to ACM, metered at the Curr Rd boundary.

8.2.2 Gas Usage
The new boiler is a natural gas-fired “D-type” water tube boiler, 10 MW rating, 40 bar working pressure, 42.9 GJ/hr burner capacity for supply of hot water and steam for the factory and milk drying. Ancillary electrical power equipment includes a 37 kilowatt force draft fan, and 2 x 55 kilowatt feedwater pumps.

Anticipated gas consumption is up to 35 GJ/hr corresponding to maximum demand at boiler startups. Daily use is expected to be 650 GJ/day (average 27 GJ/Hr for 24hr operation). Annual gas quantity requested for the APA contract is 117,000GJ/year based on milk projections and benchmarked on specific energy use GJ/kL milk intake for similar sites. The daily average over 284 peak equivalent days is about 412GJ/day giving anticipated gas consumption of about 117,000 GJ/Yr.

8.2.3 GHG emissions from gas combustion
Based on forecasted production levels and expected overall yearly load factors the expected greenhouse emissions are 6,006 tonnes CO$_2$-e per year. If the boiler runs at full capacity 365 days per year, a conservative maximum estimate of the greenhouse emissions caused by the combustion of natural gas in the boiler would be 19,281 tonnes of CO$_2$-e per year.

Note that liquid fuels (LPG, ULP, Diesel) used onsite by forklifts, etc are very low compared to NAG and therefore not assessed further here.

8.3 Electricity Usage

8.3.1 Electrical Supply
Powercor currently has a 22kV high voltage three phase overhead line in Curr Rd approximately 48m from the property boundary. An additional low voltage three phase overhead line in Curr Rd exists approximately 7m from south west corner of property. ACM will establish a new high voltage underground cable to connect to the high voltage overhead line in Curr Rd. ACM are to become a high voltage customer and are establishing their own transformer and electrical infrastructure onsite.

The site is being supplied from Powercor distribution assets at 22kV. The 22kV network onsite is owned and operated by ACM, including the new onsite transformer. Powercor is to supply the required metered electrical demand of 2.5MVA under agreement with ACM.
8.3.2 Electricity Usage

A high-level indication on electrical usage is provided below. Some assumptions have been made, as not all equipment design and selection has been finalised.

The main electrical loads expected for the proposed plant are as listed in Table 12.

<table>
<thead>
<tr>
<th>Plant/Equipment</th>
<th>Approx. Load kW</th>
<th>Site Load %</th>
<th>Main Load</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet Process 1 &amp; 2</td>
<td>450</td>
<td>21</td>
<td>Two separators, each 45kW</td>
<td>The rest of the loads are made up of a large number of small motors. Ranging in size up to 30kW</td>
</tr>
<tr>
<td>Driers 1 &amp; 2</td>
<td>700</td>
<td>33</td>
<td>Two Driers, each 200kW</td>
<td>The rest of the loads are made up of a large number of small motors. Ranging in size up to 55kW</td>
</tr>
<tr>
<td>Refrigeration Plant</td>
<td>550</td>
<td>26</td>
<td>Two screw compressors</td>
<td>The rest of the loads are made up of a large number of small motors. Ranging in size up to 22kW plus a large process pump (55kW) and two 63kW evaporator defrost heaters.</td>
</tr>
<tr>
<td>Water Filtration Plant (WFP) &amp; Wastewater Treatment Plant (WWTP)</td>
<td>150</td>
<td>7</td>
<td>WFP 79kW, WWTP 66kW aeration, irrigation pump</td>
<td>Final connected load to be confirmed, particularly for the waste water treatment plant (see ETS report)</td>
</tr>
<tr>
<td>Misc Services</td>
<td>250</td>
<td>11</td>
<td></td>
<td>Includes boiler, air compressor, mechanical services and sundry items</td>
</tr>
<tr>
<td>Lighting</td>
<td>40</td>
<td>&lt;2</td>
<td></td>
<td>This is a minor part of the plant load. The majority of lighting will be LED type.</td>
</tr>
</tbody>
</table>

**TOTAL** 2,140 100 Equates to approx. 2.3MVA

Table 12 ACM Girgarre Main Electrical Loads

Forecast electrical usage assumes a loading factor of 55% of 2.5MVA, with peak and off-peak energy usage about the same. Power factor correction (PFC) equipment will be included to ensure that the power factor is above 0.9 (expected to be close to unity). Estimate annual electrical usage is:

**Peak usage** 4,217.4 MWh + **Off-peak usage** 4,217.4 MWh = **Total Usage** 8,435 MWh/Yr

[Calc: 2500KVA x 0.9 PF x 0.55 LF x 24 Hr x 284 peak equivalent days/year = 8,435 MWh/Yr]

If the boiler ran 365 days per year then the annual electrical usage would be about 11,826 MWh/Yr.

Based on the above forecast electricity usage, annual GHG emissions will be about 9,025.2 tCO₂-e/yr.
8.4 Energy Use - Greenhouse Gas Inventory

A summary of the forecast total gas and electrical energy usage, and associated GHG emissions is provided in Table 13.

<table>
<thead>
<tr>
<th>Energy/fuel type</th>
<th>Used by</th>
<th>Amount used</th>
<th>Conversion Factor</th>
<th>GHG emissions tCO₂-e/Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural-Gas</td>
<td>Boiler</td>
<td>117,000 GJ/Yr</td>
<td>51.53 kgCO₂-e/GJ</td>
<td>6006</td>
</tr>
<tr>
<td>Electricity</td>
<td>Factory-wide use</td>
<td>8,435 MWh/Yr</td>
<td>1.07 tCO₂-e/MWh</td>
<td>9,025</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>15,031</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 13 Energy use and GHG emissions of the proposed works

8.5 Non-Energy Related Greenhouse Gas Emissions

Potential non-energy related emissions from the aerobic wastewater treatment system will be negligible.

8.6 Energy Use Efficiency Measures

The factory is a new state of the art facility incorporating best industry practice energy use elements. Key energy efficiency measures include:

- The transformer to be installed is a dry type, locally manufactured by TMC and is rated at 3.5MVA, this is an alternative to typical oil type transformer and eliminates potential of oil loss or spills. The transformer (dry type, no oil) is designed to reduce energy losses both standing (no-load) and operating. At a load of 2.5MVA (3,500A) the transformer is operating at high efficiency (~99.3%). There are also minimal energy losses in the onsite 22kV cable network. The transformer room is located in the factory building above the wet processing control room adjacent to the Master Control Centre (MCC) to further reduce energy losses in the low voltage cables between the transformer and MCC distribution.

- The major loads are associated with the milk process equipment, dryer, cool rooms and related systems. Most of the large electrical motors have VSD controls to improve efficiency. This ensures efficient use of power for the site. The building services electrical loads (lighting, general power, water and wastewater pumps and systems) are a small percentage of the total site load.

- The largest building services load will probably be the waste water transfer pumps, the size still to be determined. These pumps however will be on VSD drives to minimise energy and improve efficiency. Lighting is proposed to be LED throughout. Lighting to be controlled in utility spaces (toilets, etc) with sensors, however local control for the process areas is proposed with control for compliance with OH&S requirements. HVAC units to have VSD controlled fans to again minimise energy. Supply air is being provided and controlled into the dryer tower to maximise the reject heat to preheat the process air before being drawn into the dryer process.

- Services plant including boiler with economizer, O₂ trim control, high efficiency burner with high turn down ratio (approximately 8:1) for non-peak operating days, and VSD’s.

- Refrigeration with VSD on compressors and condensers, optimized control.

- Air compressor with two stage compression, high efficiency drive and VSD.

- Electrical energy meters are proposed to enable monitoring, process improvement and energy conservation to be managed.
ACM’s GHG emissions are additional for the area, but it should be recognised that the previous Heinz operations would also have had significant GHG emissions up until 2012.

The energy efficiencies built into the ACM project will enable ACM to make any necessary adaptions in a timely manner to respond to potential climate change issues – including those that might impact in the future on water, gas and electricity supply services to the site.

8.7 Dairy industry energy efficiency and GHG benchmarks

The Australian Dairy Manufacturers Sustainability Council (DMSC) regularly surveys the dairy processing industry and publishes Environmental Sustainability Scorecards for a number of sustainability indicators. The most recent Environmental Sustainability Scorecard 2016–17 (representing about 75% of the industry in terms of milk processed nationally) reported the following eco-efficiencies:

- average 160 tonnes (range about 80-200) of GHG emissions carbon dioxide equivalent (CO$_2$-e) per ML of milk processed.

DMSC targets for these indicators are as follows (baseline year 2010/11, target year 2002):

- average 125 tonnes of GHG emissions carbon dioxide equivalent (CO$_2$-e) per ML of milk processed.

Based on Table 13, and 114 ML/Yr raw milk throughput the new ACM plant has the following estimated GHG emission unit rates:

- ~130 tonnes of GHG emissions carbon dioxide equivalent (CO$_2$-e) per ML of milk processed

ACM forecast GHG emissions are therefore lower than the average benchmark value reported by DMSC, for the companies participating in the surveys.

The energy efficient milk processes and heat recovery systems integrated into the powder plant will ensure ACM will be towards the lower end of the range of energy intensity and GHG emissions reported by DMSC for powder production facilities.

After commissioning and commencement of operation, ACM expects greater energy use efficiency gains and reductions in GHG emissions over time as process improvements are made and staff trained.

8.8 Climate Change Considerations

Climate change readiness is inherently built into the ACM project, through key considerations such as:

- Milk availability variations follow climate variations: – i.e. lower milk availability during drought, potentially higher if there are wetter better conditions on dairy farms. During drought, there will be lower effluent loads, which would also be easier to manage during dry conditions. During wet conditions, ACM’s strategy would be to divert milk inflows to the plant if the wastewater system is hydraulically overloaded and it is too wet to irrigate recycled water.

- Energy efficiency in process – there has been an organic change in industry over the years, with dryer technology overhaul and energy use improvements of over 50% reported by DMSC (2005 Australian Dairy Manufacturing Industry State of the Environment Report).

- ACM’s plant is state of the art and contains energy efficiencies built-in (heat recovery in the evaporators and dryer plant, variable speed motors, pumps, fans, etc). If existing WWTP aerators need to be replaced, more energy efficient aerators will be installed.

- Water use efficiency and drought proofing of factory water supply – the reuse of condensate reduces reliance on GMW channel water if it becomes subject to restrictions during dry times.
• Reuse of effluent on dairy farm helps to drought proof Dickman Farms, and also helps to maintain farm viability and continuity as a third-party reuse customer

• Backup ACM irrigation area can be utilised if short term or longer term high rainfall occurs due to climatic change.

• ACM may consider future biogas recovery from wastewater through covered anaerobic pond anaerobic digestion and co-generation to reduce reliance on electrical grid supply (but energy recovered may only be enough to provide energy for aerators).

ACM’s future Operational EMP will monitor local climatic conditions and trends as part of its milk supply forecasting as well as water balance calculations for the Dickman Farm recycled water scheme.
9 Noise Emissions

9.1 Noise Assessment Guidance

Assessment of the potential noise emissions from the ACM project including factory and WWTP operations has been undertaken by specialist noise consultants Marshall Day Acoustics (MDA).

State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1 only applies to Melbourne’s metropolitan areas.

Guidance on industry noise levels and limits in Regional Victoria is described in EPA’s “Noise from Industry in Regional Victoria” (NIRV) guidelines, Publications 1411, 1412 and 1413. In particular Publication 1411 explains how recommended noise levels are set for sensitive receptors potentially impacted by an industrial operation. NIRV adopts SEPP N-1’s procedures for setting recommended noise levels and also for measurement of noise.

Background Noise Measurements have been undertaken by MDA due to potential for elevated background noise from Curr Rd, which is a VicRoads asset. MDA have reported details of relevant noise criteria, measurement surveys, noise modelling, predicted levels, and recommended noise mitigation measures for the development. MDA’s report is contained in Appendix Q.

9.2 Noise Emission Sources

The primary noise sources from the ACM project assessed for this WAA are:

- Milk tanker bay pumps and truck noise
- Product loadout bays and truck noise
- Milk processing factory, milk storage silo pumps
- Warehouse and refrigeration plant
- Milk dryers including stack noise
- Boiler (including stack noise)
- Cooling towers
- Electrical transformer
- Wastewater treatment pond (WWTP), aerators
- Irrigation pump station
- Raw water supply pump station and water filtration plant
- Other internal and external plant, equipment and ancillary works.
- Staff office and carpark arrivals and departures associated with each working shift.

Most of the significant noise sources are located inside the factory, dryer and services buildings, which are provided with acoustic panels. External noise sources are to be provided with noise covers/shrouds as required, subject to a repeat noise survey at time of commissioning.

The noise model assumed conservatively high noise emissions from ACM, based on all equipment operating 24hrs per day, including during quietest times in early morning.

Background and other Industrial zone uses have been considered including from:
• Curr Rd (VicRoads asset), which is extensively used by other milk tanker (Fonterra, Stanhope) traffic, and other heavy vehicle movements particular during peak milk season (typically September - November)

• Organic Materials Recycling facility in the Industrial Zone to the south on the ex-Heinz site. This operation is subject to Campaspe Shire planning permit and EPA Works Approval. As it has not been given permits or approvals the potential noise from this operation has not been considered in the MDA noise assessment.

9.3 Sensitive Receptors for Noise Assessment

The closest and most affected noise sensitive receivers around the ACM operations are located as shown in Figure 9 and also as described in Table 14. Receiver 1 represents residential properties within the Girgarre Township Zone, and Receivers 2, 3 and 4 are farmhouses within the Farm Zone.

![Figure 9 Location of Sensitive Noise Receptors](image)

<table>
<thead>
<tr>
<th>Receiver</th>
<th>Address</th>
<th>Description</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>29-35 Station Street, Girgarre</td>
<td>Single storey residential units</td>
<td>Approx. 170 m west of site</td>
</tr>
<tr>
<td>2</td>
<td>520 Curr Road, Girgarre</td>
<td>Single storey residential unit</td>
<td>Approx. 100 m north of site</td>
</tr>
<tr>
<td>3</td>
<td>2-8 Winter Road, Girgarre</td>
<td>Single storey residential units</td>
<td>Approx. 200 m south of site</td>
</tr>
<tr>
<td>4</td>
<td>404 Winter Road, Girgarre</td>
<td>Single storey residential unit</td>
<td>Approx. 250 m south-east of site</td>
</tr>
</tbody>
</table>

![Table 14 Description of Noise Sensitive Receivers](image)
9.4 Measured Background Noise Levels

Results of background noise testing is summarised in

Unattended noise measurements were undertaken in early March 2018, in the north west corner of the site. Full details of the monitoring methodology are provided in the MDA report. The measured background levels are summarised in Table 15.

<table>
<thead>
<tr>
<th>Description</th>
<th>Day</th>
<th>Evening</th>
<th>Night</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background Noise Level</td>
<td>30</td>
<td>36</td>
<td>29</td>
</tr>
</tbody>
</table>

Table 15 Background Noise Measurements dB L90

As the proposed operations will operate 24 hours per day, the most stringent noise limits apply during the night-time. Attended night-time measurements were conducted on 8 March 2018 as part of validating the unattended noise measurements – details provided in MDA report. The background noise level measured was 34 dB L90. Background noise measurements were low, and did not result in background noise adjustment for the RMNL’s.

9.5 Recommended Maximum Noise Levels

Recommended Maximum Noise Levels (RMNLs) were calculated in accordance with NIRV taking into account land ‘zoning types’ in the vicinity of the site. The applicable RMNLs at the noise sensitive receivers are provided in Table 16. The full derivation is provided in the MDA report in Appendix Q.

<table>
<thead>
<tr>
<th>Address</th>
<th>Day</th>
<th>Evening</th>
<th>Night</th>
</tr>
</thead>
<tbody>
<tr>
<td>29-35 Station Street, Girgarre</td>
<td>52</td>
<td>47</td>
<td>42</td>
</tr>
<tr>
<td>520 Curr Road, Girgarre</td>
<td>53</td>
<td>48</td>
<td>43</td>
</tr>
<tr>
<td>2-8 Winter Road, Girgarre</td>
<td>53</td>
<td>48</td>
<td>43</td>
</tr>
<tr>
<td>404 Winter Road, Girgarre</td>
<td>53</td>
<td>48</td>
<td>43</td>
</tr>
</tbody>
</table>

Table 16 Recommended Maximum Noise Levels at Sensitive Receptors

9.6 Noise Impact Assessment


Results of noise modelling and assessment of compliance with the NIRV RMNL’s is provided in Table 17. Cumulative noise levels from the site are predicted to meet recommended maximum noise levels during the critical night-time/early morning period.

Note that all the on-site noise generating plant and equipment is assumed to be operating simultaneously, which is considered a conservatively high emission approach. In addition, the MDA report models 3 aerators in the Settling Pond 2 (east pond), and 1 mixer/aerator in Aeration Pond 1 (west pond). The actual configuration (refer to section 5.1) will be 2 to 3 x 20kW aerators in Pond 1, and no aerator in Pond 2. Therefore, the model overestimates the overall noise from the aerators.
ACM propose to conduct commissioning noise measurements when the plant is operational to validate noise levels at sensitive receivers and take remedial action if required.

<table>
<thead>
<tr>
<th>Receiver</th>
<th>Predicted level, L_{eq} dB</th>
<th>Night-time RMNL, L_{eq} dB</th>
<th>Compliance?</th>
</tr>
</thead>
<tbody>
<tr>
<td>29-35 Station Street, Girgarre</td>
<td>40</td>
<td>42</td>
<td>✓</td>
</tr>
<tr>
<td>520 Curr Road, Girgarre</td>
<td>40</td>
<td>43</td>
<td>✓</td>
</tr>
<tr>
<td>2-8 Winter Road, Girgarre</td>
<td>40</td>
<td>43</td>
<td>✓</td>
</tr>
<tr>
<td>404 Winter Road, Girgarre</td>
<td>42</td>
<td>43</td>
<td>✓</td>
</tr>
</tbody>
</table>

**Table 17 Predicted noise levels and NIRV compliance status**

The noise sources that contribute most to the predicted levels at sensitive receivers include the pumps within the CIP tank farm (west side of factory), and the WWTP aerators. CIP pump noise mitigation will be considered – see Section 9.7. Also note that four (4) aerator units were modelled as noise sources, where only 2 to 3 are expected to be installed – see Section 9.7.

The MDA report concluded that the proposed operations are expected to meet the night-time noise recommended maximum noise levels. Night-time truck activities on-site are predicted to comply with sleep disturbance criteria at the nearest receivers.

### 9.7 Best practice noise control measures

MDA has identified a range of potential mitigation measures associated with the noise sources that are predicted to contribute most to offsite noise. MDA have suggested that ACM undertake commissioning noise measurements when the plant is operational to validate noise emissions, and undertake remedial action as required to meet RMNLs. Subject to commissioning the following has been identified as likely target areas for noise mitigation:

- Pumps within the CIP tank farm may need to be fitted with shrouds as shown in Figure 8 in the MDA report – subject to commissioning noise survey
- Only 2 to 3 aerators are expected to be in operation at any one time in Aerated Pond 1, and no aerators in Pond 2. This represents about half the actual aerator noise as modelled by MDA, and is therefore an inherent mitigation measure
- New aerators may be needed to replace the existing units if found to be unserviceable. New aerators are expected to have much lower noise levels. MDA has confirmed that new aerators only need to be <80 dB L_{Aeq} @ 1m to ensure NIRV RMNLs are met
- Product dispatch to primarily occur primarily during the day, with minimal night-time truck noise
- Where possible, forklifts and vehicles should be fitted with broadband reversing alarms as opposed to tonal alarms to minimise the potential for annoying tonal characteristics of noise.
10 Waste management

10.1 Waste Inventory

The types and volumes of wastes generated from the new ACM Girgarre operations are yet to be determined. ACM will establish a tracking system to monitor generation of wastes and potential recyclable materials. Expected types of wastes generated from ACM operations are listed in Table 18.

<table>
<thead>
<tr>
<th>Type of waste generated</th>
<th>Typical Quantity</th>
<th>Disposal destination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction waste – wood, metal, packaging, plastics, concrete, bricks, soil, etc</td>
<td>To be confirmed and subsequently tracked by ACM after commissioning and commencement of operations</td>
<td>EPA licensed facilities or construction material recyclers</td>
</tr>
<tr>
<td>General Office Waste - garbage, food wastes</td>
<td></td>
<td>EPA licensed landfill (likely to be Shepparton landfill) Campaspe Shire kerb side collection or by contractor</td>
</tr>
<tr>
<td>Office recyclables – paper, cardboard, glass and plastic drink bottles, hard plastic containers, foil, etc</td>
<td></td>
<td>Recycling facilities – to be collected by contractor</td>
</tr>
<tr>
<td>Factory packaging and recyclables - cardboard, hard plastics, etc</td>
<td></td>
<td>Recycling facilities – to be collected by contractor</td>
</tr>
<tr>
<td>Wooden pallets</td>
<td></td>
<td>Pallet or wood recycling sites</td>
</tr>
<tr>
<td>Scrap metal – old equipment, metal strapping, copper wiring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-Waste – computers, screens, etc</td>
<td></td>
<td>To E-Waste recycling facilities</td>
</tr>
<tr>
<td>Off-spec Milk</td>
<td></td>
<td>Transport to farms, piggeries, or emergency irrigation on land (subject to stringent controls on application rates, dilution and separation distances for odour control)</td>
</tr>
</tbody>
</table>
| Prescribed industrial wastes  
  i. Workshop wastes may include waste oils (lubricating, hydraulic), oily rags, oil filters, etc  
  ii. used/empty chemical containers  
  iii. Kitchen grease trap wastes | | EPA licensed facilities or recyclers – by EPA permitted transport contractor  
  IBC chemical tanks and other containers to be sent back to supplier of to EPA licensed container washing sites. |
| Wastewater ponds sludges and solids (18 months after commencement), trade waste pit pumpouts | | EPA licensed facilities or recyclers – by EPA permitted transport contractor |

Table 18 ACM General, Industrial Waste & PIW generation

10.2 Waste Recycling and Resource Recovery

Upon commencement of operations and as part of a future OEMP, ACM will identify waste recycling and resource recovery opportunities to minimise disposal to landfill and prescribed waste facilities. As part of its OEMP, ACM will establish waste management and tracking procedures to record quantities of wastes and recyclables and ensure proper disposal routes for non-recyclable materials to EPA approved and licensed facilities. Refer to Section 11 for discussion on development of the OEMP.
11 Environmental Management

11.1 Risk Assessment of Non-Routine Operations

The key risk aspects for non-routine operations considered to have potential for offsite impact are summarised in Table 19. Residual risk ratings have been determined by qualitative methods consistent with EPA’s “Licence Assessment Guidelines for Using a Risk Management Approach to Assess Compliance with Licence Conditions” (Pub. No. 1321.2, June 2011).

<table>
<thead>
<tr>
<th>Risk Aspect</th>
<th>Description of Mitigation Measures</th>
<th>Residual Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk spills to stormwater system</td>
<td>Contained within the onsite stormwater system of swales and 4.5ML detention basin. Spills cleaned out and pumped to WWTP</td>
<td>Low</td>
</tr>
<tr>
<td>Dryer bag filter failure, breach of licence emission limits, dust fallout</td>
<td>Bagfilter designed to industry best practice (99.9% recovery). ACM maintenance and inspection procedures. Parallel dryer lines provide redundancy – ability to shut one dryer line down to undertake maintenance and repairs.</td>
<td>Low</td>
</tr>
<tr>
<td>Power failure</td>
<td>Milk processing stops including dryer operations, therefore no emissions possible.</td>
<td>Low</td>
</tr>
<tr>
<td>High BOD loading to WWTP</td>
<td>Aerated Pond 1 has 3 aerators delivering up to 60kW total duty, which is 60% more than needed to meet peak BOD and ammonia loads. Pond capacity also provides double the minimum residence time required to functionally treat ACM’s organic and nutrient loads. Contingency chemical dosing will be considered to control odour.</td>
<td>Low</td>
</tr>
<tr>
<td>WWTP Aerator or other failure</td>
<td>Pond 1 can operate with no odour on just one aerator. If all aerators stop operating (eg. due to power failure) there is adequate capacity in Pond 1 (~7.8ML) to aerobic conditions until the power supply is restored and/or aerator repairs are completed. Contingency chemical dosing will be considered to control odour.</td>
<td>Low</td>
</tr>
<tr>
<td>Wastewater spills – pond overflow during high rainfall event</td>
<td>All ponds have at least 500mm freeboard, which is adequate for extreme rainfall events. The ponds will cascade from Pond 1 to 3 by gravity or pump assist if required. Water level controls on the ponds will ensure pumping to Dickman Farms where there is additional 20ML of storage available.</td>
<td>Low</td>
</tr>
<tr>
<td>Recycled water pipeline failure of spills</td>
<td>Pipeline is underground within Curr Rd reserve and is signposted to ensure it is not damaged by road excavation works. Pipeline will be routinely tested by ACM to ensure there are no unaccounted losses, pipe breaks or leaks. Any spill of recycled water (low BOD) offsite may enter G-MW drainage system, which would have low environmental consequences. There are no nearby natural waterways at risk.</td>
<td>Low</td>
</tr>
<tr>
<td>Recycled water quality – failure to meet Secondary Standards</td>
<td>The WWTP design has additional aerator capacity and detention time to ensure BOD/SS 20/30 standards are routinely met. However algal blooms may cause increase in BOD, SS and pH levels (refer to next row). Dickman Farms irrigation scheme land capability has been assessed, and algae in the recycled water is not a problem for flood irrigation systems.</td>
<td>Low</td>
</tr>
</tbody>
</table>
Algal blooms in WWTP ponds

The elevated N and P levels in the ponds may result in growth of algae particularly during warmer months of the year. Management of algal blooms are an operational element rather than a non-routine event. Algae in the recycled water is not a problem for flood irrigation systems. In the event of an algal bloom, the WWTP ponds can be diluted with condensate water to help mix and flush out the algae in recycled water sent to Dickman Farms. The receiving channel systems at Dickman Farms can be flushed with fresh channel water to restore quality. Dickman farms have a runoff collection and reuse system for potential algal laden water irrigated. These risks will be managed through the CSMP – refer to section 6.2.6.

Dickman Farm Recycled water incidents – spills to drains, irrigation runoff, storage dam/reuse sump overflow to drains

Any potential loss of recycled water at Dickman Farms is regarded as having low environmental consequence given the G-MW receiving drainage systems. Any spill of recycled water (low BOD, moderate nutrients) offsite may enter G-MW drainage system, which would have low environmental consequences. There are no nearby natural waterways at risk. These risks will be managed through the CSMP.

Noise

The assessment of noise at sensitive receptors has been assessed in section 9 using conservatively high (worst case) noise emissions assuming all equipment is operating 24hrs per day simultaneously, and additional aerators installed. Even at these high noise source emissions the MDA report predicts compliance with RMNL’s of EPA’s NIRV guidelines. Any unwanted noise events will be promptly responded to by ACM, and mitigation measure implemented as required.

Table 19 Risk Management of Non-Routine Operations

11.2 Management Systems

ACM will develop a comprehensive site Risk Aspects and Impacts register for routine and non-routine operations as part of its OEMP. ACM’s risk assessment framework will be consistent with EPA’s Licence Assessment Guidelines (Pub. No. 1321.2, June 2011).

ACM is developing an integrated management system comprising: food safety, hygiene, HSE and Environment. This system will be developed to high industry standards commensurate with a food production plant with domestic and export markets for its products.

The OEMP incorporating the Environmental Monitoring Program (see section 13.1) and Dickman Farm Customer Site Management Plan (section 12.3) will be developed prior to commencement of operations and EPA licensing. The environmental management framework is shown conceptually in Figure 10.
Figure 10 ACM OEMP Framework

- Works Approval Application
- EPA Works Approval
- EPA Licence
- ACM Site operations and Maintenance Systems and Procedures: Food Safety, Hygiene, QMS, OHS, etc
- Operations EMP
  - Aspects & Impacts Register & Environmental Monitoring Program
  - Recycled Water Scheme CSMP Dickman Farm LCA & Irrigation Management Plan
- Internal Audit Program & ACM Management Review
- Annual Compliance Statement to ACM
- Annual Performance Statement to EPA

ACM Plant Pty Ltd – Girgarre Milk Processing Facility Works Approval Application

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11.3 Construction Impact Assessment

The Construction Site Environmental Management Plan is shown in Figure 2949 C09 SH9 (D). The original CEMP risk assessment submitted to Campaspe Shire Council for the planning permit application is shown in Figure 2949 P01 SH8 (C) - now superseded by Figure 2949 C09 SH9 (D).

The CEMP covers erosion and sediment pollution controls and dust controls.

The onsite stormwater swales and 4.5ML detention basin will serve as construction sediment basins during construction phase.

After construction the detention basin will be desilted and then provide the operational stormwater management function as discussed in Section 5.3.

Any construction site runoff would have no significant consequence or sensitivity (low risk rating) given the discharge would be to G-MW drains and there are no natural waterways close to ACM.
12 Other Approvals

12.1 Commissioning Plan

ACM will undertake a commissioning phase for the milk plant and dryers. This is expected to occur over a period of 120 days. During this time plant and equipment will be tested and staff appropriately trained to ensure operations to intended design parameters and efficiencies.

There will be a commissioning period for the dryer baghouse emissions of at least 120 days, which will include testing, emission observations, and mass balance checks to verify 99.9% recovery of milk particulates as per design specifications.

The wastewater treatment ponds will also be subject to a start-up period of 3-6 months. Startup commissioning plans are discussed in the ETS report in Appendix F. It is expected that the treated effluent discharged into the Winter Storage will not achieve Table 5 standards initially. The BOD, SS and nutrient levels will start at raw levels (Table 4) but diluted by about 50% with fresh channel water or condensate at startup.

The Table 5 standards are expected to be met within 3-6 months. During this period the Dickman Farm recycled water scheme will be managed by a number of commissioning measures to ensure no odour or land capability issues at the farm. These measures include:

- Shandying with channel water and condensate
- Use of laser graded paddocks with most uniform slopes and drainage to minimise ponding
- Use of centralised flood irrigation paddocks with high internal buffers to boundaries/residences
- Flushing residual effluent out of ponded paddocks, farm channels and drains.

12.2 New Licence subsequent to Works Approval

12.2.1 Air Emission Limits

The proposed licence limits (long term median) for air emissions are provided in Table 20

<table>
<thead>
<tr>
<th>Description of discharge point</th>
<th>Stack height (metres)</th>
<th>Emission indicator</th>
<th>Licence limit (median) (kg/Day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk Dryer D1</td>
<td>24</td>
<td>PM$_{10}$</td>
<td>12.5</td>
</tr>
<tr>
<td>Milk Dryer D2</td>
<td>24</td>
<td>PM$_{2.5}$</td>
<td>12.5</td>
</tr>
<tr>
<td>Boiler</td>
<td>12</td>
<td>PM$_{10}$</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM$_{2.5}$</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 20 Proposed Air Emission Limits

12.2.2 Recycled Water Quality Limits

Recycled water discharge limits (average annual median values unless stated otherwise) are proposed to be those given in Table 5, to be discharged from Winter Storage Pond 3 to Dickman Farms. These will apply after the commissioning period and exclude the impact of algal growth.
12.3 Dickman Reuse Scheme CSMP

EPA endorsement of the Dickman Farm CSMP will be sought prior to commencement of irrigation:
The CSMP as outlined in Appendix L, will be prepared prior to commencement of the commissioning phase, when recycled water is expected to become available for reuse on Dickman Farms. Both a commissioning CSMP and operation CSMP (post commissioning) will be prepared for EPA endorsement.

ACM seeks exemption from licensing for the Dickman Farm Recycled Water Scheme, subject to endorsement of the CSMP.
### 13 Post Decision Operational Requirements

#### 13.1 Environmental Monitoring Programs

ACM will develop a risk-based environmental monitoring program derived from its Risk Aspects and Impacts register, developed in accordance with EPA Publication 1321.2. The monitoring program is expected to include the key elements as summarised in Table 21.

**Table 21 Environmental Monitoring Program – Key Elements**

<table>
<thead>
<tr>
<th>Monitoring Element</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factory throughputs – milk received, products produced</td>
<td>ACM tanker milk receival records, and product loadout sales</td>
</tr>
<tr>
<td>Water use – G-MW channel supply</td>
<td>G-MW meter</td>
</tr>
<tr>
<td>Evaporator Condensate – production and reuse</td>
<td>Sub-metering</td>
</tr>
<tr>
<td>Wastewater Flows</td>
<td>Meter on Trade waste pit</td>
</tr>
<tr>
<td>Wastewater and condensate raw water quality - Table 4 parameters</td>
<td>Routine Monitoring – frequency to be determined after commissioning</td>
</tr>
<tr>
<td>Wastewater treatment process controls</td>
<td>DO, pH and temperature monitoring in aeration and settling ponds – to be confirmed by commissioning</td>
</tr>
<tr>
<td>Sludge build-up in ponds</td>
<td>Sludge levels checked by inspection, or by sampling</td>
</tr>
<tr>
<td>Recycled Water Quality – from winter storage to Dickman Farm - Table 5 parameters</td>
<td>3 times per year during irrigation season, 2 times during non-irrigation season – to be confirmed by commissioning</td>
</tr>
<tr>
<td>Algal monitoring</td>
<td>Regular visual observations (weekly) in detention basin and WWTP ponds. Algal testing if required due to B-G algal blooms in detention basin.</td>
</tr>
<tr>
<td>Treatment and Winter storage pond levels and condition</td>
<td>Regular inspection for condition of pond embankments and depth – to verify 500m freeboard maintained</td>
</tr>
<tr>
<td>Recycled water volumes pumped to Dickman Farm</td>
<td>Irrigation pump station meter. Submeters at Dickman farm (WM1, 2 and 3)</td>
</tr>
<tr>
<td>Stormwater quality</td>
<td>Routine inspection (weekly) of detention basin Sampling of indicator pollutants in the event of a spill – from detention basin</td>
</tr>
</tbody>
</table>
**Odour and noise emissions**
Daily site inspection/ surveillance runs to verify no offensive odour or unwanted noise offsite.

**Boiler gas usage and stack emissions**
Gas meters.

Visual inspection of stack emissions – to verify no visible emissions (other than heat shimmer)

**Milk dryer emissions**
Determined by mass balance of milk solids into dryer minus milk powder produced. Daily inspection of bag filter system to ensure operating to design. Stack sampling only if unaccounted loss identified.

**Groundwater**
Monitoring of onsite bores to be undertaken prior to commencement of ACM operations and annual thereafter – in autumn each year.

**Recycled water pipeline**
Regular inspection – monthly during irrigation periods to verify no leaks or bursts in pipeline. Pipeline pressure checks at pump station.

**Dickman Recycled Water Scheme onsite water use and soils, and performance**
Dickman to implement monitoring programs and procedures described in the CSMP including water use recording by paddock number, date and volume.

Annual soil sampling (in autumn each year) of selected paddocks for agronomic parameters (soil pH, salinity, sodicity, nutrients and trace elements)

**Climate conditions**
Rainfall and evaporation for recycled water scheme water balance calculation checks

**Solid wastes**
Tracking system (via invoices) to be implemented to record volumes/tonnages of garbage, recyclables solid and other wastes generated at ACM, and disposal/recycling routes.

Prescribed industrial wastes to be tracked by EPA’s waste transport system (EPA permitted drivers and certificates).

**Town water use and sewage disposal**
GVW water and sewerage meters

The above monitoring program including testing parameters, frequencies and locations will be developed further during the commissioning phase of the project. A final monitoring program and the risk register that underpins it will be provided to EPA prior to completion of commissioning.

Monitoring results, data and records from the above programs will be maintained by ACM in secure environmental files and database repositories for subsequent use in assessing compliance with licence conditions and preparing the Annual Performance Statements to EPA due in September each year.

The environmental monitoring program will incorporate response triggers to enable interpretation of results and assessment of compliance with licence limits and conditions. A trigger action response plan (TARP) will be developed to enable appropriate responses in the event of exceedance of triggers.
13.2 Incident Response and Reporting
ACM will develop incident response and EPA reporting procedures for the following:

- **ACM factory site**  Identification of spills, odour, noise, dust, visual emissions, litter, algal blooms (in detention basin), etc from routine site inspections and internal audits. Investigation, risk assessment and resolution of incident.

- **Dickmans Farm**  Identification of recycled water pipeline spills/leaks, non-compliance with CSMP – eg. use of recycled water on land not permitted by the CSMP, soil risks identified by testing, complaints about recycled water scheme. Investigation, risk assessment and resolution of incident.

- **Environmental Complaints**  Recording and investigation of complaints received by public (could be either directly or from EPA). Possible complaint categories: spills, odour, noise, dust, visual emissions, litter, water pollution, etc. Complaints investigated as soon as practicable, complainants to be contacted on same day. Complaint resolved/reported within 24hrs.

13.3 Annual Performance Statement
ACM will prepare an EPA annual performance statement in accord with the EPA licence conditions and EPA’s Annual performance statement guidelines (Publication 1320.3, June 2011). APS information and data to be reported is expected to include

- Wastewater quantity and quality generated from the factory
- Recycled water volumes and quality discharged to Dickman Farm
- Dryer Stacks and Boiler stack emissions by mass balance and energy use calculation
- Reporting of any non-compliance with licence conditions including the incident report, complaint records as relevant.

The APS will be submitted to EPA in September each year.

An annual self-assessment and CSMP compliance statement will be undertaken by the operator of Dickman Farm recycled water scheme and submitted to ACM by the end of each financial year. The report will include compliance statement for the following:

- Recycled water use, paddock number that received effluent
- Channel water used onsite – to estimate average annual shandy/dilution
- Soil test results and any problem areas
- Incident reporting to ACM – channel overflow or runoff events, soil/pasture productivity issues, etc.