BEST AVAILABLE TECHNIQUES AND OPERATING TECHNIQUES

Environmental Permit Variation, Telford

Prepared for: **Muller UK & Ireland Group LLP**

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1.0 Introduction

SLR Consulting Limited (SLR) has been instructed by Muller UK & Ireland Group LLP (Muller) to prepare an application for a substantial variation of the existing Environmental Permit (EP), reference EPR/SP3200SY for the Muller, yogurt and yogurt drink facility located at Donnington Wood Business Park, Granville Road, Telford TF2 7GJ (the site).

The site is currently permitted for the operation of a Medium Combustion Plant (MCP) under Schedule 25B activity as described in the Environmental Permitting (England and Wales) (Amendment) Regulations (EPR) 2018.

Muller intends to increase production at the Telford site by 21%. This planned increase will include receipt of over 200 tonnes per day of milk and treatment of over 50 tonnes of effluent per day. The site will therefore, in accordance with the Environmental Permitting (England and Wales) Regulations 2016 (as amended) (EPR), require a change from an MCP EP under Schedule 25B of EPR 2018; to become a Part A(1) installation under EPR 2016, specifically for the following listed activities:

- Section 6.8 Part A(1)(e) Treating and processing milk, the quantity of milk received being more than 200 tonnes per day (average value on an annual basis.
- Section 5.4 Part A(1)(a) Disposal, recovery or a mix of disposal and recovery of non-hazardous waste with a capacity exceeding 50 tonnes per day involving one or more of the following activities:
    - (i) biological treatment; and
    - (ii) physico-chemical treatment.

A substantial variation of the EP is being applied for to convert the MCP permit (Schedule 25B activity) to a Part A(1) environmental permit to incorporate the two listed activities above, the combined heat and power plant (CHP) will become a directly associated activity (DAA).

The current EP boundary is limited to surround the onsite CHP. Muller propose to extend the EP boundary to incorporate the whole site to mirror the current site boundary. The expansion of the EP boundary has resulted in an additional point source emission to air (gas fired steam boiler) to be incorporated in the varied EP; along with two discharge points for uncontaminated rainwater to surface water; and an emission point to sewer.

This Best Available Techniques and Operating Techniques (BATOT) report is an integrated document which describes both the operating techniques that will be implemented at the plant to ensure compliance with the conditions of the EP and to demonstrate that the permitted activities comply with BAT.

Key technical standards laid out in the following documents have governed the design and operation of the plant:

- Environment Agency. Develop a management system: environmental permits guidance, published February 2016 last updated August 2022.
- Environment Agency. Risk assessments for your environmental permit guidance published February 2016 last updated August 2022.
- Environment Agency. Best Available Techniques: environmental permits, published February 2016.
- Environment Agency. Surface water pollution risk assessment for your environmental permit, published February 2016, last updated February 2022.
- European Commission. Reference Document on Best Available Techniques in the Food, Drink and Milk Industries published December 2019.
- European Commission. Reference Document on Best Available Techniques for Energy Efficiency published February 2009, updated September 2021.

1.1 The Site

The site is located on Donnington Wood Business Park, Granville Road, Telford TF2 7GJ, and is centred on National Grid Reference SJ 71170 12140.

The site, which is located approximately 3.75km northeast of Telford, is within an industrial area. To the north of the site lies Granville Road, beyond which lies a residential area (approximately 25m from the site). Commercial premises lie to the east, south and northwest of the EP boundary. Additional residential areas lie approximately 35m to the west beyond Redhill Way and 250m north. Parcels of woodland lie to the north, east, south and west of the site boundary. There is a 'detention basin' for uncontaminated rainwater located in the eastern portion of the site.

The site's location is illustrated on Drawing 001 and the site layout and EP boundary on Drawing 002. The surrounding land uses, local receptors within 500m are illustrated on Drawing 003 and cultural and natural heritage receptors within 2km are identified on Drawing 004.

1.2 Surrounding Land Uses

A summary of the site's immediate surrounding land uses is identified in Table 1-1 below.

Table 1-1
Surrounding Land Uses

Direction	Land-Use
North	Granville Road, beyond which is a small residential area (approximately 25m north of the EP boundary) and vegetated open space. A petrol station is located approximately 150m to the northwest. Residential properties lie approximately 250m north.
East	Commercial premises immediately adjacent with vegetated open space beyond.
South	Commercial properties adjacent with woodland and vegetated open space beyond.
West	Redhill Way (A4640) with residential housing (approximately 35m west of the EP boundary) and woodland beyond.

The closest residential properties lie approximately 25m north of the EP boundary, beyond Granville Road. Additional residential properties lie approximately 35m west and approximately 250m north beyond Donnington Wood Way.

The site location is presented on Drawing 001.

There are no receptors of European/international importance (i.e., RAMSAR, Special Areas of Conservation and Special Protection Areas) within 2km.

There are numerous sites of national and local ecological importance within a 2km radius of the site, including:

- Muxton Marsh (SSSI) which lies approximately 940m northeast of the site boundary.
- Granville Country Park Local Nature Reserve which lies approximately 280m south and approximately 350m east of the site.

The following features were also identified within 500m of the site:

- Four woodlands, the closest being adjacent to the northern boundary of the site.
- Four surface water features (ponds and associated streams), the closest pond is located 355m east.

With respect to cultural heritage, there are 19 Listed buildings that lie within 2km of the site boundary all of which are Grade II listed. The closest Listed Building is Southern Wash House which lies approximately 520m north of the site boundary.

Five Scheduled Monuments have also been identified within 2km. The closest monument is the Headgear at Grange colliery which lies approximately 1km southeast.

1.3 Production Activities Overview

Production activities are undertaken in the main production building located in the western portion of the site. The high bay warehouse, storage warehouse and despatch building, which provided chilled and non-chilled storage, are located in the eastern portion of the site.

Raw milk, skimmed concentrate and cream along with some food grade raw materials, are delivered to site in bulk and stored in above ground storage tanks. Raw milk is split into skimmed milk and cream once it arrives on site and is subsequently pasteurised. Milk based concentrate is also received on site.

Other food grade raw materials are delivered to site in intermediate bulk containers (IBCs), bags, boxes, sacks, etc. The production process involves the manufacture of yogurts. The manufactured yogurts are packaged (trays, cartons, etc.) and stored in rapid cooling pods in the storage warehouse prior to despatch to customers. The site operates a clean in place (CIP) system for the cleaning and sterilisation of the production areas.

Process effluent is directed to the on-site effluent treatment plant (ETP) located in the southwestern site area. Other activities undertaken at the site include a CHP plant; a natural gas fired boiler for hot water and steam raising for production activities; a cooling tower and diesel fuel storage (2,500L tank).

The site layout is presented on Drawing 002.

1.4 Pre-Application Meeting

A pre-application meeting was held with the Environment Agency (EA) on 15 November 2022. Refer to Appendix A for a copy of the meeting minutes.

The EA confirmed that:

'It is considered unlikely that the generic risk assessment for fugitive emissions will demonstrate that the risks of noise and odour are significant, and therefore a quantitative assessment is unlikely to be required, providing you are demonstrating Best Available Techniques'.

As such, no quantitative noise or odour assessments have been undertaken for the permit variation application.

2.0 Amendments Required to the Existing EP

Muller wish to make the following amendments to the existing EP:

- a change from an MCP EP under Schedule 25B of EPR 2018; to a Part A(1) installation;
- update the EP boundary to mirror the site boundary;
- incorporate the proposed changes to site including two new skimmed concentrate tanks (70,000Ltr and 90,000Ltr); and
- incorporate the natural gas fired steam boiler (emission point A2) into the EP as a MCP.

3.0 The Installation

The site comprises offices, manufacturing facilities, raw material storage (liquid and solid), high bay warehouse, storage warehouse; despatch area including finished goods storage, waste storage, engineering workshop, chilling plant, cooling tower, research and development (R&D) facility and an ETP. The manufacturing areas are separated into medium care, enclosed product (filling) and base care (packing) and low risk areas. Regarding the medium care area, this is an enclosed production area providing an environment aimed at preventing product contamination; and the base care area is an area designed to minimise product cross contamination.

The site was expanded in 2019 to incorporate the high bay warehouse, storage warehouse and despatch area (known as the PL500 expansion). A high-level flow chart of the process is presented in Figure 1 below.

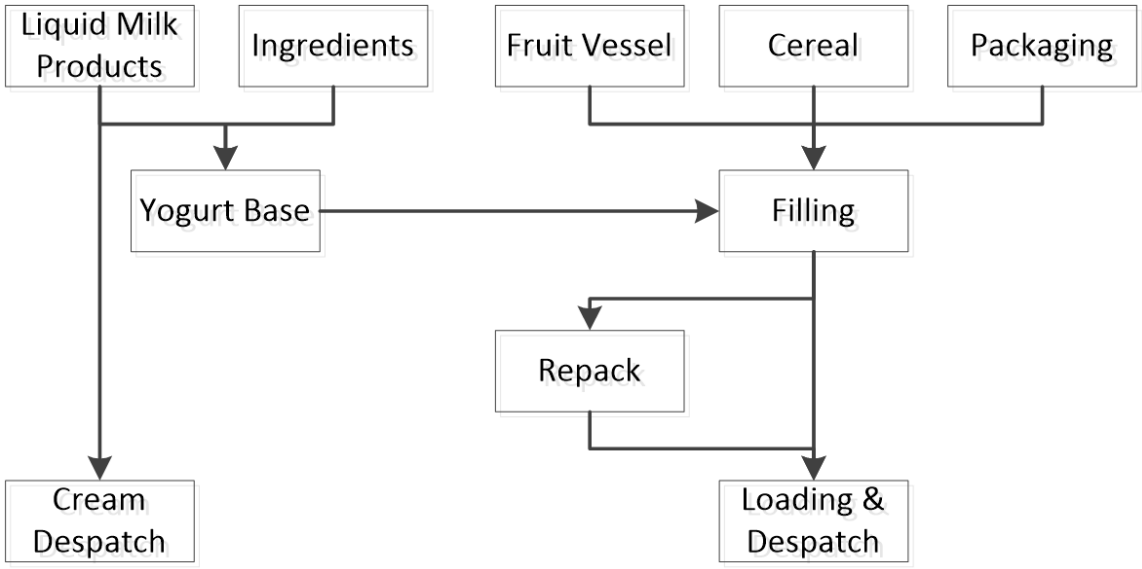

Figure 1 High Level Overview of Yogurt Manufacturing Process

3.1 Site Boundary

The proposed new EP boundary will be expanded to mirror the site boundary.

3.2 Working Hours and Staff

The site operates 365 days a year. The Company currently employs approximately 281 people at the Telford site with approximately 163 people working continental 4 days on 4 days off shift pattern.

4.0 Overview of Operational Activities

An overview of the operational activities as detailed in Section 3.0 are provided in the following sub-sections.

4.1 Food Grade Raw Materials

4.1.1 Raw Materials - Milk

A range of food grade raw materials are in used at the site for the manufacture of food-based yogurt products. Raw milk, skimmed milk, cream and milk-based concentrate are used in the manufacture of the yogurts.

The milk and yogurt products are manufactured from raw milk which is delivered to the site and stored in above ground storage tanks. Skimmed milk and cream are derived onsite from the separation of raw milk and also from offsite sources. Milk based concentrate is also utilised in yogurt manufacture.

The site proposes to increase the amount of raw milk received at the site by 21% to approximately 80,109 tonnes per year. Approximately 220 tonnes of raw milk will be received per day.

Table 4-1 presents proposed amount of raw milk to be received at the site annually from mid-2023.

Table 4-1 Proposed Annual Milk Volumes

Ingredient	Proposed* Daily Raw Milk Quantity in Tonnes	Proposed* Annual Quantity in Tonnes
Total Raw Milk Received	220	80,109

*21% increase from 2022 value

4.1.2 Additional Food Grade Raw Materials

In addition to milk, processed fruit, cereal, sweeteners, whey protein and a number of other food grade raw materials are delivered in bulk and stored in stainless steel tanks in the high bay warehouse; these are detailed in Table 4-2.

Table 4-2 Raw Materials

Ingredient	Current average usage per year in tonnes	Proposed* average usage per year in tonnes
Granulated sugar	1902	2301
Vanilla Crunch SP Sug Red 2018	767	928
PREP Banana 253434L02	721	873
CEREAL ChocShortcake WC Palm Free UTZ MB	717	868
CEREAL ChocDigestive WMC PalmFree UTZ MB	703	851
CEREAL Chocoballs 60WMC/40WC UTZ MB	703	851
CEREAL Choc Flakes WMC UTZ MB	692	838
MILK SM 9,4DM	679	821
FRT O/M Van Wht Bsct SP Sug Red 18	659	797
SAUCE Coconut 238981	645	780
PREP Strawberry Thick Creamy NAT	643	779

Ingredient	Current average usage per year in tonnes	Proposed* average usage per year in tonnes
PREP Honey 331190	632	765
PREP Strawberry 209435	631	763
PREP Cherry 050077	627	759
FRT O/M PL Strawberry SP 2018	622	753
FRT O/M PL Mango/Passionfruit/Papaya Sug Red 19	613	741
PREP Peach Apricot	590	714
FRT O/M ALDI WM Rhubarb	590	713
FRT O/M PL WM Strawberry	585	708
PREP Peach-Passionfruit_NAT	563	681
PREP Strawberry 264201L01	521	631
PREP Raspberry	477	577
WHEYPO veg WPC 35Prot	460	557
MILKPO MCC60 90/10	446	540
PREP Apricot with cream taste	442	535
O/M FRT PL Vanilla fatfree 20	426	516
FRT O/M PL Strawberry LF 6 pk	385	466
FRT OM ALDI Peach fatfree 0 Added Sugar	365	441
FRT O/M PL Cherry LF 6 pk	358	433
FRT O/M PL Raspberry LF 6 pk	340	412
PREP Strawberry 024370	319	386

*21% increase from 2022 value

4.1.3 Receipt of Raw Materials

Raw milk, cream and skimmed concentrate are received at the milk reception area. These raw materials are received onsite pre-chilled, and the temperature is tested before they are accepted. If additional chilling is required chilling can occur in the milk reception area via a plate heat exchanger using chilled water. Tankers are connected to pipework via a flexible hose and the liquid pumped to storage tanks via a computerised system. Raw milk is also then split into skimmed milk and cream.

Upon delivery of additional raw materials (i.e., sweeteners, cereal, whey protein, sugar, milk powders) trailer checks are completed so inspect condition of materials supplied and the condition of the trailer. These raw materials are then booked into the computerised system and transferred from wooden pallets to plastic pallets before being sent to the high bay storage warehouse. Materials are then requested by the process as required and issued accordingly. Fruit is delivered in stainless steel tanks (vessels) from our suppliers, inbound checks are then completed to check for any damage or tampering with the valves, then the vessels are booked into the computerised system and sent to the high bay storage warehouse.

Raw materials are stored indoors. The manufacturing lines and high bay warehouse contain impermeable hardstanding with drainage that leads to the ETP.

4.1.4 Storage Tanks – Food Grade Material

Milk and raw materials are stored in above ground stainless steel tanks at the site. Table 4-3 presents the inventory of raw material and finished product tanks present at the site currently.

Muller have installed two additional tanks for the storage of Skim Concentrate 75,000ltr and 90,000ltr to the site as part of the proposal to increase yogurt production at the site.

Table 4-3 Raw Material Storage (Food)

Tank Reference	Internal / External	Installation Date	Capacity of tank (litres)	Tank Contents
101TK01	Internal	2009	100000	Raw Milk
102TK01	Internal	2009	100000	Raw Milk
201TK01	Internal	2009	200000	Skim Milk
202TK01	Internal	2009	200000	Skim Milk
301TK01	Internal	2009	30000	Cream
302TK01	Internal	2009	30000	Cream
303TK01	Internal	2022	90000	Skim Concentrate
304TK01	Internal	2022	75000	Skim Concentrate
401TK01	Internal	2009	10000	Cream
402TK01	Internal	2009	10000	Cream
501TK01	Internal	2009	30000	Mixed Product
502TK01	Internal	2009	30000	Mixed Product
503TK01	Internal	2009	60000	Mixed Product
2101TK01	Internal	2009	60000	Culture Dosed Product
2102TK01	Internal	2009	60000	Culture Dosed Product
2103TK01	Internal	2009	30000	Culture Dosed Product
2104TK01	Internal	2009	30000	Culture Dosed Product
2105TK01	Internal	2009	30000	Culture Dosed Product
2106TK01	Internal	2009	30000	Culture Dosed Product
2107TK01	Internal	2009	30000	Culture Dosed Product
2108TK01	Internal	2009	30000	Culture Dosed Product
3101TK01	Internal	2009	30000	Finished Yogurt
3102TK01	Internal	2009	30000	Finished Yogurt
3102TK01	Internal	2009	30000	Finished Yogurt
3103TK01	Internal	2009	30000	Finished Yogurt
3104TK01	Internal	2009	30000	Finished Yogurt
3105TK01	Internal	2009	30000	Finished Yogurt
3106TK01	Internal	2009	30000	Finished Yogurt
3301TK01	Internal	2012	60000	Finished Yogurt
3302TK01	Internal	2012	60000	Finished Yogurt
3303TK01	Internal	2019	40000	Finished Yogurt

Tank Reference	Internal / External	Installation Date	Capacity of tank (litres)	Tank Contents
3304TK01	Internal	2019	40000	Finished Yogurt
3305TK01	Internal	2019	40000	Finished Yogurt
3306TK01	Internal	2019	40000	Finished Yogurt
3307TK01	Internal	2019	40000	Finished Yogurt
3308TK01	Internal	2019	40000	Finished Yogurt
9161TK01	External	2009	30000	Waste Yogurt & Fruit Mix

4.2 Process

Depending on the recipe, the yogurt base is mixed with skimmed milk, cream and additives such as sweeteners / whey protein. The mixture is then pasteurised in the ultra-heat treatment (UHT) plant which consists of heat exchangers. Five heat exchangers are present to heat and cool the milk as it passes through the pasteurisers. The heat exchangers work via steam heating of water controlled by a fully automated system. Within the UHT plant the yogurt mix is heated up to 95°C, then cooled to 40°C and stored in incubated silos for six to eight hours.

Heat treated yogurt mixes are then transferred to the filling lines where between 1.4 million and 1.6 million pots of yogurt are produced each week. Processed fruit is added to the yogurt mix. Pots are then filled, lids added and placed in trays.

Trays of yogurt are placed on pallets which are placed in cooling pods in the storage warehouse. There are approximately 300 cooling pods (glycol cooling). The cooling pods automatically turn on when finished product is placed inside. An ammonia-based cooling system is also used to cool the storage warehouse. Pallets of product are subsequently loaded onto refrigerated trailers for distribution.

An R&D pilot plant, a smaller version of the process plant is also present onsite for research and development into new products. This plant utilises 50 litres of skimmed milk and 20 litres of cream when operational.

4.3 Laboratory

The laboratory is used to test the milk including the amount of fats and total solids. Test are completed on the following stages of the process:

- raw milk;
- skimmed milk and cream;
- yogurt mix;
- incubation;
- storage in tanks; and
- shelf-life testing.

4.4 Distribution of Products

The finished products are distributed from the on-site storage despatch area to customers by road transport. Dispatch and distribution operations are outsourced to an appointed third-party organisation. No road transport refuelling occurs on site.

4.5 Proposed New Equipment

To meet the proposed increase in throughput at the site, Muller have installed two new skimmed concentrate tanks (75,000ltr and 90,000ltr). There are 8 No. existing filling lines currently at the site. No additional filling lines are proposed as part of the increase in throughput.

4.6 Clean In Place (CIP)

There are two CIP operations at the site. The first 'raw CIP' cleans from raw material intake up until the incubation stage of pasteurisation. The 'finished CIP' cleans from the incubation stage onwards. The CIP operations are automated and include the following inputs:

- recovered water from previous CIP operations for pre-rinsing;
- mains water;
- caustic diluted to 1%;
- acid diluted to 1%; and
- disinfectant.

CIP occurs after each production run of the filling lines which is typically between 72 and 84 hours. Double skinned tanks comprising bulk caustic and acid tanks (refer Section 4.7) are located in a bunded external area to the southwest of the filling lines building.

4.6.1 Process Cleaning

Cleaning includes cleaning of production/operational areas, tanks and associated pumps and pipework, drains and waste bins. Cleaning is a manual operation and involves scrapping and bagging of solid materials and the use of trigger hoses for final cleaning. Cleaning processes are operated under standard procedures and operatives are trained in cleaning processes. Cleaning is undertaken on impermeable hardstanding with drainage that leads to the ETP.

4.6.2 Drainage Cleaning

Process drain gullies in the process building are cleaned on a weekly basis. The drains are flushed with hot water. The drains are then foam cleaned with a Powerfoam solution. The drains run to the ETP where effluent is treated prior to discharge to sewer.

The surface water drainage systems are also subject to annual cleaning whereby an appointed specialist company cleans and jets the drains. CCTV inspections of the drains are undertaken annually.

4.6.3 Cleaning Chemicals

Chemicals are stored in locked, bunded containers in the central yard and to the east of the ETP (refer to Drawing 002). Various cleaning and hygiene chemicals are used on site; key cleaning chemicals used at the site are detailed in Table 4-4.

Table 4-4 Cleaning Chemicals

Description	Environmental Hazard Properties	Storage Container capacity	Storage Location	Estimated Annual Usage	Estimated 21% Increase in Annual Usage
Hydrogen Peroxide 35% Interox AG Spray 35S, 22kg	Hazardous to the aquatic environment — Chronic Hazard, Category 3	96 drums (4 pallets of 24 drums)	Bunded chemical container	1008Kg	1209.6kg
Mida FLOW 120 WZ (Klenz 3)	Not classified in terms of its acute or chronic toxicity to the aquatic environment. The MSDS states that it is not dangerous for the marine environment.	4 x 25kg	Bunded chemical container	550kg	660kg
Mida FLOW 120 WZ (Klenz 3/Klenz 4) Bulk	Not classified in terms of its acute or chronic toxicity to the aquatic environment. The MSDS states that it is not dangerous for the marine environment but release to the environment should be avoided.	30000kg	Bunded caustic silo	126000lt	151200lt
Mida FOAM 176 WD (Powerfoam/50/LC)	Not classified in terms of its acute or chronic toxicity to the aquatic environment. The MSDS states that it is not dangerous for the marine environment but release to the environment should be avoided.	2 x 1000kg IBC	Bunded chemical container	4000lt	4800lt
Mida Chriox F2	Hazardous to the aquatic environment, long-term (chronic): Toxic to aquatic life with long lasting effects. No bioaccumulation potential.	2 x 1000kg IBC	Bunded chemical container	9950kg	11940kg

Description	Environmental Hazard Properties	Storage Container capacity	Storage Location	Estimated Annual Usage	Estimated 21% Increase in Annual Usage
Mida San 311 KZ 1500 Wipes x 2	Not classified in terms of its acute or chronic toxicity to the aquatic environment. The MSDS states that it is not dangerous for the marine environment but release to the environment should be avoided.	50 tubs (25 boxes on pallet)	Bunded chemical container	150,000 wipes	180000 wipes
Mida San 311 KZ	Not classified in terms of its acute or chronic toxicity to the aquatic environment. The MSDS states that it is not dangerous for the marine environment but release to the environment should be avoided.	200kg 10 x 20kg drums	Bunded chemical container	430kg	516kg
Nitric Acid 10%	Not classified in terms of its acute or chronic toxicity to the aquatic environment. The MSDS states that it is not dangerous for the marine environment but release to the environment should be avoided.	4 x 25kg	Bunded chemical container	450kg	540kg
Nitric Acid 60% Bulk KG Telford	Not classified in terms of its acute or chronic toxicity to the aquatic environment. The MSDS states that it is not dangerous for the marine environment but release to the environment should be avoided.	30000kg	Bunded acid silo	27900kg	33,759kg
Oxysan 5 (Mida CHRIOX 5)	Very toxic to aquatic life with long lasting effects. No bioaccumulation potential.	4 x 1000kg IBC	Bunded chemical container	22000kg	26400kg

4.6.4 PIG Cleaning for Pipelines

Pipelines for the filling machines are cleaned out via 'PIG cleaning' whereby the lines are flushed out with water and the effluent is stored in the 'PIG tank' prior to being transferred offsite by tanker to a suitably licensed treatment facility.

4.6.5 Raw Material Tanks

The bulk raw material tanks are cleaned on a regular basis and inspected by an appointed third-party specialist inspection company.

4.7 Chemical and Water Storage Tanks

Table 4-5 outlines the bulk storage of onsite chemicals in above ground external storage tanks and also water, recovered water and dosed water at the site.

Smaller volumes of chemicals are stored in locked, bunded containers in the central yard and adjacent to the ETP (refer to Drawing 002). Assessment of the potential impact to effluent discharged to sewer that may contain these chemicals is presented within 410.V62639.00001_SWRA.

Table 4-5
Onsite Chemical and Water Storage

Tank Reference	Installation Date	Capacity of tank (litres)	Tank Contents	Tank Construction Detail
9103TK01	2009	30000	Recovered Water	Stainless Steel
9101TK01	2009	30000	Chemical - Caustic	Stainless Steel
9102TK01	2009	30000	Chemical - Acid	Stainless Steel
9104TK01	2009	15000	Water	Stainless Steel
9105TK01	2009	15000	Water Dosed with PAA	Stainless Steel
9301TK01	2019	15000	Water	Stainless Steel
9302TK01	2019	15000	Chemical - Caustic	Stainless Steel
9303TK01	2019	15000	Chemical - Acid	Stainless Steel
9304TK01	2019	15000	Water	Stainless Steel
9191TK01	2019	30000	Chemical - Caustic	Stainless Steel
9192TK01	2019	30000	Chemical - Acid	Stainless Steel
7251TK01	2009	200000	Water	Stainless Steel
Mains Water	2009	200000	Recirculated Water dosed with Biocide	Stainless Steel

Tank Reference	Installation Date	Capacity of tank (litres)	Tank Contents	Tank Construction Detail
Chilled water	2009	30000	Recirculated Water dosed with Biocide	Stainless Steel
Sprinkler Tank 1	2018	500000	Water	Galvanised Steel
Sprinkler Tank 2	2018	500000	Water	Galvanised Steel

4.8 Tank Management

Table 4-6 outlines Mullers approach to managing onsite tanks.

Table 4-6 Tank Management

Management	Comment
Overfill / spill / secondary containment protection system	Spill would overflow into site effluent system and then the underground sump and automatic penstock system outlined in Section 5.4.
Tank leak detection system	Visual and 6 monthly integrity testing on the tanks.
Tank Overflow Protection	High- and low-level probes
How often are the pumps etc serviced?	18 months
Date of last integrity test	May-22
Tank construction details	Stainless Steel
Pipework construction details	Stainless Steel
Pipe leak detection system	Visual
Fill / Empty Arrangements	Fixed inlet outlet pipework

Standard operating procedures are in place for bulk tanker deliveries which details the requirements for off-loading and dealing with spillages from bulk tankers. The site has a dedicated storage area for raw milk, skimmed milk and cream, located within the tank farm adjacent to the Production building.

Other food grade raw materials are delivered to the site in smaller qualities, typically in bags, boxes, sacks or tubs and some liquid materials in IBCs, which are stored in dedicated raw material storage areas within the high bay warehouse.

4.9 Waste Production & Storage

Waste is stored on site in suitable waste receptacles. Wastes produced in the manufacturing areas are collected in bins positioned in various locations within these buildings; these bins are then emptied on a regular basis into

the relevant labelled waste skips located in dedicated external waste storage area. Waste yogurt product is collected and transferred to a trailer with a battery-operated cover. All wastes are removed from site for off-site management by an appointed suitably permitted and licensed waste management company.

Product waste, card waste and plastic waste are collected once a week. Other waste streams are collected on demand as required, (i.e., when the receptacle is full). Waste accumulation within production areas is controlled and limited with external waste collection containers and compactors being maintained to prevent pest activity.

Waste is removed from site by licensed and approved contractors. Waste transfer notes for each load are obtained and filed on site and copies held in the waste contractor's portal. Waste streams are clearly labelled and segregated, as detailed on the standard operating procedures (SOP) for waste removal routes.

Records of destruction or disposal are provided where substandard product is transferred to a third party for disposal.

The key wastes and the quantities generated at the site are summarised in Table 4-7. All waste generated at the site is sent either for recycling, anaerobic digestion, animal feed or use to generate energy; no waste is disposed of to landfill.

It is understood that sludge waste and stock destruction waste were previously transferred offsite to be utilised in land spreading activities. However, Muller ~~intend to~~ send this waste for anaerobic digestion from 2023.

Table 4-7 Generated Waste Streams

Waste Type	Quantity Generated (tonnes) (2021)	Proposed 21% Quantity Generated from increased throughput (tonnes)	Recycling Route
Rejected Fruit Vessel and Ingredients	14.29 Fruit – Returned to Suppliers 0.090 – rejected ingredients 14.38 Total	17.4	Returned to supplier.
Packaging Waste, wooden pallets, metal	720.61	871.9	Recycling
Glass from laboratory	1.31	1.6	Recovered Waste - Hazardous
Waste product	2053.38	2484.6	Animal Feed
Sludge waste	1,648,960	1,995,242	Anaerobic digestion
Stock destruction	94.479 Fruit Sent to PIG waste and subsequently an anaerobic digestion Plant via Warrens waste contractor.	114.3	Packaging is recycled and food waste sent for anaerobic digestion

Waste Type	Quantity Generated (tonnes) (2021)	Proposed 21% Quantity Generated from increased throughput (tonnes)	Recycling Route
Total tonnage	1,651,844	1,998,731	

Solid waste is stored in the waste storage area in the storage yard. Waste containers are covered, including the waste product trailer which has a battery-operated cover.

4.10 Cooling

The site has cold storage in the storage warehouse for the storage of manufactured yogurt products. The cold storage area is chilled by an ammonia plant. The ammonia plant comprises:

- Four compressors which are located in a sealed room. This room is fitted with ammonia leak detection which is remotely monitored by the ammonia plant service provider. In the event of an ammonia leak the plant would automatically be shut down and the forced vent fans in that room would be operated to vent the room.
- Muller intend to add a fifth compressor to the production process, to assist with the proposed increase in throughput.
- A 3000-litre ammonia expansion tank, which is located external to the ammonia plant room is fitted with mechanical overpressure safety valves.
- Daily checks are undertaken on equipment for leaks and maintenance is undertaken by a suitably qualified subcontractor.

In addition there are approximately 210 cooling cells (glycol refrigeration system) used to cool individual pallets. The cooling pods only operate when occupied and are managed by a computerised system and the warehouse control room operator.

Five heat exchangers are present on the pasteurisers at the site and a sixth heat exchanger will be introduced as part of the works supporting the increase in throughput at the site.

The storage of dairy raw material is located in the external tank farm. The milk manufacturing area is cooled by air handling systems.

4.11 Cooling Tower

There is one mechanical draught cooling tower at the site; this serves the ammonia plant condenser and is located adjacent to the ammonia plant room. The cooling tower is registered with Telford and Wrekin Borough Council [1](cooling tower reference number CT6).

The cooling tower is dosed with the chemicals as detailed in Table 4-8. Assessment of the potential impact to effluent discharged to sewer that may contain these chemicals is presented within 410.V62639.00001_SWRA.

1 https://www.thttps://www.telford.gov.uk/downloads/file/229/public_register_of_cooling_towerselford.gov.uk/downloads/file/229/public_register_of_cooling_towers

Table 4-8 Cooling Tower Dosing Chemicals

Name	Use	Environmental Hazard Properties	Storage Container capacity (kg)	Storage	Volume used each year (kg)	Proposed 21% Estimated Annual Usage
SBGC2SC (Granulated Bromine)	BIOCIDE	Liquid biocide often described as a stabilised blend of Hypochlorite and bromide salts. Hazardous to the environment.	2.5	Bunded Chemical Container	225	272.25
C2-T	Solid Inhibitor	The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.	4	Bunded Chemical Container	112	135.5
Solcide	Solid Non-Oxidising Biocide	Hazardous to the environment.	4	Bunded Chemical Container	64	77.4

4.12 Effluent Treatment Plant

Process effluent is mainly generated as a result of the cleaning of the production lines which flows into the sealed drainage system to the below ground 20,000lt effluent sump.

Two pumps are used to pump the effluent from the sump into a 200,000lt balance tank. From the balance tank the effluent is pumped into a dissolved air floatation (DAF) facility where effluent undergoes pH adjustment (auto dosing system) and coagulation of fats with a flocculant. The fats are skimmed off and stored in a sludge tank prior to being transferred off site to a suitably licenced facility for treatment in an anaerobic digestor. The remaining effluent is discharged to sewer under a trade effluent discharge consent issued by Severn Trent (refer Appendix B).

Table 4-9 outlines the effluent tanks present at the site.

Table 4-9 Effluent Tanks

Tank Reference	Above or Below Ground Tank	Internal / External	Installation Date	Capacity of tank (litres)	Tank Contents	Tank Construction Detail
Site Effluent Sump	Below	External	2009	10000	Effluent - Milk/Chemical/Water	Plastic coated
Effluent Balance	Above	External	2009	200000	Effluent - Milk/Chemical/Water	Stainless Steel
DAF Sump	Below	External Bunded	2018	30000	Effluent - Milk/Chemical/Water	Plastic coated
DAF Sludge tank	Above	External Bunded	2018	28000	Effluent - Milk/Chemical/Water	Stainless Steel

Table 4-10 below outlines the effluent treatment tanks at the site and also what containment measures are in place to manage potential spills.

Table 4-10 Containment Measures for Effluent Treatment Tanks

Effluent Treatment Tank	Containment Measures
Site effluent sump	Penstock valves on the drainage system
Effluent balance tank	In case of a spill overflows into site effluent system
DAF sump	Penstock valves on the drainage to prevent discharge
DAF sludge tank	In the case of a spill overflows into DAF effluent system

The tanks described in Table 4-10 are contained within a concrete bund.

Please refer to the Muller Telford Containment Assessment Report (reference 410.V62639.00001_CR) in Appendix C for further detail on site containment.

The ETP is subject to continuous monitoring for:

- DAF plant: pH, chemical oxygen demand and total suspended solids;
- effluent: chemical oxygen demand; and
- Pig tank: pH, total suspended solids.

Severn Trent also attend site to sample effluent for the following determinants to verify compliance with the trade effluent discharge consent:

- temperature;
- pH;
- total dissolved solids;
- phosphorous;
- chemical oxygen demand;

- ammoniacal nitrogen;
- sulphides; and
- soluble sulphates.

4.12.1 Increase in Throughput

Muller intends to increase production at the Telford site by 21%. Therefore, generation of effluent is also expected to increase by 21%. Table 4-11 presents the proposed increase in effluent and sludge generation.

Table 4-11 Effluent Volumes

Effluent Stream	units	2021 Data	Estimated 21% increase
Influent volume from dairy	m^3	136,339	164,970
Effluent volume to sewer	m^3	127,651	154,458
Effluent treatment plant sludge	tonnes	1,648,960	1,995,242

The chemicals used for treatment of the effluent are summarised in Table 4.12. Assessment of the potential impact of effluent discharged to sewer that may contain these chemicals is presented within 410.V62639.00001_SWRA.

Table 4-12 Effluent Treatment Chemicals

Description	Environmental Hazard Properties	Storage Container capacity	Storage Location	Current Estimated Annual Usage	Proposed Estimated Annual Usage
Alba 18% Coagulant	Not considered hazardous to the environment. However, the material safety data sheet recommends that the substance is not released to the environment.	4 x 1000kg IBC	IBC stored on a bunded stillage	6,000kg	7200kg
Bacticlense 2x5L – NHFT Sanitiser.	Not regarded as dangerous for the environment. However, large or frequent spills may have hazardous effects on the environment.	5 x 5L Tub	IBC stored on a bunded stillage	70 Litres	84 Litres
Polyaluminium Chloride 18% Coagulant.	Not considered hazardous to the environment. However, the material safety data sheet recommends that the substance is not released to the environment.	4 x 1000kg IBC	IBC stored on a bunded stillage	14,000kg	16800kg

4.13 Drainage

Drainage at the site is provided for:

- uncontaminated rainwater;
- process effluent; and
- foul drainage.

Discharge points and a drainage plan are presented in Appendix D.

Uncontaminated rainwater is collected in the western portion of site, where it flows through an interceptor and is discharged through discharge point 'W2' to a local surface water, Crow Brook. There is an underground 420,000 litre sump below the carpark to the east of W2 that allows for additional storage of water if required, prior to discharge.

In the eastern portion of the site, rainwater flows through an interceptor and then collected in a 'detention basin' prior to discharge through discharge point 'W3' to a Severn Trent local sewer.

Process effluent is collected from process areas and drains to a sump before being pumped to a balance tank and treated through the ETP. Effluent is discharged to sewer under a trade effluent discharge consent issued by Severn Trent at discharge point W1.

Manual penstocks are currently present on discharge points W1, W2 and W3 to prevent water leaving site in case of an emergency. The penstock on discharge point W2 is planned to be upgraded to become automatic (refer Section 4.15 below).

A manual penstock is also present down gradient of the waste storage area to prevent water leaving this area if necessary. The waste storage area is located on an impermeable surface and drains in the area flow to the ETP.

The interceptors are subject to regular visual inspection, cleaning and maintenance, and the interceptor monitoring equipment is serviced by an appointed contractor twice a year.

4.14 Containment

SLR have undertaken an assessment of containment at the site (refer SLR Muller Telford Containment Assessment Report 410.V62639.00001_CR in Appendix C). The following containment solutions are due to be implemented on site in the next 12-18 months:

- Key issue 7: Undertake design and construction works to mobilise 340m^3 of tertiary storage capacity in the attenuation tank below the carpark on the northwest corner of the site.
- Key issue 8: Consider closing of the Penstock valve associated with the slot drain running diagonally through the stocking yard and inclusion of a sleeping policeman to close off the roadway at kerb height to the east of the turn into the stocking yard so that any spills associated with the storage of the fruit concentrate would be captured by the tertiary containment system described above in Key Issue 7 and not drain to the surface water systems to the east of the site.

As part of the response to key issues 7 and 8, Muller are currently in the process of designing and implementing the following:

- upgraded surface water drain covers the spill catchment area identified in the containment report;
- effluent manhole cover to be replaced with open grid cover to partially treat potential spills;
- new automated 600mm Dia. Penstock in main surface water outlet discharge W2 (triggered by turbidity, pH or manual activation);
- automation of the current slot drain penstock (Closed) with kerb level activation (to open) in spill catchment area identified in the containment report;

- spill catchment area (as defined in the containment report) pump set with bowser connections to feed to tanker or ETP;
- sleeping policeman by middle yard to direct spills towards the ETP.

The findings of the containment review and additional key issues are being considered by Muller.

4.15 Maintenance

There is a dedicated department responsible for ongoing maintenance at the site. The site has a preventative maintenance (PPM) system in place. PPM involves daily checks including visual inspections, analysis of water quality, plant gauges, etc. There is a daily checklist detailing the checks that are required and records of the results of these checks. For larger plant there is PPM planner in place, additionally Muller's Insurance Company details plant maintenance and testing requirements that have to be undertaken to satisfy the insurance policy.

Muller also have a Computer Maintenance Management System (CMMS) via which PPM is managed.

Engineering and maintenance activities are undertaken either directly on plant or in the Engineering Store and Workshop. Some maintenance activities are undertaken by third party appointed specialist contractors, for example the maintenance of chillers and refrigeration systems, maintenance of the boiler, cooling tower and CHP.

Maintenance chemicals, such as oils and greases, cleaning solvents, etc. are all stored in small quantities in individual containers in dedicated storage areas/cabinets within the Engineering store and throughout the site.

4.16 Combustion Plant

There is a CHP plant and also a natural gas fired steam boiler. There are also two diesel pumps for the fire suppression sprinkler system. An overview of this equipment is presented below. Further detail is provided in the air emissions risk assessment submitted as part of this application (reference 410.V62639.00001_AERA).

4.16.1 Combined Heat and Power

The site's existing permit EPR/SP3200SY allows the operator to operate the CHP plant. The CHP is classified as a Tranche B Specified Generator which is also a new medium combustion plant (MCP) between 1 and <50MWth. The plant is a new MCP as it was put into operation on or after 20th December 2018.

The CHP is fuelled by natural gas. It is considered to be a generator as it provides electricity to the associated dairy. The CHP also produces steam for use on site. The CHP plant operates for 8,060 hours per annum. The CHP plant has a rated thermal input of 3.55MWth and emits combustion gases from a 23m high stack.

4.16.2 Natural Gas Fired Steam Boiler

The natural gas fired steam boiler produces steam for process applications and hot water for cleaning across the site. The rated thermal input of the boiler is 3.9MWth. The boiler is not currently listed under environmental permit reference EPR/SP3200SY.
The boiler is operational for 8,400 hours per year and began operation in 2009. The boiler is maintained under the PPM at the site and regular maintenance is undertaken on the boiler by a third-party contractor.

Table 4-13 details chemicals used to maintain the gas boiler. Assessment of the potential impact of effluent discharged to sewer that may contain these chemicals is presented within 410.V62639.00001_SWRA.

Table 4-13 Chemicals Used to Treat the Gas Boiler

Name	Use	Environmental Hazard Properties	Storage Container capacity (litres)	Estimated Annual Usage	Estimated 21% Increase in Annual Usage
ADI S10	A catalysed oxygen scavenger for the treatment of steam raising plant and hot water systems.	Environmental precautions: No persistent, bioaccumulation or toxicity (PBT) parameters presented with regards impact to the environment. However, it is recommended that the substance is not discharged into drains or rivers. Contain the spillage using bunding.	25	600lt	720lt
ADI S20	A polymer / polyphosphate sludge conditioner for the treatment of steam raising plant where the steam may come into contact with food.		25	250lt	300lt
Ultravox	A disinfectant		25	1500lt	1800lt

4.16.3 Diesel Pumps

The site has a fire suppression sprinkler system which comprises two 500,000 litre above ground firewater storage tanks and associated pumping system.

Two diesel pumps (<1 MWth each[2]) are used within the sprinkler system in case of a fire. The diesel pumps comprise a 'direct drive' system and do not operate with the assistance of a generator. Diesel is supplied to the pumps from a double skinned above ground diesel tank (c. 2,500 litre capacity). The pumps are subject to regular testing, which involves the start-up of the pumps for a short period of time.

The diesel pumps were installed as part of the PL500 expansion in 2018 (prior to 20 December 2018). The diesel pumps are run for 30 minutes a week as part of a testing regime. This equates to 26 hours per year.

4.16.4 Combustion Plant Summary

The combustion plant present at the site are summarised in Table 4-14. Refer to Appendix D for the location of each unit.

[2] Estimated by SLR from the thermal output (0.161MWth) presented in the Clarke JU6H-LP54 Installation & Operational Datasheet (dated 17 December 2019). Estimated to be <1MWth as losses from the unit are unlikely to be 0.839MWth.

Table 4-14 Combustion Plant Rated Thermal Input

Combustion Equipment	Purpose	Location	Emissions Stack Details	Generates Electricity?	Rated Thermal Input (MWth)	Installed after 20th December 2018?
CHP	Generates electricity for the associate dairy, produces steam for the process	South of the filling lines production area.	Dedicated 23m high stack.	Yes	3.55	Yes
Gas Boiler	Generates steam for the process and hot water	South of the filling lines production area.	Dedicated 13 m high stack	No	3.99	No, installed 2009
Fire water pump 1	Powers the emergency sprinkler system	By 500,000Lt sprinkler tanks to the south of the warehouse	N/A	Yes	<1MWth	No
Firewater pump 2	Powers the emergency sprinkler system	By 500,000Lt sprinkler tanks to the south of the warehouse	N/A	Yes	<1MWth	No

4.17 Transformers

There are four electricity transformers at the site, the oil in these transformers has been confirmed not to contain polychlorinated biphenyl (PCBs) via laboratory sampling. These transformers are maintained and serviced by an appointed specialist contractor.

5.0 Best Available Techniques Assessment

An assessment of operating procedures and techniques for the proposed modifications to the site has been undertaken with respect to the following documents:

- Best Available Techniques: environmental permits, February 2016;
- Reference Document on Best Available Techniques (BREF) in the Food, Drink and Milk Industries, November 2019;
- Reference Document on Best Available Techniques for Energy Efficiency, February 2009.

The BAT assessment is presented in Appendix E.

6.0 Emissions

6.1 Point Source Emissions to Atmosphere

There are two-point source emissions to air, which relate to emissions from combustion plant at the site:

- CHP plant (emission point A1); and
- natural gas steam boiler (emission point A2).

Refer to Appendix D for the location of point source emissions to air. Emission point A2 is not currently not covered under an EP for the site.

6.1.1 Medium Combustion Plant Directive

The Medium Combustion Plant Directive (MCPD[3]) was incorporated into UK law in early 2018 via the Environmental Permitting (England and Wales) (Amendment) Regulations (EPR) 2018.

The MCPD, as set out in Schedule 25A of the EPR 2018 amendment, defines the scope, definitions, exclusions and how the regulations apply to types of medium combustion plant (MCP), MCP being combustion plant with a rated thermal input of 1 - 50MWth regardless of the type of fuel used.

6.1.2 CHP

The CHP has been assessed as being a Tranche B Specified Generator which is also a new MCP between 1MWth and <50MWth and is currently permitted under EP reference EPR/SP3200SY.

The principal emissions to air from the CHP are nitrogen oxides (NOx) and carbon monoxide (CO) from the combustion of natural gas.

6.1.3 Natural Gas Fired Steam Boiler

The principal emissions to air from the natural gas fired steam boiler are NOx and CO from the combustion of natural gas.

[3] EU Directive 2015/2193 of the European Parliament and of the Council of 25 November 2015 on the limitation of emissions of certain pollutants into the air from medium combustion plants. EUR-Lex - 32015L2193 - EN - EUR-Lex (europa.eu)

Due to the thermal rated input of the boiler, being 3.9MWth, it falls under the remit of the MCPD. As the boiler was installed in 2009, it is considered to be an 'existing' MCP and therefore must be permitted from 01 January 2029.

Combustion emissions from the natural gas-fired steam raising boiler will be required to meet the MCPD emission limit value (ELV) as stated in as stated in Table 1, Part 1 of Annex II of the MCPD for:

- Nitrogen oxides (NOx) = **250mg/m^3**

This ELV will apply from 1st January 2030.

As part of this EP variation application, Muller would like to incorporate the natural gas fired steam boiler (emission point A2) into the EP as a MCP. This will ensure that the steam boiler is incorporated in the EP prior to 01 January 2029.

6.1.4 Diesel Pumps

Due to the thermal rated input of the diesel pumps, being <1MWth, they do not fall under the remit of the MCPD. As the pumps are 'direct drive' and do not comprise a generator they are not considered to be specified generators.

6.1.5 Summary of Air Emissions Risk Assessment

An air emissions risk assessment (AERA) has been completed for all the combustion units onsite. This is Section 5 of this EP application (410.V62639.00001_AERA). The AERA assessment has quantified and assessed the potential air quality impacts associated with combustion emissions from the proposed CHP and boiler using EA approved techniques against published standards for the protection of human health and designated ecological sites. The AERA concluded that:

- the nitrogen dioxide process contribution does not lead to any exceedances of the standards (long-term or short-term) for the protection of human health at any location outside of the site; and
- the impact on designated ecological receptors are considered to cause 'no likely significant effect' to the Ramsar and 'no likely damage' to local Sites of Scientific Interest (SSSI) and Local Wildlife Sites (LWS).

6.2 Point Source Emissions to Sewer

The site is connected to the Severn Trent Water Limited sewer system at discharge point W1, the location of which is presented on the drawing provided in Appendix D. Process effluent generated by the manufacturing process is subject to onsite treatment in the ETP prior to discharge to sewer. Wastewater is mainly generated as a result of onsite cleaning activities and potential spills which are is discharged to the on-site effluent drainage system.

Discharge to sewer is under a trade effluent discharge consent (Severn Trent Water Limited discharge consent number 008891V, dated 01 February 2018) to sewer via discharge point W1.

6.2.1 Effluent Monitoring

The effluent monitoring regime comprises:

- Daily effluent flow measurement from the installed continuous flow meter from the ETP (for COD, pH and suspended solids).
- Regular visual and operational checks of the effluent system by Muller, including checking the effluent pH.

- Severn Trent Water Limited samples the treated effluent regularly, the samples being analysed for the analytes listed within the effluent discharge consent.

The site also routinely monitors pH and suspended solids from the 'PIG tank'. The site is consented for the discharge of up to 1,296 cubic metres in any continuous period of 24 hours, the discharge rate of flow is not to exceed 15 litres per second.

The volume of treated wastewater discharged to sewer via emission point W1 will not exceed the consented maximum discharge limit of 1296m^3/24-hour period with the increase in throughput and associated increase in discharge to sewer. The effluent discharge consent (refer Appendix A) was updated on 01 February 2018, just prior to the site's expansion in 2019 with a forward looking approach to ensure capacity for future increases in throughput. Therefore, changes to the consented discharge limits for the discharge of treated wastewater to sewer are not considered necessary.

Table 6-1 Discharge Limits for Treated Effluent

Parameter	Limit (1st January – 30th November)	Reference Period
Discharge Volume (maximum)	1296m^3	In any 24-hour period
Discharge Rate (maximum)	15litres	Per second
Temperature	43 degrees centigrade	maximum
pH	6-11	n/a
Suspended solids	700mg/l	n/a
COD from acidified dichromate (expressed as O)	4,000mg/l	n/a
Maximum COD load	3,630kg	Maximum in any 24-hour period
Ammoniacal Nitrogen expressed as N	50mg/l	n/a
Total sulphides	1mg/L	n/a
Soluble sulphates	1000mg/L	n/a
Phosphorous	25mg/l	n/a

A summary of the latest effluent monitoring results undertaken by Severn Trent are provided in Appendix G. Effluent discharged to sewer was within the consented discharge limits for the most recent set of results.

6.2.2 Surface Water Risk Assessment

The treated process effluent may contain hazardous pollutants which could be discharged to the Telford Sewage Treatment Works (STW) where it undergoes further treatment prior to discharge into the River Tern.

Therefore, a specific substances assessment to assess potential risks to surface waters in accordance with EA guidance (last updated 3 April 2018) has been undertaken for the purpose of this Environmental Permit application (refer to 410.V62639.00001_SWRA).

6.3 Point Source Emissions to Surface Water

Surface water runoff from roof areas and external roadways and a number of yard areas within the site drain to the on-site surface water drainage system. Surface water is directed to two discharge points W2 and W3. The locations of these discharge points are presented on the drawing within Appendix D, and comprise:

- W2 outfalls to the northwest corner of the site. The drain runs to Crow Brook. W2 drains via an interceptor prior to discharge; and
- W3 outfalls to the northeast of site into a sewer that is managed by Severn Trent Water.

The site activities will not result in direct discharges of potentially contaminating materials into surface water or groundwater from the site.

6.4 Point Source Emissions to Land

The activities undertaken on site will not result in emissions to land.

6.5 Fugitive Emissions

Significant fugitive emissions as a result of production activities undertaken at the site are considered unlikely:

- The manufacture of yogurts is undertaken within production buildings. The manufacturing processes are undertaken in accordance with relevant food standards regulations.
- Raw materials and chemicals are stored in dedicated storage containers/tanks either externally or internally within the proposed EP boundary; bulk storage tanks are provided with level alarms and/or spill/leak protection measures.
- Waste materials are stored in dedicated waste receptacles located within defined hard surfaced storage areas located on the site, which drain to the ETP.
- Drains – the surface water drainage system is subject to annual cleaning and foul water drains in production areas are subject to a regular cleaning regime. The surface water and foul water drainage systems are subject to annual camera surveys.
- Interceptors are subject to bi-annual inspection, maintenance and cleaning.

A summary of the storage arrangements for raw materials, chemicals and for wastes at the site are provided in Section 4.0.

The site refrigeration systems comprise ammonia and glycol. Refrigeration systems are subject to regular scheduled maintenance and leak testing; this is undertaken by an approved specialist contractor.

The site maintains spill procedures and operating personnel are provided with training in the implementation of the spill procedures. Additionally, regular inspections (daily and weekly visual inspections) of the site are undertaken in accordance with the site's Environmental Management System.

The site has not received nuisance complaints from nearby residents and businesses in recent times.

6.6 Odour

The yogurt manufacturing processes do not result in the generation of significant odours. The site has not received nuisance odour complaints from nearby residents and businesses in recent times. Discussion with the

Environment Agency (Refer Section 1.2) confirmed that quantitative assessment of odour was not required. Therefore, this permit application does not propose any monitoring of odour emissions. A qualitative assessment of potential odorous emissions is provided in the Environmental Risk Assessment (refer 410.V62639.00001_ERA) submitted as part of this permit variation application.

6.7 Noise and Vibration

Production activities are undertaken within the manufacturing building. Equipment located externally at the site, which could potentially be noisy, are the compressors and CHP. The CHP has been assessed for potential noise and vibration in the application for EP reference EPR/SP3200SY. The four existing compressors and the additional compressor proposed to be added are housed within a building providing noise attenuation.

All production equipment and on-site vehicles such as forklift trucks, have been designed in accordance with European noise standards; the equipment is subject to regular preventative maintenance in accordance with the manufacturer's requirements. All plant that is a potential noise source is either located within a building, is surrounded by acoustic enclosures or has sound attenuation/anti-vibration installations.

The site has not received nuisance complaints from nearby residents and businesses in recent times. Discussion with the Environment Agency (Refer Section 1.2) confirmed that quantitative assessment of noise was not required. Therefore, this permit application does not propose any monitoring or modelling of noise odour emissions.

A qualitive assessment of potential noise and vibration impacts has been undertaken as part of this permit variation application (refer 410.V62639.00001_ERA).

6.8 Pests

Pest management arrangements are in place at the site, this includes a contract with an appointed pest control company who regularly visit site to ensure pest control is adequate.
Regular inspections for pests include:

- visual inspection for signs of pests/infestation;
- checking of all pest monitoring points for activity and that each one is serviced/clean/intact/tethered in place; and
- replacement of any lures/baits/damaged devices, as required.

6.9 Accidents and Emergencies

The site has established the following:

- Fire Emergency Procedure which outlines the responsibilities during a fire emergency of the shift manager (reference SOP-HS-001 dated 11 May 2022); fire warden (reference W1-HS-062 dated 28 April 2021) and engineers and operators (reference SOP-HS-002 dated 22 October 2020).
- Emergency Response Procedure dated 23 April 2018 (reference SOP-HS-008).
- Emergency Spillage Procedure dated 25 March 2020 (reference W1-ENV-001).
- Ammonia accidental release procedures comprising the 'Emergency Response Procedure – Procedural flow' (reference SOP-HS-007 dated 20 May 2021) and the 'Ammonia Emergency Response Procedure' (reference HS-PR-100 dated 17 August 2018). These document the emergency response to a situation involving a leak of ammonia.

These procedures detail the emergency response to be implemented in the event of an emergency situation including a spillage/leak or fire. These procedures are regularly reviewed, at least every 5 years, and where

necessary revised to incorporate any additional accident or emergency scenarios arising from new plant and equipment that may be installed. These procedures will be updated to account for the increase in throughput at the site and additional proposed equipment. Appropriate training is provided to employees and contractor staff to ensure that response to an incident is prompt and efficient. Training will be updated to account for the increase in throughput and additional equipment to be installed at the site.

7.0 Monitoring

7.1 Point Source Emissions to Atmosphere

7.1.1 CHP

Muller will continue to meet the monitoring requirements and emission limits set in environmental permit EPR/SP3200SY for the CHP of 95mg/m^3 NOx.

7.1.2 Natural Gas Fired Steam Boiler

Emissions from the combustion of natural gas in the steam raising boiler (emission point A2) will be required to comply with the 250 g/m^3 NOx MCPD ELV from 1st January 2030.

7.1.3 Diesel Pumps

No monitoring required as they do not fall under the remit of the MCPD as the rated thermal input of each pump is <1MWth.

7.1.4 Methodology

The site will ensure that the monitoring of NOx emissions from emission points A1 and A2 is undertaken in accordance with the requirements stated in EA guidance document *M5 Monitoring of Stack Emissions from Medium Combustion Plants and Specified Generators*, which provides a standardised approach to monitoring stack gas emissions from plants regulated under the Medium Combustion Plant Directive (https://www.gov.uk/government/publications/m5-monitoring-of-stack-gas-emissions-from-medium-combustion-plants-and-specified-generators).

The monitoring of NOx will be undertaken by an appointed MCERTS certified air emissions monitoring specialist.

7.2 Point Source Emissions to Sewer

The site is connected to the Severn Trent sewer system. Effluent from the manufacturing process is discharged to sewer in accordance with the Severn Trent Water Limited trade effluent discharge consent (consent number Severn 008891V, dated 01 February 2018). Monitoring of the effluent is undertaken in accordance with this discharge consent. An inspection chamber is provided for the sampling of treated effluent prior at the point of discharge into the municipal sewer. An automated sampler is installed in the inspection chamber.

Compliance with BAT 4 of the Food, Drink and Milk Industries BREF (final draft October 2018)) is not applicable as the relevant monitoring requirements, as detailed in Table 7-1, relate to discharges made direct to a receiving water body. The effluent discharge from the site is discharged to sewer where it is subject to treatment at the municipal wastewater treatment works prior to final discharge. It is therefore not proposed to alter the monitoring arrangements as stipulated in the discharge consent.

Table 7-1 Food, Drink and Milk Industries BREF (November 2019)
BAT 4: Minimum Monitoring Frequency for Process Effluent

Parameter	BAT 4: Minimum Monitoring Frequency
Suspended solids	n/a (once per day monitoring required for those discharges made direct to a receiving water body)
COD	
Phosphorous	

7.3 Point Source Emissions to Surface Water

Point source emissions to surface water from the site are limited to uncontaminated surface water runoff from roof areas and external roadways and a number of yards within operational areas of the site from point source emissions W2 and W3.

Refer to Section 4.14 and Appendix C about proposed changes to the site drainage system as directed by the SLR Containment Report to contain any potential onsite spills.

7.4 Odour

The activities undertaken at the site do not inherently generate significant odours. Muller ensures the implementation of good working practices and the correct use and maintenance of plant to minimise the potential for odours. Third party odour complaints have not been received by the site in the recent past. The monitoring of odour emissions is not proposed.

8.0 Resource Efficiency

8.1 Raw Material Consumption

Details of the food grade raw materials and the chemicals in use at the site are provided in Section 4.0 of this BATOT.

The quantities of food grade raw materials used are dictated by the product recipes. Food grade raw materials are stored appropriately in accordance with food hygiene standards to ensure quality is maintained and the organisation employs a stock control system to ensure that these raw materials are used prior to expiry of their shelf life, thus reducing wastage.

In accordance with food safety requirements, rigorous quality control (QC) is employed at various stages during the manufacturing process to ensure that all products are of the highest quality as demanded by Muller. This approach minimises the quantity of QC rejects. Where possible, Muller will re-work QC rejects to minimise the use of raw materials and the generation of waste.

Hygiene and cleaning chemicals in use in production areas are designed for use in food production facilities. Other chemicals associated with production and maintenance are used in small volumes at the site. All chemicals in use on site are subject to a Control of Substances Hazardous to Health (COSHH) assessment, this includes assessment of the potential environmental hazards. Muller ensure that all hazardous chemicals are stored appropriately to minimise the risk of release to the environment.

Staff involved with cleaning activities and the use of cleaning chemicals undergo training to ensure these chemicals are used and stored appropriately.

8.2 Energy Efficiency

The site is a participant to a Climate Change Agreement, (CAA) (agreement reference DIAL/T0005-GEN-5 dated 20 August 2021). The agreement has a number of variable targets based on production output. Energy management techniques have been implemented to monitor, record and track energy consumption of the various activities undertaken at the site. The CCA Agreement is included in Appendix G.

Muller also actively monitoring their Scope 1 and 2 carbon emissions to enable calculation of their carbon footprint.

Muller have undertaken an energy savings opportunity scheme (ESOS) audit on the site in 2019. Muller currently undertakes submetering (electricity and gas) for some elements of the processes at the site, this enable Muller to monitor key energy consuming plant/activities and where necessary seek measures to optimise/reduce energy usage.

8.2.1 Energy Use

The estimated annual usage of the main fuel types is given below (based on 2021 usage) and is summarised in Table 8-1:

- electricity (GRID) = 6,018,015 kWh;
- electricity (CHP) = 6,606,745 kWh; and
- natural gas = 22,118,391 kWh.

CHP electricity generation is not included in Table 8-1 below as it is generated from natural gas received at the site and its primary energy will be included in the natural gas calculation.

Table 8-1 2021 Electricity and Gas Use

Energy Type	Electrical Energy Consumption per Year (kWhr)	Primary Energy 2021* (kWh/year)	Estimated Primary Energy (kWh/year) for Proposed Increase in Throughput – 21% increase
Electricity (GRID)	6,018,015	15,646,839	18,932,675.19
Natural gas	22,118,391	57,507,816.6	69,584,458.09
Total	**28,136,406**	**73,154,656**	**88,517,133.28**
*Correction factor for electricity of 2.6 used to convert delivered energy to primary energy.			

Energy consumption at the site when the proposed increase in throughput is in place will generate 16,765,064 kg of carbon dioxide (CO_2) emissions as summarised in Table 8-2.

Table 8-2 Carbon Dioxide Emissions

Energy Source	Annual Primary Energy Consumption (kWh)	CO2 Emission Factor (Kg CO2e/kWh)*	Annual CO2 Emission 2021 (kg)	Annual CO2 Emission (kg) for Proposed Increase in Throughput 21%
Electricity	15,646,839	0.21233	3,322,293.32	4,019,974.92
Natural gas	57,507,816.6	0.18316	10,533,131.69	12,745,089.34
Total	73,154,656		**13,855,425.01**	**16,765,064.26**
* - 2021 UK greenhouse gas conversion factors				

In accordance with BAT (BAT 2) of the Food, Drink and Milk Industries BREF (November 2019), in order to increase energy efficiency and reduce emissions the site maintain an inventory of energy consumption via the Carbon Desktop system which is subject to regular review. As part of the Energy Management System, the site will establish energy objectives and targets, will monitor energy use and seek opportunities to reduce/optimise energy usage.

The site are committed to constantly reviewing their energy usage by undertaking weekly review meetings and regular environment meetings and implementing measures such as replacing all light bulbs with LED lights.

The site have KPI's in place relating to energy efficiency which are discussed at the weekly review meetings.

Energy consumption minimisation techniques employed at the site are detailed in the BAT assessment presented in Appendix E.

8.3 Water Minimisation

Annual water consumption at the site is 178,497m^3 (based on 12-month usage for 2022[4]). This is anticipated to increase to 215,981.37m^3 for the proposed increase in throughput at the site of 21%.

The site currently undertakes submetering for some elements of the processes at the site which enables the monitoring of key water consuming plant/activities and where necessary seek measures to optimise/reduce water usage. The site has prepared a Water Mass Balance for cleaning activities undertaken on site.

- water consumption minimisation techniques employed at the site include:
- re use of water in CIP processes. The pre-rinse water is recovered water from the previous clean;
- use of pigging systems to clean production pipelines;
- use of dry-cleaning methods;
- use of triggers on hoses;
- steam cleaners are used for deep cleaning of machinery;
- closed loop water systems for chilled and hot water heating systems;
- manual cleaning involves the use of pressurised nozzle hoses and steam cleaning equipment;
- use of hot water and specialist detergent to improve cleaning efficiencies;
- condensate (60%) is recovered in the hot-well of the boiler; and
- Steam generated from the CHP is recovered.

In addition, in accordance with the EMS, the site plans to undertake an annual water balance to support improvements with water efficiency. This is considered to be BAT in accordance with BAT (BAT 2) of the Food, Drink and Milk Industries BREF (November 2019).

Further details as to how the site meets the BAT requirements for minimising water consumption are provided in Appendix E.

8.4 Waste Minimisation

The site, in accordance with the EMS, regularly reviews the site's waste generation using data obtained from the appointed waste contractors and undertakes a review of waste generated at the site to identify potential waste minimisation opportunities. This is considered to be BAT in accordance with the Food, Drink and Milk Industries BREF.

[4] Average of January 2022 to September 2022 data used to calculate predicted consumption for October to December 2022).

9.0 Environmental Management System

The site has an Environmental Management System (EMS) which is certified to the ISO14001 international standard. Internal System Audits and their frequency are defined on the Internal Audit Plan and based on relevant risk assessment. Audits are scheduled over 12 months. Audits are conducted in accordance with the Procedure for Internal Audit and have a defined scope. The audit schedule is reviewed annually, and frequency changed if required based on performance and comments added to audit schedule.

The Environmental Management System is accessible electronically.

The EMS is structured as follows:

- Top Level Policies - This document contains Company Policies and brief outlines of systems and procedures.
- Procedures - Procedures which address the ISO 14001 standard.
- Work Instructions or Standard Operating Procedures - Some procedures require a detailed work instruction or Standard Operating Procedure in order to provide key training and support for specific operating processes. These are designed by trained personnel with the appropriate levels of experience and expertise within these areas. Photos and diagrams are used for training as appropriate.
- Records / Forms - Forms, record sheets or other documentation for collecting data relating to Environmental Management requirements.

The EMS is considered to be compliant with the requirements as detailed in Environment Agency guidance *'Develop a management system: environmental permits, April 2018'* and is considered to be BAT.

9.1 Policy

The site has developed an Environmental and Energy policy. The policy is displayed on notice boards at the site and is included in the EMS Manual.

The policy clearly defines the organisation's commitment to ensure that the impact of business activities upon the environment is kept to a minimum, ensure legal compliance, minimise the environmental impacts of emissions, efficient use of energy, water, materials and natural resources, use of energy efficient products and services and for continuous improvement of environmental performance. The Policy is reviewed at least annually at the Management Review meeting. The policy commits to the setting and reviewing of objectives and targets.

9.2 Organisation

The site has established and maintains documented procedures for identifying and recording environmental aspects for all its activities, products and services and has developed a register of environmental aspects and impact. Where significant, the environmental aspects have been considered in the development, implementation and maintenance of the EMS. These are also considered when introducing new or modified activities, products and services. Muller has also documented in the EMS a procedure for the setting and managing of environmental Objectives and Targets.

The site has documented within the EMS the structure and responsibility within the organisation. Senior management have overall responsibility for the provision and maintenance of an effective EMS policy and improvement programme and will ensure that the requirements of the EMS are addressed in all management and business decisions.

The site has established a procedure for periodic internal audits of environmental documents, procedures, implementation and compliance status to determine whether the EMS conforms to planned arrangements, and to determine whether it has been appropriately implemented and maintained in accordance with its

Environmental Policy. The EMS is externally verified through certification and surveillance audits by the appointed management system certification organisation.

Any environmental issues are escalated, and corrective actions are established, recorded in the sites tracker document and communicated to the relevant personnel to be completed within agreed timescales. Documentation is retained and actions signed off when completed.

9.3 Operations and Maintenance

9.3.1 Operational Control

The site implements a range of operational controls to minimise the impact on the environment. The environmental impact of the site's activities is minimised by:

- the choice and control of material inputs;
- minimising raw material, energy and water usage; and
- maintaining the site in accordance a planned preventative maintenance programme.

Operational controls implemented at the site are maintained within the EMS. Operational control procedures have been established to ensure that activities and operations are undertaken to ensure environmental performance is achieved in line with the Environmental Policy.

9.3.2 Preventative Maintenance

The site has a PPM to ensure the continued integrity of pollution prevention systems. PPM is managed through an asset management software package. The system generates PPM instructions to the maintenance personnel. Maintenance requirements are based upon maintenance manuals, manufacturer's handbooks, statutory requirements, insurance requirements, environment, health and safety requirements, and site processes and procedures.

9.4 Competence and Training

The site has an established training programme to ensure that the training needs of all employees, including those whose activities may affect the environment, are identified and that the necessary knowledge and skills are provided through appropriate education, training and experience. Training needs are identified primarily by line management but may be identified as a consequence of monitoring/inspections/audits.

An induction programme provides all new recruits and, if appropriate, contractors with basic environmental awareness. This includes environmental awareness training and spill training. All new starters within production have on the job training and start learning through a buddy system with an experienced trained operator. Additional on-the-job training and more specialist formal training is provided as required. Training records are held within a training matrix which is the responsibility of departmental managers and are in place to continuously monitor personnel and role progression.

9.5 Accidents, Incidents and Non-Conformance

The site has established and maintains documented procedures for the management of environmental incidents and accidents that may arise. The site has implemented the following procedures:

- Fire Emergency Procedure which outlines the responsibilities for the shift manager (reference SOP-HS-001 dated 11 May 2022); fire warden (reference W1-HS-062 dated 28 April 2021) and engineers and operators (reference SOP-HS-002 dated 22 October 2020).
- Ammonia accidental release procedures comprising the 'Emergency Response Procedure – Procedural flow' (reference SOP-HS-007 dated 20 May 2021) and the 'Ammonia Emergency Response Procedure'

(reference HS-PR-100 dated 17 August 2018). These document the emergency response to a situation involving a leak of ammonia.

- Emergency Spillage Procedure dated 25 March 2020 (reference W1-ENV-001). This procedure addresses the safe handling, disposal and reporting of spillages on site which may pose a pollution risk to the ground, surface water drainage system. This procedure applies to all trained operatives and contractors who undertake work at Muller and who use substances and equipment that could potentially cause spillages if not handled correctly.
- Emergency Response Procedure dated 23 April 2018 (reference SOP-HS-008).

There are tank filling and emptying procedures in place including the Milk Intake Procedure (SOP-EN-00016340 dated 14 July 2021).

The site also maintains systems to ensure non-conformances are investigated and that actions are taken to correct and prevent the causes. Systems are in place for investigating and managing all environmental corrective and preventative actions. Accidents, incidents (including environmental incidents such as spillages and leaks), and non-conformances are reported and tracked.

The site will review and update relevant procedures prior to the proposed increase in throughput occurring.

APPENDIX A

Pre-Application Meeting

APPENDIX B

Discharge Consent

APPENDIX C

SLR Containment Report

APPENDIX D

Emission Points and Drainage Plan

APPENDIX E

Best Available Techniques Assessment

Table AppE-01 Food, Drink and Milk Industries BREF (November 2019) - Assessment of BAT

BAT Ref.	Indicative BAT requirement	Compliance level
1	BAT 1. In order to improve the overall environmental performance, BAT is to elaborate and implement an environmental management system (EMS) that incorporates all of the following features: i)commitment, leadership, and accountability of the management, including senior management, for the implementation of an effective EMS; (ii) an analysis that includes the determination of the organisation's context, the identification of the needs and expectations of interested parties, the identification of characteristics of the installation that are associated with possible risks for the environment (or human health) as well as of the applicable legal requirements relating to the environment; (iii) development of an environmental policy that includes the continuous improvement of the environmental performance of the installation; (iv) establishing objectives and performance indicators in relation to significant environmental aspects, including safeguarding compliance with applicable legal requirements; (v) planning and implementing the necessary procedures and actions (including corrective and preventive actions where needed), to achieve the environmental objectives and avoid environmental risks; (vi) determination of structures, roles and responsibilities in relation to environmental aspects and objectives and provision of the financial and human resources needed;	The site has an environmental management system (EMS) certified to ISO 14001 and energy management system (refer to Section 8.2 of the main report). These management systems are considered to address the majority of the indicative general BAT requirements. Muller will update the EMS to incorporate any changes as a result of the increase in throughput to ensure the EMS meets BAT 1. Once this exercise is complete, Muller are considered to be compliant with BAT.

BAT Ref.	Indicative BAT requirement	Compliance level
	(vii) ensuring the necessary competence and awareness of staff whose work may affect the environmental performance of the installation (e.g., by providing information and training); (viii) internal and external communication; (ix) fostering employee involvement in good environmental management practices; (x) Establishing and maintaining a management manual and written procedures to control activities with significant environmental impact as well as relevant records; (xi) effective operational planning and process control; (xii) implementation of appropriate maintenance programmes; (xiii) emergency preparedness and response protocols, including the prevention and/or mitigation of the adverse (environmental) impacts of emergency situations; (xiv) when (re)designing a (new) installation or a part thereof, consideration of its environmental impacts throughout its life, which includes construction, maintenance, operation and decommissioning; (xv) implementation of a monitoring and measurement programme, if necessary, information can be found in the Reference Report on Monitoring of Emissions to Air and Water from IED Installations; (xvi) application of sectoral benchmarking on a regular basis; (xvii) periodic independent (as far as practicable) internal auditing and periodic independent external auditing in order to assess the environmental performance and to determine whether or not the EMS conforms to planned arrangements and has been properly implemented and maintained; (xviii) evaluation of causes of nonconformities, implementation of corrective actions in response to nonconformities, review of the	

BAT Ref.	Indicative BAT requirement	Compliance level
	effectiveness of corrective actions, and determination of whether similar nonconformities exist or could potentially occur; (xix) periodic review, by senior management, of the EMS and its continuing suitability, adequacy and effectiveness; (xx) following and taking into account the development of cleaner techniques. Specifically for the food, drink and milk sector, BAT is to also incorporate the following features in the EMS: (i) noise management plan (see BAT 13); (ii) odour management plan (see BAT 15); (iii) inventory of water, energy and raw materials consumption as well as of wastewater and waste gas streams (see BAT 2); (iv) energy efficiency plan (see BAT 6a	
2	Establish, maintain and regularly review an inventory of water, energy and raw materials consumption as well as wastewater and waste gas streams as part of the EMS. I. Information about the food, drink and milk production processes, which incorporates all of the following features: (a) simplified process flow sheets that show the origin of the emissions; (b) descriptions of process-integrated techniques and wastewater/waste gas treatment techniques to prevent or reduce emissions, including their performance. II. Information about water consumption and usage (e.g., flow diagrams and water mass balances), and identification of actions to reduce water consumption and wastewater volume (see BAT 7). III. Information about the quantity and characteristics of the wastewater streams, such as: (a) average values and variability of flow, pH and temperature;	In accordance with the requirements of the site's EMS; water, energy and raw material consumption and wastewater volumes discharge to sewer are regularly reviewed. Muller maintain an inventory of energy consumption via the Carbon Desktop system which is subject to regular review. Muller currently undertakes submetering for some elements of the processes at the site which enables Muller to monitor key water consuming plant/activities and where necessary seek measures to optimise/reduce water usage. Muller has prepared a Water Mass Balance for cleaning operations which addresses water consumption for key areas of the site. Muller currently maintain elements of the information outlined in BAT 2 (I to V) as part of the water, energy and raw material consumption inventory maintained at the site. Muller will update the inventory to incorporate any changes as a result of the increase in throughput to ensure the inventory meets BAT 2 (I to VI).

BAT Ref.	Indicative BAT requirement	Compliance level
	(b) average concentration and load values of relevant pollutants/parameters (e.g., TOC or COD, nitrogen species, phosphorus, chloride, conductivity) and their variability. IV. Information about the characteristics of the waste gas streams, such as: (a) average values and variability of flow and temperature; (b) average concentration and load values of relevant pollutants/parameters (e.g., dust, TVOC, CO, NOX, SOX) and their variability; (c) presence of other substances that may affect the waste gas treatment system or plant safety (e.g., oxygen, water vapour, dust). V. Information about energy consumption and usage, the quantity of raw materials used, as well as the quantity and characteristics of residues generated, and identification of actions for continuous improvement of resource efficiency (see for example BAT 6 and BAT 10). VI. Identification and implementation of an appropriate monitoring strategy with the aim of increasing resource efficiency, considering energy, water and raw materials consumption. Monitoring can include direct measurements, calculations or recording with an appropriate frequency. The monitoring is broken down at the most appropriate level (e.g., at process or plant/installation level)	Once this exercise is complete, Muller are considered to be compliant with BAT.
3	For relevant emissions to water as identified by the inventory of wastewater streams (see BAT 2), BAT is to monitor key process parameters (e.g., continuous monitoring of wastewater flow, pH and temperature) at key locations (e.g. at the inlet and/or outlet	Process effluent is discharged under consent to sewer following DAF treatment and pH adjustment, if required. The effluent quality is monitored in accordance with the requirements of the discharge consent, and continuously monitored for pH, sampled for suspended solids and chemical oxygen demand.

BAT Ref.	Indicative BAT requirement	Compliance level
	of the pre-treatment, at the inlet to the final treatment, at the point where the emission leaves the installation).	Muller is considered to be compliant.
4	BAT is to monitor emissions to water with at least the frequency given below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality	**BAT not applicable.** Compliance with BAT 4 is not applicable as the relevant monitoring requirements relate to discharges made direct to a receiving water body. The effluent discharge from the site is discharged to sewer where it is subject to treatment at the municipal wastewater treatment works prior to discharge to water.
5	Monitor channelled emissions to air with at least the frequency as detailed in the BREF.	**BAT not applicable.** BAT 5 does not comprise emissions monitoring specifications for natural gas boilers, diesel pumps or a CHP.
6	Energy efficiency - to improve energy efficiency BAT is to use one or a combination of the techniques as detailed in the BREF: a)energy efficiency plan. An energy efficiency plan, as part of the environmental management system (see BAT 1), entails defining and calculating the specific energy consumption of the activity (or activities), setting key performance indicators on an annual basis (for example for the specific energy consumption) and planning periodic improvement targets and related actions. The plan is adapted to the specificities of the installation. b) Use of common techniques, such as: — burner regulation and control; • cogeneration; • energy-efficient motors; • heat recovery with heat exchangers and/or heat pumps (including mechanical vapour recompression); • lighting;	The site has implemented environmental and energy management systems as detailed in BAT 1. Muller also maintains an inventory of energy consumption via the Carbon Desktop system which is subject to regular review. Furthermore, techniques used for energy efficiency at the site include: • burner regulation and control; • energy-efficient motors; • heat recovery with heat exchangers and/or heat pumps; • lighting; • minimising blowdown from the boiler; • optimising steam distribution systems;

BAT Ref.	Indicative BAT requirement	Compliance level
	• minimising blowdown from the boiler; • optimising steam distribution systems; • preheating feed water (including the use of economisers); • process control systems; • reducing compressed air system leaks; • reducing heat losses by insulation; • variable speed drives; • multiple-effect evaporation; • use of solar energy.	• reducing compressed air system leaks by regular maintenance; and • reducing heat losses by insulation (on the incubation tanks). Muller is considered to be compliant.
7	Reduce water consumption and the volume of wastewater discharged using one or a combination of the techniques as detailed in the BREF. a)Water recycling and/or reuse. b) Optimisation of water flow. c) Optimisation of water nozzles and hoses. d) Segregation of water streams. e) Dry cleaning. f) Pigging system for pipes. g) High-pressure cleaning. h) Optimisation of chemical dosing and water use in cleaning-in-place (CIP). i) Low-pressure foam and/or gel cleaning. J) Optimised design and construction of equipment and process areas. k) Cleaning of equipment as soon as possible.	Water consumption minimisation techniques employed at the site include: • reuse of water in CIP processes. The pre-rinse water is recovered water from the previous clean; • optimisation of chemicals used in CIP processes; • drains are flushed with hot water and then foam cleaned with a hypofoam solution during weekly drain cleaning; • use of pigging systems to clean production pipelines; • raw material tanks are cleaned via high pressure cleaning; • use of dry-cleaning methods (catch pots with a mesh cover) to collect waste prior to water cleaning taking place; • use of triggers on hoses; • steam cleaners are used for deep cleaning of machinery; • closed loop water systems for chilled and hot water heating systems; • manual cleaning involves the use of pressurised nozzle hoses and steam cleaning equipment;

BAT Ref.	Indicative BAT requirement	Compliance level
		• use of hot water and specialist detergent to improve cleaning efficiencies; condensate (60%) is recovered in the hot-well of the boiler; and steam generated from the CHP is recovered. Muller is considered to be compliant.
8	Prevent or reduce the use of harmful substances (i.e., cleaning and disinfection) using one or a combination of the techniques as detailed in the BREF: a) Proper selection of cleaning chemicals and/or disinfectants b) Reuse of cleaning chemicals in cleaning-in-place (CIP) c) dry cleaning d) Optimised design and construction of equipment and process areas	Cleaning chemicals in use at the site are approved for use in food manufacturing processes. All chemicals in use on site are subject to a Control of Substances Hazardous to Health (COSHH) assessment, this includes assessment of the potential environmental hazards. Muller will ensure that all hazardous chemicals are stored appropriately to minimise the risk of release to the environment. a) optimisation of chemicals used in CIP processes is undertaken by proper selection of appropriate chemicals; b) reuse of water in CIP processes. The pre-rinse water is recovered water from the previous clean; c) use of dry-cleaning methods (catch pots with a mesh cover) to collect waste prior to water cleaning taking place; and d) the equipment and process areas are designed and constructed in a way that facilitates cleaning and are situated on impermeable surfacing that drains to the ETP. Muller is considered to be compliant.
9	In order to prevent emissions of ozone-depleting substances and of substances with a high global warming potential from cooling and freezing, BAT is to use refrigerants without ozone depletion potential and with a low global warming potential.	The refrigeration system comprises ammonia which has a low global warming potential and does not have ozone depletion potential. Muller is considered to be compliant.

BAT Ref.	Indicative BAT requirement	Compliance level
10	To increase resource efficiency BAT is to use one or a combination of the following techniques: a) anaerobic digestion; b) use of residues (animal feed); c) separation of residues; d) recovery and reuse of residues from the pasteuriser; e) phosphorus recovery as struvite; and f) use of wastewater for land spreading.	Waste streams are segregated at the site. All waste generated at the site is sent either for recycling, animal feed or use as energy from fuel; no waste is disposed of to landfill. Sludge that was previously sent for land spreading will be sent for anaerobic digestion by the time the proposed increase in throughput occurs. Muller is considered to be compliant.
11	To prevent uncontrolled emissions to water, BAT is to provide an appropriate buffer storage capacity for wastewater.	Muller are currently designing and implementing upgrades to the drainage system identified from 'key issue 7' and 'key issue 8' as identified in the SLR Muller Telford Containment Report (reference 410.V62639.00001_CR) presented in Appendix x. Refer also to Section 4.14 for further detail. Once the upgrades are in place relating to 'key issue 7' and 'key issue 8' then Muller will become compliant.
12	To reduce emissions to water, BAT is to use an appropriate combination of techniques detailed in the BREF.	Within the ETP, Muller utilise adjustment of pH with caustic and coagulation / flocculation within the DAF plant to reduce emissions to water. This approach meets BAT 12 as it incorporates coagulation, flocculation, and neutralisation. Muller is considered to be compliant.

BAT Ref.	Indicative BAT requirement	Compliance level
13	To prevent or reduce noise, BAT is to set up, implement and regularly review a noise management plan as part of the EMS that includes the elements as detailed in the BREF. BAT 13 is only applicable to cases where a noise nuisance at sensitive receptors is expected and/or has been substantiated.	**Not applicable.** A pre-application meeting was held with the Environment Agency on 15 November 2022. It was confirmed with the Environment Agency that: *'It is considered unlikely that the generic risk assessment for fugitive emissions will demonstrate that the risks of noise and odour are significant, and therefore a quantitative assessment is unlikely to be required, providing you are demonstrating Best Available Techniques'.* No noise complaints have been received in recent years by the site. As such, no quantitative noise assessment has been undertaken for the permit variation application and a noise management plan is not considered necessary for the site.
14	To prevent or reduce noise emissions, BAT is to use one or a combination of the techniques detailed in the BREF.	Not Applicable - refer to BAT 13.
15	To prevent or reduce odour emissions, BAT is to set up, implement and regularly review an odour management plan as part of the EMS that includes the elements as detailed in the BREF (BAT 14 is only applicable to cases where odour nuisance at sensitive receptors is expected and/or has been substantiated).	**Not applicable.** A pre-application meeting was held with the Environment Agency on 15 November 2022. It was confirmed with the Environment Agency that: *'It is considered unlikely that the generic risk assessment for fugitive emissions will demonstrate that the risks of noise and odour are significant, and therefore a quantitative assessment is unlikely to be required, providing you are demonstrating Best Available Techniques'.* No odour complaints have been received in recent years by the site.

BAT Ref.	Indicative BAT requirement	Compliance level
		The activities undertaken at the site do not inherently generate significant odours. Muller ensures the implementation of good working practices and the correct use and maintenance of plant to minimise the potential for odours. As such, no quantitative odour assessment has been undertaken for the permit variation application and an odour management plan is not considered necessary for the site.

Table AppE-02 Reference Document on Best Available Techniques for Energy Efficiency, February 2009 - Assessment of BAT

BAT Ref.	BAT	Indicative BAT requirement	Compliance level
1	Energy Management System	BAT is to implement an Energy Management System	Muller implement an energy management system (refer to Section 8.2 of the main report. Muller will update their energy management system to meet the requirements of BAT 1 of the Food, Drink and Milk Industries BREF (November 2019) as this is Sector Specific Guidance (refer Table AppE-01 above). Once this exercise has been completed then Muller are considered to be compliant.
2	Energy Management System	Continuously minimise the environmental impact of an installation by planning actions and investment on an integrated basis….. considering the cost benefits and cross media effects	Budget guidelines for energy and environment activities are fulfilled on an annual basis including a full capex plan of improvements. Previous projects include upgrading three existing filling lines and adding three new filling lines in 2019 and adding a combined heat and power plant in 2020. Muller is considered to be compliant.
3	Energy Management System	Identify aspects of an installation that influence energy efficiency by carrying out an audit.	Muller operate under the ESOS scheme which requires an energy audit every four years at the site. The latest ESOS audit occurred in 2019. Muller is considered to be compliant.
4	Energy Management System	When carrying out an audit, ensure that the audit identifies the following aspects: • energy use and type and its component systems and processes; • energy-using equipment and type and quantity of energy used in the installation;	All of these aspects are covered in the ESOS energy audits. Muller is considered to be compliant.

BAT Ref.	BAT	Indicative BAT requirement	Compliance level
		• possibilities to minimise energy use; • possibilities to use alternative sources or use of energy that is more efficient; • possibility to apply energy surplus to other processes; and • possibilities to upgrade heat quality.	
5	Energy Management System	Use tools or methodologies to assist with identifying and quantifying energy optimisation such as: • energy models, databases and balances; • a technique such as pinch methodology exergy or enthalpy analysis or thermo-economics; or • estimates and calculations.	Muller use the energy inventory to track energy use and use estimates and calculations to derive opportunities to optimise energy use on site. This is supported by discussion on energy management and efficiency at weekly meetings. Muller is considered to be compliant.
6	Energy Management System	BAT is to identify opportunities to optimise energy recovery within the installation, between systems within the installation and/or with a third party.	Muller installed a CHP plant in 2019 to generate electricity and recover waste heat for heating. There is no opportunity to extend energy recover to a third party at the site. Muller is considered to be compliant.
7	Energy Management System	Optimise energy efficiency by taking a systems approach to energy management.	Muller's energy management system continually looks at how energy efficiency can be introduced to the whole site. This is driven by the weekly energy review meetings. Examples of Muller implementing changes across the whole site includes:

BAT Ref.	BAT	Indicative BAT requirement	Compliance level
		Systems to be considered for optimising as a whole are, for example: • process units; • heating systems such as steam and hot water; • cooling and vacuum; • motor driven systems such as compressed air and pumping; • lighting; or • drying, separation and concentration.	• introduction of a CHP in 2019; • lighting changes to a fully LED lighting system; and • heat exchangers on the pasteurisation section of the production line. Muller is considered to be compliant.
8	Energy Management System	Establish energy efficiency indicators by: • identifying suitable energy efficiency indicators for the installation, and where necessary individual processes, systems, units and measure change over time; • identifying and recording appropriate boundaries associated with the indicators; and • identifying and recording factors that can cause variance in energy efficiency of the process, system, units.	Muller has overall efficiency KPIs in place, including use of a score card and calculation of energy use per pot of yogurt produced. Energy usage is reviewed on a weekly basis. Energy use is sub metered and tracked through the Carbon Desktop system. Muller use the energy inventory to track energy use and use estimates and calculations to derive opportunities to optimise energy use on site. This is supported by discussion on energy management and efficiency at weekly meetings. Muller is considered to be compliant.

BAT Ref.	BAT	Indicative BAT requirement	Compliance level
9	Energy Management System	BAT is to carry out comparisons with sector, national or regional benchmarks, where validated data are available.	A monthly report is submitted to Group which allows benchmarking across all of the Muller Plants. Muller is considered to be compliant.
10	**Energy Efficient Design (EED)**	Optimise energy efficiency when planning a new installation, unit or system or significant upgrade by considering: • initiating EED at early design stage; • development/selection of energy efficient technologies; • EED should be carried out by an energy expert; and • initial mapping of energy consumption should also be addressed which parties in the project organisations influence the future energy consumption and should optimise the energy efficiency design of the future plant.	Mapping of energy consumption was carried out when undertaking the PL500 extension in 2018/2019 and also the installation of the CHP in 2019. Energy efficiency is considered at the very beginning of all projects. All new CAPEX projects must be signed off by the Environment and Energy, Quality, H&S and Production Managers and all projects go through an environmental and energy risk assessment procedures. Muller is considered to be compliant.
11	**Increased Process Integration**	Seek to optimise the use of energy between more than one process or system with the installation or with a third party.	The site installed a CHP plant which co-generates heat and electricity for the site. The CHP avoids network losses and reduces emissions. Muller is considered to be compliant.

BAT Ref.	BAT	Indicative BAT requirement	Compliance level
12	**Managing and maintaining the impetus of energy efficiency initiatives**	Maintain the impetus of the energy efficiency programme by using a variety of techniques such as: • implementing specific energy efficiency measures; • accounting for energy usage based on real (metered) values; • creation of financial profit centres for energy efficiency; • benchmarking; • fresh look at existing management systems; and • using change management techniques.	Refer BAT 3, BAT 5, BAT 6, BAT 7 and BAT 9 above. Muller is considered to be compliant.
13	**Maintaining expertise**	Maintain expertise in energy efficiency and energy using systems by using: • skilled staff; • training staff offline periodically; • sharing in-house resources between sites; • use of appropriately skilled consultants; and • outsourcing specialist systems and/or functions.	Muller utilise skilled staff trained to operate equipment on site in accordance with the manufacturer's instructions. Muller share in house energy and environmental specialists to provide support between Muller sites. Muller use suitably qualified consultants to advise on energy and environmental matters. Muller also use specialist third parties to service and maintain equipment when required (i.e., cooling system; CHP; natural gas fired steam boiler). Muller is considered to be compliant.

BAT Ref.	BAT	Indicative BAT requirement	Compliance level
14	**Effective Control of Processes**	Ensure that the effective control of processes is implemented by techniques such as: • having systems in place to ensure that procedures are known, understood and complied with; • ensuring that the key performance parameters are identified, optimised for energy efficiency and monitored; and • documenting or recording these parameters.	Operating procedures have been developed for the site and staff are suitably trained in the operation and maintenance of plant and equipment to ensure optimal operation. Muller is considered to be compliant.
15	**Maintenance**	BAT is to carry out maintenance at installations to optimise energy efficiency by applying all of the following: • clearly allocating responsibility for the planning and execution of maintenance; • establishing a structured programme for maintenance based on technical descriptions of the equipment, norms, etc. as well as any equipment failures and consequences; • supporting the maintenance programme by appropriate record	The site has a Preventative Maintenance Programme in place; the maintenance of equipment is undertaken in accordance with manufacturer's requirements to ensure the efficiency, including energy efficiency, of equipment is maintained. Designated maintenance personnel undertake the required maintenance activities; where required specialist contractors will be appointed to undertake maintenance of specific equipment. Records of maintenance are retained at the site. Muller is considered to be compliant.

BAT Ref.	BAT	Indicative BAT requirement	Compliance level
		keeping systems and diagnostic testing; • identifying from routine maintenance, breakdowns and/or abnormalities possible losses in energy efficiency, or where energy efficiency could be improved; and • identifying leaks, broken equipment, worn bearings, etc. that affect or control energy usage, and rectifying them at the earliest opportunity.	
16	**Monitoring and Measurement**	Establish and maintain documented procedures to monitor on a regular basis key characteristics of operations and activities that can have a significant impact on energy efficiency.	Muller have energy KPIs for utilities, machinery, and equipment. Operations and activities that may have a significant impact on energy efficiency are also tracked in the inventory of energy consumption via the Carbon Desktop system which is subject to regular review. Energy usage is discussed at weekly meetings. Muller is considered to be compliant.
17	**Combustion**	Optimise energy efficiency of combustion as per the techniques stated in the BREF.	Muller operate a CHP at the site. This approach meets BAT 17 as it incorporates cogeneration. Additionally, combustion plant is subject to regular maintenance and servicing in accordance with the manufacturer's requirements, this ensures optimal performance of this plant. Combustion plant is controlled by a computerised system which ensures efficient operation, which also meets the requirements of BAT 17.
18	**Steam Systems**	Optimise the energy efficiency by using techniques such as those stated in the BREF.	The natural gas fired steam boiler was collects and returns condensate to the boiler for re-use. Additionally, the boiler is subject to regular maintenance and servicing in accordance with the manufacturer's requirements, this ensures

BAT Ref.	BAT	Indicative BAT requirement	Compliance level
			optimal performance of this plant. The boiler is controlled by a computerised system which ensures efficient operation. Muller is considered to be compliant.
19	**Heat Recovery**	Maintain efficiency of heat exchangers by monitoring the efficiency periodically and preventing/removing fouling.	Heat exchangers are monitored periodically for efficiency and are subject to cleaning periodically to prevent/remove fouling. Muller is considered to be compliant.
20	**Cogeneration**	Seek possibilities for cogeneration inside or outside the Installation (with a third party)	Refer BAT 11. A CHP has been installed to co-generate power within the site. Muller is considered to be compliant.
21	**Electrical power supply**	BAT is to increase the power factor according to the requirements of the local electricity distributor by using techniques such as: • installing capacitors in the AC circuits to decrease the magnitude of reactive power; • minimising the operation of idling or lightly loaded motors; • avoiding the operation of equipment above its rated voltage; and • when replacing motors, using energy efficient motors.	Muller's equipment is operated in accordance with the manufacturers specifications which include minimising periods of equipment using idle motors or operating the equipment above its rated voltage. Energy efficient motors are used as standard when replacing equipment. Muller employs on site electricians and consultant specialists when required to manage the onsite electrical power supply. Muller is considered to be compliant.

BAT Ref.	BAT	Indicative BAT requirement	Compliance level
22		BAT is to check the power supply for harmonics and apply filters if required.	Muller check the power supply for harmonics and apply filters if required. Muller is considered to be compliant.
23		BAT is to optimise the power supply efficiency by using techniques such as: • Ensure power cables have the correct dimensions for the power demand. • Keep online transformer(s) operating at a load above 40 - 50 % of the rated power. • Use high efficiency/low loss transformers. • Place equipment with a high current demand as close as possible to the power source (e.g., transformer).	Muller currently optimise the power supply as per the requirements outlined in BAT 23. Muller is considered to be compliant.
24	**Electric Motor Driven Sub-Systems**	Optimise electric motors as per requirements outlined in the BREF.	A programme of replacing old motors with high-efficiency ones is in place. Muller is considered to be meeting BAT 24. Muller is considered to be compliant.
25	**Compressed Air Systems**	Optimise compressed air systems by … surveys and fixing of leaks as per requirements outlined in the BREF.	A leak prevention programme is implemented on compressed air systems. Muller is considered to be compliant.

BAT Ref.	BAT	Indicative BAT requirement	Compliance level
26	**Pumping Systems**	Optimise pumping systems as per requirements outlined in the BREF.	Pumping systems have been designed/specified to the correct sizing; oversized pumps have not been specified. All new pumps are correctly matched to the motor duty. The pumps and motors will be subject to regular PPM. All pipework has been designed to the correct diameter for the designated activity and pipeline layouts designed to minimise the need for bends and valves. Muller is considered to be compliant.
27	**HVAC Systems**	Optimise Heating, ventilation and air conditioning (HVAC) systems using techniques outlined in the BREF.	A more energy efficient strategy has resulted in 'cooling pods' being used to chill products to reduce the load on the ammonia system. The cooling pods only operate when occupied. Free cooling is utilised on the HVAC system where possible. The HVAC system is managed via the PPM system and is operated according to the manufacturer's instructions. Muller is considered to be compliant.
28	**Lighting**	Optimise artificial lighting systems by using techniques outlined in the BREF.	All lights at the site now operate on LED bulbs. The selection of fixtures and lamps was selected according to specific requirements for the intended use of the light. Muller is considered to be compliant.
29	**Drying, Separation & Concentration Processes**	Optimise drying, separation and concentration processes by using techniques such as those outlined in the BREF.	**Not applicable**

APPENDIX F

Recent Effluent Monitoring

APPENDIX G
CCA Agreement

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