

# Consultation on our decision document recording our decision-making process

The Permit number is: EPR/BJ7590IB  
The Operator is: Holmen Iggesund Paperboard Limited  
The Installation is: Workington Board Mill  
This Variation Notice number is: EPR/BJ7590IB/V006

Consultation commences on: 24/07/2022  
Consultation ends on: 24/08/2022

## What this document is about

This is a draft decision document, which accompanies a draft Consolidated Variation Notice.

It explains how we have considered the Applicant's Application, and why we have included the specific conditions in the draft permit we are proposing to issue to the Applicant. It is our record of our decision-making process, to show how we have taken into account all relevant factors in reaching our position. Unless the document explains otherwise, we have accepted the Applicant's proposals.

The document is in draft at this stage, because we have yet to make a final decision. Before we make this decision we want to explain our thinking to the public and other interested parties, to give them a chance to understand that thinking and, if they wish, to make relevant representations to us. We will make our final decision only after carefully taking into account any relevant matter raised in the responses we receive. Our mind remains open at this stage: although we believe we have covered all the relevant issues and reached a reasonable conclusion, our ultimate decision could yet be affected by any information that is relevant to the issues we have to consider. However, unless we receive information that leads us to alter the conditions in the draft Consolidated Variation Notice, or to reject the Application altogether, we will issue the Consolidated Variation Notice in its current form.

In this document we frequently say "we have decided". That gives the impression that our mind is already made up; but as we have explained above, we have not yet done so. The language we use enables this document to become the final decision document in due course with no more re-drafting than is absolutely necessary.

We try to explain our decision as accurately, comprehensively and plainly as possible. Achieving all three objectives is not always easy, and we would welcome any feedback as to how we might improve our decision documents in future. A lot of technical terms and acronyms are inevitable in a document of this nature: we provide a glossary of acronyms near the front of the document, for ease of reference.

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## Glossary of acronyms used in this document

(Not all of these acronyms are necessarily used in this document.)

BAT	Best Available Technique(s)
BAT-AEL	BAT Associated Emission Level
BAT-AEPL	BAT associated environmental performance levels
BATc	BAT conclusion
BREF	Best available techniques reference document
CBA	Cost Benefit Analysis
CHP	Combined heat and power
COD	Chemical oxygen demand
DAA	Directly associated activity – Additional activities necessary to be carried out to allow the principal activity to be carried out
DD	Decision document
Derogation	from BAT AELs stated in BAT Conclusions under specific circumstances as detailed under Article 15(4) of IED where an assessment shows that the achievement of emission levels associated with the best available techniques as described in BAT conclusions would lead to disproportionately higher costs
EAL	Environmental assessment level
ELV	Emission limit value derived under BAT or an emission limit value set out in IED
EMS	Environmental Management System
EPR	Environmental Permitting (England and Wales) Regulations 2016 (SI 2010 No. 1154)
EQS	Environmental quality standard
ETP	Effluent treatment plant
EU-EQS	European Union Environmental Quality Standard
IED	Industrial Emissions Directive (2010/75/EU)
NPV	Net Present Value
N	Nitrogen
PC	Process Contribution
PEC	Predicted Environmental Concentration
P	Phosphorous
SAC	Special Area of Conservation
SGN	Sector guidance note
SHPI(s)	Site(s) of High Public Interest
SSSI(s)	Site(s) of Special Scientific Interest
TGN	Technical guidance note
TSS	Total Suspended Solids
WFD	Water Framework Directive (2000/60/EC)

# 1 Our proposed decision

We are minded to issue the Consolidated Variation Notice to the Operator. This will allow it to continue to operate the Installation, subject to the conditions in the draft Consolidated Variation Notice. The way we assessed the Operator's request for derogation and how we subsequently arrived at our conclusion is recorded in this document.

We consider that, in reaching that decision, we have taken into account all relevant considerations and legal requirements and that the varied permit will ensure that a high level of protection is provided for the environment and human health.

The draft Consolidated Variation Notice contains many conditions taken from our standard Environmental Permit template including the relevant Annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the Notice, we have considered the techniques identified by the operator for the operation of their installation, and have accepted that the details are sufficient and satisfactory to make those standard conditions appropriate.

## **2 How we reached our draft decision**

### **2.1 Receipt of Application**

The Application was duly made on 13/04/2021. This means we considered it was in the correct form and contained sufficient information for us to begin our determination but not that it necessarily contained all the information we would need to complete that determination: see below.

### **2.2 Commercial confidentiality**

The Applicant claimed that certain information was commercially confidential and should be withheld from the public register. We considered this request and determined that the information claimed as confidential was commercially sensitive in relation to the operator's commercial strategy and critical in their competitiveness.

We have determined that the following information included in the application and subsequent responses to information notices (Schedule 5 Notices), is confidential and should be excluded from the public register:

- Cost Benefit Analysis IPW BJ7590IB CBA including revisions 1, 2, 3 and 4.
- Additional information in support of the CBA dated 08/04/2022

We decided that the confidentiality of the information in the scope of the applicant's claim is provided by law to protect a legitimate economic interest and, taking account all circumstances, the public interest in maintaining the confidentiality outweighs the public interest in including it in the public register, in accordance with the criteria in Regulation 51(c) (i), (ii) and (iii) of EPR.

The Applicant provided an overview of the CBA outcome within the application documentation to ensure that information included in the Public Register allows public understanding of the scope of the application, adequate technical inputs and details, full understanding of environmental risk assessment, results and outcomes of cost benefit analyses. All the information related to emissions has been included in the Public Register and the information withheld has been kept to a minimum.

Apart from the issues and information just described, we have not received any information in relation to the Application that appears to be confidential in relation to any party.

### **2.3 Change of Company Name**

The registered legal name at Companies House has changed from Iggesund Paperboard (Workington) Ltd to Holmen Iggesund Paperboard Ltd, with effect from 1st December 2021.

The company number and operating address remain unchanged.

## **2.4 Requests for Further Information**

Although we were able to consider the Application duly made, we did in fact need more information in order to determine it. Additional information and clarification of the derogation application was requested on 24/08/2021 and a response was received on 13 October 2021 and further information was requested on 14 December 2021 and a response was received on 14 January 2022. A copy of each information notice was placed on our public register, along with the additional documentation submitted by the Operator in response to these notices, except in the cases when we determined that this information was commercially confidential (see above).

## **2.5 How we will consider the responses from public consultation**

Having carefully considered the Application and all other relevant information, we are now putting our draft decision before the public and other interested parties in the form of a draft Consolidated Variation Notice, together with this explanatory document. As a result of this stage in the process, the public has been provided with all the information that is relevant to our determination and we have given the public the opportunity to make comments. Once again, we will consider all relevant representations we receive in response to this consultation and will amend this explanatory document as appropriate to explain how we have done this, when we publish our final decision.

We are consulting on our draft decision. A summary of the consultation responses and how we have taken into account all relevant representations is shown in Annex 4.

### 3 The legal framework

The Consolidated Variation Notice will be issued, if appropriate, under Regulation 20 of the EPR. The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the regulated facility is:

- an *installation* as described by the IED;
- subject to aspects of other relevant legislation which also have to be addressed.

We consider that, if it is issued, the Consolidated Variation Notice will ensure that the operation of the Installation complies with all relevant legal requirements and that a high level of protection will be delivered for the environment and human health.

We explain how we have addressed specific statutory requirements more fully in the rest of this document.

We have set the ELVs in line with the BAT Conclusions other than for those parameters for which a derogation was sought as detailed in Annex 1 of this document. The emission limits and monitoring tables have been incorporated into Schedule 3 of the permit.

#### Article 15(4)

The IED enables a competent authority to allow derogations from BAT AELs stated in BAT Conclusions under specific circumstances as detailed under Article 15(4):

By way of derogation from paragraph 3, and without prejudice to Article 18, the competent authority may, in specific cases, set less strict emission limit values. Such a derogation may apply only where an assessment shows that the achievement of emission levels associated with the best available techniques as described in BAT conclusions would lead to disproportionately higher costs compared to the environmental benefits due to:

*(a) the geographical location or the local environmental conditions of the installation concerned; or*

*(b) the technical characteristics of the installation concerned.*

#### Cost Benefit Analysis

If a derogation is potentially applicable then Cost Benefit Analysis (CBA) is undertaken. The CBA allows calculation to indicate whether the costs of compliance are greater or less than the environmental benefits.

It essentially groups all the costs on one side, with all the benefits, as far as possible, on the other side. It then includes the effect of time on the value of those costs and benefits in order to produce a Net Present Value (NPV).



This gives an indication of whether those costs are disproportionate or not, but there are many sensitivities in the analysis and many aspects of the environment that cannot yet be monetised so the actual decision on disproportionality rests with the Regulator.

Where the NPV is positive, this indicates that the cost of compliance with the BAT AEL(s) does not outweigh the environmental benefits.

Where the NPV is negative, this indicates that the costs of compliance with the BAT AEL(s) outweigh the environmental benefits.

### Growth duty

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 variation.

Paragraph 1.3 of the guidance says:

“The primary role of regulators, in delivering regulation, is to achieve the 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.”

We have addressed the legislative requirements and environmental standards to be set for this operation in this decision document. 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.

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.

## 4 Overview of the site and installation

The Workington site is a paperboard manufacturing operation within the Iggesund Paperboard AB business area, part of the Holmen Group. The Holmen Group is a Swedish stock market listed forest products company.

The site is situated in Siddick, just north of Workington on the A596 road to Maryport. The location is approximately 0.5 km from the Solway coast.

The main purpose of the installation is the manufacture of virgin fibre-based folding box board. This board grade provides high quality product to the food, pharmaceutical, drinks, tobacco and graphical markets. Production in 2019 was 240kT. Approximately 50% of the product is retained in the UK home market and the rest is exported, mainly to mainland Europe.

Folding box board is a virgin fibre multiply grade. Mechanical pulp constitutes the middle 3 plies, chemical pulp is used for the outer plies. Both sides can be coated with a pigment dispersion. The Workington mill is semi-integrated, meaning the mechanical pulp is produced on site using UK-sourced Sitka spruce. Pulp for the outer plies is chemical (kraft) pulp and is purchased from outside the UK. The coating is a stabilised calcium carbonate / kaolin based dispersion applied at 3 in-line boardmachine blade coaters.

The manufacturing process has the following key units:

- Woodyard: receipt of roundwood logs and sawmill chips, debarking, chipping and storage
- Pulpmill: main chip refining (CTMP), screening, alkaline peroxide bleaching, stock preparation, silo storage
- Coating and chemical plant: receipt and storage of bleaching, coating and process chemicals, preparation of coating mixes.
- Board machine (BM2): 5.5m wide machine, 5 fibre plies, 3 coating stations, size press, MG cylinder, winder
- Finishing plant: reel store, sheeters, reel and pallet wrappers, despatch

The main processes are supported by an on-site freshwater treatment plant and primary effluent plant.

Freshwater is taken from the River Derwent at Barepot, supplied by the regional water utility company and treated on site.

The effluent plant, which is the main subject of this permit variation application, comprises 2 primary clarifiers, thickening tanks and vertically fed screw presses. Sludge is removed from site and finds re-use and recovery applications.

The final effluent is discharged, under the conditions of the permit, to the Solway receiving waters via a dedicated outfall pipe. The end of the pipe is submerged but lies close to the shoreline under low water tidal conditions.

Electricity and thermal heat are provided to the mill processes by an on-site biomass-fired CHP plant. The plant comprises a fuel handling and A-frame storage facility, a 150 MW thermal input bubbling fluidised bed boiler and 50 MW condensing steam turbine / generator set. The site is self-sufficient in energy needs and exports electricity to the National Grid. The power plant is registered on the Ofgem Renewable and CHP register. All energy is deemed and verified as renewable and sustainable.

As a back-up, there are 2 auxiliary gas boilers which can provide steam to the process and electrical power can be imported from the Grid.

The site has been operational for over 50 years.

These activities fall under the following descriptions in Part 2 of Schedule 1 of the Environmental Permitting Regulations (EPR) 2016:

- Section 1.1 Part A(1)(a) - Burning any fuel in an appliance with a rated thermal input of 50 megawatts or more.
- Section 5.4 Part A(1)(a)(i) - Disposal of non-hazardous waste with a capacity exceeding 50 tonnes per day (or 100 tonnes per day if the only waste treatment activity is anaerobic digestion) involving biological treatment. (Added as part of this variation to include the anaerobic digestion plant).
- Section 5.4 Part A(1)(a)(ii) Disposal of non-hazardous waste with a capacity exceeding 50 tonnes per day by physio-chemical treatment.
- Section 6.1 Part A(1)(a) - Producing, in industrial plant, pulp from timber or other fibrous materials.
- Section 6.1 Part A(1)(b) - Producing, in industrial plant, paper and board where the plant has a production capacity of more than 20 tonnes per day.

Other directly associated activities carried out at the installation include: Generation of electricity using a single steam turbine, fuel receipt, storage and processing prior to use in biomass boiler, treatment of raw water supply in a sand filtration plant for use in pulp and paperboard production and biomass CHP plant and treatment of boiler makeup water (demineralisation).

## 5 Key Issues

The key issues arising during the determination of this variation application are the review and assessment of the derogation application from meeting BAT conclusion 40 and 50 of Best Available Techniques Conclusions Document for the production of pulp, paper and board, 2014/687/EU, published on 30/09/2014.

We therefore describe how we determined these issues in more detail in the following sections of this document.

### 5.1 Description of Derogation request

To extend the previously granted time limited derogation for BAT 40 and BAT 50 of the BAT Conclusions for the Production of Pulp, Paper and Board and their associated BATAEL's for the emissions to water to a non-time limited derogation of BAT 40 and BAT 50.

The non-time limited derogation for the BATAEL's (BAT40 and BAT50) is for TSS, COD and P and is based on the technical characteristics of the mill. These limits are to be extended from 31/12/2021 to the 31/12/2024, the higher limits to apply thereafter until the next BREF review.

Key to this derogation is BATc 14. This specifies that both primary (physico-chemical) and secondary (biological) treatments will be used. The revised timescale is also based on the technical characteristics of the mill, extends the time from 31/12/2021 to the 31/12/2024.

The new emission limits are based on the planned primary treatment plant and the proposed secondary biological treatment (i.e. a derogation against BAT conclusions 40 and 50) and timescales for these limits to be set taking into account the construction timescales. Hence the revised timescale for implementing secondary treatment. (NB: No derogation is being sought for Nitrogen).

### 5.2 Background and Operator's proposal

The Operator was not able to meet the BAT AELs as defined in BAT Conclusion 52 and Table 17 of the BAT Conclusions by the BAT Conclusions implementation date of 28/10/2018. In 2018 we granted a time limited derogation to the Operator (variation No. EPR/FP3139FN/V009), valid until 31/12/2020, but the Operator was not able to meet this deadline and have applied for a further derogation.

The Operator has applied for one derogation that covers the relevant BATAEL's for this mill. This application for a variation has been made to request a non-time limited derogation from BAT Conclusion BAT 40 and BAT 50. The non-time limited derogation for the BATAEL's (BAT40 and BAT50) is for TSS, COD and P and is based on the

technical characteristics of the mill. Pursuant to article 15(4)(b) of the Industrial Emissions Directive (IED). These limits are to be extended from 31/12/2021 to the 31/12/2024, the higher limits to apply until the next BREF review.

The BAT AELs relevant to this derogation application are found in the (BAT) conclusions, Directive 2010/75/EU, for the production of pulp, paper and board dated 26/09/2014.

- **Table 17 under BAT Conclusion 40**
- **Table 20 under BAT Conclusion 50**

For semi-integrated multi-product pulp and paper mills, the BAT-AELs are defined for the individual processes (pulping, papermaking) and products need to be combined according to a mixing rule based on their additive shares of discharge. For Workington Mill this is;

- **at the ratio of 70% Table 17 BAT AELs (CTMP pulp mill), BAT 40, and**
- **at the ratio of 30% Table 20 BATAELs (paper making) BAT 50**

The resultant BAT AELs apply to the direct waste water discharge to receiving waters.

- **BAT Conclusion 40.** In order to reduce fresh water use, waste water flow, and the pollution load from the pulping activity, BAT is to use a suitable combination of the techniques specified in BAT 13, BAT 14, BAT 15 and BAT 16 and various techniques to reduce pollution load and waste water flow from the pulping activity given in the techniques table under BAT40.
- **BAT Conclusion 50.** Is to use a suitable combination of the techniques specified in BAT 13, 14, 15, 47, 48 and BAT 49 to prevent and reduce the pollution load of waste water into receiving waters from the whole mill and Table 20 sets out BAT-associated emission levels (AELs) for the direct waste water discharge to receiving waters from a non-integrated paper and board mill (excluding speciality paper) that apply to this emission.

There are no valid applicability exclusions.

The BREF provides a list of suitable techniques to be used in order to achieve the BATAELs for the direct waste water discharge to receiving waters. Compliance with the BATAEL is to be achieved by using a suitable combination of those techniques, in this case: key to this derogation is BATc 14;

- **BAT Conclusion 14.** In order to reduce emissions of pollutants into receiving waters, BAT is to use all of the techniques given below.
  - a) Primary (physico-chemical) treatment and
  - b) Secondary (biological) treatment

The new emission limits are based on the planned primary treatment plant and the proposed secondary biological treatment (ie. a derogation against BAT conclusions 40 and 50) and timescales for these limits to be set taking into account the construction timescales. Hence the revised timescale for implementing the secondary treatment

The approach throughout has been:

1. Reduce emissions at source where possible.
2. Upgrade existing primary effluent treatment plant.
3. Design and install secondary biological treatment plant.

The purpose behind this approach is to focus on preventing emissions ahead of any end-of-pipe treatment. By reducing the volume and quantity of effluent, the scale, and therefore the impact, of the effluent treatment can be optimised.

These reductions have included, among other activities:

- Changed bleaching recipe, with partial substitution of sodium hydroxide by magnesium hydroxide, giving reduced COD generation per tonne of pulp. The impact on the final effluent was a reduction of approximately 20%.
- The coating stations on the board machine have been modified to reduce pigment loss to the effluent system. This work is ongoing.
- The recent size press replacement on the board machine is expected to give a COD reduction in the final effluent close to 10%. It is likely that the poor mechanical condition of the former size press may explain some of the higher COD levels before it was replaced.
- Heat Recovery projects have enabled the effluent temperature to be reduced nearer to the appropriate conditions for secondary biological treatment.

### **5.3 Background to Second Derogation Request.**

The initial derogation was based on a staged implementation of the improvement plan within the V005 variation, with the primary treatment plant to be upgraded in preparation for the secondary stage to be added. This would allow time for the process optimisation work to be carried out and the benefit to the effluent quality confirmed.

However, the review of the existing primary treatment plant identified that it was not viable to be upgraded and should be replaced. This was due to outdated design as well as its ageing structures which are now in extremely poor condition. At this stage it was recognised that combining the primary and secondary plant design and construction would be preferable in order to streamline the process based on primary settling, secondary moving bed biofilm reactor (MBBR) with settling, and sludge thickening.

However, detailed ground surveys were carried out for the proposed location of the plant, which identified that the geological conditions in that area were not suitable for supporting the size of basins required. The recommendation was to relocate the plant to a more stable area.

No parcel of land large enough could be created. Alternative off-site options were investigated but is situated on land which is too close to residential properties. The scale of the plant required became a concern in terms of complexity and capital investment costs but also for the likely impact on the residential area. For example, the structures would be close to 10m tall and very close to the neighbouring houses.

Costs had escalated due to the increased scale and revised location of the plant. Therefore, it was concluded that a significant reduction in emissions of COD and TSS can be achieved with a simpler effluent treatment plant (AD treatment of the pulpmill stream only, followed by primary treatment of the combined effluent with associated sludge thickening). This plant can be built within the site boundary and will minimise the negative impacts on the local area. The Cost Benefit Analysis supports the conclusion that this is the appropriate option.

In addition, Iggesund intend to decouple the design and construction work for the primary treatment and AD pre-treatment. The ageing status of the current ETP calls for the work on the primary treatment plant to be carried out quickly (Phase 1). The full technical details for the AD stage (Phase 2) still need finalising mainly to ensure the design is suitable for the specific characteristics of the pulpmill COD, following the refining and bleaching chemistry changes over recent years. (these will be subject to pre-operational conditions).

A derogation is also requested against the BAT-AEL for phosphorus emissions to the Solway Firth. This is based on the technical characteristics of the process, combined with the local environmental conditions in the receiving waters. The Phosphorus emission levels are averaging 0.022 kg/t in 2018-2020, but the BAT-AEL is lower still at 0.011 kg/t.

Sampling and analysis of the freshwater and wastewater streams has been able to explain very little of the phosphorus sources. The measured values are small, making it difficult to be confident in the data. The most likely source of the phosphorus is from the wood raw material itself, with the highest concentration measured after the chip washing stage. It is likely that the bleaching process releases phosphorus from the fibres, which then reaches the effluent system. Small amounts of phosphorus are also present in the chemicals used for the CHP water pH control systems. No other sources of phosphorus have been identified in the mill processes.

The derogation request for phosphorus emissions to the Solway Firth is primarily based on the Workington mill's technical characteristics. The Pulp & Paper BREF

document includes data on the typical nutrient levels observed in a variety of pulpmills. This shows that the level of phosphorus in untreated wastewater for a bleached CTMP mill can be expected to be in the range 50-60 g/t, (or 0.05 – 0.06 kg/t, expressed in the same units as the mill permit AELs). The mill's phosphorus emissions averaged 0.022 kg/t in the period 2018-2020, and are typically between 0.02 – 0.03 kg/t. Comparison with the BREF benchmark indicates that these levels are not unreasonable for this type of process.

Comparison of measured concentrations to and from the mill do show that there is an increase in phosphorus within the system. The only identified added chemical source of phosphorus is in the CHP plant as part of the water treatment systems. The quantities used in this location are very small, however, and account for no more than 2% of the emissions to the Solway.

It is considered most likely that the phosphorus arises from the wood raw material itself, given that trees are known to contain quantities of nutrients and metals absorbed from the ground. There may additionally be an amount from the chemical pulp stream, but this is less likely given that any nutrients will have been washed out during the pulping process and into the effluent stream in the producing mill. The quantities present do not explain the full increase between incoming water and the effluent stream, but they will have contributed to the final level. Similarly, some seasonal variation can be seen in the incoming freshwater composition, which may be related to agricultural land upstream of the Workington Mill.

The Solway Firth has a high tidal range and repeated surveys have demonstrated that there is not an impact on the shoreline around the outfall pipe from the relatively small quantities of phosphorus.

The requested derogation will not exceed these historical emission levels and can therefore be considered to carry the same low risk of harm to the local environment.

Treatment to reduce the phosphorus levels in the final effluent, such as chemical precipitation, would create its own waste streams. This must be evaluated against the minimal benefit to the receiving waters and is reflected in the cost benefit analysis conclusions.

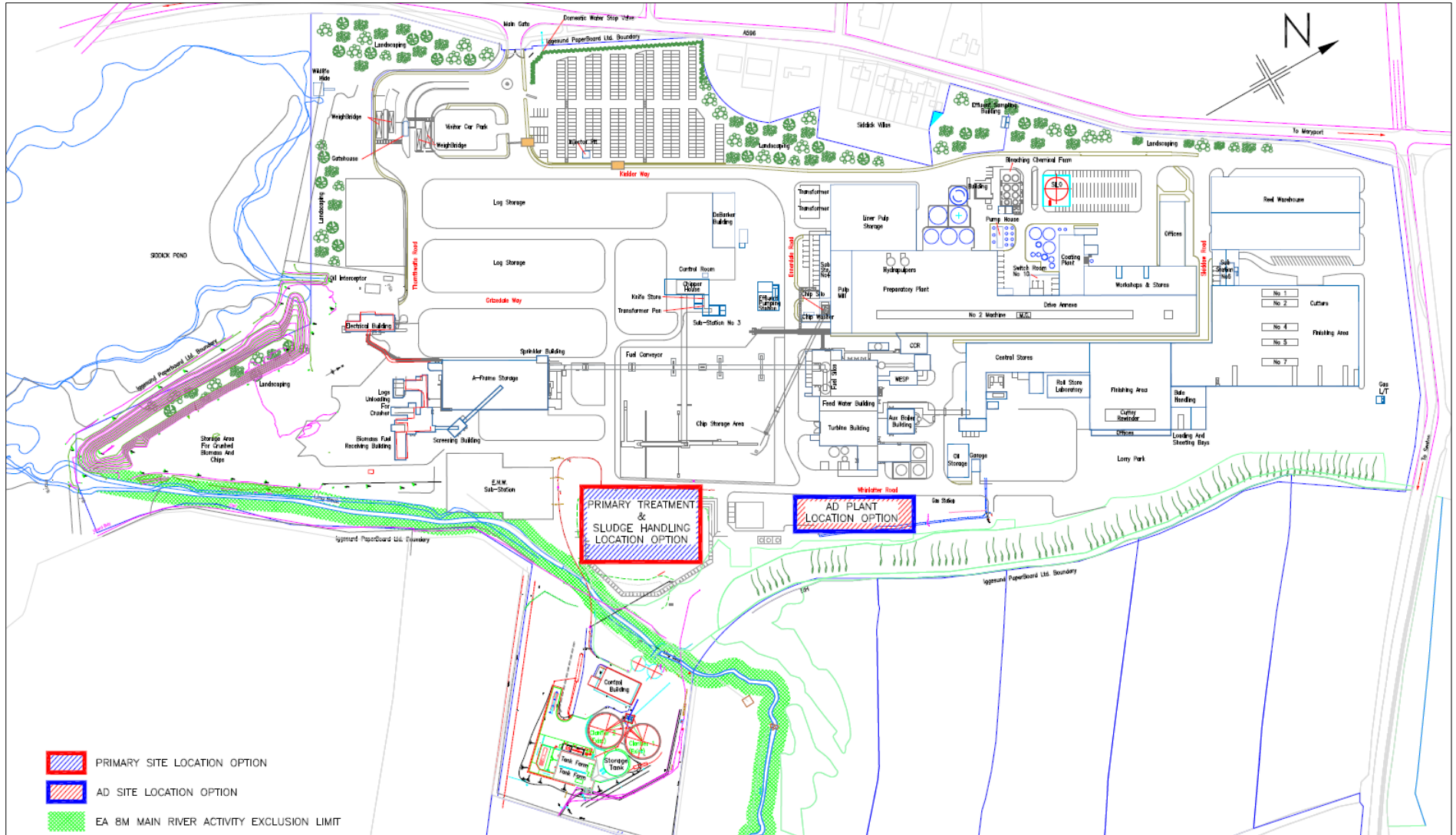
Once the AD biological treatment has been commissioned it will be possible to control the nutrient levels in the pulpmill wastewater stream by balancing the AD nutrient requirements to compensate. Earlier pilot trial work has indicated that it should not be necessary to add further phosphorus and only a small amount of nitrogen when treating the pulpmill wastewater stream. This will be considered within the detailed design of the AD plant. Given that phosphorus is not intentionally added in the mill processes, there is no feasible route to reduce the nutrient levels in the effluent, it is not something that can be directly controlled within the production process itself.



Although it is expected that phosphorus emissions can be reduced once the AD plant is operational, it is not certain that this will bring the measured level within the BAT-AEL range, although Iggesund propose that an Improvement Programme requirement be included in the permit for optimising the AD plant operation and therefore minimising the nutrient loads.

In summary, even with new primary and secondary treatment (AD) Iggesund will not be able to achieve the BAT-AELs as required by the current V005 permit for COD, TSS or Phosphorus. A time-limited derogation cannot therefore be requested. However, the achievement levels for nitrogen are close to the BAT-AEL and no nitrogen derogation is being sought.

During the paper and pulp sector review, the operator indicated that they were not fully compliant with the BAT-AELs but that they intended to be so by the compliance deadline. However, the Operator has now concluded that they cannot meet the BAT AEL as defined in BAT Conclusion 14 and 40 by the BAT Conclusions implementation date of 30/09/2018 and the derogation granted until 1st January 2022. A Moving Bed Biofilm Reactor (MBBR) followed by a secondary clarifier had been selected as the preferred option when applying for the current permit variation V005. However, significant difficulties were encountered with the proposed route which have led to the option for Anaerobic Digestion of the concentrated pulpmill effluent stream being the preferred option. The main issues identified were around the size and required footprint for the full MBBR option, and indeed any option which requires large secondary basins. The AD plant will have a smaller footprint than any of the other options, enabling it to be located within the site boundary.



## 5.4 Emission Limit Values (ELVs)

The derogation request includes proposed ELV's and a staged timescale whilst construction of the primary and then secondary treatment is completed.

## 5.5 Current ELVs / emission levels

Parameter	Yearly average kg/t*
Chemical oxygen demand (COD)	43.9
Total suspended solids (TSS)	7.4
Total Phosphate	0.022
Total Nitrogen (not subject to derogation)	0.16

\* t is tonne of paper produced per year

## 5.6 BAT AELs and Proposed ELVs

Based on the configuration of the mill, the products made, the results of lab trials and more recently the sulphite-pre-treatment of the woodchips before refining all demonstrate that the mill is operating as a CTMP mill rather than simply a mechanical pulp mill. A mixing calculation has been applied at the ratio of 70% Table 17 BATAELs (CTMP pulp mill), BAT 40 and 30% Table 20 BATAELs (paper making) BAT 50 the resultant BATAELs that apply to the direct waste water discharge to receiving waters are as follows:

### BAT AEL's

Parameter	Yearly average kg/t*
Chemical oxygen demand (COD)	14.45
Total suspended solids (TSS)	0.74
Total Phosphorus	0.011

\* t is tonne of paper produced per year

Flow (This is a performance standard and not a BAT AEL). (BAT 5)	17.20 m <sup>3</sup> /t
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## Proposed ELV's

Table 1: Emission Limit Value (ELV) comparison table					
	COD kg/T	TSS kg/T	P kg/T	Timescale	Comments
<b>Benchmark (2012-2014)</b>	47	11	0.021		Water usage: 36.6 m <sup>3</sup> /T
<b>Current status (2018-2020)</b>	43.9	7.4	0.022		Water usage: 28.5 m <sup>3</sup> /T
<b>BAT AEL (V005)</b> BATc Table 17/20 (70%/30%)	14.45	0.74	0.011	Apply from 1 January 2022	Not achievable
<b>Derogation request interim AELs)*</b>	45	7.5	0.022	until 31/12/2023	During construction of new primary ETP
<b>Derogation request (current permit, new primary ETP)</b>	40	2.8	0.022	01/01/2024 – 31/12/2024	Plant to be operational during 2023. 1 <sup>st</sup> full calendar year: 2024
<b>Derogation request (Anaerobic digestion)</b>	26	2.8	0.022	from 01/01/2025	Plant to be operational during 2024. 1 <sup>st</sup> full calendar year: 2025

\*The reasoning for the slightly higher limits on TSS and COD for the interim period is because the current status is an average of three years' performance, the figures have been rounded up to allow for annual variations.

## 5.7 Derogation criteria

The derogation request is based on technical characteristics of the site which are summarised in the table below. We consider that the derogation criteria are met on the grounds of technical characteristics and that the configuration of the plant is the key criteria.

Derogation criteria assessment		
Criteria detail	Operator proposal – linked to DEFRA IED EPR guidance	Environment Agency view
<b>Technical – plant configuration</b>	There is not sufficient space within the existing Iggesund site for the required secondary biological treatment plant to achieve the BAT-AEL limits. Alternative off-site options were investigated. A number of locations have been evaluated of which one near the outfall pipe was selected for full design work. The other sites were either too small or too far away and would involve significant levels of energy to transfer the volumes to/from the treatment plant. Several companies were	It is acknowledged that there are various constraints / issues and technical limitations which limit the available options. The evidence included full engineering surveys. The conclusion is together with the extremely large footprint and process stages identified in the engineering proposal

	<p>engaged for scoping and pre-engineering and several site and ground studies were made on potential sites. These included groundwater, hydro-geological, services and pipeline mapping and ground stability tests. The preferred site (old gas CHP area) identified several problems especially regarding the geological sub-strata.</p> <p>The original MBBR scheme is extremely large in size and has many sub-processes. Central to it are 3 large circular structures with diameters between 38m and 54m. An estimated footprint of the new operation is 30,000 m<sup>2</sup>. One potential site area. This is the area south of the old gas CHP plant and previously home to the oil storage tanks. It has the benefits of being in good proximity to the existing effluent infrastructure with little impact on any future site development but is extremely tight in terms of size. This area has been extensively studied and subsequently discounted as a potential site. The main concerns are that the general status and variable nature of the sub-strata are unsuitable for this type and scale of construction but also having limitations associated with existing services and groundwater conditions.</p>	<p>concluded that there is no possibility of constructing the full effluent treatment operation within the existing site boundary.</p> <p>The AD plant will have a smaller footprint than any of the other options, enabling it to be located within the site boundary.</p>
	<p>Extensive work has been undertaken in the mill both at the pulping and paper making stages of the process as well as complete reconfiguration and upgrade to the effluent treatment plant, once loadings and flows from the mill have been reduced as far as practicable. The work plan includes new white water silos to allow greater re-use of water on site, new bleaching chemistry to reduce COD levels from the bleaching process as well as reduced emissions from the onsite coating activities and improvements throughout the paper making machine.</p>	<p>Regular progress reports have been submitted to the Environment Agency since the current permit (v005) was issued in November 2016. These give the history of the improvements made on site to date. The approach throughout has been to reduce emissions at source where possible. Improvements have been made with a focus on preventing emissions ahead of any end-of-pipe treatment, by reducing the volume and quantity of effluent, the scale, and therefore the impact, such that the effluent treatment can be optimised.</p>

	<p>The basis for the derogation request is that the mill is unique and not represented in the data set used to compile the BATAEL's for mechanical pulp mills within the revised BREF. The data set used for mechanical pulp mills does not include any examples where the same level of brightness needs to be achieved from a purely mechanical pulp coupled with high levels of bleaching with hydrogen peroxide. This is more normally achieved by a chemi-mechanical pulp process or CTMP mill that would then need to use less bleaching. Such mills would normally already have secondary (biological) effluent treatment plants installed in order to meet the BATAEL's and so Iggesund have to make significant alterations to the process and reconfiguration across much of the site in order to install the most appropriate secondary (biological) treatment that will meet the agreed BATAEL's.</p>	<p>The Operator previously presented a case based on the configuration of the mill and we have accepted the case that they are operating more closely to a CTMP. The conclusion of uniqueness in comparison to other mills is accepted.</p>
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## 5.8 Options review

The BREF provides a list of suitable techniques to be used in order to achieve the BATAELs. Compliance with the BATAEL is to be achieved by using a suitable combination of those techniques, in this case:

BAT 40 (various techniques to reduce pollution load and waste water flow from the pulping activity) BAT 50 (various techniques to reduce pollution load and waste water flow from the whole mill) and BAT 14 (use of Primary [physico-chemical] AND Secondary [biological] treatment).

The Operator previously addressed options for achieving the BAT AEL. The considerations were; anaerobic treatment, moving bed biofilm reactor (MBBR), activated sludge, membrane bioreactor and dissolved air flotation. MBBR was chosen as the preferred option and the most appropriate route for achieving BATAEL's.

MBBR was selected for its smaller volume, tolerance of feed variations and good experience within the pulp and paper industry. However, significant difficulties were encountered with the proposed route, which have led to the option for anaerobic digestion of the concentrated pulpmill effluent stream being revisited. The main issues identified were around the size and required footprint for the full MBBR option, and indeed any option which requires large secondary basins. The AD plant will have a smaller footprint than any of the other options, enabling it to be located within the site boundary.

Where we have considered an option appropriate for cost benefit analysis (CBA), this has been identified as such and considered further.

CBA Options for achieving the BAT AEL using available techniques that are considered as viable are taken forward for disproportionality assessment. The Operator is proposing cost benefit assessment of a number of options for achieving the BAT AEL and has adequately justified this decision.

The following scenarios have been considered in the EA Cost Benefit Analysis (CBA) model:

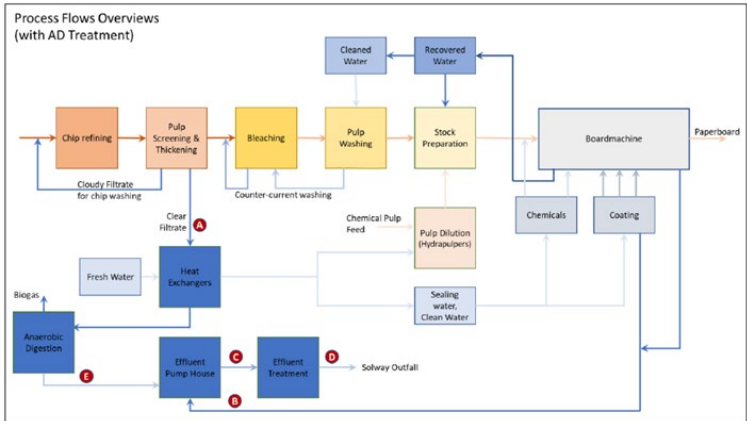
- (1) Business as Usual (BAU) (as at June 2020).
- (2) BAU - new primary treatment.
- (3) new primary treatment + AD.
- (4) full scope BAT AEL achievement.
- (5) BAT AEL immediately, stop treatment, waste water to be treated offsite.

Options considered as viable and taken forward for disproportionality assessment		
Option	Description	Timescale for completion
<b>Scenarios 1 and 2: Business as usual (BAU) / BAU - new primary treatment</b>	The studies show that the option of rebuilding the existing effluent treatment plant continues an unacceptable level of risk, high downtime and potential to cause structural damage. Abnormal and emergency conditions would continue to present a risk to the environment resulting in untreated (partially or fully) effluent being discharged to the recipient. By considering the costs, the final effluent qualities and the impact on the environment, as well as practical and locational issues, it is considered that the most effective solution is to build a new primary effluent treatment plant, on site. Scenario 1 represents the current position, as at the summer of 2020. Scenario 2 represents the situation which will exist once the primary treatment plant has been rebuilt. Note: although the new primary effluent treatment plant is intended to be built as a requirement of the current permit (V005) the costs for this work have been included within the BAU scenarios. This is because the costs for the alternative scenarios cannot be easily separated from the primary stage rebuild.	No change / Primary treatment Plant to be operational during 2023.

Options considered as viable and taken forward for disproportionality assessment		
Option	Description	Timescale for completion
<b>Scenario 3: New primary treatment + AD <u>Proposed derogation</u></b>	<p>The first scenario (BAU) includes the construction of a new primary treatment plant, with appropriate balancing stage and sludge handling. This can be expected to give a significant benefit in terms of the plant reliability and therefore the suspended solids discharged to the receiving waters. BATc 14 requires a combination of primary and secondary treatment stages, and Iggesund propose to install an Anaerobic Digestion plant to pre-treat the pulpmill effluent stream. Evaluation of this scenario assumes a stepwise approach, with the primary treatment replaced first and optimised. The design for the secondary treatment is then be finalised based on the confirmed requirements.</p> <p><b>Effluent Sources</b></p> <p>The pulpmill and boardmachine processes are designed such that water is reused multiple times before reaching the effluent systems.</p> <p>In the pulpmill system, clarified process water from the boardmachine is introduced at the last (third) washing stage for the bleached pulp. The pressate from this stage is used to dilute and wash the bleached pulp in the second stage, and the chemical-rich pressate from this stage is then used as a pre-treatment for the unbleached pulp in order to maximise the chemical efficiencies. This counter-current washing method effectively separates the pulpmill and boardmachine water systems by preventing carry-over of residual bleaching chemicals to the boardmachine stages.</p> <p>Data analysis has been used to model the COD content of the effluent stream based on the mill process data. The main sources of effluent from the boardmachine arise from the associated coating and chemicals equipment and from the stock preparation systems. These primarily consist of solids from the coating system, starch mixture from the size press area and overflows from the fibre-containing process water systems. These are estimated to create approximately 70-80% of the total flow, &gt;90% of the suspended solids and 30-40% of the total COD load in the effluent.</p> <p>The COD chiefly arises from the size press starch overflows, which have been addressed by the recent replacement of the original size press (in May 2021). It is hoped that this quantity could be halved by eliminating the overflow and early indications are that the COD generated per tonne has indeed dropped. Optimisation work is ongoing to ensure the losses are minimised as far as possible.</p> <p>The preferred approach is to prevent the losses at source rather than to treat them in the effluent system. This will</p>	<p>Primary treatment operational by January 2023.</p> <p>Secondary Treatment Plant to be operational during 2024.</p>



**Options considered as viable and taken forward for disproportionality assessment**

Option	Description	Timescale for completion
	<p>be monitored and reviewed as the new size press operation is optimised.</p> <p><b>Pulpmill</b></p> <p>The main outlet in the pulpmill is the “Clear Filtrate” from the disc filters which thicken the screened pulp before bleaching. This stream contains outlet flows from both the chip washing and post-bleaching pulp washing and, by design, is the most concentrated COD stream available. It is logical to treat this stream before it is diluted by the other effluent streams. The pulpmill effluent stream has been identified as a suitable option for anaerobic digestion (AD) before mixing with the rest of the mill’s wastewater. The stream has a high concentration of COD making it suitable for this type of AD reactor and represents approximately 70% of the total COD load, 20% of the total flow and 15% of the total solids. Previous pilot trial work on this effluent stream has indicated that anaerobic digestion can be expected to remove 50% of the COD. The treated pulpmill effluent would therefore contain approximately 35% of the current untreated COD emissions. COD reductions are planned at source for the boardmachine, through the size press replacement, and through AD treatment of the pulpmill Clear Filtrate stream. Figure 2 shows the proposed routing.</p>  <p>The diagram, titled 'Process Flows Overview (with AD Treatment)', illustrates the integration of anaerobic digestion (AD) into the pulpmill and boardmachine processes. It shows the flow of pulp (orange and yellow boxes) and water (blue boxes) through various stages: Chip refining, Pulp Screening &amp; Thickening, Bleaching, Pulp Washing, Stock Preparation, Boardmachine, and Coating. Key water streams include Cloudy Filtrate for chip washing, Clear Filtrate (labeled 'A'), Recovered Water, and Cleaned Water. The AD process (blue box) receives 'Clear Filtrate' (labeled 'A') and produces 'Biogas' and 'Effluent' (labeled 'B'). The effluent is pumped to an 'Effluent Pump House' (labeled 'C') and then to 'Effluent Treatment' (labeled 'D'), which discharges to a 'Solway Outfall'. 'Chemicals' and 'Coating' are also shown as inputs to the Boardmachine. The diagram uses color coding: orange and yellow for pulp streams, blue for water streams, and grey for board-related and chemical streams.</p> <p>Figure 2: Process flows, with AD treatment of PM stream          (Orange/yellow are pulp streams, blue are water streams, grey is board-related and chemicals).</p>	

**Options considered as viable and taken forward for disproportionality assessment**

Option	Description	Timescale for completion																																																																												
	<table border="1" data-bbox="432 349 1174 712"> <thead> <tr> <th></th> <th>Pulpmill Effluent (Clear Filtrate) <b>A</b></th> <th>Clear Filtrate (after AD pretreatment) <b>E</b></th> <th colspan="2">Other streams <b>B</b></th> <th>Effluent Pumphouse (ETP Feed) <b>C</b></th> <th>Final Effluent to Solway <b>D</b></th> <th>Effluent Cake</th> </tr> </thead> <tbody> <tr> <td>Sources</td> <td>chip washing bleaching system</td> <td></td> <td colspan="2">overflows Size press coating systems general drains</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>50% COD reduction across stage</td> <td colspan="2">30% COD reduction from process optimisation</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>as % of ETP Feed</td> <td>as % of ETP Feed</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Flow</td> <td>ML/d</td> <td>3.3</td> <td>3.3</td> <td>17%</td> <td>16.2</td> <td>85%</td> <td>19.5</td> <td>19.5</td> </tr> <tr> <td rowspan="2">COD</td> <td>mg/l</td> <td>5275</td> <td>2638</td> <td></td> <td>459</td> <td></td> <td>828</td> <td>819</td> </tr> <tr> <td>t/d</td> <td>17.4</td> <td>8.7</td> <td>54%</td> <td>7.4</td> <td>46%</td> <td>16.1</td> <td>16.0</td> </tr> <tr> <td rowspan="2">Solids</td> <td>mg/l</td> <td>150</td> <td>150</td> <td></td> <td>1022</td> <td></td> <td>874</td> <td>100</td> </tr> <tr> <td>bd/t/d</td> <td>0.5</td> <td>0.5</td> <td>3%</td> <td>16.6</td> <td>97%</td> <td>17.1</td> <td>2.0</td> <td>15.1</td> </tr> </tbody> </table> <p data-bbox="427 752 1182 1151">The AD plant design is centred around an Expanded Granular Sludge Bed (EGSB) type of reactor. Key advantages of this option are a significantly smaller footprint due to compact design and use of a tower rather than lagoon or basin. The biomass for the AD plant is supported on a granular medium allowing for a high specific surface area, and the tower is designed to give minimal carryover of the biomass with the treated effluent. This type of AD plant is quite different to the AD processes typically seen in agricultural and other industrial / municipal settings. It is designed for high efficiency in a small area.</p> <p data-bbox="427 1155 807 1189"><b>Anaerobic vs aerobic options</b></p> <p data-bbox="427 1193 1182 1890">The main driver for selecting the AD plant over an aerobic system is the lack of available space within the site boundary. The Environmental Risk Assessment previously submitted demonstrated that the scale of plant required for aerobic treatment of the entire mill effluent had significant drawbacks in terms of local impact (BAT AEL option in the summary table below). The Cost Benefit Analysis supported this showing the costs outweighed any potential benefit. This was evident even with the smaller footprint associated with the MBBR process compared to a traditional aerobic lagoon. The required volume of the secondary biological treatment plant is determined by the COD load rather than the volumetric flowrate. If an aerobic treatment stage was to be installed after the planned AD treatment of the pulpmill stream, then it can be estimated at 35% of the BAT-AEL design. However, the costs, footprint and local impact associated with this would not see the same reduction and the arguments against installing the aerobic option for the entire mill effluent still hold true for this sub-stream.</p>		Pulpmill Effluent (Clear Filtrate) <b>A</b>	Clear Filtrate (after AD pretreatment) <b>E</b>	Other streams <b>B</b>		Effluent Pumphouse (ETP Feed) <b>C</b>	Final Effluent to Solway <b>D</b>	Effluent Cake	Sources	chip washing bleaching system		overflows Size press coating systems general drains							50% COD reduction across stage	30% COD reduction from process optimisation								as % of ETP Feed	as % of ETP Feed				Flow	ML/d	3.3	3.3	17%	16.2	85%	19.5	19.5	COD	mg/l	5275	2638		459		828	819	t/d	17.4	8.7	54%	7.4	46%	16.1	16.0	Solids	mg/l	150	150		1022		874	100	bd/t/d	0.5	0.5	3%	16.6	97%	17.1	2.0	15.1	
	Pulpmill Effluent (Clear Filtrate) <b>A</b>	Clear Filtrate (after AD pretreatment) <b>E</b>	Other streams <b>B</b>		Effluent Pumphouse (ETP Feed) <b>C</b>	Final Effluent to Solway <b>D</b>	Effluent Cake																																																																							
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<p><b>Scenario 4: BAT- AEL / full scope</b></p>	<p>This scenario is based on a new Primary treatment, Secondary MBBR treatment and associated sludge handling, situated off-site. Tertiary treatment has been</p>	<p>By December 2024.</p>																																																																												

Options considered as viable and taken forward for disproportionality assessment		
Option	Description	Timescale for completion
<b>BAT AEL achievement</b>	<p>considered as an option it would be one of the potential scenarios for control of TSS, COD and phosphorus emissions but is not considered to be beneficial due to the increased sludge generation which is difficult to dewater and would require removal from site for disposal, most likely in landfill. Removing phosphate with ferric dosing for example increases sludge production significantly due to precipitation of ferric phosphate, ferric hydroxide and increased solid and BOD settlement due to the effect of adding multivalent metal ions to the main process flow. This argument is supported by comments in the Pulp and Paper BREF document: Section 7.3.12 relates to Tertiary waste water treatment by chemical precipitation. A tertiary stage is therefore not included within the presented costs.</p> <p>At present, the primary treatment sludge is recovered as animal bedding and this would either continue, or the sludge would be dried to give a sufficient calorific value for heat recovery as a biomass fuel. This may also be possible for the secondary sludge or else there are other generally available recovery options. The main concern would be with any tertiary sludge in the event that chemical precipitation was required for a final polishing stage. If possible, non-chemical treatment would be selected to allow the sludge to be combined with earlier stages and recovered. Review of the scope, practical feasibility and costs has determined that this option is no longer viable. The excessive costs and impact on local residents far outweigh any potential benefit in the receiving waters.</p>	
<b>Scenario 5: BAT-AELs immediately - stop onsite effluent treatment , waste water to be treated offsite</b>	<p>A scenario to enable the BAT-AEL limits to be achieved immediately was considered and initially screened out however this scenario was later used in the CBA to provide an example of an option for achieving BAT immediately. The concept was to transport wastewater off-site to municipal treatment works and is repeated here for comparison only. This would eliminate the requirement for treatment on site but would introduce a new requirement to fill road tankers to transport the wastewater to a suitable facility (most likely the majority of the volume would need to be taken to Davyhulme near Manchester).</p> <p>The rough calculation is as follows:  The discharge volume would be at least 18 ML/day (currently it is higher, so this allows for some efficiency gains and is a conservative estimate). If a tanker is assumed to hold 20 m<sup>3</sup>, then this is the equivalent of 900 loads per day (328 500 loads per year)</p>	Immediate

Options considered as viable and taken forward for disproportionality assessment		
Option	Description	Timescale for completion
	<p>A ballpark day-rate for tankers of £750 has been used, with the assumption that each tanker would make 2 trips per day and that the return journeys would be empty. Again, this is a conservative estimate. The total annual transport cost would therefore be approximately £123.2 million.</p> <p>Given the extremely high transport costs no additional costs have been calculated for the infrastructure, which would require multiple loading points, transfer pipes, pumps and controls, buffer storage capacity and traffic management measures. The visual impact for local residents would be significant given the number of tankers required to be arriving and leaving site would be close to 40 per hour even if operating 24 hours a day.</p> <p>The capacity at any receiving wastewater treatment site or the availability of suitable road transport have not been investigated.</p> <p>A mitigating option might be to remove only part of the wastewater stream for off-site treatment (say, the COD-rich pulpmill effluent which has relatively low solids content). This would reduce the volume to approximately 3.5 ML/day, or 175 tankers per day, and reduce the transport cost to approximately £24million / year.</p> <p>This reduced scenario would still require the primary ETP to be operational, with the corresponding costs for labour, maintenance and energy, and would still require new infrastructure for tanker filling, etc.</p> <p>In reality, these scenarios could not happen and would result in ceasing operations at the site.</p> <p>The remaining option, to limit paperboard production and therefore emissions, would not be viable due to the competitive nature of the industry. Most competitor mills have significantly higher production capacity and/or have dedicated chemical pulp production nearby, which gives economies of scale for their production costs.</p> <p>Workington's operation depends on achieving good productivity rates, having already reduced fixed costs to a minimum, and a lower annual production level would not be viable.</p>	

## **5.9 Demonstrating disproportionality of costs and benefits**

We have audited the Cost Benefit Analysis (CBA) submitted by the Operator and we consider that the Operator has satisfactorily demonstrated that the stated derogation criterion would result in disproportionate costs for achieving the BAT AEL compared to the environmental benefits.

### **5.9.1 Cost Benefit Analysis (CBA)**

The CBA has been reviewed and considered to support the derogation request. Key points from the CBA (CBA tool version 6.23) are summarised below.

### **5.9.2 Audit of CBA tool**

We audited the CBA tool submitted by the Operator, including its inputs, assumptions, outcomes and their interpretation. We are satisfied with the operator's approach and justification for the data input for each of the options.

The evidence as described in the submission and the CBA tool was reviewed and considered to be applicable and correct and should be considered as part of the derogation request. The basis of some cost assumptions were challenged and considered reasonable.

The costs have been compared using the Environment Agency CBA tool V 6.23, which is based on HM Treasury's Green Book guidance. The results are summarised in terms of Net Present Value (NPV). The costs of meeting the BAT AEL outweigh the monetised benefits in comparison to the proposed derogation (i.e.  $NPV < 0$ ).

### **5.9.3 Results of CBA**

The weighted average cost of capital (WACC) is consistent with what we would expect and has been drawn from Figures set by Holmen Group for capital proposals.

The NPV is negative for both options, including under the sensitivity and scenario analyses. This means that in comparison with the proposed derogation, the cost of compliance with the BAT-AELs (additional cost of around £60 million as NPV) is disproportionate compared to the environmental benefit achieved, as is the costs of the other option considered (additional cost of around £2 billion as NPV).

The CBA using central assumptions shows a negative NPV for the BAT AEL of £53m and therefore the cost of compliance is disproportionate compared to the environmental benefit achieved.

Other options: The costs of the BAT AEL immediate option was disproportionate compared to the environmental benefit achieved, with a negative NPV of £2.1 billion

using central case assumptions. Transport of the wastewater to a suitable facility would need to be taken to Davyhulme near Manchester.

PV costs/benefits: BAT improves the environment by £0.17m over the time period for each of the options in the detailed results PV costs and PV benefits table. It is calculated using National Water Environment Benefits Survey (NWEBS) for the Solway Tweed (nearest water body for NEWBs values) for a change from Poor to Moderate (the latest ecological status for the Solway was reported as poor – 01/02/2022). It was estimated that a maximum of 10km of coastline may be affected by current emissions. Using these assumptions, the emissions were modelled with the CBA tool to give the improved benefits. These benefits are likely to accrue over all options and therefore do not affect the NPVs of each option.

#### **5.9.4 Sensitivity analysis:**

Sensitivity analysis is focused on investment costs for the BAT-AEL. From the table:

The lowest negative NPV for the BAT AEL of £-55.58m is caused by high upfront investment costs; and

The highest negative NPV for the BAT AEL of £-49.68m is caused by low upfront investment costs.

We carried out manual sensitivity checks on capital investment for the BAT-AEL option. This showed that the capital costs would have to be reduced from £83.44 million to £45.89 million before a positive NPV occurs. This represents 55 per cent of the reported capital costs of this option. Sensitivity analysis on operational costs and energy costs were not conducted since these values set at zero would still lead to a negative NPV as compared to the proposed option. Manual sensitivity analysis was not conducted on the BAT-AEL immediate option because of the magnitude of the disproportionate costs.

#### **5.9.5 Summary of the CBA**

We consider that the operator has provided a credible argument that the increased costs linked to the technical characteristics are disproportionate for achieving the BAT AEL. An appropriate range of options were reviewed and those identified as technically viable were considered further. Two options (BAT-AEL and BAT-AEL immediate) were taken forward for Cost Benefit Analysis (CBA), were adequately described in the CBA and the cost of the BAT AEL option (and the other option) was confirmed as disproportionate compared to the environmental benefits. The Cost Benefit Analysis using central assumptions shows negative NPV(s) for the BAT AEL (£52.6 million) and for the other option (£2.1 billion), and therefore the cost of compliance is disproportionate compared to the environmental benefit achieved.

## 5.10 Environmental risk assessment

We have reviewed the environmental risk assessment submitted by the Operator and we are satisfied that the allowing the proposed derogation will not cause any significant pollution or prevent a high level of protection of the environment as a whole to be achieved.

Allowing the proposed derogation would not cause any significant pollution or prevent a high level of protection of the environment. Table 1 below shows the annual mass emission release in tonnes per year of COD, TSS and P from the activity and the reduction in that release compared to the current status, the derogation and the BATAELs.

For COD the mass emission released at proposed derogation limit is 5705 tonnes per year, at a paper production of 219,432 tonnes per year this is a reduction of 3760 tonnes per year, though 2534 tonnes per year discharged above the BAT-AEL.

For TSS the mass emission released at proposed derogation limit is 614 tonnes per year, at a paper production of 219,432 tonnes per year this is a reduction of 1448 tonnes per year, though 452 tonnes per year discharged above the BAT-AEL.

For P the mass emission released at proposed derogation limit is 4.8 tonnes per year, at a paper production of 219,432 tonnes per year this is a reduction of 0.27 tonnes per year, though 2.4 tonnes per year discharged above the BAT-AEL.

The Operator's proposal will mean that the annual mass emissions will decrease in a phased reduction aligned to the constructional phases of the primary and secondary treatment.

<b>Table 1: Mass Emission Releases</b>							
<b>W1</b>	<b>Mass emission released at derogation t/yr</b>	<b>Mass emission released at BAT AEL t/yr</b>	<b>Annual Mass Difference (derogation cf BAT AEL) t/yr</b>	<b>Annual Mass Difference (Derogation cf current) t/yr</b>	<b>2021 emission t/yr</b>	<b>Derogation kg/t</b>	<b>BAT AEL kg/t</b>
COD	5705	3171	2534	3760	9465	26	14.45
TSS	614	162	452	1448	2062	2.8	0.74
P	4.8	2.4	2.4	0.27	5.07	0.022	0.011

**Production Tonnes (2021)**                      **219,432.25**

**Predicted impact:** The predicted impact of derogating from the BAT AEL on any long term or short Environmental Quality Standards (EQS) / Environmental

Assessment Levels (EAL). There are no statutory water quality standards for P, COD and TSS in coastal waters and therefore no short term or long term EQS's or EAL's.

There has been a lot of previous work comprising of shoreline studies carried out on behalf of Iggesund and these have never identified any significant impacts on the ecology near or at the foreshore. The Solway Firth has a high tidal range and the most recent (2020) shoreline survey provided as part of this derogation request has again not identified any harm to the shoreline around the outfall pipe or local area as a result of the discharge. Any environmental impact from the current discharge is either not detectable or minor and is less than that seen in naturally occurring temporal variation.

In order to investigate the impact in further detail, a more complex model, CORMIX, has been used to assess dispersion rates under different tidal conditions to understand the different impact on the receiving waters under various scenarios including the present situation, BAT-AEL and the proposed derogation. CORMIX considers the momentum and buoyancy of the discharge to accurately predict mixing behaviour. There are no statutory water quality standards for P, COD and TSS in coastal waters. The Environment Agency provides a standard for thermal discharges to rivers under which the discharge should not increase the temperature of the receiving waters by more than 3°C outside the initial mixing zone. Results from the modelling confirm that the thermal discharge does not lead to an increase in the ambient water temperature of more than 3°C beyond 100m from the outfall location required as EA standard. Water quality in the Solway Firth is improved under the derogation request compared to baseline, although not to the extent of the BAT-AEL. We have reviewed those reports and are satisfied that they present conservative assessments to reach a conclusion of 'no deterioration' that we are in agreement with.

The following tables summarise the flows and loads of the discharge and uses these along with production tonnages to calculate figures for the total P, TSS and COD and waste water per tonne of product.

<b>Summary of predicted outputs COD</b>			
<b>Parameter</b>	<b>BAU</b>	<b>Derogation</b>	<b>BAT AEL</b>
<b>COD load of discharge (kg/day)</b>	28866	17096	9501
<b>Discharge flow (m<sup>3</sup>/day)</b>	18600	18600	18600
<b>Total COD BAT-AEL (kg/t)</b>	43.9	26	14.45
<b>Wastewater per tonne of product (m<sup>3</sup>/tonne)</b>	28.3	28.3	28.3
<b>Total COD (mg/l)</b>	1552	919	511



Summary of predicted outputs TSS			
Parameter	BAU	Derogation	BAT AEL
TSS load of discharge (kg/day)	4866	1841	487
Discharge flow (m <sup>3</sup> /day)	18600	18600	18600
Total TSS BAT-AEL (kg/t)	7.4	2.8	0.74
Wastewater per tonne of product (m <sup>3</sup> /tonne)	28.3	28.3	28.3
Total TSS (mg/l)	262	99	26

Summary of predicted outputs P			
Parameter	BAU	Derogation	BAT AEL
P load of discharge (kg/day)	14.5	14.5	7.2
Discharge flow (m <sup>3</sup> /day)	18600	18600	18600
Total P BAT-AEL (kg/t)	0.022	0.022	0.011
Wastewater per tonne of product (m <sup>3</sup> /tonne)	28.3	28.3	28.3
Total P (mg/l)	0.778	0.778	0.389

**Scale of impact:** The predicted impact of derogating from the BAT AEL on any long or short term EQS / EAL. There are no statutory water quality standards for P, COD and TSS in coastal waters and therefore no short term or long term EQS's or EAL's.

The Solway Firth has a high tidal range and the most recent (2020) shoreline survey provided as part of this derogation request has again not identified any harm to the shoreline around the outfall pipe or local area as a result of the discharge. Any environmental impact from the current discharge is either not detectable or minor and is less than naturally occurring temporal variation. Water quality modelling using CORMIX indicating water quality in the Solway Firth is improved under the Derogation Request compared to baseline, although not to the extent of the BAT-AEL. Results from the modelling confirm that the thermal discharge does not lead to an increase in the ambient water temperature of more than 3°C beyond 100m from the outfall location required as EA standard. We have reviewed those reports and agree with their findings.

#### **Other potential environmental impacts:**

Emissions of P, COD and TSS will not affect any sites of heritage, landscape or nature conservation, and/or protected species or habitat. Based on the analysis of the shoreline surveys and the Comix modelling, due to the subtle nature of any effects seen and the limited area affected, it is not considered that the effluent has any discernible impact on the integrity of any nearby protected areas.

The Solway Firth (SAC) provides migratory passage for river lamprey to and from spawning and nursery grounds in a number of rivers. We are satisfied that the conclusions of the modelling assessment confirm that there is no likely significant effect from the discharge on these migratory species.

## Summary of risks of allowing the derogation:

That the Operator has demonstrated that the assessment of derogation impacts shows they are not likely to be significant. Evidence from the shoreline surveys and the COMIX modelling supports the conclusion that there will not be a significant environmental impact from the derogation proposal.

## 5.11 Permit Conditions

We need to set improvement conditions and pre-operational measures so that the outcome of the techniques detailed in the application are achieved by the installation. Justifications for these improvement conditions and pre-operational measures are set out below and are detailed in Annex's 2 and 3 of this decision document.

### Improvement Conditions

<b>Reference</b>	<b>Justification</b>
IP1	Completed 21/12/2016. The detail has been used to populate Table S1.5 Minimum Start-up Load and Minimum Shutdown load
IP2	Completed 21/12/2016. The detail has been used to populate Table S1.5 Minimum Start-up Load and Minimum Shutdown load
IP3	Superseded by this variation.
IP4	Superseded by this variation.
IP5	Superseded by this variation.
IP6	Superseded by this variation.
IP7	Completed. The operator has installed an auto-sampler for the collection of flow proportional samples at emission point W1 as defined in table S3.2 of this permit.
IP8	A requirement to review the site's sampling arrangements due to any constructional changes, such as pipework and changes to pumping arrangements that may have an impact on the sampling methodology.
IP9	A requirement to report on the commissioning of the AD plant to summarise the environmental performance of the plant as installed and propose any improvements as necessary.
IP10	A requirement for the operator to submit a report that investigates the inputs to the effluent treatment plant and the options to reduce and minimise pollutants at source to ensure continual improvements are made. The report shall also include a review of the emissions from the on-site effluent treatment plant to the receiving water body. A mechanism shall also be included within the site EMS procedures to determine further opportunities for improvement and a timescale for implementation.
IP11	A requirement for the operator to submit a gas utilisation plan to report and assess current performance and compliance against the emission limits for boilers LCP 187 when fired on both natural gas and combined natural gas/ biogas.

## Pre-operational Measures

<b>Table S1.4 Pre-operational measures</b>	
<b>Reference</b>	<b>Justification</b>
POM1	Carried over from previous variation and remains valid. The operator shall provide a written demonstration that burning of the effluent filter cake will produce sufficient calorific value to be considered as a waste recovery operation rather than a waste disposal operation.
POM2	The detailed design of the AD plant has not been provided at this stage. As all the detail is not available at the application stage a pre-operational conditions is required to cover and agree that remaining detail. A report that reviews the final design of the AD plant is required and must demonstrate that the design meets the requirements of BAT (best available techniques) as described in the BAT Reference Document for Waste Treatment (the BREF) and BAT conclusions dated 10/08/2018. These details must be agreed before any effluent can be accepted at the AD plant.
POM3	A requirement to provide a commissioning plan for the AD plant which includes the expected emissions to the environment during the different stages of commissioning, the expected durations of commissioning activities and the measures to be taken to protect the environment and report to the Environment Agency in the event that actual emissions exceed expected emissions.  These details must be agreed before any effluent can be accepted at the AD plant.
POM4	A requirement to provide an odour management plan that takes into account the appropriate measures for odour control specified in section 7.6.5 of the Environment Agency Draft Technical Guidance for Anaerobic Digestion (Reference LIT 8737, November 2013). The plan shall also include all the required information as specified in the Environment Agency Horizontal Guidance H4 - Odour Management.  These details must be agreed before any effluent can be accepted at the AD plant.
POM5	Confirmation that the Environmental Management System (EMS) has been updated to include the AD plant and any changes to equipment or any necessary updates to staff training and that the requirements of permit condition 1.1.1 have been satisfied.  These details must be agreed before any effluent can be accepted at the AD plant.

## **6 Decision considerations**

### **6.1 Confidential information**

A claim for commercial or industrial confidentiality has been made. We have accepted the claim for confidentiality. Refer to section 2.2. The decision was taken in accordance with our guidance on confidentiality.

### **6.2 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.

### **6.3 Consultation**

The consultation requirements were identified in accordance with the Environmental Permitting (England and Wales) Regulations (2016) and our public participation statement. Our notice publicised on GOV.UK for the public was also carried out between 11/05/2021 and 09/06/2021.

We consulted the following organisations;

UK Health Security Agency (previously PHE, HPA)  
Director of Public Health  
Allerdale Local Planning Authority  
Allerdale Environmental Health  
Health and Safety Executive  
Foods Standard Agency  
Marine Management Organisation – MFA Marine Consents  
Centre for Environment Fisheries & Aquaculture Science CEFAS  
Association of Inshore Fisheries and Conservation Authority  
United Utilities  
Whitehaven Harbour Commissioners

Their comments and our responses are summarised in the consultation responses section 7 Annex 1.

Consultation is relevant for derogations and we have consulted on our 'minded to' (draft) decision. The application was publicised on the GOV.UK website. The comments and our responses to the 'minded to' (draft) decision will be summarised in the consultation responses section.

### **6.4 Nature conservation**

We have checked the location of the application to assess if it is within the screening distances we consider relevant for impacts on nature conservation, landscape, heritage and protected species and habitat designations. The application is within our screening distances for these designations.

Emissions of P, COD and TSS will not affect any sites of heritage, landscape or nature conservation, and/or protected species or habitat. Based on the analysis of the shoreline surveys and the Comix modelling, due to the subtle nature of any effects seen and the limited area affected, it is not considered that the effluent has any discernible impact on the integrity of any nearby protected areas.

The Solway Firth (SAC) provides migratory passage for river lamprey to and from spawning and nursery grounds in a number of rivers. We are satisfied that the conclusions of the modelling assessment confirm that there is no likely significant effect from the discharge on these migratory species.

We have assessed the application and its potential to affect sites of nature conservation, landscape, heritage and protected species and habitat designations identified in the nature conservation screening report as part of the permitting process. Based on the source/pathway/receptor mechanisms entailed by the derogated operations and the pollutants emitted, we consider that the application will not affect any site of nature conservation, landscape and heritage, and/or protected species or habitats identified. We have not consulted Natural England. The decision was taken in accordance with our guidance.

## **6.5 Environmental risk**

We have reviewed the operator's assessment of the environmental risk from the operations in the scope of this variation application. The operator's risk assessment is satisfactory.

The assessment shows that, applying the conservative criteria in our guidance on environmental risk assessment or similar methodology supplied by the operator, or advised by a statutory consultee, and reviewed by ourselves, the emissions associated with the proposed derogation will not cause any significant pollution or prevent a high level of protection of the environment as a whole to be achieved. Refer to section 5.3 for further details.

## **6.6 Operating techniques**

We have reviewed the techniques used by the operator, as relevant to the scope of this variation application, and compared these with the paper and Pulp BAT Conclusions document. This variation permits a derogation from BAT conclusion 40 and 50 and the associated BAT-AELs for emissions of TSS, COD and P, granted in accordance with Article 15(4) of IED and our guidance.

## **6.7 Updating permit conditions during consolidation**

We have updated permit conditions to those in the current generic permit template as part of permit consolidation. The conditions will provide the same level of protection as those in the previous permit.

## **6.8 Use of conditions other than those from the template**

Based on the information in the application, we consider that we do not need to include conditions other than those in our permit template:

## **6.9 Improvement programme**

Based on the information on the application, we consider that we need to include an improvement programme. (IP8 to IP11)

We have included an improvement programme to ensure that the Operator complies with the proposed derogation options. Refer to section 5.4 for further details on the reasons as to why we consider we have to impose improvement conditions. Refer to Annex 2 below for the wording of the improvement conditions.

We have also updated the status of previous improvement conditions according to their status.

## **6.10 Pre-Operational Measures**

Based on the information on the application, we consider that we need to include pre-operational measures.(POM2 to POM5)

We have these to ensure that the Operator complies with the proposed derogation options. Refer to section 5.4 for further details on the reasons as to why we consider we have to impose pre-operational measures. Refer to Annex 3 below or the wording of the pre-operational measures.

## **6.11 Emission limits**

Emission limits have been amended, refer to the key issues section for details on the derogation from the BAT-AELs for TSS, COD and P granted by this variation.

Table S3.3 below provide the interim and final limits (until the next BREF review) based on the phased reduction aligned to the constructional phases of the primary and secondary treatment.

There is a ELV limit reduction of 30% for emission point W1 due to installation of new ETP / AD for COD and TSS. (Table S3.2 Point Source emissions to water (other than sewer) – emission limits and monitoring requirements).

<b>Table S3.3 Annual limits</b>				
Limit (including unit) kg/T				
Substance	Medium	Until 31/12/2023	Until 31/12/2024	From 01/01/2025
Chemical Oxygen Demand (COD)	Water <sup>Note 1</sup>	45	40	26
Total suspended solids (TSS)	Water <sup>Note 1</sup>	7.5	2.8	2.8
Total nitrogen	Water <sup>Note 1</sup>	0.16	0.16	0.16
Total phosphorus	Water <sup>Note 1</sup>	0.022	0.022	0.022

Note 1: For integrated or multi product mills where the BAT AEL range has been calculated according to a mixing rule based on their share of the discharge, based on information supplied by the Operator, the Operator must notify the Environment Agency if the product/ raw material mix changes by more than 10% in any direction.

**Table S3.2 Point Source emissions to water (other than sewer) – emission limits and monitoring requirements.**

Emission limits have been reduced for W1 due to expected improvements to be made to the ETP. Note 3 covers a limit reduction by 30% for SSS and COD once the ETP, both primary and secondary AD for COD and TSS has been installed by 01/01/2024.

<b>Extract from Table S3.2 Point Source emissions to water (other than sewer) – emission limits and monitoring requirements.</b>		
Total suspended solids	Effluent Treatment plant	750 mg/l 525 mg/l from 01/01/2024 Note 3
		70 Te/week 49 Te/week from 01/01/2024 Note 2, Note 3
Chemical Oxygen Demand (COD)	Effluent Treatment plant	2,250 mg/l 1,575 mg/l from 01/01/2025 Note 3
		280 Te/week 196 Te/week from 01/01/2025 Note 2, Note 3

### Table S3.1 Point source emissions to air - Biogas Emergency Flare (A5)

Emission limits have been added for the biogas emergency flare. Monitoring is only required if the flare is operational for more than 10% in any year.

Extract from Table S3.1 Point source emissions to air - Biogas Emergency Flare (A5)		
Biogas emergency flare [1]	Oxides of Nitrogen (NO and NO <sub>2</sub> expressed as NO <sub>2</sub> )	150 mg/m <sup>3</sup>
	Carbon monoxide	50 mg/m <sup>3</sup>
	Total VOCs	10 mg/m <sup>3</sup>
Note [1]: Following commissioning, monitoring to be undertaken in the event the emergency flare has been operational for more than 10 per cent of a year (876 hours).		

## 6.12 Process Monitoring

**Table S3.4 Process monitoring requirements** - Process monitoring has been added for the anaerobic digestion (AD) plant. The Process Monitoring will allow the operator to continuously monitor and regulate the process variables, as well as track and record multiple data streams from numerous points throughout the operation. The requirements for AD have been added to the Process Monitoring table.

## 6.13 Previous performance

The Operator failed to comply with the timetable proposed by them in 2016 to achieve compliance with BAT conclusion 40 and 50. However, we have taken into account the justification provided by the Operator, which is explained in section 5.1.2, and, on balance, we have decided to grant the variation to the permit. We take compliance with our permits very seriously. We will be monitoring the site.

## 6.14 Conclusion

The derogation request meets the technical characteristic criteria of IED Article 15(4) with an appropriate range of options reviewed and taken forward for CBA. The operator has demonstrated that the costs of achieving the BAT-AEL are disproportionate to the environmental benefits. Evidence from the shoreline surveys and the COMIX modelling supports the conclusion that there will not be a significant environmental impact from the derogation proposal. Allowing the proposed derogation would not cause significant pollution or prevent a high level of protection of the environment as a whole to be achieved.

We are satisfied that the operator has demonstrated that the proposed derogation option achieves the best overall environmental outcome.



## 7 Annex 1: Consultation Responses.

The following summarises the responses to the public consultation on the application and with other organisations, our notice on GOV.UK for the public carried out between 11/05/2021 and 09/06/2021, and the way in which we have considered these in the determination process.

Response received from
UK Health Security Agency
Brief summary of issues raised
<p>The response notes the various other emissions from the installation which are not covered by this variation and highlights potential issues from the current and proposed effluent treatment plants. Specific issues identified include any emissions to air associated with the new effluent treatment plant, including odours as the detailed design was not available for the new effluent treatment plant or the AD plant at this time. The response also identified that there is no site condition report for the new development.</p>
Summary of actions taken or show how this has been covered
<p>The existing emissions at this installation were assessed as part of the previous determination process. Emission from the “existing” activities have been included as part of the background data when assessing the new activities.</p> <p>The new primary effluent treatment plant uses the same techniques as the old plant which it is replacing but will deliver a higher quality effluent. The replacement plant will enhance the reliability of the equipment and provide notable benefits in the context of managing the sludge removed from the plant.</p> <p>The additional treatment provided by AD the plant will use an Expanded Granular Sludge Bed (EGSB) type of reactor specifically designed for this type of effluent. This enables a significantly smaller footprint due to compact design and use of a tower rather than lagoon or basin. The EGSB is a gas-tight system the biogas is collected in the head space of the reactor and therefore odour nuisance will be low.</p> <p>The AD plant and new primary treatment will be constructed within the current boundary of the site and therefore no site condition report is required, though the ground conditions are well known.</p> <p>The gas produced by the AD will be utilised in the existing auxiliary boilers a partial substitution for natural gas which is currently used. The permit require the operator to monitor the emissions from the auxiliary boilers and assess the impact against the emission limits which are unchanged by this variation.</p> <p>The AD plant will be designed to minimise emissions to air, including odours, according to current good practices. The plant will be designed in line with the BAT Reference Document for Waste Treatment (the BREF) and BAT conclusions dated 10/08/2018 and agreed with the Environment Agency prior to construction and operation.</p>

A commissioning plan and commissioning report will be required both must be agreed with the Environment Agency before any operations commence. In order to demonstrate BAT the operator must provide a BAT report which will include all necessary risk assessments and validation of previous air quality H1 assessments for emissions to air.

The odour management plan will take into account the appropriate measures for odour control specified in section 7.6.5 of the Environment Agency Draft Technical Guidance for Anaerobic Digestion (Reference LIT 8737, November 2013). And the Environment Agency Horizontal Guidance H4 - Odour Management.

POM2, POM3, POM4, POM5 and IP9 cover the commissioning of the AD plant and the associated risk assessments required to demonstrate BAT. The Operator must provide these reports to the Environment Agency, for approval, before any operations commence.

Response received from
Marine Management Organisation – MFA Marine Consents
Brief summary of issues raised
Marine Management Organisation informed us that any works within the marine area require a licence from the Marine Management Organisation. It is down to the applicant themselves to take the necessary steps to ascertain whether their works will fall below the mean high water springs mark.
Summary of actions taken or show how this has been covered
None required

Response received from
Centre for Environment Fisheries & Aquaculture Science CEFAS
Brief summary of issues raised
No comments made. Routine advice not funded.
Summary of actions taken or show how this has been covered
None required

No other responses were received.

## 8 Annex 2: Improvement Conditions

Based in the information in the application and our own records of the capability and performance of the installation at this site, we consider that we need to set improvement conditions so that we can monitor the progress of the project proposed by the Operator to achieve compliance. These additional improvement conditions are set out below - justifications for them are provided at the relevant section of the decision document.

<b>Table S1.3 Improvement programme requirements</b>		
<b>Reference</b>	<b>Improvement Condition</b>	<b>Requirement Date</b>
IP8	At least 6 weeks after commissioning of the Anaerobic Digestion (AD) plant (Activity AR2) the operator shall review the site's sampling arrangements due to any constructional changes, such as pipework and changes to pumping arrangements that may have an impact on the sampling methodology and provide an MCERTs accreditation 'certificate of site conformity' for the W1 emission point.	4 months after commissioning
IP9	At least 10 weeks after commissioning of the AD plant (Activity AR2) the Operator shall submit a written report to the Environment Agency on the commissioning of the AD plant (Activity AR2). The report shall summarise the environmental performance of the plant as installed against the design parameters set out in the Application. The report shall also include a review of the performance of the facility against the conditions of this permit and details of procedures developed during commissioning for achieving and demonstrating compliance with permit conditions. The Operator shall submit the report to the Environment Agency, for approval, summarising the findings along with any proposed improvements if required.	6 months after commissioning
IP10	The operator shall submit for approval by the Environment Agency a report that investigates the inputs to the effluent treatment plant and the options to reduce and minimise pollutants at source. The report shall also include a review of the emissions from the on-site effluent treatment plant to the receiving water body. The investigations shall include but not limited to the following: <ul style="list-style-type: none"> <li>- Current performance, with the emission limits values (ELV's) or annual limits as specified in Table S3.3 of this permit.</li> </ul>	12 months after commissioning of the ETP and AD Plant

	<ul style="list-style-type: none"> <li>- A methodology for continuous improvement and assessment to highlight opportunities for reducing emissions from the on-site effluent treatment plant to the receiving water body.</li> <li>- A plan and programme of works for further effluent mapping work to check the understanding on the process, effluents and water use are still current and to identify further opportunities for reducing flow, TSS, COD, P and N in the discharge by evaluating the pulping and paper making operations on site, having tracked the changing profiles throughout the process.</li> <li>- Opportunities and techniques for reducing the residual temperature of the discharge by evaluating all options for heat recovery throughout the pulping and paper making operations on site, having tracked the changing temperature profile throughout the period.</li> <li>- Opportunities and techniques for reducing freshwater use, wastewater flow at the point of discharge and the pollution load of the discharge by evaluating all options for minimising freshwater use throughout the pulping and paper making operations on site.</li> <li>- Following commissioning of the ETP and AD plant review emission data and evaluate the suitability of the ELV's for COD and TSS for W1 as detailed in Table S3.2 of this permit, provide justification for retaining any headroom and explore opportunities for improvement.</li> </ul> <p>A mechanism shall also be included within the site EMS procedures to determine further opportunities for improvement. The Operator shall submit the report to the Environment Agency, for approval, summarising the findings along with any proposed improvements and a timescale for its implementation.</p>	
IP11	<p>The operator shall develop and submit for approval by the Environment Agency a gas utilisation plan to report and assess current performance and compliance against the emission limits for boilers LCP 187 when fired on both natural gas and combined natural gas/ biogas. The gas utilisation plan shall include but not limited to an assessment on gas volume and composition.</p>	<p>12 months after commissioning of the ETP and AD Plant</p>

	<p>The report should include any additional monitoring undertaken and set out the results and conclusions of the assessment including where necessary proposals for improvements to meet the ELV requirements.</p> <p>If the assessment identifies that compliance with the emission limits is problematic, the Operator shall propose alternative mixed gas emission limits for approval by the Environment Agency, for example representative multi-fuel emission limits that complies with the requirements of Article 40 of the Industrial Emissions Directive.</p> <p>Any changes to the ELV's will require a variation to the permit and any proposed change to the current limits must be supported using an appropriate air dispersion model using our H1 guidance or equivalent methodology. The Operator shall notify the Environment Agency of the intention to vary within 12 months after commissioning of the ETP and submit an application for a variation to the Environment Agency within 15 months after commissioning of the ETP.</p>	
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## 9 Annex 3: Pre-Operational Measures

Based in the information in the application and our own records of the capability and performance of the installation at this site, we consider that we need to set pre-operational measures so that we can monitor the progress of the AD plant proposed by the Operator to achieve compliance. These additional pre-operational measures are set out below - justifications for them are provided at the relevant section of the decision document.

<b>Table S1.4 Pre-operational measures</b>	
<b>Reference</b>	<b>Pre-operational measures</b>
POM1	The operator shall provide a written demonstration that burning of the effluent filter cake will produce sufficient calorific value to be considered as a waste recovery operation rather than a waste disposal operation. The operator shall not burn any effluent filter cake until written acceptance has been provided by the Environment Agency.
POM2	The operator shall submit a report that reviews the final design of the AD plant (Activity AR2) to demonstrate that the design meets the requirements of BAT (best available techniques) as described in the BAT Reference Document for Waste Treatment (the BREF) and BAT conclusions dated 10/08/2018. The report should identify and confirm how the process control and the monitoring requirements for the AD plant (Activity AR2) detailed in table S3.4 will be implemented. No waste or effluent shall be accepted at the AD plant (Activity AR2) unless the Environment Agency has given prior written permission under this condition.
POM3	At least 10 weeks (or any other date as agreed with the Environment Agency) prior to the commencement of commissioning of the AD plant (Activity AR2), the operator shall provide a written commissioning plan (including timescales for completion) for approval by the Environment Agency. The commissioning plan shall include the expected emissions to the environment during the different stages of commissioning, the expected durations of commissioning activities and the measures to be taken to protect the environment and report to the Environment Agency in the event that actual emissions exceed expected emissions. Commissioning shall be carried out in accordance with the commissioning plan as approved by the Environment Agency. No waste or effluent shall be accepted at the AD plant (Activity AR2) unless the Environment Agency has given prior written permission under this condition.

<b>Table S1.4 Pre-operational measures</b>	
<b>Reference</b>	<b>Pre-operational measures</b>
POM4	At least 2 weeks (or any other date as agreed with the Environment Agency) prior to the commencement of commissioning of the AD plant (Activity AR2), the operator shall submit an odour management plan to the Environment Agency for written approval. The plan shall take into account the appropriate measures for odour control specified in section 7.6.5 of the Environment Agency Draft Technical Guidance for Anaerobic Digestion (Reference LIT 8737, November 2013). The plan shall also include all the required information as specified in the Environment Agency Horizontal Guidance H4 - Odour Management. No waste or effluent shall be accepted at the AD plant (Activity AR2) unless the Environment Agency has given prior written permission under this condition.
POM5	At least 2 weeks (or any other date as agreed with the Environment Agency) prior to commissioning of the AD plant, the operator shall confirm in writing that the site Environmental Management System (EMS) has been updated to include the AD plant (Activity AR2) and any changes to equipment or any necessary updates to staff training and that the requirements of permit condition 1.1.1 have been satisfied.

## 10 Annex 4: Consultation on the Draft Decision

This section reports on the outcome of the public consultation on our draft decision carried out between 27/07/2022 and 24/08/2022.

The draft decision record and associated draft consolidated variation notice were published and made available to view on gov.uk website between the dates detailed above.

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

Response received from
UK Health Security Agency
Brief summary of issues raised
<p>The main emissions of potential concern associated with the permit variation will be effluent from the current and proposed new effluent treatment plants and any emissions to air associated with the new effluent treatment plant and anaerobic digestate (AD) plant, including odours.</p> <p>They acknowledged that whilst no detailed design is currently available for the AD plant the Draft Decision Document and Draft Permit Variation Notice make it clear that an Odour Management Plan for the site which complies with the Environment Agency H4 Guidance on Odour Management and the Environment Agency draft technical guidance on Anaerobic Digestion will be required.</p> <p>Based on the information contained in the application the UKHSA has no significant concerns regarding the risk to the health of the local population from the installation.</p> <p>They confirmed their consultation response is based on the assumption that the permit holder shall take all appropriate measures to prevent or control pollution, in accordance with the relevant sector guidance and industry best practice.</p>
Summary of actions taken or show how this has been covered
<p>No actions necessary. Refer to comments made in Section 7 Annex 1 consultation responses.</p>

No further consultation responses were received.