

Permitting decisions

Variation (substantial)

We have decided to grant the variation for Kemsley Paper Mill operated by DS Smith Paper Limited.

The application is to change the effluent treatment process at the facility to replace the existing secondary aeration lagoon with an anaerobic digestion (AD) plant.

Bio-gas will be converted to bio-methane and injected into the national grid.

The mechanical treatment of pulping rejects will also increase from 55,000 tonnes per annum to a maximum of 78,000 tonnes per annum.

The variation number is [EPR/BJ7468IC/V010](#).

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 provides a record of the decision making process. It summarises the decision making process in the decision checklist to show how all relevant factors have been taken into account.

This decision document provides a record of the decision making process. It:

- highlights [key issues](#) in the determination
- summarises the decision making process in the [decision checklist](#) to show how all relevant factors have been taken into account
- shows how we have considered the [consultation responses](#)

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

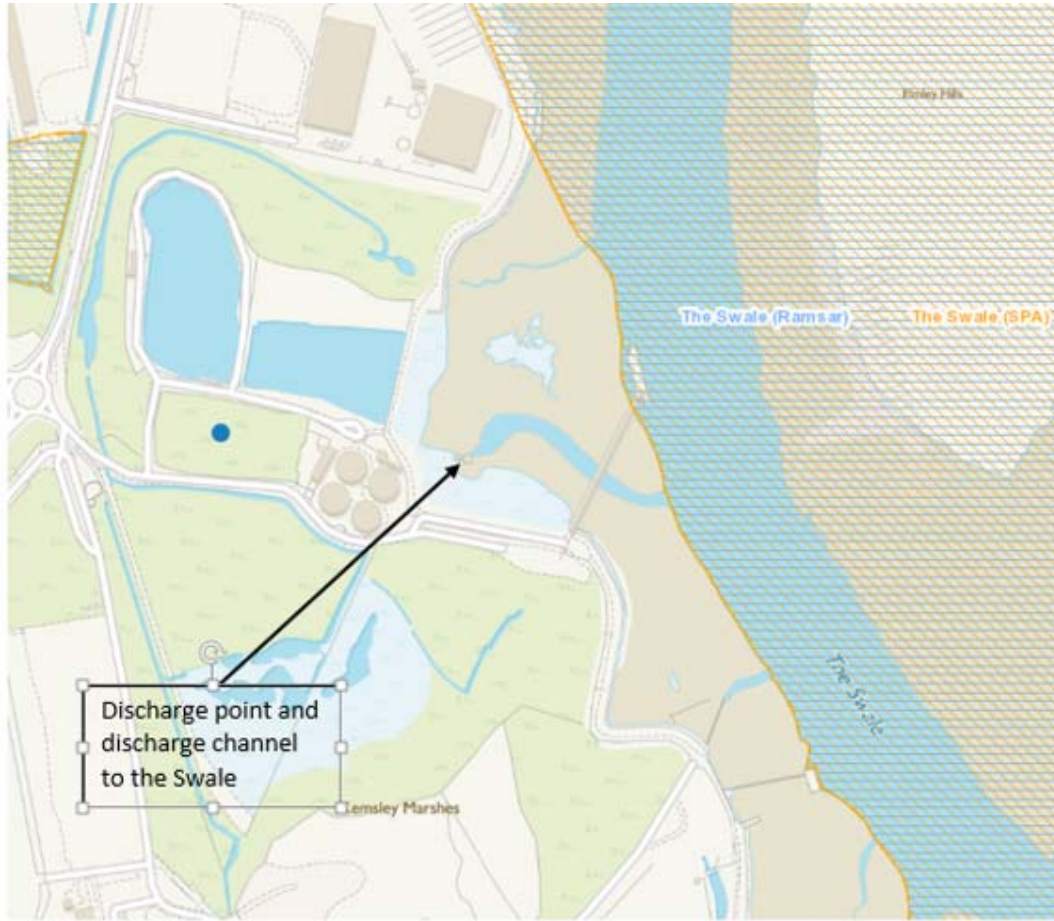
Read the permitting decisions in conjunction with the environmental permit and the variation notice. The introductory note summarises what the variation covers.

Key issues of the decision

Summary of the proposals

DS Smith Paper Ltd operate a paper mill at the Kemsley site that produces an array of products, from specialist papers to corrugated case materials used to make corrugated board. The main purpose of the installation is therefore the manufacture of various recycled paper products on three paper making machines.

Kemsley Mill is located near Kemsley, Kent ME10 2TD on the North Kent coast adjacent to the Swale estuary. The Swale is designated a Ramsar, special protection area (SPA), site of special scientific interest (SSSI) and Marine Conservation Zone (MCZ).



Scale bar: 0 100 m





The Swale is a complex of brackish and freshwater, floodplain grazing marsh with ditches, and intertidal saltmarsh and mudflat. These habitats together support internationally important numbers of wintering waterfowl. Rare wetland birds breed in important numbers. The saltmarsh and grazing marsh are of international importance for their diverse assemblages of wetland plants and invertebrates.

Aside from the Swale, the local area is largely industrial premises with some local residential housing.

This substantial variation is to modify the effluent treatment plant (ETP) by replacing the current secondary aeration lagoon with an anaerobic digestion (AD) process. The bio-gas produced will be upgraded/converted to bio-methane by the removal of moisture and other substances such as carbon dioxide, hydrogen sulphide and volatile organic compounds, prior to being injected into the national grid.

The proposed AD location lies just to the north of the main Kemsley site and immediately west of the existing aerobic treatment facility. The Swale flows approximately 200m to the east of the proposed development site.

The current treatment process at the site discharges to the Swale and the proposed discharge from the AD will not impact on the currently consented discharge limits (volume or chemical type/ level) other than an increase to the discharge temperature.

The operator is proposing increases to the discharge temperature as follows:

Hourly average from 30 C to 35 °C; and

Instantaneous from 35 °C to 38 °C.

There are also releases to air of Hydrogen Sulphide (H₂S) and Volatile Organic Compounds (VOCs) from the bio-gas upgrade plant at emission point 156.

The operator is also proposing to increase the tonnage of mechanical treatment of pulping rejects from 55,000 to 78,000 tonnes per annum. There are no additional emissions to air land or water as a result of the waste operation.

Discharge to the Swale

The current ETP is permitted to discharge to the Swale. The proposed changes to the effluent treatment process that relate to this variation may result in a change to the temperature of the discharge. The emission limits and monitoring requirements for all other parameters of the point source emission to water (Table S3.2 of the permit) remain unchanged. The following therefore only considers the impact of the temperature change.

The operator is proposing the permitted temperature of the discharge be increased as described above. There is a potential that the thermal plume resulting from the increased temperature may impact on the conservation objectives of the designated sites (Ramsar, SPA, SSSI and MCZ). Further details of the potential impact of the thermal plume on the designated sites are detailed in the Habitat Risk Assessments (Stage 1 and Stage 2), Marine Conservation Zone assessment and CRoW Appendix 4 that were submitted to Natural England 25 July 2018 and 20 August 2018 for consultation. These assessments are available on our public register.

The operator has modelled the thermal plume and impacts of a discharge temperature of 32.2 °C and completed an ecological assessment for this. This information is presented in the report 'Predicting temperature contours in the Swale estuary for the proposed increase in discharge temperature from the DS Smith Kemsley Paper Mill, Ecospan Environmental, June 2018'

The Environment Agency have reviewed this report and concluded that the modelling and information is reliable and support the conclusions of the ecological assessment.

The assessment demonstrates that at 32.2 °C, any ecological effects would be largely restricted to the effluent channel, and an area of the intertidal mudflats which fringe the channel and the impacts on the Swale would not be significant.

However, the assessment does not support the proposal to increase the hourly average temperature of the discharge to 35 °C and the instantaneous to 38 °C.

Concern was expressed over the cross-sectional area of the Swale and the area that the thermal plume/mixing zone would occupy and the subsequent impact of this on migrating fish. The British Energy Estuarine and Marine Studies (BEEMS) report states that it is good practice that the mixing zone should not occupy more than 25% of the cross-sectional area of an estuarine channel. The report reference is 'Thermal standards for cooling water from new build nuclear power stations – Scientific advisory report series 2011, no 8.'

Further information was requested from the operator with additional modelling carried out to confirm the areas of the plume where the temperature was ≥2°C above the ambient temperature. The percentage of the main channel cross-section of the Swale (at Kemsely) occupied by the plume was calculated. The results are tabulated below and show that the plume occupies more of the channel cross-section in winter conditions and in particular is greatest for the winter spring tide conditions. The maximum, 13.8%, is below the limit of 25% set in the BEEMS report.

Conditions	Percent of main channel cross-section affected by $\geq 2^{\circ}\text{C}$ above ambient
Summer spring tide	1.5%
Summer neap tide	3%
Winter spring tide	13.8%
Winter neap tide	9%

It was agreed that this addresses any concerns regarding the cross-sectional area of the thermal plume/mixing zone and demonstrates that more than 75% of the cross-section would be open to migration of fish.

The modelling and ecological assessment demonstrates that at the modelled discharge temperatures (of up to 32.2°C) there would be no significant impact on the designated sites of the Swale. However, it has not been demonstrated that there would be no significant impact at the higher temperatures applied for.

The operator has therefore agreed that the permit will limit the hourly average temperature of the discharge to 32°C and the instantaneous will remain at 35°C .

The operator will be required to submit a separate application to vary the environmental permit if they require the higher temperatures of 35°C for the hourly average and 38°C for the instantaneous. They will need to demonstrate, with additional modelling and actual temperature monitoring during the commissioning phase, that the higher temperatures will not have a significant impact. If we agree with this then we may allow an increase in the temperature; however this will be subject to consultation with Natural England.

It is proposed that during the commissioning phase quenching will be used, if required, to ensure the permit temperatures are not exceeded.

The operator has confirmed that a -2°C cooling-effect can be facilitated by a quenching effect of $\sim 139\text{ m}^3/\text{hr}$ of pond water at 15°C (this is the same effect that would be obtained from their Air Blast Coolers). This would take place before the Internal Circulation (IC) reactors.

It is estimated that the cooling required to meet the current permit limit, would only be required 14 days a year. If cooling is required, quenching may not be the most suitable approach for a permanent solution. We have therefore included an improvement condition requiring the operator to review further cooling measures.

Natural England have advised that the operation can go ahead, refer to Consultation section below.

Site containment proposals

The site containment proposals for the above ground tanks associated with the AD facility are as follows:

The proposals exclude the sludge buffer tank ($1 \times 1,400\text{ m}^3$) from the site containment.

Digestion of paper mill effluent is very different to that of a biomass plant. The biomass used to seed and the biomass produced is granular/bead like material which cannot flow.

The water is described as clear and contamination free and 'the sludge will not flow or infiltrate into the ground'.

The buffer tank contains digestate derived from AD of biodegradable matter and will have a high biochemical oxygen demand (BOD). This has the potential to impact ecological receptors and cannot be considered to be insignificant.

However, if we treat the contents of the buffer tank in the same way as the AD digester tanks or the contents of a typical digestate storage tank, this does not influence the outcome of the assessment undertaken by the operator. The assessment concludes that 'due to the nature of the digestate the potential impact of it reaching the Swale would be to the nutrient regime but this would not breach the permitted discharge amount. Adverse significant effects on The Swale is considered negligible.'

As the sludge buffer tank is smaller than the AD reactors (1,400 m³ compared with 2,000 m³) and is in a similar location with similar content, it was concluded that the outcome of the assessment is also valid for the sludge buffer tank. We agree with this conclusion.

The BAT assessment for the AD facility considers four containment options and concludes that "informal transfer system to adjacent lagoons with some escape allowed" is BAT.

The EPR 1.00 (withdrawn as internal guidance) states that all above-ground tanks containing liquids whose spillage could be harmful to the environment must be bunded. If secondary containment (bunding) is not practicable or structures are designed to work without secondary containment (such as lagoons and concrete effluent treatment plants) then appropriate measures to prevent or minimise leakage would include:

- regular maintenance and inspections to a written procedure;
- ensuring that any leakage is detected for example by monitoring boreholes or sampling adjacent watercourses.

There is no bunding of the AD facility; however the presence of lagoons 1 and 3 will ensure that any spills due to a catastrophic tank failure would be captured in them.

We have approved the site containment proposal and incorporated it into the operating techniques in Table S1.2 of the permit.

Additional conditions for the AD process

We have included the following conditions from our anaerobic digestion permit template:

3.6.1 & 3.6.2	Pests
2.5.1 and associated pre-operational conditions PO1	Table S1.4
process monitoring	Table S3.5
performance parameters	Table S4.2
additional definitions	Schedule 6

Bio-gas upgrade plant – emissions to air

Bio-gas produced by the AD facility will be converted to bio-methane for injection to the national grid. Bio-gas purification and upgrading will be achieved using a water wash unit and comprises a water wash tower, where carbon dioxide and hydrogen sulphide are removed, followed by a thermal-swing adsorption unit for drying of the resultant bio-gas.

There will be two emergency flares (one for bio-gas and one for bio-methane), these flares will meet the regulatory requirements and ensure that emissions are below bench-mark thresholds.

The operator carried out an assessment of the impact from the bio-gas upgrade plant (emission point 156) and the AD biomass storage tank vent (emission point 157) using the H1 screening tool. Hydrogen sulphide and total VOCs (ethylbenzene was used as a surrogate pollutant) were assessed. It is considered that the H1 assessment of emissions to air from the bio-gas upgrading plant to be sufficient for determination.

Air Impact Screening Stage One

Screen out Insignificant Emissions to Air

This page displays the Process Contribution as a proportion of the EAL or EQS. Emissions with PCs that are less than the criteria indicated may be screened from further assessment as they are likely to have an insignificant impact.

Number	Substance	Long Term		Long Term			Short Term		
		EAL	EAL	PC	% PC of EAL	> 1% of EAL?	PC	% PC of EAL	> 10% of EAL?
		µg/m3	µg/m3	µg/m3	%		µg/m3	%	
1	Hydrogen sulphide	140	150	0.0379	0.0271	No	0.954	0.636	No
3	Ethylbenzene	4,410	55,200	0.0307	0.000696	No	0.807	0.00147	No

The impact from the emissions are screened out as insignificant with the long term PC <1% of the Environmental Assessment Level (EAL) and the short term PC <10% of the EAL. No further assessment is required.

Calcium Carbonate/ash build up.

The Environment Agency considers calcification a potential issue for AD plants used in the paper and pulp industry due to the nature of the wastewater being treated. Calcification of reactors can cause operational issues and impact treatment efficacy. The operator has measured the current ash (calcium carbonate) content in biomass and will conduct further measurements during commissioning (to be detailed in the commissioning document). These values will give a baseline for evaluation of weekly results from the monitoring of the sampling points at the bottom of the internal circulation (IC) reactors that have been included in table S3.5 of the permit. If the build-up of ash is detected, the rate of biomass harvesting will be increased, thus removing the heavy (ash-rich) biomass.

It should also be noted that the site has been designed to avoid calcification. There is also a permanent feed to the reactors as the mill has three paper machines, with at least one in operation at all times.

Mechanical treatment of pulping rejects

The operator is also proposing to increase the tonnage of the existing permitted mechanical treatment of pulping rejects (activity reference AR10) from 55,000 to 78,000 tonnes per annum with the addition of a shredder. This increase in capacity means more of the rejects can be processed sustainably. Following mechanical treatment, wet fibrous paper is re-used on the paper machines, ferrous metals and mild steel are recycled, plastics are burnt in the on-site fluidised bed combustor and refuse derived fuel is incinerated with energy recovery.

We are satisfied that the operator will have measures in place to control the additional risks.

Additional changes as a result of this variation

Lorry vehicle wash	There is no longer a connection from the lorry wash to the sewer, with waste water recirculated and effluent disposed of off-site. The directly associated activity, reference A6 in Table S1.1 for the release to sewer is deleted together with the point source emission for the release to sewer, S1 in Table S3.3 of the permit.
Air emission points	Two of the emissions to air in Table 3.1 of the permit are amended as shown below. This was the result of minor operational changes to the vacuum system that we agreed in December 2016; however the permit was not updated at that time. The benefit of this was a reduction in noise and energy use, with no change to emissions or operations. <ul style="list-style-type: none">• amend emission point 114 to 114a/114b and amend the source from Nash Pump Exhaust to blower exhausts; and• amend emission points 120-121 to 121a/121b and amend the source from Sulzer Blower vents to blowers exhausts. The site plan (drawing K046-T-LD-023538) showing the point sources has also been updated.
Annual limits	Annual limits in Table S3.4 of the permit are updated. For integrated or multi product mills, the BAT AEL range is calculated according to a mixing rule based on their share of the discharge. The original limits were set based on a mixing calculation in accordance with the BAT Conclusions, such that 30% of the operations related to de-inked recycled fibre (RCF) and 70% were RCF without de-inking. The operator confirmed that the proportion is actually 10 % and 90 % respectively. We have amended the limits in accordance with current operations.
Sludge	We have included an improvement condition in Table S1.3 of the permit for the operator to assess the impact of burning the sludge produced from the new effluent treatment process in the K2 incinerator.
Process monitoring	We have also included the requirement to monitor the ash content of the biomass in Table S3.5 of the permit.
Internal waste transfer	We have added Table S2.4 to allow the multi-operator installation to be flexible in its approach to waste management.

Decision checklist

Aspect considered	Decision
Receipt of application	
Confidential information	A claim for commercial or industrial confidentiality has not been made.
Identifying confidential information	We have not identified information provided as part of the application that we consider to be confidential. The decision was taken in accordance with our guidance on confidentiality.
Consultation/Engagement	
Consultation	The consultation requirements were identified in accordance with the Environmental Permitting Regulations and our public participation statement. The application was publicised on the GOV.UK website. We consulted the following organisations: Natural England Local Authority - Planning Local Authority – Environmental Health Health and Safety Executive No responses were received from the Local Authority or the Health and Safety Executive. Responses were received from Natural England and are summarised in the consultation section .
The facility	
The regulated facility	We considered the extent and nature of the facility/facilities at the site in accordance with RGN2 'Understanding the meaning of regulated facility', Appendix 2 of RGN 2 'Defining the scope of the installation', Appendix 1 of RGN 2 'Interpretation of Schedule 1', guidance on waste recovery plans and permits. The extent of the facility is defined in the site plan and in the permit. The activities are defined in Table S1.1 of the permit.
The site	
Extent of the site of the facility	The operator has provided a plan which we consider is satisfactory, showing the extent of the site of the facility including the discharge points. The plan is included in the permit.
Biodiversity, heritage, landscape and nature conservation	The application is within the relevant distance criteria of a site of heritage, landscape or nature conservation, and/or protected species or habitat. We have assessed the application and its potential to affect all known sites of nature conservation, landscape and heritage and/or protected species or habitats identified in the nature conservation screening report as part of the permitting

Aspect considered	Decision
	<p>process.</p> <p>Refer to key issues section above for further details for the assessment of the potential impacts on biodiversity, heritage, landscape and nature conservation and how the conclusion was reached that there would be no likely significant effect on the designated sites.</p> <p>Operational controls / emission limits / conditions have been placed in the permit to protect the Swale SPA, Ramsar, SSSI and MCZ.</p> <p>We have consulted Natural England on our MCZ assessment, Habitats Regulations and SSSI assessments, and taken their comments into account in the permitting decision. Further details on the comments received from Natural England can be seen in the Consultation section below.</p> <p>The decision was taken in accordance with our guidance.</p>
Environmental risk assessment	
Environmental impact assessment	<p>In determining the application we have considered the Environmental Statement.</p> <p>We have also considered the planning permission and the committee report approving it.</p>
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 assessment shows that, applying the conservative criteria in our guidance on environmental risk assessment all emissions may be categorised as environmentally insignificant.</p> <p>Refer to the key issues section above for further information on the emissions from the bio-gas upgrade plant and associated H1 modelling.</p>
Operating techniques	
General operating techniques	<p>We have reviewed the techniques used by the operator and compared these with the relevant guidance notes and we consider them to represent appropriate techniques for the facility.</p> <p>The operating techniques that the applicant must use are specified in Table S1.2 in the environmental permit.</p>
Operating techniques for emissions that screen out as insignificant	<p>Emissions of hydrogen sulphide and VOC (modelled as ethylbenzene) associated with the bio-gas upgrade plant have been screened out as insignificant, and so we agree that the operator's proposed techniques are BAT for the installation.</p> <p>We consider that the emission limits included in the environmental permit reflect the BAT for the sector.</p>
Permit conditions	
Use of conditions other than those from the template	<p>Based on the information in the application, we consider that we do not need to impose conditions other than those in our permit template.</p>

Aspect considered	Decision
Waste types	<p>We have specified the permitted waste types, descriptions and quantities, which can be accepted at the regulated facility.</p> <p>We are satisfied that the operator can accept these wastes for the following reasons:</p> <ul style="list-style-type: none"> • they are suitable for the proposed activities • the proposed infrastructure is appropriate; and • the environmental risk assessment is acceptable.
Pre-operational conditions	Based on the information in the application, we consider that we need to impose a pre-operational condition to ensure that the Environmental Management System (EMS) is updated accordingly with the procedures for the AD facility, refer to Management system below.
Improvement programme	<p>Based on the information in the application, we consider that we need to impose an improvement programme.</p> <p>Refer to the key issues section for further details on the improvement programme that has been imposed.</p>
Emission limits	<p>The current emission limits have not been amended other than the temperature of the discharge. Refer to the key issues section above for further details.</p> <p>We have added the necessary emissions limits in accordance with our AD permit template. These have been added to Table S3.1 of the permit for emission points 154 and 155.</p>
Monitoring	<p>We have imposed additional monitoring in Table S3.1 of the permit for emission points 154 to 157 in accordance with our AD permit template.</p> <p>The other monitoring has not changed as a result of this variation.</p>
Operator competence	
Management system	<p>There is no known reason to consider that the operator will not have the management system to enable it to comply with the permit conditions.</p> <p>The operator has an established management system to comply with environmental permit decisions. We have reviewed the operator's submissions on Technical Competence (BJ7468IC Technical Competence V2) and proposed amendments to the EMS (DS Smith BJ7468IC EeMS Report V2) to cover the processes covered by this variation. We have included a pre-operational condition to secure compliance with this.</p>
Growth Duty	
Section 108 Deregulation Act 2015 – Growth duty	<p>We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit.</p> <p>Paragraph 1.3 of the guidance says:</p> <p>“The primary role of regulators, in delivering regulation, is to achieve the</p>

Aspect considered	Decision
	<p>regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation.”</p> <p>We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.</p> <p>We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.</p>

Consultation

The following summarises the responses to consultation with other organisations, our notice on GOV.UK for the public and the way in which we have considered these in the determination process.

Response received from
Natural England 22 August 2018 - Marine & Coastal Adviser - MCZ Assessment
Brief summary of issues raised
Natural England agree with the conclusions made in the MCZ assessment. They confirm that having reviewed the evidence relating to the site they believe that the works will not hinder the conservation objectives of this site; so long as they are undertaken in strict accordance with the information provided by the applicant. They welcome our requirement for additional monitoring and modelling before the higher temperature regime is considered.
Summary of actions taken or show how this has been covered
The operator will be required to submit an application to vary their environmental permit prior to our consideration of higher temperatures. We have set an improvement condition for the operator to review the need for further cooling measures to ensure compliance with the temperature requirements.

Response received from
Natural England 23 August 2018 - Lead advisor - Stage 2 Habitat Risk Assessment (HRA)
Brief summary of issues raised
Natural England advise that that the operation can go ahead as long as they are consulted again if the temperature limit is raised. They confirm that they are satisfied with the HRA and have no objection to the permit variation.
Summary of actions taken or show how this has been covered
The operator will be required to submit an application to vary their environmental permit prior to our consideration of higher temperatures. If this is the case we will consult with Natural England.