

# Environment Agency permitting decisions

## Variation

We have decided to issue the variation for Davidstow Creamery operated by Dairy Crest Limited.

The variation number is EPR/BN6137IK/V007

The variation was determined as a substantial variation and was duly made on 03/06/14.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

## Purpose of this document

This decision document:

- explains how the application has been determined
- provides a record of the decision-making process
- shows how all relevant factors have been taken into account
- justifies the specific conditions in the permit other than those in our generic permit template.

Unless the decision document specifies otherwise we have accepted the applicant's proposals.

## Structure of this document

- Key issues
- Annex 1 the decision checklist
- Annex 2 the consultation and web publicising advertising responses

## Key issues of the decision

### Summary

Dairy Crest Limited are upgrading the existing whey powder plant in the Davidstow Creamery to make demineralised whey powder for use in infant formula. A prebiotic production plant will also be installed to produce a syrup which can be used to enhance the nutritional value of foods. The waste water treatment plant (WWTP) will also be expanded to cope with increased volumes of wastewater and upgraded to enable treated water to be reused within the process.

### **Demineralised whey powder**

The new demineralised whey powder production process will utilise existing equipment including the evaporator and drier. Two new cyclones will be fitted to the spray dryer for use in the process and are not anticipated to result in any additional emissions to the environment.

### **Prebiotic syrup**

The new prebiotic syrup production process is being added to the permit as a newly prescribed Section 6.8 Part A(1)(d)(i) activity. The new processing plant will be designed to produce 13,500 tonnes of prebiotic syrup per annum with the aim to further increase capacity to process an additional 21,500 tonnes per annum in the future.

The process will require the intake of lactose powder, which is derived from milk. The lactose powder will be dissolved in hot water to make a syrup. The syrup will be transferred to a reaction vessel and enzyme added. Following the reaction, the syrup will be concentrated in a membrane plant before being further concentrated in a new evaporator. The syrup will then be stored and packaged in intermediate bulk containers for distribution. This new process will take place in existing buildings and within the new extension which is connected to a new drainage network linked to the WWTP.

During the prebiotic syrup production process water will be recovered where possible by reverse osmosis. This recovered water will be combined with other sources of water on site for use in processing. Liquid waste that cannot be recovered will amount to approximately 400m<sup>3</sup>/day. This waste will have a low fat content but will have a high chemical oxygen demand (COD) and a high sugar content and therefore will be directed to the WWTP.

### **Waste water treatment plant**

The WWTP is being upgraded and expanded to accommodate increased levels of wastewater from the factory and to treat the effluent to a high level enabling water reuse within the factory.

A new balance tank, an anoxic tank, two aeration tanks and settlement tanks will be added to the WWTP. All new tanks will be constructed from concrete and 200mm high bunds will be installed around the tanks. Although the new bunding does not meet our best available techniques (BAT) requirement for capacity, due to the other protection measures discussed below and the omission of surface water drains within the area we accept that the new proposed tanks and bunding are suitable for the setting. There will be ultrasonic level transducers installed in all tanks which will monitor the tank level and initiate an alarm in the event of a high level of content in the tank. This alarm will typically be set 500mm below the overflow level. A regular visual inspection of the tanks will be conducted as a part of a planned preventative maintenance programme.

Sludge levels are predicted to increase to approximately double existing levels. The sludge will continue to be dewatered and sent offsite for land spreading.

Indicative BAT at stated within EPR 6.13	Operators proposals
<b>Emissions to Water</b>	
Use a balancing tank or pond (equalising or balancing), with a hydraulic retention time of 6-12 hours, which can improve treatment	To manage the increased volumes an additional 1,500m <sup>3</sup> balance tank and associated anoxic tank will be installed to receive flows from the new process streams and the dissolved air flocculation effluent treatment plan (DAF) (maximum flow 2,600m <sup>3</sup> /day).
Provide contingency measures to prevent accidental discharges from overloading or damaging the treatment plant.	The plant has capacity to hold one day of wastewater. The plant will have the option to revert to standard whey powder processing only if the calcium phosphate removal system fails.

### Calcium phosphate removal

The demineralisation of whey produces a waste stream containing high calcium phosphate. Phosphate levels in the site effluent and also phosphate levels in the receiving water course have been measured at high values through monitoring in the past. The Environment Agency have reduced the phosphate emission limit value for the site previously to help facilitate the receiving water course meeting its phosphate target under the Water Framework Directive.

The whey effluent will pass through an additional phosphate removal stage prior to entering the WWTP to address the increased phosphate loading. The process will remove between 70% and 90% of the calcium phosphate. The calcium phosphate rich waste will be dewatered and sent offsite for use as fertiliser.

### Raw materials

A new raw ingredient, lactose powder will be processed at the site for the new prebiotic syrup line. Lactose is purchased as a powder in one tonne bags. The site will store up to 100 tonnes of lactose in the current powder warehouse which is being extended. The lactose will be fed into the process, via a de bagging unit located between the warehouse and main product processing area. The one tonne bags of powder will be unloaded and moved to the de bagger using a fork lift truck.

There will be increased usage of ferric chloride, nitric acid and hypochlorite to serve the new treatment processes within the WWTP. Following this variation there will be no other new raw materials but the volumes used of some existing raw materials will increase.

Existing storage and handling processes for raw materials will be maintained. There will be no new chemical storage areas.

### Water reuse

To meet the increasing site demands for water the operator proposes to treat water effluents to potable standards for reuse within the installation. Approximately 1,700 m<sup>3</sup> of water will be recovered daily. Further processing of the treated waste water will involve reverse osmosis, chlorination and ultra violet treatment to treat and sterilise the water prior to reuse within the installation. This level of treatment is considered BAT for the dairy and milk processing sector in line with technical guidance note EPR 6.13.

In order to recover water and decrease the total biological oxygen demand (BOD) load from the demineralisation process, a filtration plant composed of reverse osmosis and nano filtration will be installed. The recovered water will be re-used for ion exchange regeneration or membrane unit cleaning and will be sufficient to provide 100% of the total water requirements (dilution excluded).

Indicative BAT at stated within EPR 6.13	Operators proposals
<b>1.3 Efficient use of raw materials and water</b>	
Identify and evaluate how you can recycle or reuse water, taking into consideration hygiene issues.	The new system will include further water recovery through reverse osmosis treatment of treated effluent. Up to 1,700m <sup>3</sup> /day will be recovered
Optimise clean in place (CIP) systems to reduce water use	A new CIP will be installed.

### Cleaning

An additional clean in place (CIP) set will be installed to clean the new demineralised whey powder process lines.

Indicative BAT at stated within EPR 6.13	Operators proposals
<b>Cleaning and Sanitation</b>	
Cleaning in place	New spray devices will be fitted to tanks and silos, efficient models will be used and systems optimised to control water and chemical use.

### Noise and vibration

Noise complaints were received in relation to the WWTP in 2012. The source of the complaint was found to be the blowers. The operator changed the old blowers to new 'triton' aerators which operate at a lower noise level. Since this change waste made, no noise complaints have been received.

The new reverse osmosis (RO) and water treatment processes will be housed within a building designed to attenuate noise emissions to ensure they are not higher than the current levels at the installation boundary. The majority of new

equipment related to the change in factory processes will be internal to the main factory buildings. No increase in noise from the plant is anticipated.

The upgrade to the WWTP will fully remove the louder roots blowers and will incorporate 10 new Triton aerators. The new Triton aerators will run continuously and operate at a noise level of around 61dB(A) at a distance of 10m. Ten Triton blowers will equate to a sound power level of 71dB. The daytime background sound power level at the WWTP was measured at 66dB on 28/04/14. The nearby sensitive receptors to the WWTP are Trewassa Village and Trewassa flats, located 167m and 314m respectively from the WWTP.

The combined WWTP background and power level from the 10 Triton blowers equates to 72dB. When calculating sound dampening with distance, the sound power level from the 10 Triton blowers would achieve 46dB against a background of 61dB at Trewassa Village and 41dB against a background of 65dB at Trewassa flats. For both cases the sound power level is significantly below the background level which indicates that complaints are unlikely. However the increase in noise level from the addition of the triton blowers adds 5dB to the calculated sound power level at the sensitive receptors when compared to calculations using the WWTP background level. The 5dB increase is considered of marginal significance in accordance with BS4142.

The planning permission conditions for the WWTP upgrade states that all fixed plant and/or equipment (including pumps, belt press, condensers, fans) shall be designed and located to achieve a cumulative noise rating level (LArTr) at least 5 dB below the measured background noise level at noise sensitive premises. This is to include a 5 dB characteristic penalty where appropriate. The rating level (LArTr) and the background noise level (LA90) shall be determined in accordance with the guidance and methodology set out in BS4142: 1997.

The above assessment only considers daytime noise impact. The operator has not submitted background noise data for night time at the sensitive receptors. The above calculations also do not take into consideration other changes at the effluent plant such as the installation of new equipment and the removal of the old blowers.

We believe that compliance by the Operator with the planning conditions will ensure that complaints will be unlikely from the proposed changes at the WWTP. We have incorporated an improvement condition into the permit to ensure the operator completes a noise survey of the WWTP after commissioning to re-assess the impact of noise at the sensitive receptors and to propose any noise mitigating measures if identified as appropriate.

### **Odour**

Potential odour sources have been identified from the new production processes and from the WWTP. The operators risk assessment categorised all potential odour sources as either not significant or low. The operator has identified that effective management is required during calcium phosphate

removal, use of the anoxic tanks within the WWTP and for sludge storage to ensure odour is minimised. There is an odour suppression system for the sludge storage and the primary risk of odour would result from failure of this system. The operator has outlined contingency measures in the event of this occurring. The potential odour from the anoxic tanks would result from anaerobic conditions occurring. The operator will be carrying out regular checks of the WWTP to monitor for this.

There is no change in the main activity from the installation. The majority of process changes will be situated within the existing buildings and new extensions. There have been no complaints from the processing plant within the last 5 years.

We have specified an improvement condition requiring the Operator to complete a commissioning report of the waste water treatment plant system to review the potential odour from the new processes post commissioning. If a risk from odour is identified, the operator is required to submit suitable measures to minimise the risk.

## BAT assessment

Indicative BAT at stated within EPR 6.13	Operators proposals
<b>1.1 Accident management</b>	
Use automated process controls backed up by manual supervision, both to minimise the frequency of emergency situations and to maintain control during emergency situations.	The current processes are automated and the new processes will be linked to these existing systems or will have their own automated controls. For waste water pipelines a camera survey will inspect the integrity of pipes/joints every 5 years. The operator has a planned preventative maintenance procedure in place for the maintenance of the site.
Have instrumentation such as microprocessor controls, trips and process interlocks, coupled with independent level, temperature, flow and pressure metering and high or low alarms.	High level alarms, trend analysis and automatic diverts on key waste water treatment tanks. Flow calibrated to MCERTS on discharge pipeline.
Have techniques and procedures in place to prevent overfilling of tanks, liquid or powder.	Level controls are to be installed on the new tank as a part of the automated systems. High level alarms and automated diverts will be installed on key treatment plant tanks.
Use measures to detect variation in effluent composition	Current effluent system is monitored using an automatic sampler the second effluent line will also have this monitoring.
Identify major risks associated with the waste water treatment plant and have procedures in place to minimise them.	The new process will result in more front loading of phosphate rich liquor to the WWTP. The redesigning of the WWTP should reduce this. However upon failure it is likely the consent limit will be breached. The current retention capacity is 1 day within the divert tanks and balance tanks (800m <sup>3</sup> ).

## Energy

The ion exchange membranes are designed in stacks with low electrical resistance which equates to approximately 30-50% less energy consumption than other designs.

The increase in energy use by the WWTP and during water purification is approximately 8.2 million kWh. The demineralisation process will increase the electricity usage by 5 million kWh. The energy use for the pre-biotic processing is mainly steam. The existing boilers will be able to accommodate this increased demand.

The new processes will exceed the sites electrical supply of 5.8MW. Western Power has agreed with the operator to upgrade their distribution system which is planned for October 2014. The operator will be making provision for installing standby fuel oil generators in case there are any delays to this timeframe.

The operator has calculated the carbon potential from the increased electricity and steam usage from the three new processes. Steam is provided by two biomass boilers and three oil fired boilers. Currently 80% of the steam is generated by the biomass boilers. The extra demand for steam will be provided by the oil fired boilers. The air impact assessment completed when the biomass boilers were installed at the installation assessed a worst case scenario of running the three oil fired boilers and the two biomass boilers in combination . The conclusion reached was that there was no significant impact.

Indicative BAT at stated within EPR 6.13	Operators proposals
<b>1.2 Energy Efficiency</b>	
Use heat recovery from, for example evaporators, pasteurisers and sterilisers	The new prebiotic plant will have heat recovery in the design.
Use of multi-effect evaporators in large scale evaporator applications	The new evaporator for the prebiotic is a multi-effect evaporator and will be lagged
Minimise water use e.g. use of re-circulating water systems	The project includes the installation of reverse osmosis systems to maximise the opportunities for water reuse.
Schedule production to optimise continuous processing instead of batch	The demineralisation process will be carried out when cheese is being manufactured so that a continuous supply is guaranteed. The prebiotic (lactose syrup) will need to be a batch process due to process requirements.

### Particulate emissions

The operator has identified particulates from the whey powder as a low risk emission to air. As a result of this variation 15% less powder will be produced by the drying of demineralised concentrate. Two additional cyclones are being installed prior to the existing bag filter. The existing emission controls will remain in place which include planned preventative maintenance, alarm systems and emissions monitoring. We agree with the operator that there is no significant increase in risk from the particulate emissions.



## Annex 1: decision checklist

This document should be read in conjunction with the Duly Making checklist, the application and supporting information and permit/ notice.

Aspect considered	Justification / Detail	Criteria met
		Yes
<b>Receipt of submission</b>		
Confidential information	<p>A claim for commercial or industrial confidentiality has been made.</p> <p>A request for confidentiality was made by the operator for Appendix 5 only of the application documents.</p> <p>We have accepted the claim for confidentiality. We consider that the inclusion of the relevant information on the public register could have a negative impact on the applicant's interests. The reasons for this are given in the notice of determination for the claim. The decision was taken in accordance with our guidance on commercial confidentiality.</p>	✓
Identifying confidential information	<p>We have identified information provided as part of the application that we consider to be confidential. The decision was taken in accordance with our guidance on commercial confidentiality.</p> <p>Appendix 5 of the application is excluded from the public register.</p>	✓
<b>Consultation</b>		
Scope of consultation	The consultation requirements were identified and implemented. The decision was taken in accordance with Regulatory Guidance Note 6 High Profile Sites, our Public Participation Statement and our Working Together Agreements.	✓
Responses to consultation and web publicising	<p>The web publicising and consultation responses (Annex 2) were taken into account in the decision.</p> <p>The decision was taken in accordance with our guidance.</p>	✓
<b>Operator</b>		
Control of the facility	We are satisfied that the operator is the person who will have control over the operation of the facility after the grant of the permit. The decision was taken in accordance with Environmental Permitting Regulations	✓

Aspect considered	Justification / Detail	Criteria met
		Yes
	(EPR) Regulatory Guidance Note 1 Understanding the meaning of operator.	
<b>European Directives</b>		
Applicable directives	All applicable European directives have been considered in the determination of the application.	✓
<b>The site</b>		
Extent of the site of the facility	<p>The operator has provided a plan which we consider is satisfactory, showing the extent of the site of the facility.</p> <p>The site plan has been updated to include the effluent discharge pipelines from the factory to the WWTP and the pipeline from the WWTP to the final discharge point at the River Inny. The original site plan is also retained to show the location of emission points to air and water. A third plan has been added to the permit to show the revised WWTP layout.</p> <p>A plan is included in the permit and the operator is required to carry on the permitted activities within the site boundary.</p>	✓
Biodiversity, Heritage, Landscape and Nature Conservation	<p>The application is within the relevant distance criteria of a site of heritage, landscape or nature conservation, and/or protected species or habitat .</p> <ul style="list-style-type: none"> <li>• There are two sites of special scientific interest within 2,000m of the installation; the River Camel and Bodmin Moor.</li> <li>• There are three Special Areas of Conservation within 10,000m of the installation; Tintagel Marsland &amp; Clovelly Coast, the River Camel and Crowdy Marsh.</li> <li>• One local wildlife site is located within 2,000m of the installation; North Bodmin Moor.</li> </ul> <p>A full assessment of the application and its potential to affect the sites and habitat has been carried out as part of the permitting process. We consider that the application will not affect the features of the site and habitat. An Appendix 4 and 11 proforma have been completed for the variation concluding that there is no significant</p>	✓

Aspect considered	Justification / Detail	Criteria met
		Yes
	<p>source-pathway-receptor mechanisms for impact.</p> <p>Formal consultation has been carried out with Natural England. The consultation responses (Annex 2) were taken into account in the permitting decision.</p>	
<b>Environmental Risk Assessment and operating techniques</b>		
Environmental risk	<p>We have reviewed the operator's assessment of the environmental risk from the facility.</p> <p>The operator's risk assessment is satisfactory.</p> <p>The operator has submitted a risk assessment with considerations to odour, noise and fugitive emissions please see key issues section for further information.</p>	✓
Operating techniques	<p>We have reviewed the techniques used by the operator and compared these with the relevant guidance notes.</p> <ul style="list-style-type: none"> <li>• How to comply with your Environmental Permit</li> <li>• Dairy and milk processing Sector (EPR 6.13)</li> </ul> <p>The proposed techniques/ emission levels for priorities for control are in line with the benchmark levels contained in the Technical Guidance Notes and we consider them to represent appropriate techniques for the facility. The permit conditions ensure compliance with relevant best available techniques reference documents (BREFs).</p>	✓
<b>The permit conditions</b>		
Updating permit conditions during consolidation.	<p>We have updated previous permit conditions to those in the new generic permit template as part of permit consolidation.</p> <p>The operator has agreed that the new conditions are acceptable.</p>	✓
Improvement conditions	<p>Based on the information on the application, we consider that we need to impose improvement conditions.</p> <p>We have imposed improvement conditions to ensure that:</p> <ul style="list-style-type: none"> <li>➤ appropriate measures are in place to ensure that accidents that may cause pollution are minimised.</li> <li>➤ the appropriate measures are in place to prevent fugitive emissions.</li> </ul>	✓

Aspect considered	Justification / Detail	Criteria met
		Yes
	<ul style="list-style-type: none"> <li>➤ the appropriate measures are in place to prevent annoyance from noise and vibration.</li> <li>➤ the appropriate measures are in place to prevent pollution from odour.</li> </ul> <p><b>IP11</b> – The operator shall complete a commissioning report of the upgraded WWTP with considerations to water quality, odour, and noise.</p>	
Incorporating the application	<p>We have specified that the applicant must operate the permit in accordance with descriptions in the application, including all additional information received as part of the determination process.</p> <p>These descriptions are specified in the Operating Techniques table in the permit.</p>	✓
Emission limits	<p>There is no change to the emission limits as a result of this variation.</p> <p>Emission point to air A6 (Thermo King Heater) has been removed from the permit as a result of this variation.</p>	✓
Monitoring	<p>We have decided that monitoring should be carried out for the parameters listed in the permit, using the methods detailed and to the frequencies specified.</p> <p>There is no change to the monitoring requirements as a result of this variation.</p>	✓
Reporting	<p>We have specified reporting in the permit.</p> <p>The operator is now required to report the production in tonnes of demineralised whey powder and prebiotic syrup on reporting form performance 1 (PI1).</p>	✓
<b>Operator Competence</b>		
Environment management system	<p>There is no known reason to consider that the operator will not have the management systems to enable it to comply with the permit conditions. The decision was taken in accordance with Regulatory Guidance Note 5 on Operator Competence.</p>	✓

## Annex 2: Consultation and web publicising responses

Summary of responses to consultation and web publication and the way in which we have taken these into account in the determination process.

Response received from
Public Health England (PHE) (response received 26/06/14)
Brief summary of issues raised
There is no qualitative risk assessment to support the application and therefore we (PHE) are unable to comment on public health risks from the installation. Provided the site is well regulated and managed we (PHE) would not expect there to be significant public health risks.
Summary of actions taken or show how this has been covered
No further action required.

Response received from
Local Authority (response received 09/07/14)
Brief summary of issues raised
Three complaints have been received in regards to noise and odour from the wastewater treatment plant in 2012. Request that regard should be given to the relevant noise conditions contained in planning references PA13/09828, PA14/01664 and PA14/04737.
Summary of actions taken or show how this has been covered
We have been involved with the planning permissions referred to and have considered the conditions with relevance to noise. Odour risk has been assessed within the application determination - please see Key Issues for further information on noise and odour.

Response received from
Natural England
Brief summary of issues raised
No response received.
Summary of actions taken or show how this has been covered
N/A

Response received from
Primary Care Trust
Brief summary of issues raised
No response received.
Summary of actions taken or show how this has been covered
N/A

Response received from
Health and Safety Executive
Brief summary of issues raised
No response received.
Summary of actions taken or show how this has been covered

N/A
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Response received from
Food Standards Agency
Brief summary of issues raised
No response received.
Summary of actions taken or show how this has been covered
N/A