

Before the Independent Commissioner

Under the Resource Management Act 1991

In the matter of an application by Tegel Foods Limited for resource consent for the discharge of contaminants to air at 112 Carmen Road, Hornby, Christchurch

Statement of Evidence of Anthony John Atkinson

28 July 2020

Applicant's solicitors:
Sarah Eveleigh | Jessica Hardman
Anderson Lloyd
Level 3, 70 Gloucester Street, Christchurch 8013
PO Box 13831, Armagh, Christchurch 8141
DX Box WX10009
p + 64 3 379 0037 | f + 64 3 379 0039
sarah.eveleigh@al.nz | jessica.hardman@al.nz

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Introduction

- 1 My name is Anthony John Atkinson. I am the Christchurch Engineering Manager for Tegel Foods Limited (**Tegel**).
- 2 I hold a New Zealand Certificate in Mechanical Engineering and a Degree in Applied Management in Operations and Production from ARA institute of Canterbury formally CPIT. I have 39 years industrial engineering experience, 34 of which have been in the meat and food processing industry, the last 25 as Engineering Manager at Tegel.
- 3 My role at Tegel is the management of the Carmen Road site (the **Site**) engineering department including responsibilities for all plant maintenance, process efficiency and capital plant development.
- 4 In addition my duties include the rendering plant operation and production management. The key performance requirements include responsibility for product cost, quality and exports as well as all plant compliance requirements.

Scope of evidence

- 5 In this evidence I address:
 - (a) Rendering process management and operation;
 - (b) Protein recovery plant (**PRP**) ventilation upgrade;
 - (c) New biofilter design and maintenance;
 - (d) Boiler upgrades and fuel sources; and
 - (e) Plant engineering and maintenance.

PRP process management and operation

- 6 The PRP is operated by a team of six staff on rotating shifts (two staff per shift) with a day shift supervisor. They have responsibility for the correct operation of the PRP which includes managing the process to prevent odour discharges to the atmosphere. Their duties include monitoring critical processes and plant such as the offal cookers, meal and tallow processes, as well as the ventilation system and biofilter (discussed further below).
- 7 If there is a plant failure, (for example the ventilation system shuts down due to fan fault, or there is a problem with the cooking pressure system, or any other PRP plant equipment fails that could have an effect on odour discharges), the PRP operation will be shut down until the repair is completed. The process involves the

PRP team leader shutting down the plant and then escalating the issue to the Plant Engineer or Engineering Manager as required to resolve the issue.

- 8 The PRP is Ministry of Primary Industries (**MPI**) export registered and currently has the highest level of compliance requiring only a six-monthly visit from MPI. This is a measure of the standard of housekeeping and plant operations.
- 9 Tegel is required by MPI to undertake its operations in accordance with the Tegel Good Manufacturing Process (**GMP**) manual. The GMP manual is registered and audited against the MPI requirements for the rendering operations. The GMP manual sets out the process details for plant operation including the housekeeping and hygiene procedures that apply to areas of concern for discharges to atmosphere for the PRP operation. The documented management procedures contained in the GMP manual include daily operator checks, critical parameter monitoring, process failure response processes and planned maintenance procedures.

PRP ventilation upgrade

- 10 We have installed a new ventilation system that has increased the airflow extraction from the PRP by approximately 70%. The new extraction process increased the air movement from key odour sources to the biofilter thus ensuring we maintain the plant at a negative pressure situation. Point extractions have been upgraded and added to all sources within the system. This will ensure that the PRP is under negative pressure, allowing only air movement inwards and directing all of the odorous air to the biofilter for treatment.
- 11 The wastewater tank has been covered and ventilation installed to extract air from the tank and take it to the biofilter, ensuring that odours from this source are also captured and treated.

Biofilter process management and operation

- 12 The biofilter extraction system is operated on a continuous basis 24 hours per day, seven days per week regardless of what hours the PRP is operating, providing continuous extraction of odours including from the wastewater tank.
- 13 The biofilter and ventilation system is controlled and monitored by our computer control system and Supervisory Control and Data Access (**SCADA**) system. The computer control system controls the PRP automated processes. SCADA allows all process variables to be displayed to the PRP operators on a PC screen.
- 14 If any of the process variables go out of specification, the computer control system initiates an alarm that will instantaneously call the plant operators via an alarm and a two way radio. This alarm is also sent to our engineering department.

- 15 The alarm triggered by process variables going out of specification includes major events such as a ventilation system stopping which would require immediate plant shut down, or in the case of the biofilter it could be a slow drift in the operating parameters. In the biofilter, this could include the critical process variables of the bark media bed such as pressure, temperature, moisture and pH which would be investigated and corrective action taken as required.

Replacement biofilter

- 16 The redesign concept was based on proprietary German designed “Hahn” system and advice from Daniel O’Carroll, the plant manager at Living Earth who has had significant experience in biofilter design and operation. The biofilter was redesigned using a scale working model built by our engineering department. We had a University of Canterbury mechanical engineering student assist us with the design and scale model. This work was verified by Mr Pene at Tonkin and Taylor consultants. Mr Cudmore of Golder Associates has also provided advice regarding biofilter design, construction and operation, as detailed further in his evidence.
- 17 The previous biofilter design presented significant challenges in maintaining moisture control due to having no leachate drainage system (a mechanism under the biofilter bed that allows excess water in the bed to positively drain away so as to not flood the bed with water at any time). The moisture levels affected the performance of the biofilter. Other key learnings from our previous biofilter is the need to establish and maintain consistent air flow across the bark bed. The new design has benefits in improved airflow uniformity and air flow distribution through the bark media bed. It also has positive leachate drainage and allows better moisture control of the media. Mr Cudmore provides further detail regarding the biofilter design.
- 18 Our experience with the previous biofilter also demonstrated the need to keep the bark bed in a “healthy state” using continuous monitoring. This monitoring should include visual checks and technical checks of the back pressure, pH, moisture, and inlet temperature. We have now a much greater understanding of the important elements of the biofilter that need to be maintained, and the new biofilter has been designed to enable monitoring and management of these elements.
- 19 The new biofilter is smaller in floor plan area than the previous biofilter, which is more cost effective for installation and ongoing maintenance. It has been designed to cope with the increase in air flow resulting from the ventilation upgrade for the rendering plant, and is appropriately sized for the plant it supports. The new design will provide effective treatment of odour as verified by the evidence from Mr Pene and Mr Cudmore.
- 20 The management procedures to support and control the performance of the PRP systems (including the biofilter) are set out in our GMP manual. The management

procedures have been written taking into account previous experience with the biofilter and contain details that ensure checks required and actions required are clearly defined. This will ensure we are able to maintain a good standard and response to any variance in our process.

Boiler upgrades and fuel sources

- 21 The boiler upgrades for the Site include the replacement of two front site 1.1MW boilers with a new 2MW boiler. This project is currently under construction. There will be a period of time during the commissioning of the new boiler when it will be running simultaneously with the old boilers. This is required to allow the transfer of plant steam connections to the new boiler. The total boiler steam output will not be greater than 2.2MW during this period but will be distributed across old and new boiler plant. Tegel also intends to replace the four rear site 1.1MW boilers with a new 4MW boiler located in the new front site boiler house but no timeframe has been established for this plan.
- 22 The Site is currently running on recycled lubrication oil (**RLO**) fuel and had previously used light fuel oil (**LFO**). LFO is no longer readily supplied and is therefore not the preferred option. The new front boiler will be run on diesel fuel with an option to use liquefied petroleum gas (**LPG**). The four rear site boilers are currently run on RLO but the intention is to convert to diesel fuel due to the high maintenance requirements associated with running on RLO. The proposed 4MW boiler would also be run on diesel with an LPG option.

Plant engineering and maintenance

- 23 The Site is maintained by a team of 12 engineers and four electricians with two supervisors and a finance and purchasing administrator. The engineering team are on a roster to operate seven days per week. The Site has a dedicated maintenance planner and uses BWM¹ software planned maintenance system supplied by Maintenance Transformations NZ to manage and maintain all Site process assets and equipment.
- 24 The biofilter and ventilation along with all other rendering plant is on a regular scheduled maintenance program. Written programmed maintenance work orders are generated by the system on an appropriate schedule and issued to engineers as required for completion.

¹ BWM is the trade name of the software

- 25 The rendering plant has a shift engineer rostered to that plant covering 3am to 11pm Monday to Friday and 3am to 3pm Saturday. For engineering support outside of these hours there is an engineer on call back support as required.

Conclusion

- 26 The Site is supported by a dedicated on-site engineering team which ensure that the Site is professionally managed and maintained to a high standard. There is a culture of proactive improvement in plant development which has resulted in significant upgrades over a number of years.
- 27 The PRP extraction system capacity has been increased by approximately 70% above the previous operating level. The biofilter has been completely replaced with a new system, which has been designed taking account of experience with the previous biofilter and technical advice from a number of experts, and which I believe is taking industry best practice in its design. I am confident that the upgrades will provide a step change in the performance of the ventilation system and biofilter resulting in robust odour control.
- 28 The maintenance and operation processes for key equipment are comprehensive and will further ensure the security of odour control.

Tony Atkinson

Dated 28 July 2020