Environment Agency permitting decisions

Variation

Consultation on our decision document recording our decision-making process

We are minded to issue the variation for Snetterton Biomass Plant operated by BWSC East Anglia Limited.

The variation number is : EPR/AP3037FL/V004

Consultation commences on:
Consultation ends on:

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

Purpose of this document

This draft decision document:

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

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

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 Permit, or to reject the Application altogether, we will issue the Permit 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.

Structure of this document

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

About this variation

The operator has applied for a substantial variation to their existing permit in order to make the following changes:

- Change of operator name from Iceni Energy Limited to BWSC East Anglia Limited,
- Change of registered office address,
- Change of effluent disposal route (to the River Thet)

Key issues of the decision

The permit covers listed activity S1.1A(1)(a) *[table S1.1 of the permit]* - for an Installation containing a combustion appliance rated >50MW – fuelled by solid biomass.

An Installation of this type typically generates effluent in small volumes / relatively clean. The primary source for this effluent is from boiler operations – whereby key equipment requires pure water in order to prevent equipment fouling / build-up. As a result, periodic blow down is planned at twice yearly intervals whereby critical areas of the boiler are drained and re-filled with pure water.

Currently, the Installation is in construction phase (non-operational), whereby design and construction plans have advanced since submission of the original application, and hence this variation application seeks to change the disposal route for this effluent .

Key issues covered within this document:-

✓	1. change in operator name
✓	2. change in registered address
✓	3. change in effluent disposal a) appraisal of disposal options i. sewer ii. ground iii. transfer offsite iv. watercourse
✓	4. treatment technology
✓	5. capacity of treatment plant
✓	6. water quality impacts / modelling
✓	7. ELVs
✓	8. flood risk
✓	9. ecology / habitats
✓	10. permit changes - Fire Prevention condition 3.5

1. **Change of operator name**

A change in operator name has been applied for.

Existing operator name	*New operator name*
Iceni Energy Limited	BWSC East Anglia Limited

The company registration number remains unchanged [07227486] and therefore is not the subject of a transfer.

2. **Change of registered office address.**

In addition to the above name change, the registered office address has also changed as follows:

Existing registered office address	*New registered officer address*
c/o M+A Partners (North Norfolk) *12 Church Street* *Cromer* *Norfolk* *NR27 9ER*	*20 - 22 Bedford Row* *London* *WC1R 4JS*

The company registration number remains unchanged [07227486] and therefore is not the subject of a transfer. We are able to make this change within the variation

Since the receipt of this application, we have determined an Environment Agency led administrative variation (V003), and within this document we have applied the above changes.

Environment Agency led administrative variations do not include decision documents. As a result we have retained detail of this change within this decision document.

3. Change of effluent disposal.

Prior to duly making the application, we required the applicant to provide detail of why such change is required, and an appraisal of the options considered. Details provided in response include:

The existing permit (prior to any variation) authorises the discharge of effluent (following onsite treatment) to sewer. This was assessed during determination of the original application.

This variation seeks to change this with discharge of treated effluent - direct to the River Thet. This change has been sought because connection to sewer would require significant infrastructure changes around the locality of the site. (These are detailed below).

a) Appraisal of disposal options.

i) Treatment and discharge to sewer

- Closest sewer is 3km from the site - connection would require significant infrastructure changes including crossing the A11 highway and a railway line, or diversion from the railway line at an increased pipeline distance of 4km.
- The costs associated with installing such pipeline would be estimated at £400,000, and extensive negotiations with a number of different landowners would be required.
- A pumping station would be required to transfer the treated effluent to sewerage works.

Summary : This option is now considered not viable due to the construction costs, wayleaves and land access requirements associated with the installation of the pipework

ii) Treatment and discharge to ground

- The site is located on a 'Major Aquifer' (thus features a high permeability) and therefore would require significantly more treatment to remove all contaminants to prevent potential contamination of ground/groundwater.
- Alternative treatment methods (such as reverse osmosis) could provide greater treatment however would incur significantly greater capital and operating costs.

Summary : This option is not considered viable due the sensitivity of the aquifer beneath the site and the costs associated with treating the effluent to a suitable quality for it to be discharged.

iii) Transfer off-site to a wastewater treatment works

- This method would require the installation of a large storage tank on site (approximate capacity of 200 – 300 m^3).
- The operating costs associated with the storage and transfer off-site are estimated at approximately £400,000 per annum.

Summary : This option is not considered viable due to significant operating costs associated.

iv) Treatment and Discharge to Watercourse

- The River Thet is located approximately 2 km from the installation.
- No further infrastructure amendments are required (to those considered within the original application).
- The pipeline capital cost to the River Thet is estimated at £200,000.

- impacts associated with discharging this effluent to the River Thet are not considered to be '*significant*'.

Summary : *The applicant has concluded that this is the only 'available' option for the management of the effluent from the waste water treatment system – considering costs and impacts from such release.*

4. Treatment Technology

The original application / permit allowed for the provision of an onsite effluent treatment process, and the operator has stated that this application is not for a change in treatment processes, but is for a change in the receiving environment.

Having considered this statement, we considered it necessary to give some consideration for whether the permitted treatment plant remains appropriate for the change in receiving media (river instead of sewer). We requested some detail (as part of duly making) from the applicant on the type of treatment plant employed. The response detailed the following outline:

Drainage flows are routed to a collection sump by drain line with a maximum inlet flow of 36 m^3/hr. The effluent received here will be of alkaline nature, and treatment commences by pH neutralisation (dosing with hydrochloric acid) as controlled by a pH measurement device. Following the neutralisation process, both coagulation and flocculation methods occur (using aluminium or iron sulphate) and solid particle separation within a sedimentation chamber. Heavy metal treatment (where necessary) will take place prior to flocculation by the addition of a heavy metals precipitation agent. Any surface oil (little expected) is removed by oil skimmer (and disposed off site appropriately).

Since submission of the original application, and following consultation responses relating to the local situations around the discharge, the operator provided details of a modification (in response to the schedule 5 notice) which will provide greater safeguards prior to releasing the treated effluent into the river.

Modifications:-

i. The inclusion of 4 – 6 buffer storage tanks (50m^3 each – allowing for nearly 6 days' of treated effluent storage) prior to releasing such discharge.
ii. Bypass arrangements for effluent leaving the main biomass plant – to divert away from the treatment plant, so that it is pumped directly to the buffer storage tanks (where required) – for removal off site by licensed contractor.

These revisions allow temporary storage of treated effluent, whereby the river flow conditions are not acceptable for receipt of the effluent (see section 8 for more details), or where the treated (or untreated) effluent does not meet the specifications for discharge, and thus would be removed off site by licensed contract (under such conditions).

As a result, the discharge will only occur when effluent has been treated to acceptable parameters and/or the river is within tolerable flow limits.

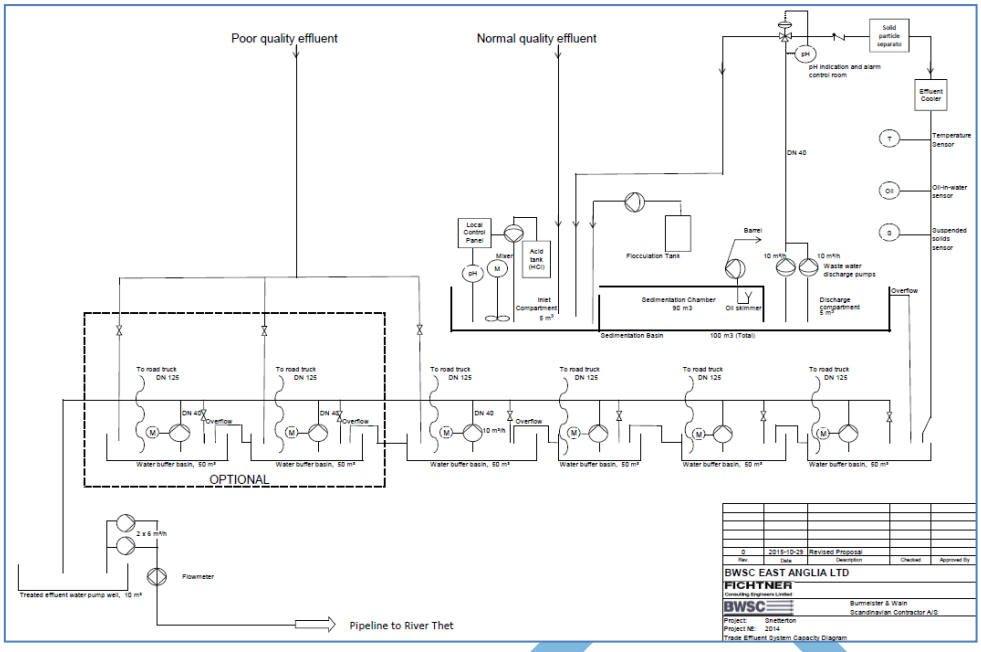
The operator has confirmed that monitoring provisions will be in place to monitor pollutant concentration, effluent flow and other parameters such as temperature and pH. Such monitoring will feed to a central control room within the Installation, which is manned 24 hours a day, allowing performance of the treatment process to be monitored.

Other parameters, (as detailed within section 9 – permit changes) will be monitored by composite sampling as recommended by the findings from the water quality assessment / modelling (as detailed within section 6 of this document).

If parameters do not meet the set determinants, then the operator will perform one of the two following options:-

- re-circulate effluent back through the treatment process until the parameters are compliant – then transport treated effluent to the buffer tank - pending discharge to river, or
- segregate non compliant effluent - to dedicated buffer tank for removal and disposal offsite (by licensed contractor).

Treated effluent (which meets the set parameters) will be stored within the buffer tanks, pending discharge to the river. The discharge pumps will only operate when the river is within the pre-determined flow range as detailed within sections 6 and 8 of this document.



The applicant has stated that detailed design, technical specifications and equiment information has not been completed, but will be readily available in due course. As a result of this, we have included a “pre-operational condition” within the permit in order to provide such details. Further detail is provided within section 9 of this document.

5. Capacity of Treatment Plant

Further clarification was provided by the applicant detailing the capacity of the ETP, as the current permit does not refer to such activity (table S1.1).

The applicant confirmed “*the average effluent treatment rates will be 34.3m^3/day with peaks of 115.8 m^3/day”.*

The Environmental Permitting (England & Wales) Regulations 2010 provides a threshold within schedule 1, section 5.4 (relevant to effluent treatment) for 50 tonnes per day (~S5.4 Part A(1)(a)(ii)).

As a result of this, an additional listed activity (Section 5.4 Part (1)(a)(ii) has been included within table S1.1 of the permit.

For the purposes of charging, the Environment Agency’s fees and charges scheme (April 2014) describes how we charge plants such as this (which support a main activity) and are above threshold for S5.4A(1)(a)(ii). Page 10, Rule 9 states that no listed activity charge applies within OPRA for plants with a capacity of less than 300m^3 per day.

Confirmation of the ETP design is required by pre-operational condition. Any increases to capacity of ETP would be subject to application for variation.

6. Water Quality impacts / modelling.

We have assessed data provided by the applicant, including the H1 risk assessment, water quality assessment (including modelling) and ecological risk assessment.

As part of our assessment we have checked values and data used in these reports, including screening data, mass balance data, assumptions used, and receptors assessed. In addition we have also carried out additional testing for various scenarios.

We have carried out screening of both Hazardous Pollutants and Sanitary Determinands according to Environment Agency guidance for hazardous pollutants – following the same steps as H1 risk assessment.

Effluent Flow Rates

Two values have been provided for flow data (the discharge element), at 34.3 m^3/day (average), and 115.8 m^3/day (maximum). This equates to 0.000394 m^3/s and 0.00134 m^3/s, or 0.4 l/s (average) and 1.34 l/s (maximum) respectively.

The peak value represents boiler blow down periods i.e. when the boiler is emptied for maintenance in order to flush down the system and supply clean water to critical plant areas such as the steam turbine, and water steam cycle. The frequency of this occurrence is unlikely to be no more than twice in a 12 month period (for planned maintenance) under normal operations .

In reality, the flow rate through the pipeline will be approximately 4 l/s at those intervals (boiler blow down) due to the pumping operation that will be used, however the assessment considers 0.4 l/s and 1.34 l/s which are considered better representative of the average flow over a given period of time – also representing the overall impact upon the river in terms of substance contribution.

Hazardous Pollutants : Effluent Concentrations

Parameter	Typical concentration	Peak concentration
Sulphate	50 mg/l	150 mg/l
Arsenic	< 0.020 mg/l	0.125 mg/l
Cadmium	0.003 mg/l	0.005 mg/l
Chromium	0.060 mg/l	0.180 mg/l
Copper	0.015 mg/l	0.030 mg/l
Lead	0.025 mg/l	0.050 mg/l
Nickel	0.005 mg/l	0.010 mg/l
Zinc	0.100 mg/l	0.200 mg/l

River Quality – derived from sampled data and water quality standards.

Parameter	Value	Statistic basis
Arsenic	0.05 mg/l	mean
Cadmium	0.00015 mg/l	mean
Chromium	0.0041 mg/l	mean
Copper	0.028 mg/l	mean
Lead	0.0072 mg/l	mean
Nickel	0.02 mg/l	mean
Zinc	0.125 mg/l	mean

Hazardous Pollutants : Environmental Quality Standards (EQS).

Parameter	Annual Average (AA)	Maximum allowable concentration (MAC)
Arsenic	50	
Cadmium	0.07	0.44
Chromium III	4.7	32
Chromium VI	3.4	
Copper	1	
Lead	7.2	
Nickel	20	
Sulphate	400,000	
Zinc	8	

Screening has been carried out using the Environment Agency's H1 environmental risk assessment process. Here, phase 1 is used to screen out substances which are not liable to cause pollution in two steps:

- Test 1 where the concentration of a substance in the discharge is <10% of the EQS (AA / MAC / 95 %ile)
- Test 2 Where the process contribution or PC is <4% of the EQS. The PC is the concentration in the water course of the substance after dilution

For substances that do not screen out at phase 1, phase 2 provides an assessment of detailed modelling.

Each of these phases assesses against annual average (AA) and/or maximum allowable concentration (MAC) EQSs (as detailed above).

Screening – Phase 1
The table below shows consideration of tests 1 and 2

Substance	Typical concentration	Peak concentration
Sulphate	Screened out	Screened out
Arsenic		
Cadmium		
Chromium (III)		Not screened out
Chromium (VI)		Screened out
Copper		
Lead		
Nickel		
Zinc		

The above assessment shows that Chromium (III) requires further assessment by modelling. Phase 2 modelling provides a more detailed assessment of this substance (not screened as insignificant).

Modelling – Phase 2

Chromium III

Modelling has been undertaken in order to further assess chromium III – which was not screened out during the H1 risk assessment process.

The H1 risk assessment process is a basic tool which overestimates the impacts in order to provide a conservative approach (allowing for any uncertainties in the assessment).

We have used the same concentration values in the modelling - as used within the H1 assessment, but replaced the conservative assumptions on the water course withactual data / characteristics from the watercourse in order to provide a more accurate assessment. This data / characteristics include :-

- Typical and peak effluent concentrations are truly representative of the proposed discharge
- The upstream concentration of the substances in the environment are a simplistic multiple of the EQS for each parameter
- The Q10 river flow data equates to a Q95 exceedance flow in the modelling.

- For those substances where water hardness is a relevant factor, the receiving water has been assumed to have the highest hardness rating.

Using this approach, we have run 3 modelling tests for Chromium III, all of which have now been screened out as passing this modelling assessment.

We have decided that it is not appropriate to set an ELV for chromium III (or any of the other hazardous pollutants) within the permit as they have all screened out. We have required monitoring to be carried out – to be reported monthly for the first 3 months of operation, and then 6th monthly thereafter.
We have also included an improvement condition (IC5) requiring the operator to provide a report – reviewing the 12 months of monitoring data for these parameters, in comparison to the theoretical data provided within the application.
Following the assessment of this improvement condition, the Environment Agency may impose limits for these parameters as identified within table S3.3 of the draft permit.

Sanitary Determinands - : Concentrations (within effluent)

Parameter	Typical concentration	Peak concentration
Suspended Solids	20 mg/l	40 mg/l
Ammoniacal Nitrogen	10 mg/l	20 mg/l
BOD	15 mg/l	30 mg/l

River Quality – derived from sampled data and water quality standards.

Parameter	Value	Statistic basis
Suspended Solids	8 mg/l	Mean
BOD	2.2 mg/l	90th %ile
Total Ammonia	0.19 mg N/l	90th %ile

Environmental Quality Standards (EQS).

Parameter	Annual Average	MAC
BOD	4000	1490
Ammonia	300	

We carried out modelling for the above sanitary determinands, and conclude the following :-

BOD We are satisfied that there would be no likely significant impact from the discharge on the receiving environment provided that this parameter does not exceed 100 mg/l in the 95%ile. Taking the percentile into account, we consider that any limit should not exceed 200 mg/l as a maximum value. ELVs are shown in section 7 below.

Suspended Solids Our usual procedure is to set a limit in ratio of 1.5 x to the BOD limit, we do not carry out modelling for this determinand. Our usual procedure is to set a limit in ratio of 1.5 x to the BOD limit. We consider that any limit should not exceed 300 mg/l as a maximum value. ELVs are shown in section 7 below.

Ammonia The modelling suggests that a maximum Ammonia limit of 41.48 mg/l would protect the receiving watercourse from greater than 10% deterioration, in the 90%ile river quality value.
An Ammonia limit of 30 mg/l (95%ile) would be appropriate to achieve no more than 10% deterioration, however considering effluent flow at peak levels, a limit of 30 mg/l (95%ile) exceeds the 10% deterioration value.
As a result, we have set a maximum limit of 20 mg/l and a 95%ile limit of 15 mg/l in order to achieve no more than 10% deterioration during peak and typical flow rates.

Impact upon the river during Low River Flows

The operator has provided Q95, Q99, and Q99.5 flow data for the River Thet during the summer months, and the year as a whole, at Redbridge gauging station.

Flow Percentile	River Flow during summer months (m^3/s)	Annual Flow (m^3/s)
Q95	0.105	0.110
Q99	0.080	0.100
Q99.5	0.055	0.085

The operator has confirmed that *twice annual* peak effluent flow rates (when the boiler is emptied) will not occur during periods of low flow within the river (i.e. less than the Q95).

In summer months when the Q99 percentile flow occurs, the river flow will be 200 times greater than the average effluent discharge rate of 0.000394 m^3/s, and 140 times greater during the Q99.5 flow. Dilution during these periods of low flow is considered to achieve acceptable dispersion with minimised impacts.

The Q99.5 summer flow of 0.055 m^3/s is estimated to occur for an average of 0.6 days per summer. The operator has committed to not discharging when the river flow falls below this value in order to retain a dilution factor of 100. During these periods, effluent will be collected in 4 holding tanks (50 m^3 each) until conditions are appropriate for the discharge. For any periods where the discharge is restricted beyond 6 days, then off-site disposal will be made by licensed contractor.

Summary

We have assessed the hazardous pollutants and sanitary determinands and consider that no significant deterioration will result on the receiving water course.

Modelling outcomes and information from our in-house audit – which have been used in the determination of this application have been saved on our Electronic Document Records Management system (public register).

We have considered information provided by the operator – covering periods of low flow and are satisfied by the measures that will be put in place by the operator in order to ensure adequate dispersion.

7. Emission Limit Values

The application confirms (Section C3, table 2) concentrations for the parameters to be released. We have sought confirmation from the applicant that these values are the maximum that they will emit. As a result, we have set these values as ELVs where they are more stringent than the values recommended within section 6, or vice versa where the recommended values are more stringent – in order to minimise any impacts.

Parameter	Concentration's presented by applicant	Environment Agency's recommendations for maximum ELVs based upon check modelling.		
		Limit	95%ile	Maximum
pH	6 - 10	6-9		
Suspended Solids	40 mg/l		-	300 mg/l
COD	100 mg/l		-	-
BOD	30 mg/l		-	200 mg/l
Ammoniacal N	20 mg/l		15 mg/l	44 mg/l
Arsenic	125 µg/l		Note1	Note1
Cadmium	5 µg/l		Note1	Note1
Chromium	180 µg/l		Note1	Note1
Copper	30 µg/l		Note1	Note1
Lead	50 µg/l		Note1	Note1
Nickel	10 µg/l		Note1	Note1
Zinc	200 µg/l		Note1	Note1

Note1 **An improvement condition will require a programme of monitoring for 12 months of operation – as documented previously within this section.**

The above concentrations are the levels which have been assessed for discharge impacts upon the River Thet. Details of this assessment are included within the section "Impacts".

The operator has committed to the above “application concentrations”, and we have set ELVs based upon the most stringent of these or recommended maximum values from the check modelling.

8. Flood Risk

During our initial consultation on the application (*following the application being duly made*) we received a number of representations which referred to concerns about flooding given previous experiences of flooding in this locality, and the impact that such additional impact could have on the River Thet / flood risk.

As a result of this, we required the operator to provide – i) an assessment on the impact from such a discharge upon the river - during periods where the river is at risk of flooding, and ii) details of any controls in order to mitigate against this - for implementation by the operator. This information was provided as additional information on 9th November 2015.

Within this information, the operator has provided peak flood flows (from Redbridge gauging station) between 1967 and 2012, and has used the Flood Estimation Handbook to assess flood flows for a range of periods (1 in 2 years to 1 in 200 years). They have considered the maximum effluent discharge likely from the Installation upon such flood flows and conclude that the increase in impact is negligible at < 0.02% of such peak flood flows.

A flood flow with a return period of 1 in every 2 years (50% annual probability) is equivalent to bank-full river flow at 8.3 m^3/s. This is the level above which it is considered that a flood may occur. In context, typical effluent flows equate to 0.000394 m^3/s.

Proposed controls to mitigate against such impact have been proposed by the operator as follows:

When the flow of the river reaches bank-full level (i.e. measurements of 8.3 m^3/s at Redbridge gauging station), then the operator will cease to discharge directly to the river, and instead will divert any discharge to four 50 m^3 effluent holding tanks. These tanks have the capacity to retain 6 days of effluent discharge. In an extreme event whereby 6 days is not sufficient, the plant has the facility to pump the effluent out of these tanks – into a mobile tanker for licensed disposal elsewhere.

In addition to the provision of a bank-full river level, the operator has also provided data for low flow periods (drought). This assessment is detailed within section 6 of this document.

9. Ecology / Habitats / Conservation

We have carried out a screen of "IR EPR discharges to water" (*linear length downstream screen*) for the vicinity, and can confirm that there are no European Sites or SSSIs within the screening criteria from the Installation

The following conservation sites have been identified as being at potential risk from the Installation – having considered the linear length screening distance (appropriate for assessing discharges to water) downstream from the Installation:-

- Lakes & River in Shropham (LWS)
- Adjacent River Thet (LWS)
- North of Red Bridge (LWS)

We have considered the water quality assessment which showed that the level of pollutants would not exceed those required in order to maintain its "Good" ecological / Water Framework Directive status for the River Thet. This is supported by the review that we have carried out of the applicants modelling (section 6).

We have consulted with the local Geomorphology Technical Officer (East Coast: Humber to Thames) Fisheries, Biodiversity & Geomorphology, and have received no comments on this proposal.

We consider that the application will not affect these local wildlife sites. We have considered the impact from the Installation alone to determine whether it would cause significant pollution.

10. Permit changes

Conditions

The following conditions are amended as a result of table changes within the schedules 1 – 4 of the permit:-

- 3.1.1,
- 3.6.1, and
- 3.6.4.

The following condition relating to Fire prevention has been added to the latest permit template, and is required to be incorporated by this variation.

3.5.1 The operator shall take all appropriate measures to prevent fires on site and minimise the risk of pollution from them including, but not limited to, those specified in any approved fire prevention plan.

3.5.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to a risk of fire, submit to the Environment Agency for approval within the period specified, a fire prevention plan which prevents fires and minimises the risk of pollution from fires;

(b) implement the fire prevention plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

The following conditions are to be used for all installations subject to the industrial Emissions Directive (IED) and is required by this variation.

3.1.3 Periodic monitoring shall be carried out at least once every 5 years for groundwater and 10 years for soil, unless such monitoring is based on a systematic appraisal of the risk of contamination.

4.3.1 In the event:

(a) that the operation of the activities gives rise to an incident or accident which significantly affects or may significantly affect the environment, the operator must immediately—

(i) inform the Environment Agency,

(ii) take the measures necessary to limit the environmental consequences of such an incident or accident, and

(iii) take the measures necessary to prevent further possible incidents or accidents;

(b) of a breach of any permit condition the operator must immediately—

(i) inform the Environment Agency, and

(ii) take the measures necessary to ensure that compliance is restored within the shortest possible time;

(c) of a breach of permit condition which poses an immediate danger to human health or threatens to cause an immediate significant adverse effect on the environment, the operator must immediately suspend the operation of the activities or the relevant part of it until compliance with the permit conditions has been restored.

4.4.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made "immediately", in which case it may be provided by telephone.

Schedules

Table S1.1 has been updated in order to account for the Effluent Treatment Process which meets listed activity thresholds (and should be included as a listed activity within this table). The size of plant has not increased as a result of this variation, but is required to be specified within table S1.1.

Table S1.1 activities		
Activity listed in Schedule 1 of the EP Regulations	Description of specified activity	Limits of specified activity
Section 5.4 A(1)(a)(ii)	Disposal of non-hazardous waste with a capacity exceeding 50 tonnes per day involving physico-chemical treatment. (Excludes activities covered by Council Directive 91/271/EEC concerning	From the receipt of process effluent to its treatment within a dosing and settlement treatment plant pending discharge to the River Thet. Discharge from emission point W1 to the River Thet

Table S1.1 activities		
Activity listed in Schedule 1 of the EP Regulations	Description of specified activity	Limits of specified activity
	urban waste-water treatment)	shall only be made when the emission limits specified in table S3.3 have been met, and when river flow is between 0.055 m^3/s and 8.3 m^3/s (as measured at Redbridge gauging station).

The following information is considered relevant to this variation and has been incorporated into table S1.2 as appropriate.

Table S1.2 Operating techniques		
Application EPR/AP3037FL/V004 and additional supporting information.	Application for substantial variation parts :- Forms C2, C3 (revised), W4048-150318 – EP Supporting Info, Environmental Risk Assessment, DEM7323-RT001-R09-00- Water Quality Assessment, Ecological Risk Assessment, H1v2_72, 2014.S2.K01.001.RA.Plant Effluent System, additional information provided 27th May 2015, S1901-0010-0003JRS and Clarification on Duly Making.	Duly Made 11/06/2015
Schedule 5 Response	All information including : 915 Buffer Tanks Location; 2014.S2.K01.002.R0 Trade Effluent System, MCM7593-RT001-R01-00, w4048-151123 – Treatment details.	23/11/2015

An additional improvement condition has been added to table S1.3 in order obtain a detailed report following 12 months of monitoring data, as recommended by the Water Quality Assessment. Following this report, the Environment Agency will amend emission limit values within table S3.3

Table S1.3 Improvement programme requirements		
IC5	The operator shall provide a detailed report containing a review of 12 months of monthly monitoring data (for the following pollutants) as required by table S3.3:- • Arsenic • Cadmium • Chromium • Copper • Lead • Nickel • Zinc The report shall include an assessment of measured emissions in comparison to predicted emissions (as provided within application	15 months after the completion of commissioning

	data). *Where emission concentrations are higher than predicted, the operator shall provide i) a detailed justification for this, ii) a detailed assessment of impacts (using the actual data), and iii) submit improvement proposals (with timescales for their implementation) in order to remove such variances.* The report shall seek written approval from the Environment Agency. Limits and Monitoring requirements specified within table S3.3 will be revised by the Environment Agency, following the completion of this condition.	

An additional pre-operational condition PO4 has been added to table S1.2 in order to gather further information and clarification about the Effluent Treatment Plant specification – which was not available during the time of application (or schedule 5 notice). The operator committed to providing such detailed plans when available – nearer the time of Installation construction.

Table S1.4 Pre-operational measures	
PO4	At least three months before commissioning (or such other date as agreed in writing by the Environment Agency), the operator shall provide written detailed design specifications and plans for the Effluent Treatment Plant to the Environment Agency for approval. Where any variance occurs to the outline data provided within the application, the operator shall provide a detailed justification for such variance, including revised BAT assessment, impact assessment, operating techniques, and any other relevant documents.

We have included the following limits and monitoring requirements in table S3.3,

Footnotes have been included in order to :-

1. *Ensure that the discharge is only made under appropriate flow conditions.*
2. *Emission Limits and Monitoring may be revised by the Environment Agency upon completion of improvement condition IC5, as outlined above.*

Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference Period	Monitoring frequency	Monitoring standard or method
W1 (599651,292389) to River Thet [as shown on application document W4048-d11-I00 Note1	Effluent Treatment plant	Maximum Effluent Flow	115.8 m^3/day	Total daily volume	Continuous	MCERTs
		15-minute instantaneous or averaged flow	No limit set. [record as m^3/s]	15 minute	Continuous	
		pH	6 - 9	Instantaneous	Continuous	BS ISO 10523
		Suspended Solids	40 mg/l	24-hour flow proportional sample	weekly for first 3 months of	BS EN 872
		COD	100 mg/l			BS 6068-2.34

		BOD	30 mg/l		operation, then monthly thereafter	BS EN 1899-1
		Ammoniacal Nitrogen (expressed as N)	20 mg/l (max) 15 mg/l (for 95% of all measured values of periodic samples taken over one month)			SCA blue book 48 ISBN 0117516139
		Arsenic	No Limit Set Note2	24-hour flow proportional sample	weekly for first 2 months of operation, then monthly thereafter Note 2	BS EN 26595 ISO 6595 BS
		Cadmium				BS EN ISO 5961
		Chromium III				BS EN 1233
		Chromium VI				BS EN 1233
		Copper				BS 6068-2.29 ISO 8288
		Lead				
		Nickel				
		Zinc				

Note1 Discharge to river Thet shall only be made when the river flow is between 0.055 m^3/s and 8.3 m^3/s (as measured at Redbridge gauging station).

Note2 To be revised following the collection of 12 months of monitoring data as required by Improvement Condition IC5 (table S1.3).

Annex 1: decision checklist

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

Aspect considered	Justification / Detail	Criteria met Yes
Receipt of submission		
Confidential information	No claim for commercial or industrial confidentiality has been made.	✓
Identifying confidential information	We have not identified information (provided as part of the application) that we consider to be confidential. The decision was taken in accordance with our guidance on commercial confidentiality.	✓
Consultation		
Scope of consultation	The consultation requirements were identified and implemented. The decision was taken in accordance with RGN 6 High Profile Sites, our Public Participation Statement and our Working Together Agreements.	✓
Responses to consultation and web publicising	The web publicising, and consultation responses (Annex 2) were taken into account in the decision. This decision was taken in accordance with our guidance.	✓
Operator		
Control of the facility	We are satisfied that the operator is the person who will have control over the operation of the facility after the grant of the permit. The decision was taken in accordance with EPR RGN 1 Understanding the meaning of operator.	✓
European Directives		
Applicable directives	All applicable European directives have been considered in the determination of the application.	✓
The site		
Extent of the site of the facility	There are no changes to the extent of the site as a result of this variation. A plan is included in the permit and the operator is required to carry on the permitted activities within the site boundary.	✓
Site condition report	There is no change to the extent of the site as a result of this variation. Activities which are subject to this variation will be carried out within the existing site area which has already been assessed for site condition.	✓
Biodiversity, Heritage, Landscape and Nature Conservation	We have carried out a screen of "IR EPR discharges to water" for the vicinity, and confirm that there are no European Sites or SSSIs within the screening criteria. The following conservation sites have been identified as being at potential risk from the Installation – having considered a linear length screening distance (appropriate for assessing discharges to water) downstream from the Installation:- • Lakes & River in Shropham (LWS)	✓

Aspect considered	Justification / Detail	Criteria met Yes
	• Adjacent River Thet (LWS) • North of Red Bridge (LWS) A full assessment of the application and its potential to affect the sites has been carried out as part of the permitting process. We consider that the application will not affect these local wildlife sites. We have considered the impact from the Installation alone to determine whether it would cause significant pollution. Further detail is included within section 6 of this document. We have not formally consulted on the application. The decision was taken in accordance with our guidance.	
Environmental Risk Assessment and operating techniques		
Environmental risk (operator's assessment)	We have reviewed the operator's assessment of the environmental risk from the facility. The operator's risk assessment is satisfactory. The assessment shows that, applying the conservative criteria in our guidance on Environmental Risk Assessment all emissions may be categorised as environmentally insignificant with the exception of Chromium III. Further considerations were made for Chromium III using water quality modelling, the results of which screened this parameter out from further assessment requirements. This is covered within section 6 of this document.	✓
Environmental risk (check modelling).	We have carried out our own check modelling for hazardous pollutants [*sulphate, arsenic, cadmium, chromium III and VI, Copper, Lead, Nickel and Zinc]*, BOD, and Ammonia. During the check modelling we used revised assumptions and values in order to test the modelling (and in some cases use values which we considered to be more appropriate). The results from this check modelling indicate that we agreed with the operators conclusions that "the impact of the plant effluent on the quality of the River Thet, and nearby wildlife sites would be minimal. As a portion of the assessments and modelling are based upon assumptions, the water quality assessment (check modelling) recommends prescribing permit limits for sanitary determinands and no initial limits for hazardous pollutants until operational data has been collected – and compared to the data provided within the application. Following this, the Environment Agency may set limits where it is deemed necessary from such comparison. Details on Emission Limit Values and Permit conditions are detailed within sections 7 and 9 of this document.	✓
Operating techniques	We have reviewed the techniques used by the operator and compared these with the relevant guidance notes [Combustion activities (EPR1.01)]. ***Boiler blowdown*** *- during normal operations boilers are blown down to control the composition of the boiler water. This blowdown is a concentration of the small amounts of solids remaining in the boiler feed water from the water de-ionisation plant, plus any chemicals used for treating the water, e.g. phosphates, small amounts of alkalis, hydrazine, ammonia etc* ***Waste water treatment*** *- many sites will have on-site wastewater treatment plants for treating domestic wastes and suitable other*	✓

Aspect considered	Justification / Detail	Criteria met Yes
	streams. ***De-ionisation effluent-*** *Neutralise water de-ionisation plant regeneration effluent before discharge.* ***Site drainage including rainwater -*** *Use an efficient oil/water separation/interceptor system. Further treatment may be required to remove dissolved hydrocarbons.* *Direct discharge to controlled waters will only be allowed where discharges will meet discharge requirements under all conditions.* ***Waste water treatment -*** *On-site wastewater treatment plant effluent must meet discharge standards.* The above techniques (EPR1.01) are in line with techniques referred within this application. Consideration for the treatment technology and water quality impacts is detailed within sections 4 and 6. The operator is required to confirm detailed design for the effluent treatment system (currently not available) as a pre-operation condition.	
The permit conditions		
Updating permit conditions during consolidation.	We have updated previous permit conditions to those in the new generic permit template as part of permit consolidation. The new conditions have the same meaning as those in the previous permit(s).	✓
Pre-operational conditions	Based on the information in the application, we consider that we need to impose pre-operational conditions. We have include pre-operational condition PO4 (table S1.4) requiring the operator to provide written detailed designs for the Effluent Treatment Plant, which the operator committed to provide as a pre-operational requirement due to not have detailed designs at the time of application. Information covered within section 10 of this document	✓
Improvement conditions	Based on the information in the application, we consider that we need to impose an improvement condition. Improvement Condition IC5 (table S1.3) requires a detailed report containing a review of 12 months of monitoring data for Arsenic, Cadmium, Chromium III, Chromium VI, Copper, Lead, Nickel, and Zinc – after which point limits and monitoring will be set by the Environment Agency. This follows advice provided by the Water Quality assessment in consideration of the impact assessments for these substances. Information covered within section 10 of this document.	✓
Incorporating the application	We have specified that the applicant must operate the permit in accordance with descriptions in the application, including all additional information received as part of the determination process. These descriptions are specified in the Operating Techniques table in the permit.	✓

Aspect considered	Justification / Detail	Criteria met Yes
Emission limits	We have decided that emission limits should be set for the parameters listed in the permit. It is considered that the numeric limits (detailed in section 7) will prevent significant deterioration of receiving waters. We have imposed numeric limits because either a relevant environmental quality or operational standard requires this. Further detail on this is covered within section 6 and 7 of this document.	✓
Monitoring	We have decided that monitoring should be carried out for the parameters listed in the permit, using the methods detailed and to the frequencies specified. These monitoring requirements have been imposed in order to:- • Ensure that numerical values obtained from monitoring during actual operations, is in line with the information provided within the application – to which impact assessments and modelling have been based. • To allow ELVs to be set within table S3.3 following the collection of 12 months of monitoring. The above follows advice provided by the Water Quality assessment. We have included monitoring requirements within table S3.3. Further information is contained within section 10 of this document. We made these decisions in accordance with our Technical Guidance Note (Monitoring) - M18.	✓
Reporting	We have specified reporting in the permit. We require reporting of monitoring data in relation to the change made by this variation, and upon recommendations by the Water Quality assessment – undertaken by the Environment Agency water quality team. We made these decisions in accordance with our Technical Guidance Note (Monitoring) - M18.	✓
Operator Competence		
Environment management system	There is no known reason to consider that the operator will not have the management systems to enable it to comply with the permit conditions. The decision was taken in accordance with RGN 5 on Operator Competence.	✓

1 Annex 2: Consultation, and web publicising responses

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

We have consulted with the following consultees :-

- Local Authority (Environmental Protection)
- Food Standards Agency
- Health and Safety Executive
- Public Health England
- National Grid

Response received from
Public Health England
Brief summary of issues raised
PHE has no significant concerns regarding risk to health of the local population from this proposed activity, providing that the applicant takes all appropriate measures to prevent or control pollution, in accordance with the relevant sector technical guidance or industry best practice. In relation to potential risk to public health, we recommend that the Environment Agency also consult the following relevant organisation(s) in relation to their areas of expertise: o the local authority for matters relating to impact upon human health of contaminated land; noise, odour, dust and other nuisance emissions; o the Food Standards Agency, where there is the potential for deposition on land used for the growing of food crops or animal rearing; o the Director of Public Health for matters relating to wider public health impacts.
Summary of actions taken or show how this has been covered
We have considered appropriate measures and pollution control – within sections 4, 5 and 6.

Web Publicising Responses

Brief summary of issues raised	**Actions taken**
Flood safety measures - ensure that there is no pollution/contamination, carry out or pay for sufficient ongoing dredging etc works to ensure the flood risk is not increased by the additional discharge.	Considered within section 6 (water impacts) and section 8 (flood risk).
Apparently YOU have given permission for effluent to be pumped into the river! area is prone to flooding....so how can this be a good idea??	Considered within section 8 flood risk
Floods in several places & the river rises very rapidly when it rains fairly heavily, The river needs dredging not more fluid pumped into it. If any pollutants were to escape from the biomass plant & be pumped into the river the results could be catastrophic to the natural environment the river flows through. (Accidents)	Considered within section 6 (water impacts) and section 8 flood risk.

I would like confirmation that none of the massively polluting transport organisation that will feed the biomass plant when it is operational will only access it via the A11 and none will be permitted through Snetterton North End.	This is within the remit of the planning authority and not the Environment Agency
It would seem that with private households, dairy farming, and a food processing plant, bordering the river that this is an extraordinary development, with scant regard for the environment, and the quality of the river water. We are already at North End Snetterton bordering a new farm gas and fertiliser plant, with the associated noise and smells, and a massive increase in the related heavy traffic on a single track lane from the two construction sites and associated plant products. I am fully aware of the need for future Eco friendly power supplies etc., that safeguard the planet, but it would appear that there has been a total lack of care or thought for the local environment as these plans have been escalated far beyond the original planning application.	Considered within section 6 (water impacts) and section 8 (flood risk). The change from discharge to sewer to discharge to water will not have an impact upon the existing odour or noise assessments – as considered within the original application. This content of the planning application within the remit of the planning authority and not the Environment Agency. We are satisfied appropriate environmental risks have been considered in this EPR variation determination
Considerable **local flooding** each winter downstream from the proposed site of the discharge. Fields belonging to the World Horse Welfare charity become unusable because of the flooding. Fields belonging to a farmer who grazes sheep and cattle also become unusable. Last winter the farmer had to move his stock very quickly to prevent a catastrophe when the Thet burst its banks overnight and the fields were flooded to a very dangerous level. The hamlet of South End Snetterton lies near to these fields and it will not be too long before flooding occurs here with the associated heartache which will ensue, compatible to the scenes we witnessed in the West Country last winter. If the Biomass factory is allowed to discharge into the Thet then the increase in **water volume** will only exacerbate the already critical situation.	Considered within section 6 (water impacts) and section 8 (flood risk).
Considerable improvement in the **water quality**. It is not right (it definitely isn't fair) that someone can then just pop up and undo all that work	Considered within section 6 (water impacts) and section 8 (flood risk).
Having reviewed the proposed changes, they are proposing a much bigger installation than they have received approval for. I am concerned that this will result in a greater throughput of traffic into the local area, with increased waste production, increased noise and pollution. **Flood risk area**, there is the potential for **contamination** to local environment.	The permit already includes a limitation on throughput per annum, as assessed within the original permit application. This variation does not request increases to throughput. Traffic (except that onsite) is within the remit of the planning authority and not the Environment Agency Assessment of flooding is covered within section 8 (flood risk).

I would not object if the effluent is cleaned and the river dredged to Thetford.	Considered within section 6 (water impacts) and section 8 (flood risk).
Concerns for the effects of discharging the effluent into the River Thet - polluting the environment and extremely bad for the ecology of the area. Not only will this effect flooding (flooded 3 times). If it goes ahead I would like assurance that we will not flood and that gullies and drains will be cleared to allow free drainage.	Considered within section 6 (water impacts) and section 8 (flood risk).
You will no doubt be aware that the **river floods** during the winter months and during prolonged periods of heavy rain in other seasons. We are extremely concerned that, if the discharge of effluent into the river is allowed, then the probability of serious flooding with increased frequency will be significantly increased.	Considered within section 8 (flood risk).
I would like to register my concerns to any effluent discharge into the river Thet in connection with the above Planning application. As a local resident I am very concerned about the whole Bio Mass Station which is situated close to my home and do not think that any effluent at all should be permitted in this small river. It seems that the original planning permission has been granted but not this discharge.	Considered within section 6 (water impacts) and section 8 (flood risk). The Environmental Permit is separate to the planning permission. The planning decision is the responsibility of the local, council
I have recently learned that a planning application has been made, and approved by Breckland Council, for the discharge of effluent into the river Thet, by the new Snetterton Biomass Plant. It would seem that with private households, dairy farming, and a food processing plant, bordering the river that this is an extraordinary development, with scant regard for the environment, and the quality of the river water. We are already at North End Snetterton bordering a new farm gas and fertiliser plant, with the associated noise and smells, and a massive increase in the related heavy traffic on a single track lane from the two construction sites and associated plant products. I am fully aware of the need for future Eco friendly power supplies etc., that safeguard the planet, but it would appear that there has been a total lack of care or thought for the local environment as these plans have been escalated far beyond the original planning application.	Planning permission is covered by the Local Council and not the Environment Agency. Considered within section 6 (water impacts) and section 8 (flood risk). The change from discharge to sewer to discharge to water will not have an impact upon the existing odour or noise assessments – as considered within the original application. Traffic and Planning matters are not covered within the remit of the Environment Permit, and are covered by the relevant Planning Authority
I object because the River Thet currently floods and additional volume into the River will just exacerbate the situation. I am concerned about a 25% increase in ammonia to the River together with traces of other metals. What is the proposed contingency if the treatment plant fails. It will only take one accident for a major impact on the flora and fauna of the River Thet and surrounding land. I am a resident of Snetterton and am dismayed at the lack of (zero) communication / liaison with the Parish from the Snetterton Renewable Energy Biomass Plant.	Considered within section 6 (water impacts) and section 8 (flood risk). This point has been highlighted to the operator.

Regarding the planning proposal to put more effluent waste into the River Thet at Snetterton, We as residents of Snetterton, living near the river, are not exactly happy regarding this proposal. Typical to push a planning proposal through, despite local objections, perhaps with some concessions, and then half way through the building process, to push through an expansion of the project. Regarding the river, for much of the year there is not exactly a fast flow of water in the river, which already suffers from too much fertility due to excessive agricultural fertilizers being used on soils with a degraded colloidal quality due to over use. The result is often rank weed growth rather than the sort of plant life upon which much of the river fauna depends. Hence any further pollution of the river, especially from a project which claims to be providing an environmental benefit in the form of green energy, is really not acceptable. It shows that the so called green credentials are in fact rather hollow, and it is more about big business profits being put in front of the quality of life for the local community and the wildlife of the river. There are supposed to be otters now residing in the river locally, there have been kingfishers, usually are swans, all these depend of a high standard of water quality.	This is within the remit of the planning authority and not the Environment Agency Considered within section 6 (water impacts) and section 8 (flood risk).
Concerns raised over the volume of effluent being released into our rivers Potential increase in flooding of our fields within our Parish Our children will not be able to play in our rivers as they have done for Centuries The waste produced would not be suitable for irrigation The River Thet already has historical flooding issues Concern over water quality in the future for local businesses, Norfolk Water and English Whiskey Company	Considered within section 6 (water impacts) and section 8 (flood risk).
There are plans to release large amounts of water, and possibly some effluent into the river Thet. This is a small river that runs from Snetterton, through our village and on through neighbouring villages into the town of Thetford just down the road. This is a small river that does not have a large course in many places and is already very susceptible to flooding and I am very concerned that additional water being put into the river will increase this risk all along the river. This risk of flooding will also increase the risk of water getting into the Breckland aquifer which is used locally by the distillery for their water amongst other users. The potential for effluent into the water also seriously concerns me. Many farmers use the water from the river to irrigate their crops which would become impossible if the water were to become contaminated by the plant. It is planned that the plant will burn straw. There is a very sparse supply of straw in the local area and local farmers are naturally very concerned about what this large additional demand will do to straw prices which are already very high. In addition, if there is insufficient straw locally then the plant will have to import the straw from further afield, such as Essex. This appears to me to be	Considered within section 6 (water impacts) and section 8 (flood risk). This application solely concerns the change requested by application (the discharge). The permit has previously been granted / consulted during which, considerations for raw materials were made.

madness. Any environmental benefit to this plant would surely be wiped out by the additional emissions from the lorries bringing the straw to the plant. In addition, should the plant not be allowed to remove the waste water by way of the water course then the only alternative is to remove it by tanker, again adding significantly to local traffic and also to emissions. **The site already has a permit and planning permission granted since 2012? We are only consulting on the specific changes requested by this variation (discharge).** Lastly, given that there is little or no straw production in the immediate Snetterton area, the straw will naturally have to be brought in by road. I have been told that this straw will have to be brought in by way of the A11, however that there is also no way of enforcing this, nor is there any ruling about how far along the A11 the straw must travel..... significant increases to road traffic that will naturally occur, very likely through our village.	Yes, this site is existing. The original permit was granted in 2012. This application solely concerns a change to the discharge. This is within the remit of the planning authority and not the Environment Agency
As a resident of Mill Lane in Snetterton, I wish to register my opposition to this application. Our property boundary lies adjacent to a tributary of the Thet River and as such is already vulnerable to flooding. The proposals in this application will, I believe, leave my home and its grounds open to increased risk. I am also concerned that treated water will have a detrimental effect upon the fragile flora and fauna of the Thet and its environs. I also oppose the changes requested in this application which would adversely affect local traffic conditions on our narrow roads.	Considered within section 6 (water impacts) and section 8 (flood risk). This is within the remit of the planning authority and not the Environment Agency
I would like to object to the permitting being sought by BWSC to discharge effluent from the Snetterton Biomass Plant in to The River Thet. Whilst the plant itself, sitting approx. 1 km from The River Thet is flood risk zone 1 the river itself breaks its banks every Autumn and Winter and floods the surrounding pasture, farmland and woodland all the way down to East Harling and must be viewed as flood risk 3 and 2 for months on end. I am also concerned by the prospect of increased ammonia and metals being pumped into the River Thet as part of this effluent which could affect the fish population and, during periods of flooding, the flowers and fauna and grazing land. The biomass operators are not permitted to allow this effluent to be sprayed on fields so how can it be right that it should be discharged into the river ?	Considered within section 8 (flood risk). Considered within section 6 (water impacts).
I would like to object to the permitting being sought by BWSC to discharge effluent from the Snetterton Biomass Plant in to The River Thet. Whilst the plant itself, sitting approx. 1 km from The River Thet is flood risk zone 1 the river itself breaks its banks every Autumn and Winter and floods the surrounding pasture, farmland and woodland all the way down to East	Considered within section 8 (flood risk).

Harling and must be viewed as flood risk 3 and 2 for months on end. I am also concerned by the prospect of increased ammonia and metals being pumped into the River Thet as part of this effluent which could affect the fish population and, during periods of flooding, the flowers and fauna and grazing land. The biomass operators are not permitted to allow this effluent to be sprayed on fields so how can it be right that it should be discharged into the river ?	Considered within section 6 (water impacts).