Further Information Submission

(ref. 19.PA0011)

November 2009

Bord na Móna Energy Limited

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Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
A	26/11/2009	R. H	P. K	P.K	Final Issue

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Content

Executive Summary

A *Request for Further Information* was issued by An Bord Pleanála on the 28th August 2009 to Bord na Móna Energy Limited requesting further information in relation to planning application reference number 19.PA0011. A copy of this correspondence is included in Appendix A *Request for Further Information*. On behalf of the applicant, Bord na Móna Energy Limited, Mott MacDonald Ireland Limited are pleased to respond with further information and revised proposals as detailed in this document.

In response to the request for further information Bord na Móna Energy Limited have revised their proposals in respect of both the quantity of the volumetric discharge and the concentration of the relevant constituent parameters in the proposed discharge to the Yellow River:

- Reduce maximum Daily Volumetric Discharge from 360m^3 to 250 m^3 per day;
- Reduce BOD concentration in discharge from 20mg/l to 10 mg/l.;
- Reduce Ammonia concentration in discharge from 1.5 mg/l to 1 mg/l.

In addition Bord Na Móna Energy Limited present in this submission justification for the suitability of the proposed discharge location (as specified in the Environmental Impact Statement) to the Yellow River in the context of the stricter environmental quality standards as required under the *European Communities Environmental Objectives (Surface Water) Regulations 2009*, (the "2009 Regulations")

This submission contends that the proposed discharge will not cause deterioration in the overall water status of the Yellow River in compliance with the requirements of the above mentioned Regulations (the "2009 Regulations"). To support this contention, this submission demonstrates that the proposed discharge will not result in a deterioration in the chemical status or the ecological status as supported by the physicochemical conditions of the river.

Consultation undertaken with the Environmental Protection Agency and a review of the currently unpublished Water Services National Training Group of the Department of Environment Heritage and Local Government document entitled *Guidance, Procedures and Training on the Licensing of Discharges to Surface Waters and to Sewer* has allowed us to determine the current policy being implemented in relation to discharges for situations where the background concentrations in the receiving waters currently exceed the EQS values specified in the regulations. It is our understanding that the current approach is to assess discharges on a case by case basis and that a proposed discharge may be permissible in the event where it is clearly identified that the following conditions are met;

Condition 1. The current overall water status of the receiving waterbody is not classified as "High Overall Status".

Condition 2. The application of Best Available Techniques (BAT) has been applied at the proposed development and in relation to the proposed discharge.

Condition 3. The proposed discharge will not cause deterioration in the chemical status or ecological status of the waterbody.

Condition 4. The proposed discharge will not inhibit the receiving waterbody attaining the water quality objectives as outlined in the River Basin Management Plan within the required time period. Nor will it inhibit the effectiveness of the measures specified within the River Basin District Programme of Measures for the specified waterbody to enable the waterbody to attain the water quality objectives as outlined in the relevant River Basin Management Plan.

In the context of the above revised proposals, consultation undertaken and analysis completed as detailed in this document, the following conclusions have been drawn;

- The proposed discharge will not result in deterioration in the chemical status or the ecological status of the waterbody.
- The proposed waterbody into which the effluent will be discharged is not classified as being of 'High Overall Status';
- The number of dilutions available to the proposed discharge are 85 and would not be considered to present a 'risk' to the receiving waterbody having regard to the publication "*Recommendations for Programmes of Measures for Point Source Discharges to Surface Waters Resulting From Municipal and Industrial Regulated Activities (MIR Poms Study) Volume 1, South Western River Basin District"*
- The proposed discharge will not inhibit the implementation of the *Eastern River Basin District – Programmes of Measures 2009 -2015* nor will it inhibit the waterbody (or the adjacent waterbody downstream) from attaining Good Overall Status as required.
- The assimilative capacity calculations presented in Table 4 and Table 5 of this submission indicate that the proposed discharge in the context of the overall environmental quality standards are considered to be insignificant and will not compromise or inhibit the waterbody retaining Good Overall Status.
- In accordance with the document entitled *Guidance, Procedures and Training on the Licensing of Discharges to Surface Waters and to Sewer,* (which is currently at the final stages of development), discharges are not prohibited from occurring to a waterbody where the assimilative capacity of the receiving waterbody is currently incapable of assimilating the proposed discharge under certain conditions.
- There are a number of recent cases [since the implementation of the *European Communities Environmental Objectives (Surface Water) Regulations 2009*] whereby the Environmental Protection Agency have granted authorisations to discharge where the environmental quality standards as specified in the regulations cannot be attained.
- Best Available Techniques (BAT) will be employed for all processes at the proposed facility to ensure that the proposed discharge will be limited in terms of daily volumetric discharge and the concentration of the relevant constituent parameters.

In conclusion, it is contended that the information contained within this document clearly demonstrates that the discharge from the proposed development will have an insignificant impact on the water quality of the Yellow waterbody and will not result in a deterioration in the chemical status or the ecological status of the Yellow River and will not in any way hinder or inhibit the waterbody achieving Good Overall Status as required under the Water Framework Directive.

The current policy approach being recommended and adopted by other public authorities such as the Environmental Protection Agency in instances where the background concentrations in the receiving waters currently exceed the EQS values specified in the 2009 regulations is to assess discharges on a case by case basis. A proposed discharge may be permitted in the event where it is clearly identified that certain conditions are met. It is considered that the above approach is in keeping with the requirements of

Article 5 of the regulations which requires that a public authority in performance of its functions, shall not undertake those functions in a manner that knowingly causes or allows deterioration in the chemical status or ecological status of a body of surface water.

It should also be noted that Bord na Móna is also a designated public authority and as such is bound by Article 5 of the *European Communities Environmental Objectives (Surface Waters) Regulations 2009* which requires a public authority in performance of its functions not to undertake those functions in a manner that knowingly causes or allows deterioration in the chemical status or ecological status of a body of surface water.

As set out in our covering letter with this document, Bord na Móna Energy Limited would be happy to respond to any request for further information, submissions or observations and indeed if pursuant to Section 37E of the Planning and Development Act, 2000 (as amended) An Bord Pleanála so requires, Bord na Móna Energy Limited would be very happy to attend any meeting were the Board to consider such a meeting expedient for the purposes of determining the application or were the Board to consider such a meeting necessary or expedient for purposes of resolving any issue in relation to the application and/or this response in relation to the European Communities Environmental Objectives (Surface Water) Regulations 2009.

1. Introduction

1.1 General

A *Request for Further Information* was issued by An Bord Pleanála on the 28th August 2009 requesting further information in relation to planning application reference number 19.PA0011. A copy of this correspondence is included in Appendix A *Request for Further Information*. On behalf of the applicant, Bord na Móna Energy Limited, Mott MacDonald Ireland Limited are pleased to respond with revised proposals and further information and clarification as detailed in this document.

Following a request to An Bord Pleanála for a time extension, correspondence was issued granting this on 15th September 2009. A copy of the original request and associated response correspondence is included in Appendix B *Time Extension Correspondence.* It was considered necessary to request this time extension in order to allow access to a new guidance document being prepared by the Water Services National Training Group (WSNTG), (Department of Environment Heritage and Local Government) in consultation with the Environmental Protection Agency and other stakeholders to assist in the interpretation of implementation of licensing of discharges to waters and sewers in the context of the new *European Communities Environmental Objectives (Surface Water) Regulations 2009.* It was understood at the time of the request for further information that this document was to be finalised by November 2009, however the delivery date for this document has been further delayed in the interim. It is now anticipated that the document will be finalised in December 2009.

In preparation of this response document, additional consultation has been completed with the following public authorities and organisations;

- Offaly County Council;
- Office of Climate, Licensing and Resource Use, Environmental Protection Agency;
- Office of Environmental Assessment, Environmental Protection Agency; and
- Eastern River Basin District.

1.2 Content of Request for Further Information

An Bord Pleanála have requested that in accordance with section 37F(1) of the 2000 Act, as amended that further information be furnished as follows:

Revised proposals so as to ensure that the process effluent from the proposed development will not result in a deterioration in the water quality of the Yellow River, in compliance with the requirements of the European Communities Environmental Objectives (Surface Water) Regulations 2009. Details should be provided in terms of both chemical and ecological quality.

An Bord Pleanála in making this request have referred to certain articles of the *European Communities Environmental Objectives (Surface Water) Regulations 2009* as follows:

- Article 5 of the *European Communities Environmental Objectives (Surface Waters) Regulations 2009* requires that a public authority in performance of its functions, shall not undertake those functions in a manner that knowingly causes or allows deterioration in the chemical status or ecological status of a body of surface water.
- Article 28(1) states of the regulations state that a surface water body whose status is determined to be high or good shall not deteriorate in status; and
- Article 28(2) states that a surface water body whose status is determined to be less than good shall be restored to at least Good Overall Status not later than the end of 2015.

An Bord Pleanála have identified that increases in Biological Oxygen Demand (BOD), Total Ammonia and Molybdate Reactive Phosphorus (MRP) in the Yellow River due to the discharge of process effluent from the proposed development may preclude them from granting approval if such discharges result in a deterioration in the chemical status or the ecological status of the Yellow River. An Bord Pleanála seek revised proposals so as to ensure that the chemical status or ecological status of the Yellow River will not be deteriorated. These are detailed below.

2. Current Implementation and Interpretation of the Regulations 2009

2.1 Background

The European Communities Environmental Objectives (Surface Water) Regulations 2009 were signed into effect in July 2009. There is a significant lack of clarity as to how these Regulations will be interpreted in terms of permitting/licensing discharges to receiving waters, particularly in the scenario where background water quality levels are currently elevated over and above the environmental quality standards specified in the above mentioned regulations.

In order to gain a comprehensive understanding of the current situation Mott MacDonald undertook a series of consultation meetings with the Environmental Protection Agency due to their responsibilities as an authority in Ireland for licensing of industrial and other discharges, with specific responsibility for Integrated Pollution Prevention Control (IPPC) licensing. In addition the Environmental Protection Agency are central to the process of identifying the status of waterbodies in Ireland in accordance with the requirements of the Water Framework Directive (2000/60/EC).

A document entitled *Guidance, Procedures and Training on the Licensing of Discharges to Surface Waters and to Sewer* is currently at the final stages of development. This document has been prepared by the Water Services National Training Group (WSNTG), Department of Environment, Heritage and Local Government in conjunction with the Environmental Protection Agency and other stakeholders. This document offers guidance to licensing authorities in relation to discharges to surface waters taking cognisance of the *European Communities Environmental Objectives (Surface Water) Regulations 2009.*

In recognition of the situation whereby certain waterbodies have current water quality which exceeds the criteria outlined in the 2009 regulations, this document identifies that discharges should not be prohibited from occurring to a waterbody where the assimilative capacity of the waterbody is currently insufficient to demonstrate that the resultant concentration of pollutants is within the environmental quality standards specified in the 2009 regulations.

2.2 Conditions for Consideration of Discharge.

Based on consultation undertaken with the Environmental Protection Agency and a review of the document entitled *Guidance, Procedures and Training on the Licensing of Discharges to Surface Waters and to Sewer,* it has been ascertained that current advise and guidance in relation to instances where there is difficulty with assimilative capacity in the receiving waterbody, is that it is best practice to assess discharges on a case by case basis and that a proposed discharge may be permitted in the event where it is clearly identified that the following conditions are met;

Condition 1. The current overall water status of the receiving waterbody is not classified as “High Overall Status”.

Condition 2. Best Available Techniques (BAT) has been applied at the proposed development and in relation to the proposed discharge.

Condition 3. The proposed discharge will not cause deterioration in the chemical status or ecological status of the receiving waterbody.

Condition 4. The proposed discharge will not inhibit the receiving waterbody attaining the water quality objectives as outlined in the River Basin Management Plan within the required time period and the measures specified within the Eastern River Basin District Programme of Measures for the specified waterbody will allow the waterbody to attain the water quality objectives as outlined in the River Basin Management Plan.

2.3 Case Histories to Date

It is understood that the principles of the conditions listed above have been utilised to determine the appropriateness or otherwise of granting wastewater discharge authorisation certificates to wastewater treatment plants discharging to receiving waterbodies where there currently is insufficient assimilative capacities to allow for compliance with the environmental quality standards (EQS's) of the *European Communities Environmental Objectives (Surface Water) Regulations 2009* in circumstances similar to the situation for the proposed discharge associated with the power plant at Derrygreenagh. During consultation with the Environmental Protection Agency it was identified that there have been no IPPC licence applications processed to date which require the consideration of the *European Communities Environmental Objectives (Surface Waters) Regulations 2009.*

Similar to the requirements of An Bord Pleanála under the *European Communities Environmental Objectives (Surface Waters) Regulations 2009, Article 3* of the *Waste Water Discharge (Authorisation) Regulations, 2007* in respect of the Environmental Protection Agency states the following:

The Agency shall not grant an authorisation for a waste water discharge which, in the opinion of the Agency, will—

(a) Cause deterioration in the chemical status or ecological status or ecological potential as the case may be in the receiving body of surfacewater,

There are a significant number of WwTP discharges that have been licensed recently although there is insufficient assimilative capacity for certain parameters in order to allow compliance with the *European Communities Environmental Objectives (Surface Waters) Regulations 2009.* These include Athlone, Co. Westmeath, Clonroche, Co. Wexford, Monksland, Co. Roscommon , Rathkeale, Co. Limerick, Castlerea, Co. Roscommon, Carlow town, Co. Carlow and Killucan-Rathwire, Co. Meath. Specific details relating to the Wastewater Discharge Authorisation Certificate recently issued for Athlone, Co. Westmeath are provided in *Appendix C Example of a recently issued Wastewater Discharge Authorisation Certificate*.

It is considered important to draw the comparison between the proposed discharge at Derrygreenagh (subject of this document) and the ongoing licensing of wastewater treatment plants in the country by the Environmental Protection Agency (a public authority) in instances where there is not sufficient assimilative capacity in the receiving waters, as demonstrated in the above examples. Whilst the comparison in terms of the nature of development cannot be directly related, it is important to note that this project is considered to be of strategic public interest in a similar manner to the provision of adequate wastewater infrastructure.

In addition, it should be noted that the extension of WwTP's is not currently being precluded in such cases where there is insufficient assimilative capacity. An example of the same is Athlone WwTP which is to be

extended significantly by 2014 (Refer to Appendix C *Example of a recently issued Wastewater Discharge Authorisation Certificate*. In this case, it is estimated that 44% of the wastewater loading to the WwTP arises from non-residential sources, primarily consisting of commercial and industrial enterprises, which are critical to allow the proper economic function of the Athlone area. Aside from the strategic importance of the proposed power plant at Derrygreenagh mentioned above, it would also serve a very important economic function in the Co. Offaly area particularly in light of the reduction in economic activity associated with the peat harvesting industry when current peat resources are exhausted.

3. Appraisal of Proposed Discharge

3.1 Introduction

In this section of the report, the proposed discharge to the Yellow River is assessed having regard to the conditions set out in *Section 2.2 Conditions for Consideration of Discharge* in order to determine the suitability of the proposed discharge location as proposed in the Environmental Impact Statement for the receipt of a modified and reduced loading (to that specified in the Environmental Impact Statement) taking full cognisance of the requirements of the *European Communities Environmental Objectives (Surface Water) Regulations 2009.*

3.2 Background

3.2.1 Eastern River Basin Management Plan 2009 -2015

The final *Eastern River Basin District – River Basin Management Plan 2009-2015* has recently been published (September 2009) and is awaiting full adoption by all Local Authorities in the region.

The River Basin Management Plan sets out the aims and objectives of improving and protecting water quality and ecology in the Eastern River Basin district in order to allow for compliance with the requirements of the *Water Framework Directive (2000/60/EC).* The Plan also outlines how these objectives will be achieved by a Programme of Measures. The Programme of Measures is detailed in the associated document entitled *Eastern River Basin District – Programmes of Measures 2009 -2015* document.

The Programme of Measures Report outlines the following information for each of the waterbodies within the River Basin District:

- Current Water Status;
- Year by which "Water Quality Objectives" should be achieved; and.
- Measures to be implemented to allow for the achievement of "Water Quality Objectives".

3.2.2 Exemptions

The Water Framework Directive intends for all surface water bodies to achieve their water quality objectives by 2015, however Article 4 of the Water Framework Directive allows for the exemption of certain waterbodies from the achievement of their water quality status by 2015 in certain cases. In *Chapter 10 Target Objectives and Exemptions and Implementation of Measures of the Eastern River Basin District – River Basin Management Plan 2009 -2015* the "water management units" which are exempt from the achievement of their water quality objectives have been listed. One of these water management units is the Boyne Upper Water Management Unit which includes the waterbodies relevant to this project ("Yellow1_Upper" Waterbody and "Yellow2_Lower" Waterbody). The Boyne Upper Water Management Unit as a whole has been exempt from achieving its water quality objectives until 2027 for the following reason:

Due to Peatlands: naturally occurring ammonia. Diffuse agricultural and wastewater point source pollution. Extrapolated sub-catchments – need more data.

The reason presented above as per the *Eastern River Basin District – River Basin Management Plan 2009 -2015* suggests three primary reasons for the exemption in relation to the Boyne Upper Water Management Unit which are:

- Naturally occurring Ammonia levels in peatland dominated catchments;
- Urban wastewater discharges;
- Requirement for more and better quality monitoring data.

It should be noted that while the *Eastern River Basin District Management Plan 2009 -2015* (and *the Eastern River Basin District – Programmes of Measures 2009 -2015*) specify that the overall Water Management Unit needs to attain the water quality objectives by 2027, individual waterbodies within the Water Management Unit have different dates for attainment of their objectives. These dates are relative to the occurrence of the identified issues within the waterbodies.

There are two waterbodies relevant to this development and they are the "Yellow 2_Upper" waterbody to which it is proposed to discharge process effluent and the "Yellow 1_Lower" waterbody which is the next waterbody downstream of the proposed discharge location (located *c.* 2.1 Km downstream of proposed discharge location). *(*Refer to Figure 1 *Proposed Discharge Location from the Power Plant at Derrygreenagh).* The "Yellow2_Upper" Waterbody is required to reach Good Overall Status by 2009, as specified in the *Eastern River Basin Management Plan – Programme of Measures Summary Report*. Thus, the overall objective for this waterbody is to "Protect" its current status. The "Yellow 1_Lower" waterbody is required to achieve Good Overall Status by 2021 as specified in the *Eastern River Basin Management Plan – Programme of Measures Summary Report*. This waterbody has been exempt from achieving Good Overall Status" by 2015 as discussed above.

Having regard to the four conditions specified in section 2.2 of this document (pages 3 -4) for determining the suitability of a proposed discharge these are addressed sequentially hereunder.

3.3 Condition 1. The Water Status of the Receiving Waterbody is not Classified as "High Overall Status".

The waterbody into which it is proposed to discharge is the "Yellow2_Upper" Waterbody with the next waterbody located approximately 2.1km downstream known as "Yellow1_Lower" waterbody. *Table 2: Current Status and Year by which the Waterbody must attain Good Overall Status* outlines the current status of each of these waterbodies and the year by which each waterbody must attain "Good Overall Status"

Table 2: Current Status and Year by which the Waterbody must attain Good Overall Status

Water Body	Status defined by "Q Value" Assessment	General Physicochemical Status	*Current Overall Status*	*Achieve Good Overall Status By*
Yellow2_Upper	Good	na[1]	Good	2009
Yellow1_Lower	Moderate	High	Moderate	2021

[1] There is no long term physicochemical monitoring data for this waterbody.

As can be identified from the table above and as detailed in the submission to An Bord Pleanála at the Oral Hearing, the water body into which it is proposed to discharge is considered to be of Good Overall Status, with the downstream waterbody considered to be of Moderate Overall Status.

Based on consultation undertaken with the Environmental Protection Agency, it has been identified that there may be a prohibition on additional discharges occurring to "High Overall Status" waterbodies in an attempt to protect the water status in such waterbodies. However neither of the waterbodies considered here are classified currently as being of "High Overall Status". In addition it is understood that this prohibition will not extend to waterbodies currently classified as being of less than "High Overall Status", e.g. "Good Overall Status" or "Moderate Overall Status".

3.4 Condition 2: Best Available Techniques (BAT) has been Applied

Best Available Techniques (BAT) will be employed for all processes at the proposed facility. The proposed development has been designed in accordance with Reference Document on Best Available Techniques for Large Combustion Plants, (European Commission, July 2006).

As mentioned in Section 3.7.4 Plant Efficiency of the Environmental Impact Statement, the high overall efficiency of the main electricity generating element of the site, the CCGT unit will lead to lower specific emissions to the environment generally compared to any other form of conventional thermal power plants. In addition BAT will be utilised throughout the site with particular reference to the proposed treatment of both foul discharge and process wastewater discharges.

3.4.1 BAT for Foul Discharge

In accordance with BAT, foul water comprising sewage and domestic type waste water, emanating from the site will be treated in an on-site proprietary secondary treatment system prior to discharge. The treated wastewater will then pass through the process wastewater discharge tank for additional treatment and monitoring prior to discharge to the Yellow River.

3.4.2 BAT for Process Wastewater Discharge

As detailed in *Section 3.7.5 Plant Facilities* of the Environmental Impact Statement the proposed development will incorporate an air cooled condenser thereby significantly reducing the potential volumes of water consumption and process waste water generated from the site.

The raw feedwater required on the site is primarily for the purposes of;

- Generation of steam in the Heat Recovery Steam Generator (HRSG); and
- Water Injection for the purposes of running the CCGT or OCGT units on distillate (where required).

For the purposes of both of these processes high purity feed water will be required and as such feedwater will be treated in a demineralisation plant prior to use. The quality of the raw feedwater, and the nature of the closed loop CCGT system, further reduces the volume of water consumption and effluent generation on site. Dry cleaning methods will also be employed wherever practicable to reduce water consumption on site.

The water used in the HRSG will be demineralised water conditioned with supplementary chemicals. Dosing of boiler feedwater will be carefully controlled and minimised to reduce the impact of the waste water on receiving waters.

The Environmental Impact Statement, identifies that Tri-Sodium Phosphate may be utilised for the purposes of pH adjustment, however in recognition of the difficulty arising due to the assimilative capacity of the receiving water, it is now proposed that this chemical (or any other phosphate based chemical) will not be used for pH adjustment in the boiler.

It is necessary to maintain the salt content in the HRSG water / steam cycle below a certain threshold to prevent depositions and resulting accelerated corrosion through evaporation. In order to maintain the quality of the HRSG water it is therefore necessary to regularly blow down water from the HRSG. The boiler blowdown will consequently contain very low concentrations of salts.

The blow down water from the boiler circulation system will be quenched in a boiler flash vessel. The blowdown will then discharge to the process waste water discharge tank.

Treated foul water and effluent from the water treatment plant and condensate drain waste will also discharge to the process wastewater discharge tank. Compressor cleaning waste water will be disposed of as hazardous waste through an appropriately permitted contractor in accordance with the requirements of the *Waste Management Acts 1996 to 2008*. In accordance with BAT process waste water drains will run above ground and will be completely segregated from uncontaminated storm water.

Process wastewater will be mixed and pH corrected, as required. To further reduce the temperature, and aerate the waste water, air will be pumped through the tank chambers. Settled solids from the discharge tank will be removed from site by appropriately licensed / permitted contractors. Neutralisation and sedimentation, as utilised in the wastewater treatment plant are also considered to be in compliance with BAT for process waste water.

The wastewater will be continuously monitored for Ammonia, Conductivity, Dissolved Oxygen, pH, Total Organic Carbon and temperature. If any of the parameters exceed the limits of the IPPC licence the wastewater will be recirculated back through the process waste water discharge tank. An on-site laboratory will also be provided to offer additional monitoring as required.

In the Environmental Impact Statement it was proposed that a maximum process wastewater discharge arising from the development site would be 360m^3/day. It was proposed that the maximum discharge would only occur in the event that the boiler had to be completely drained. However, it is now considered that due to the implementation of the new *European Communities Environmental Objectives (Surface*

Waters) Regulations 2009, a lower maximum discharge would be appropriate. Having re-evaluated the design it is proposed that a revised maximum of 250 m^3 of process waste water will be discharged each day. The discharge tank has a capacity of 1,200 m^3 which is adequate to store excess process discharge wastewater arising in events such as a complete boiler drain down.

In addition, Bord na Móna Energy Limited have revised their proposals in respect of the concentration of the relevant constituent parameters in the proposed process wastewater discharge to the Yellow River as follows:

- Reduce maximum Daily Volumetric Discharge from 360m^3 to 250 m^3 per day;
- Reduce BOD concentration in discharge from 20mg/l to 10 mg/l.;
- Reduce Ammonia concentration in discharge from 1.5 mg/l to 1 mg/l.

The reduction of wastewater quantity and concentration at source is considered to be BAT.

To operate the proposed development there will be a requirement to submit an application to the Environmental Protection Agency for an Integrated Pollution Prevention and Control (IPPC) licence as the proposed development is classified as a Category 1, Section 1.1 Activity under Annex 1 of the *Integrated Pollution Prevention and Control (IPPC) Directive 96/61/EC*, i.e. Combustion Installations with a rated thermal input exceeding 50MW. In order to be granted an IPPC licence from the Environmental Protection Agency, Bord na Móna Energy Limited will be required to demonstrate that BAT is utilised at the facility and to ensure that the proposed discharge to the Yellow River does not cause a significant environmental impact as per the requirements of all relevant legislation including the *European Communities Environmental Objectives (Surface Waters) Regulations 2009*. It is contended that Best Available Techniques (BAT) will be implemented at the site and will be implemented in regard to the treatment of wastewater prior to discharge. In addition, Bord Na Móna will be required to adhere to discharge limits as set in an IPPC licence by the Environmental Protection Agency and implement BAT as required to meet limits set. It should be noted that the technologies, processes and discharge limits proposed here are equal or better than those proposed as BAT, and accepted by the Environmental Protection Agency as such, for a recently IPPC licenced power plant at Ballakelly, Co. Louth (Quinn Energy (Ballakelly) Limited, Licence No. P0863-01).

3.5 Condition 3: No Deterioration in the Chemical or Ecological Status of the Waterbody.

Hereunder, the analysis and results of an assessment undertaken to assess the impact (if any) on the proposed receiving water are presented. It is intended to demonstrate that the proposed discharge will not result in deterioration in the ***chemical status*** or the ***ecological status*** of the receiving water. The chemical status of a waterbody is assigned by the Environmental Protection Agency based *on the monitoring results for the chemical substances and their environmental quality standards established in Schedule 6 of the regulations.* The ecological status of a waterbody is assigned based on monitoring results of the relevant biological quality elements and the supporting physicochemical data as specified in *Schedule 5 of the regulations.*

3.5.1 Chemical Status

There are no substances contained within the proposed discharge to the Yellow River which are listed in the *European Communities Environmental Objectives (Surface Water) Regulations 2009*, Schedule *6 Table 11 The environmental quality standards for priority substances and certain other pollutants to apply for the purpose of assigning chemical status*, *and Table 12 The Environmental Quality Standards for Priority Hazardous substances to apply for the purpose of assigning chemical status*. Hence, in accordance with the 2009 Regulations there is no deterioration in the chemical status of the Yellow River as a result of the proposed discharge.

3.5.2 Ecological Status

The ecological status of a waterbody is a function of the biological quality elements of that waterbody supported by the physicochemical conditions. Criteria for both the biological quality elements and the physicochemical elements are specified in the *European Communities Environmental Objectives (Surface Waters) Regulations 2009.* Analysis has been undertaken for the purposes of this submission to demonstrate that the proposed discharge does not have a significant effect on the biological quality elements or the supporting physicochemical elements utilised to determine the ecological status of a waterbody. This analysis is outlined in this section of the document as follows:

- ***Physicochemical Conditions Supporting Biological Elements:*** The results of analysis undertaken are presented here to support the contention that the proposed discharge will not have a significant effect on the physicochemical status of the relevant waterbodies. This analysis was undertaken by way of an assessment of available dilutions available in the receiving waterbody and by an analysis of the assimilative capacities of the relevant water bodies. The analysis presented here focuses on the physicochemical criteria specified on Table 9 *Physicochemical conditions supporting the biological elements, Part A: General Conditions of the European Communities Environmental Objectives (Surface Waters) Regulations 2009*, with particular reference to the nutrient conditions (as specifically mentioned in the *Request for Further Information*). No appraisal was undertaken of Table 10 *Physico-chemical conditions supporting biological elements Part B, Specific Pollutants,* due to the fact that there are no substances contained within the proposed discharge to the Yellow River which are listed in this table.

- ***Biological Quality Elements:*** In addition, an analysis was undertaken by Dr. William O Connor of Ecofact Environmental Consultants to determine the impact (if any) of the proposed discharge on the biological quality of the receiving waterbody having particular regard to the Regulations.

3.5.2.1 Physicochemical Conditions Supporting Biological Elements

The proposed discharge from the power plant will occur to the Yellow 2_upper waterbody (Refer to Figure 1 *Proposed Discharge Location from the Power Plant at Derrygreenagh).* In the absence of long term physicochemical monitoring data for this waterbody, physicochemical data was utilised from the Yellow1_Lower waterbody (Obtained from the Environmental Protection Agency monitoring station at Garr Bridge, Site code 07/Y02/0100) to determine the assimilative capacity of the Yellow2_Upper waterbody in the Environmental Impact Statement.

For the purposes of addressing the potential impact of the proposed discharge on the receiving waterbodies in order to demonstrate that the proposed discharge will not result in a deterioration in the

physicochemical conditions of the receiving waterbody the following analysis was undertaken for the purposes of this submission:

- Assessment of the potential impact of the proposed discharge on the Yellow2_Upper waterbody (proposed waterbody for receipt of discharge).

- In the absence of long term physicochemical data for the Yellow2_waterbody an assessment of the potential impact of the proposed discharge on the waterbody was undertaken utilisising data from the Yellow1_Lower waterbody.

The usage of physicochemical data from the Yellow1_waterbody for this purpose is considered to be a conservative worst case scenario, due to the fact that this waterbody is classified as having of Moderate Overall Water status, when compared to the Yellow2_Upper waterbody to which the discharge will occur which is classified as having overall Good Overall Status.

Yellow2_Upper Waterbody (proposed waterbody for receipt of discharge)

The current water quality status Yellow2_Upper waterbody has been determined by the Environmental Protection Agency based solely on the ecological status of the waterbody using a macroinvertebrate (Q-value) assessment which identified the waterbody as of Good Overall Status.

The lack of long term physicochemical monitoring data resulted in difficulty in assessing the assimilative capacity of the proposed receiving waterbody. However a document entitled *Recommendations for Programmes of Measures for Point Source Discharges to Surface Waters Resulting From Municipal and Industrial Regulated Activities (MIR Poms Study) Volume 1, South Western River Basin District* as approved and adopted by the Environmental Protection Agency and the River Basin Districts in Ireland identifies a methodology for the appraisal of "waterbodies at risk from point source discharges". This methodology specifies the risk to the waterbody arising from point sources based on the dilution available in that waterbody. For the purposes of identifying water bodies at risk from point source discharges a dilution of 25 or less is taken as the threshold for categorising water bodies at risk.

Table 3: Dilution available for proposed effluent in the Yellow2_Upper Waterbody

Flow in River m3/s)[1]	0.247	Available Dilutions
Discharge (max proposed) m3/s	0.0029	85

[1] Located at the closest operational EPA hydrometric monitoring station Garr Bridge (c. 400m downstream of the proposed discharge location.

[2] Based on a maximum discharge of 250m^3/day

The results presented in *Table 3 Dilution available for proposed effluent in the Yellow2_Upper Waterbody* indicates that the proposed discharge to the Yellow2_Upper waterbody will not result in the waterbody being classified as "At risk from Point Source Discharges" due to the factor of 85 dilutions being available to the proposed discharge.

Arising from this lack of physicochemical data for the waterbody assimilative capacity calculations were undertaken which assumed a background concentration of "zero" in terms of the physicochemical

parameters. The Environmental Protection Agency recommended this approach during our consultation undertaken for the purposes of this submission. This assessment serves to illustrate the levels of Biological Oxygen Demand (BOD), Ammonia and Molybdate Reactive Phosphorus (MRP) that would be present in the receiving water as a result of the proposed discharge in isolation. The proposed discharge volume and concentrations utilised for the purposes of these calculations comprises the process wastewater discharge as revised for this submission i.e. Volumetric Flow = 250 m^3/day (max), BOD = 10mg/l, Ammonia = 1mg/l and MRP = 0.1mg/l. In addition the assimilative capacity calculations include for the foul discharge as per the proposed discharge volume and concentrations proposed in the Environmental Impact Statement.

In *Table 4 Assimilative Capacity Results assuming Zero background Concentrations* the resultant concentrations are compared to the EQS's as defined in the *European Communities Environmental Objectives (Surface Water) Regulations 2009* It is important to note that the concentrations of BOD, Ammonia and MRP are presented in Table 4 *Assimilative Capacity Results assuming Zero Background Concentrations* in terms of both Mean and 95%ile concentrations in order to be consistent with the EQS as specified in the regulations.

As can be identified from the table below the proposed discharge (at a maximum discharge of 250m^3/day) will result in a very low quantity of the assimilative capacity being taken up by the proposed discharge. It is contended that the proposed emissions are insignificant and will not impact in any way on the protection of "Good Overall Water Status" in the receiving waterbody.

Table 4: Assimilative Capacity Results assuming Zero Background Concentrations.

	BOD		**Ammonia**		**MRP**	
	***Mean*[1]**	***95%ile*[1]**	***Mean*[1]**	***95%ile*[1]**	***Mean*[1]**	***95%ile*[1]**
***Background Concentration (mg/l)*[2]**	0	0	0	0	0	0
Proposed Discharge Concentration (mg/l)	10		1		0.1	
***Resultant Concentration (mg/l)*[3]**	0.034	0.118	0.003	0.013	0.0004	0.001
% of EQS's	2.27	4.54	4.62	9.29	1.14	1.33
EQS's (mg/l)	1.5	2.6	0.065	0.14	0.035	0.075

[1] *Concentrations of BOD, Ammonia and MRP are presented in terms of both Mean and 95%ile concentrations in order to be consistent with the EQS as specified in the regulations.*

[2] *Background concentrations taken from the EPA dataset for EPA monitoring location Gar Bridge (Site Code 07/Y02/0100) covering the period from 2006-2007.*

[3] *Resultant Concentration refers to the concentration that would occur in the receiving water due to the proposed discharge as revised for this submission i.e Volumetric Flow = 250 mg/l (max), BOD = 10mg/l, Ammonia = 1mg/l & MRP = 0.1mg/l.*

Yellow1_Lower Waterbody (next adjacent waterbody downstream)

As discussed above, due to the lack of long term physicochemical data for the Yellow2_Upper Waterbody assimilative capacity calculations were also undertaken for the Yellow1_Lower Waterbody. The assimilative capacity of the Yellow1_Lower Waterbody has been recalculated utilising the dataset provided by Environmental Protection Agency, which has been used by the Environmental Protection Agency in order to determine the water status of waterbodies as presented in the *Eastern River Basin District – River Basin Management Plan 2009 -2015*). As a result, it is considered to be more appropriate in the context of this submission to utilise this dataset. It should be noted that this dataset varies slightly from the dataset utilised in the Environmental Impact Statement due to the slightly different period covered by the datasets.

The results of this assessment are presented in Table 5 Assimilative Capacity Results assuming discharge to the Yellow1_Lower Waterbody. The results indicate that the background water quality is in excess of the environmental quality standards (EQS's) for this waterbody as presented in the *European Communities Environmental Objectives (Surface Water) Regulations 2009*. However Table 5 *Assimilative Capacity Results assuming Discharge to the Yellow1_Lower Waterbody* clearly indicates that the non-compliance with the EQS's is a function of the background water quality levels in the catchment and that the proposed discharge would have an insignificant impact on the overall water quality levels within the waterbody. In addition, it is contended that these insignificant discharges to the waterbody would not in any way compromise and/or inhibit the attainment of the water quality objectives for this waterbody as required by the *Eastern River Basin District - River Basin Management Plan 2009 -2015* by 2021.

Table 5: Assimilative Capacity Results assuming Discharge to the Yellow1_Lower Waterbody. (Downstream waterbody - Moderate Overall Status)

Scenario	BOD		Ammonia		MRP	
	Mean[1]	***95%ile[1]***	***Mean[1]***	***95%ile[1]***	***Mean[1]***	***95%ile[1]***
Background Concentration(mg/l)[2]	3.420	11.490	0.293	0.806	0.042	0.116
Proposed Discharge Concentration (mg/l)	10		1		0.1	
Resultant Concentration (mg/l)[3]	3.442	11.473	0.295	0.808	0.0423	0.116
% Increase over Background	0.64	-0.15	0.68	0.248	0.714	0
EQS's (mg/l)	1.5	2.6	0.065	0.14	0.035	0.075

[1] *Concentrations of BOD, Ammonia and MRP are presented in terms of both Mean and 95%ile concentrations in order to be consistent with the EQS as specified in the regulations.*

[2] *Background concentrations taken from the EPA dataset for EPA monitoring location Gar Bridge (Site Code 07/Y02/0100) covering the period from 2006-2007.*

[3] *Resultant Concentration refers to the concentration that would occur in the receiving water due to the proposed discharge as revised for this submission i.e Volumetric Flow = 250 m^3/day (max), BOD = 10mg/l, Ammonia = 1mg/l & MRP = 0.1mg/l.*

The results of the assimilative capacity presented in the table above clearly identifies that the proposed discharge is insignificant in terms of the background water quality in the receiving water.

In addition it should be noted that the discharge wastewater will be cooled in the discharge tank prior to discharge by way of aeration (bubbling air through the wastewater to reduce temperature), in order to ensure that there will be *no increase in temperature of greater than 1.5°C in ambient temperature outside the mixing zone* as required by the *European Communities Environmental Objectives (Surface Waters) Regulations 2009.* Continuous monitoring of the temperature of the wastewater in combination with continuous monitoring of the receiving waterbody downstream of the discharge location will ensure that this condition is met.

The pH of the wastewater discharge will be controlled by way of pH adjustment to ensure that the proposed discharge does not compromise the receiving waterbody complying with the required acidification status as required by the *European Communities Environmental Objectives (Surface Waters) Regulations 2009.* Continuous monitoring of the pH of the wastewater in combination with continuous monitoring of the receiving waterbody downstream of the discharge location will ensure that this condition is met.

3.5.2.2 Biological Quality Elements

The European Communities Environmental Objectives (Surface Water) Regulations 2009 specifies the biological quality elements of rivers that may be used to classify the ecological water status of a waterbody. These are listed in Table 5 *The biological quality elements that may be used when calculating ecological status* of Schedule 4 of the regulations. In general terms they are:

- Aquatic flora:
- Benthic Invertebrate Flora:
- Fish Fauna.

In preparation for the Environmental Impact Statement for the proposed development an aquatic habitat survey was undertaken of the watercourse in the vicinity of the proposed discharge location by Ecofact Environmental Consultants in June 2008. This survey was undertaken to determine the baseline ecological status of the river at this location. This survey identified the species of benthic macroinvertebrates, fish and aquatic flora present in the river on the day of sampling. This data was then utilised to identify the ecological status of the waterbody at the location of the discharge.

For the purposes of this submission, Ecofact Environmental Consultants have utilised the list of species generated from the field assessment to identify the specific risk posed by the proposed discharge to both benthic macroinvertebrate and fish species recorded in the river. In addition the impact (if any) on the trophic status of the river as identified by the usage of biotic indices has been analysed.

Following assimilation of the proposed discharge to the Yellow River, the resulting downstream concentrations of three physicochemical water quality parameters (BOD, Ammonia and Molybdate Reactive Phosphorus) have been modelled to ascertain the effect on physicochemical water quality. Biological elements and the aquatic ecology of a river are influenced by the physicochemical chemical water quality.

The percentage increase over background levels for BOD, Ammonia and Orthophosphate as a result of the proposed process water discharge is insignificant when compared with the mean background

concentrations in the Yellow River. Therefore the proposed process water discharge is considered to have have an insignificant impact on the aquatic ecology of the receiving water.

Specific detail in terms of the considered impact arising from the elevated BOD, Ammonia and Molybdate Reactive Phosphorus (MRP) on the biological quality elements of the receiving waterbody are described further below:

BOD

The Biological Oxygen Demand (BOD) is a measurement of the rate of oxygen usage by aerobic micro-organisms. When Dissolved Oxygen (D.O.) is used up, either by polluting material or by plants that live in the water, the oxygen levels can decrease. Dissolved oxygen is essential for the survival of fish and other aquatic life, including macroinvertebrates. The threshold value for good water status in relation to BOD is 1.5 mg/l at mean flow, and 2.6mg/l at 95%ile flow. Background concentrations of BOD do not meet the criteria for good water status with BOD as described in section 3.5.2.1 *Physicochemical Conditions Supporting Biological Elements*.

The deoxygenation reaction in a river resulting from BOD is relatively slow with D.O levels falling gradually. Due to dilution coupled with the natural recovery process that takes place in rivers the effects of de-oxygenation resulting from the proposed discharge is expected to be negligible on fish species including salmonids. Pollution sensitive Heptagenid mayfly larvae would be the most susceptible macroinvertebrate Group to increased BOD concentration but would be unlikely to be affected by the proposed discharge due to the insignificant increase in BOD resulting in addition to the fact that the species is confined to riffled parts of rivers, where D.O. is naturally higher. In terms of BOD, the proposed discharge would not be expected to affect higher plants or algae as the water would not be turbid to a degree that photosynthesis would be affected.

Ammonia

The threshold value for Good Water Status in relation to Ammonia is 0.065mg/l at mean flow, and 0.14mg/l at 95%ile flow. The proposed discharge would not be expected to alter the macroinvertebrate, fish or plant life in the river, or the status of the river. Un-ionized ammonia (NH_3) is harmful to aquatic life and may accumulate in organisms and cause alteration in metabolism or increases in body pH. Salmonids and juvenile fish are especially sensitive to elevated concentrations of NH_3. Arising from the complex relationship between total Ammonia concentration, pH and temperature, there emerges a level of *c.* 0.3 mg/l Total Ammonia considered to be that which would contain the limiting amount of un-ionised ammonia. The background concentration at 95%ile flow (0.43mg/l) which is high. However, the presence of a rich macroinvertebrate assemblage as recorded in the benthic invertebrate survey undertaken for this project at the discharge location in June 2008 suggests that this concentration of Ammonia is perhaps an overestimate of the normal levels associated with the discharge location. It is therefore deemed that such adverse conditions occur only rarely and for short periods. The proposed discharge only increases mean Ammonia concentration by approximately 0.7% and would not threaten the faunal life or result in a deterioration of the ecological status of the river.

Molybdate Reactive Phosphorus (MRP)

The significance of MRP is principally in regard to the phenomenon of eutrophication (over-enrichment). Eutrophication causes abnormal growth of plants. The proposed discharge from the power plant would

cause a very slight increase in downstream MRP levels at mean flow and at 95%ile flow. For MRP, the proposed discharge would contribute only 1.14 % of the EQS threshold value for good status at mean flow and 1.33% of the threshold value at 95%ile flow. These predictions are based on the maximum discharge rate of 250m^3/day and even at the maximum rate of discharge, the contribution of the proposed effluent would have an imperceptible or no impact on aquatic ecology and plant production.

In order to address the potential impact of the above mentioned physicochemical parameters on the ecological status of the Yellow River as measured by the trophic status of the river, the usage of Biotic Indies and fish habitats, details of an analysis are presented below under the following headings:

- Potential Impacts on the trophic status of the river
- Biotic indices and macroinvertebrates
- Fish

Potential Impacts on the trophic status of the river

Following the aquatic survey undertaken in June 2008 of the Yellow River for this project, the aquatic ecosystem near the proposed discharge location was found to be dependent on inputs from outside the system (heterotrophic ecosystem). Blackfly larvae (filtering collectors) and freshwater shrimp (shredders) collectively overwhelmed other feeding groups, and comprised the bulk of the macroinvertebrate biomass. Shredders chew, mine, bore and gouge large particles such as leaves, stems and branches which may be dead or alive, while filterers filter particulate matter, alive or dead, from the water.

Due to the hetrotrophic nature of the ecosystem at the location of the proposed discharge and the fact that the system is not as sensitive as one that would be more dependent on sensitive aquatic flora such as periphyton, it is considered that the relatively robust nature of the macroinvertebrate community would mean that the proposed discharge would not have any impact on the trophic status of the river and would not result in a deterioration on the ecological status of the river. Overall it is concluded that the proposed discharge would not change the trophic status of the system at the surveyed site (riffled part of the river). Most of the river however is sluggish and deeper than the stretch surveyed and would therefore be expected to be even more heterotrophic than riffled areas resulting in the proposed discharge having even less of an impact along most of the river.

Periphyton also contributes significantly to nutrient cycling in stream ecosystems directly by increasing nutrient supplies, uptake of nutrients and back-release to the river. The role of periphyton in the Yellow River aquatic ecosystem near the discharge is not significant and a discharge to the river as proposed is not expected to cause a change that would affect periphyton, and consequently nutrient cycling in the river.

Biotic indices and macroinvertebrates

A biotic index is a scale used to identify water quality by way of a classification system based on the presence and abundance of organisms present in it, i.e. a measure of the trophic status.

During the June 2008 survey, a rich macroinvertebrate assemblage (group) was recorded at the site surveyed, with 21 families occurring. Stresses caused by pollution can change the macroinvertebrate assemblage due to the varying sensitivities of the different components of the community. A change in the assemblage can affect the status of a river. The proposed discharge would be considered to cause an

immeasurable change to the macroinvertebrate community given the minimum dilution available (85:1) for the effluent discharge proposed.

Only one pollution sensitive taxon was recorded in the surveyed site on the Yellow River near the proposed discharge point. The species recorded *Heptagenia sulphurea* was restricted to the riffled part of the river, a short stretch atypical of the river which was suited to the requirements of this organism. This species would be expected to occur in greater abundance if more suitable habitat was available. It is noted that the survey was carried out during low water levels when pollution sensitive indicators are most susceptible to pollution.

A change in water quality, with particular reference to Ammonia concentrations could result in the loss of this species but it is considered that the proposed discharge would not cause the loss of this species.

The next most sensitive group – comprising cased caddisfly larvae (*Halesus digitatus, Limnephilus lunatus, Goera pilosa* and *Sericostoma personatum*) and stonefly larvae of *Leuctra inermis* - are classed as less sensitive species. A significant change in water quality would be needed to result in the loss of these species (depressed D.O., higher concentrations of Ammonia than currently exist). Such a change however will not occur in response to the proposed discharge. The bulk of the macroinvertebrate community comprised pollution tolerant taxa and it is highly unlikely that this group would be affected by the proposed discharge.

An improvement in background water quality in the Yellow River (as will occur in response to the proposed measures under the *Eastern River Basin Management Plan*), the relative abundance of pollution sensitive indicators (Group A and Group B) would be expected to increase. The impact of the proposed discharge on a macroinvertebrate community indicative of a Q4 or Q4-5 rating is considered insignificant given the negligible changes that would be brought about by the proposed discharge. In addition the receiving waterbody was also assessed using the Biological Monitoring Working Party (BMWP) biotic index. This biotic index is similar to that utilised in the Q-value biotic index and it utilises macroinvertebrates as biological indicators. The higher the BMWP score is the better the water quality and a score over 100 is indicative of good water quality The BMWP score of 119.4 at the proposed discharge location is indicative of good water quality and interpreted as ‘unpolluted, unimpacted’. The loss of at least three more sensitive families would have to occur before deterioration in the BMWP status would be brought about. Under the current proposed discharge, this loss is not predicted so water quality in BMWP terms would remain unpolluted.

Fish

Salmonids require clean water for spawning and early life stages (Q4). The area of the Yellow river in proximity to the proposed discharge is characterised as having limited salmonid spawning areas with some satisfactory nursery habitat. Other parts of the river have better physical habitat for salmonids. Based on the macroinvertebrate assemblage at the surveyed site, the Yellow River near the proposed discharge location has a predictable juvenile salmonid food supply. Fish can also be affected by the parameters MRP (eutrophication can lead to a reduction in the quality of spawning grounds via algal growth and increased turbidity), BOD (reduced oxygen levels) and Ammonia (toxic effect). The predicted increase in the concentration of these parameters over background levels arising from the proposed discharge is so limited that fish are unlikely to be affected.

3.5.3 Conclusion

In conclusion it is considered that the proposed discharge will not result in a deterioration in the overall chemical status of the ecological status of the receiving waterbody on receipt of the proposed discharge (as modified for the purposes of this submission).

3.6 Condition 4 Proposed Discharge will not Inhibit Requirements of River Basin Management Plan

As the waterbody into which it is proposed to discharge ("Yellow2_Upper") is of "Good Overall Status" it is considered that the proposed discharge will not inhibit the waterbody from attaining the water quality objectives as outlined in the *Eastern River Basin District – River Basin Management Plan 2009 -2015*.

The objective for the next downstream waterbody (Yellow1_Lower Waterbody) is to restore the waterbody to "Good Overall Status" from the current classification of "Moderate Overall Status". As detailed previously this waterbody has been exempted from achieving Good Overall Status until 2021. This exemption is in recognition of the significant ongoing background conditions that exist in this catchment which are resulting in the degraded status of the waterbody currently. The primary issues of concern for this waterbody are diffuse agricultural discharges, discharges from Rhode WwTP and the existence of naturally elevated levels of Ammonia due to the existence of peatlands within these catchments. The exemption for this waterbody and the extended period to allow for attainment of Good Overall Status is to allow for these significant background issues to be addressed effectively,

Measures to be employed to protect and restore the status of the river will be targeted towards the pressures identified in the *Final Eastern River Basin District – River Basin Management Plan 2009*. The measures proposed by the Eastern River Basin District are detailed in the *Eastern River Basin Management Plan – Programme of Measures Summary Report*. It is contended that the implementation of the measures as specified in the above mentioned document will result in the relevant waterbodies attaining their water quality objectives as required by the *Water Framework Directive (2000/60/EC). In addition it is considered* that the attainment of these water quality objectives will not be inhibited by the proposed discharge from the proposed power plant development, due to the insignificance of the discharge and the limited potential impact resulting as discussed in detail in this submission.

4. Conclusions

In response to the *Request for Further Information* that was issued by An Bord Pleanála on the 28th August 2009 to Bord na Móna Energy Limited requesting further information in relation to planning application reference number 19.PA0011 Bord na Móna Energy Limited with Mott MacDonald Ireland Limited have prepared this document. It is outlined in this document how it is proposed to revise the proposed discharge both in terms of the quantity of the volumetric discharge and the concentration of the relevant constituent parameters in the proposed discharge to the Yellow River as follows:

- Reduce maximum Daily Volumetric Discharge from 360m^3 to 250 m^3 per day;
- Reduce BOD concentration in discharge from 20mg/l to 10 mg/l;
- Reduce Ammonia concentration in discharge from 1.5 mg/l to 1 mg/l.

In addition Bord Na Móna Energy Limited present in this submission the justification for the suitability of the proposed discharge location (as specified in the Environmental Impact Statement) to the Yellow River in the context of the stricter environmental quality standards as required under the *European Communities Environmental Objectives (Surface Water) Regulations 2009*, (the "2009 Regulations")

This submission contends that the proposed discharge will not cause deterioration in the overall water status of the Yellow River in compliance with the requirements of the above mentioned Regulations (the "2009 Regulations"). To support this contention, this submission demonstrates that the proposed discharge will not result in a deterioration in the chemical status or the ecological status as supported by the physicochemical conditions of the river.

Consultation undertaken with the Environmental Protection Agency and a review of the currently unpublished Water Services National Training Group of the Department of Environment Heritage and Local Government document entitled *Guidance, Procedures and Training on the Licensing of Discharges to Surface Waters and to Sewer* has allowed us to determine the current policy being implemented in relation to discharges for situations where the background concentrations in the receiving waters currently exceed the EQS values specified in the regulations. It is our understanding that the current approach is to assess discharges on a case by case basis and that a proposed discharge may be permissible in the event where it is clearly identified that the following conditions are met;

Condition 1. The current overall water status of the receiving waterbody is not classified as "High Overall Status".

Condition 2. The application of Best Available Techniques (BAT) has been applied at the proposed development and in relation to the proposed discharge.

Condition 3. The proposed discharge will not cause deterioration in the chemical status or ecological status of the waterbody.

Condition 4. The proposed discharge will not inhibit the receiving waterbody attaining the water quality objectives as outlined in the River Basin Management Plan within the required time period. Nor will it inhibit the effectiveness of the measures specified within the River Basin District Programme of Measures for the specified waterbody to enable the waterbody to attain the water quality objectives as outlined in the relevant River Basin Management Plan.

In the context of the above revised proposals, consultation undertaken and analysis completed as detailed in this document, the following conclusions have been drawn;

- The proposed discharge will not result in deterioration in the chemical status or the ecological status of the waterbody.
- The proposed waterbody into which the effluent will be discharged is not considered to be of 'High Overall Status';
- The number of dilutions available to the proposed discharge are 85 and would not be considered to present a 'risk' to the receiving waterbody having regard to the publication "*Recommendations for Programmes of Measures for Point Source Discharges to Surface Waters Resulting From Municipal and Industrial Regulated Activities (MIR Poms Study) Volume 1, South Western River Basin District"*
- The proposed discharge will not inhibit the implementation of the *Eastern River Basin District – Programmes of Measures 2009 -2015* nor will it inhibit the waterbody (or the adjacent waterbody downstream) from attaining Good Overall Status as required.
- The assimilative capacity calculations presented in Table 4 and Table 5 of this submission indicate that the proposed discharge in the context of the overall environmental quality standards are considered to be insignificant and will not compromise or inhibit the waterbody retaining Good Overall Status.
- In accordance with the document entitled *Guidance, Procedures and Training on the Licensing of Discharges to Surface Waters and to Sewer,* (which is currently at the final stages of development), discharges are not prohibited from occurring to a waterbody where the assimilative capacity of the receiving waterbody is currently incapable of assimilating the proposed discharge under certain conditions.
- There are a number of recent cases [since the implementation of the *European Communities Environmental Objectives (Surface Water) Regulations 2009*] whereby the Environmental Protection Agency have granted authorisations to discharge where the environmental quality standards as specified in the regulations cannot be attained.
- Best Available Techniques (BAT) will be employed for all processes at the proposed facility to ensure that the proposed discharge will be limited in terms of daily volumetric discharge and the concentration of the relevant constituent parameters.

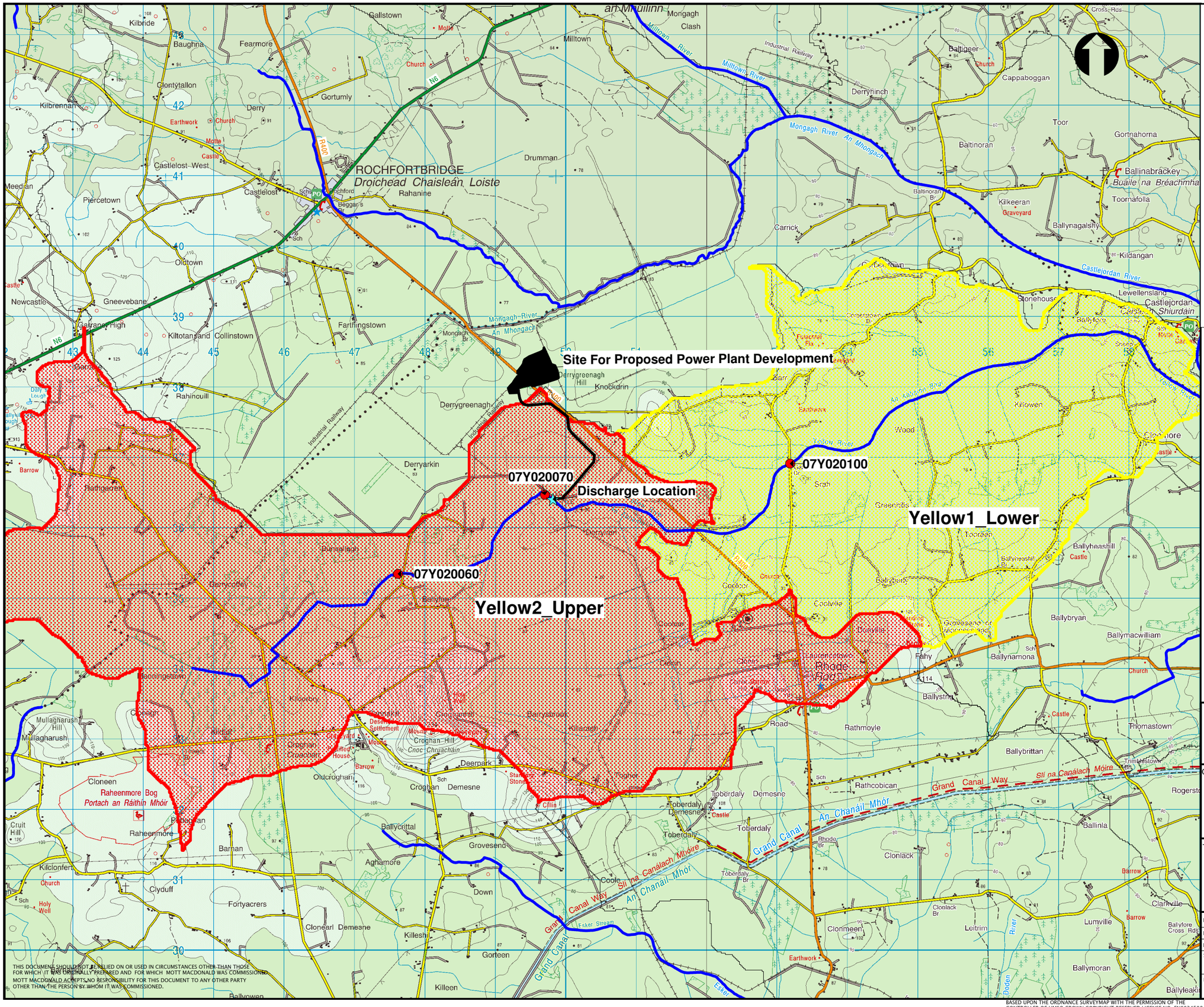
In conclusion, it is contended that the information contained within this document clearly demonstrates that the discharge from the proposed development will have an insignificant impact on the water quality of the Yellow waterbody and will not result in a deterioration in the chemical status or the ecological status of the Yellow River and will not in any way hinder or inhibit the waterbody achieving Good Overall Status as required under the Water Framework Directive.

The current policy approach being recommended and adopted by other public authorities such as the Environmental Protection Agency in instances where the background concentrations in the receiving waters currently exceed the EQS values specified in the 2009 regulations is to assess discharges on a case by case basis. A proposed discharge may be permitted in the event where it is clearly identified that certain conditions are met. It is considered that the above approach is in keeping with the requirements of Article 5 of the regulations which requires that a public authority in performance of its functions, shall not undertake those functions in a manner that knowingly causes or allows deterioration in the chemical status or ecological status of a body of surface water.

It should also be noted that Bord na Móna is also a designated public authority and as such is bound by Article 5 of the *European Communities Environmental Objectives (Surface Waters) Regulations 2009*

which requires a public authority in performance of its functions not to undertake those functions in a manner that knowingly causes or allows deterioration in the chemical status or ecological status of a body of surface water.

As set out in our covering letter with this document, Bord na Móna Energy Limited would be happy to respond to any request for further information, submissions or observations and indeed if pursuant to Section 37E of the Planning and Development Act, 2000 (as amended) An Bord Pleanála so requires, Bord na Móna Energy Limited would be very happy to attend any meeting were the Board to consider such a meeting expedient for the purposes of determining the application or were the Board to consider such a meeting necessary or expedient for purposes of resolving any issue in relation to the application and/or this response in relation to the European Communities Environmental Objectives (Surface Water) Regulations 2009.



Discharge Location

EPA WQ Monitoring Locations

Rivers

Discharge Pipeline

Proposed Development Site

Waterbody Boundary

- Yellow1_Lower
- Yellow2_Upper

Mott MacDonald Pettit Ltd
South Block, Rockfield
Dundrum, Dublin 16
Ireland

Tel + 353 (1) 291 6700
Fax +353 (1) 291 6747
Web www.mottmacpettit.ie
Email engineers@mottmacpettit.ie

Client

BORD NA MÓNA
BORD NA MÓNA ENERGY LIMITED

Title

Bord Na Mona Energy
Proposed Discharge Location from the Power Plant at Derrygreenagh

Designed	RH		Eng. Chk.	SK	
Drawn	RH		Coordination	PK	
Drg. Chk.	SK		Approved	PK	

Scale at A3: NTS
Project: 243190
Mapinfo file: Discharge Location.WOR
Status: PRE
Drawing Number: Figure 1
Rev: P2

Appendix A. Request for Further Information

Our Ref: 19.PA0011

Your Ref: Bord na Móna Limited

3 1 AUG 2009		
Ref No.	1917	
Attn	Action	Info
Director		✓
Deputy		
Powergen	✓	
Finance		
Admin		
Peat Ops		
Archive		✓

An Bord Pleanála

Charles Shier
Bord Na Móna Energy Limited
Derrygreenagh
Rochfortbridge
Mullingar
Co. Westmeath

28th August 2009

Re: Construct and operate an electricity generating station comprising an Open Cycle Gas Turbine and a Combined Cycle Gas Turbine at Derrygreenagh, Co. Offaly.

Dear Sirs,

I have been asked by An Bord Pleanála to refer further to the above-mentioned proposed development which is before the Board for consideration.

The Board proposes to take into consideration the following:

Article 5 of the European Communities Environmental Objectives (Surface Waters) Regulations 2009 requires that a public authority, in performance of its functions, shall not undertake those functions in a manner that knowingly causes or allows deterioration in the chemical status or ecological status of a body of surface water. In addition Article 28(1) states that a surface water body whose status is determined to be high or good shall not deteriorate in status and Article 28(2) states that a surface water body whose status is determined to be less than good shall be restored to at least good status not later that the end of 2015. An Bord Pleanála is listed as a relevant public authority in Schedule 1 of the said Regulations.

Based on the information provided in the environmental impact statement accompanying the application supplemented by the details provided at the oral hearing, the proposed development, in the discharge of process effluent, will result in increases of Biological Oxygen Demand, Total Ammonia and Orthophosphate in the Yellow River. The waterbody has been categorised as 'good' overall status with the status of the water body downstream of the proposed discharge point cetegorised as slightly polluted (Q3-4).

Therefore, as per Article 5 of the said Regulations, the Board may be precluded from granting approval for the proposed development as it will result in the deterioration in the physio chemical quality of the Yellow River.

Having regard to the above, in accordance with section 37F(1) of the 2000 Act, as amended, the Board hereby requires you to furnish the following further information:

Revised proposals so as to ensure that the process effluent from the proposed development will not result in a deterioration in the water quality of the Yellow River, in compliance with the requirements of the European Communities Environmental Objectives (Surface Water) Regulations 2009. Details should be provided in terms of both chemical and ecological quality.

The further information referred to above should be received by the Board within 5 weeks from the date of this notice **(i.e. no later than 5.30 p.m. on 2nd October 2009)**.

64 Sráid Maoilbhríde.
Baile Átha Cliath 1

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64 Marlborough Street.
Dublin 1

Please note that following its examination of any information lodged in response to this request for additional information, the Board will then decide whether or not to invoke its powers under section 37F(2) of the 2000 Act, as amended, requiring you to publish notice of the furnishing of any additional information and to allow for inspection or purchase of same and the making of further written submissions in relation to same to the Board.

Futhermore, in accordance with section 37J(2)(a) of the 2000 Act, as amended, it is a statutory objective of the Board to ensure that a decision under section 37G on an application made under section 37E is made within a period of 18 weeks beginning on the last date for making observations or submissions.

Where it appears to the Board that it would not be possible or appropriate to determine a particular application for permission within this period, a notice must be sent to the applicant, local authority and the observers in accordance with section 37J(3) of the 2000 Act, as amended.

The Board hereby serves notice under section 37J(3) of the 2000 Act, as amended, that it appears to the Board that it would not be possible to determine the above matter within the period of 18 weeks (i.e. by **31st August, 2009**) because the Board considers it necessary to request further information, as set out above.

The Board intends to determine the application for permission of the above proposed development before **27th November, 2009**. The Board will take all such steps as are open to it to ensure that the matter is determined before that date.

If you have any queries in relation to the matter please contact the undersigned officer of the Board.

Please quote the above-mentioned An Bord Pleanála reference number in any correspondence or telephone contact with the Board.

Yours faithfully,

Sinéad McInerney
Executive Officer

Registered Post

An Bord Pleanála

64 Sráid Maoilbhride,
Baile Átha Cliath 1.

Tel (01) 858 8100
LoCall: 1890 275 175
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64 Marlborough Street,
Dublin 1

Appendix B. Time Extension Correspondence

Our ref Bord Na Móna Limited
T 01 291 6700
E ronan.hallissey@mottmac.com
Your ref 19.PA0011

Mott MacDonald

An Bord Pleanála,
64 Marlborough Street,
Dublin 1.

23rd September 2009

19.PA0011: Construct and operate an electricity generating station comprising an Open Cycle Gas Turbine and a Combined Cycle Gas Turbine at Derrygreenagh, Co. Offaly: Response to Request for Further Information

Dear Sir/ Madam,

Further to your letter of the 28th August requesting further information in relation to the above referred planning application, on behalf of Bord na Móna Energy Limited we respectfully request an extension to the deadline of Friday 2nd October as set out in the correspondence.

This request for extension of deadline is required to allow Bord na Móna to take account of guidance which is currently being developed for local authorities by the Water Services Training Group (Department of the Environment Heritage & Local Government) on 'Guidance, *Procedures and Training on the Licensing of Discharges to Surface Water and to Sewer*' which is expected to be forthcoming in November 2009. This guidance is being developed through consultation with a number of key stakeholders, including the Environmental Protection Agency, and will prescribe a standardised approach to be applied by local authorities when licensing discharges to waters. It is anticipated that the provisions of this guidance will be adopted across the board by all licensing authorities.

The Guidance will address the new Environmental Quality Standards (EQS) for surface waters which are set out in the *European Communities Environmental Objectives (Surface Water) Regulation, 2009* in the context of how these standards must be considered in assessing an application for a licence to discharge

Mott MacDonald

effluent to waters.

It is our understanding that this Guidance will have a significant influence in determining the acceptability of proposed new discharges into surface water bodies in Ireland particularly in the context of where environmental quality standards are not currently being achieved and where Measures are proposed to address this to secure the objectives of the Water Framework Directive.

In addition, the Environmental Protection Agency has on the 30th August 2009 released the final classification of the status of river waterbodies in Ireland (in accordance with the requirements of the 2009 Regulations referred to above). We are awaiting data in support of the classification of status for the waterbodies relevant to this proposed development. It is considered that this data may have a significant bearing on the assessment of a proposed discharge and is considered essential that this information is fully presented to An Bord Pleanála as part of Bord Na Móna's submission.

Simultaneously Bord na Móna are currently reviewing their proposals for the configuration of the proposed discharge and on completion of this in conjunction with receipt of the information as set out above, anticipate that a comprehensive submission can be made to An Bord Pleanála by Friday 27th November 2009.

If you have any queries concerning the above matter please do not hesitate to contact us otherwise we would appreciate a response concerning your consent or otherwise to the proposed extension.

Yours faithfully,

For & behalf of Mott MacDonald Ireland

Dr. Ronan Hallissey

243190 -

Our Ref: 19.PA0011

Your Ref: Bord na Móna Limited

An Bord P

Ronan Hallissey
Mott MacDonald Ireland
South Block
Rockfield
Dundrum
Dublin 16

25th September 2009

Re: Construct and operate an electricity generating station comprising an Open Cycle Gas Turbine and a Combined Cycle Gas Turbine at Derrygreenagh, Co. Offaly.

Dear Sir,

I have been asked by An Bord Pleanála to acknowledge receipt of your correspondence dated 24th September, 2009.

The Board will revert to you as soon as possible in relation to the matter.

If you have any queries in relation to the matter please contact the undersigned officer of the Board.

Please quote the above-mentioned An Bord Pleanála reference number in any correspondence or telephone contact with the Board.

Yours faithfully,

Sinéad McInerney
Executive Officer.

ch08.ltr

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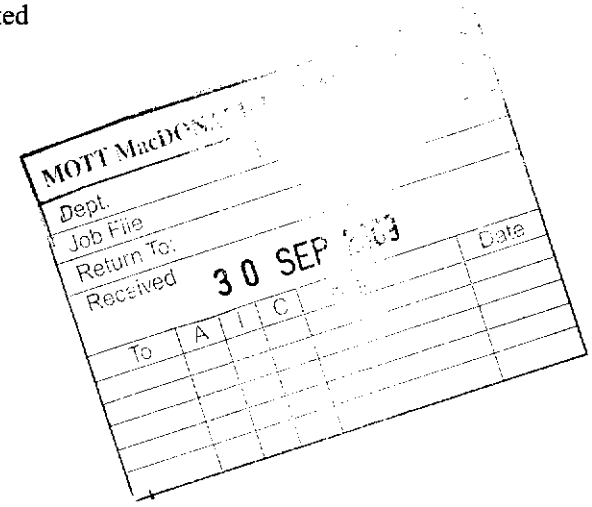
Our Ref: 19.PA0011

243190

Your Ref: Bord na Móna Limited



An Bord Ple

Ronan Hallissey
Mott MacDonald Pettit
South Block
Rockfield
Dundrum
Dublin 16

29th September 2009

Re: Construct and operate an electricity generating station comprising an Open Cycle Gas Turbine and a Combined Cycle Gas Turbine at Derrygreenagh, Co. Offaly.

Dear Sir,

I have been asked by An Bord Pleanála to refer further to your letter received on 24th September, 2009 in relation to the above mentioned case.

The Board has agreed to your request for an extension of time in relation to the request for further information issued on 28th August, 2009.

Any response to the Board's request for further information should now be received on or before **Friday, 27th November 2009.**

If you have any queries in relation to the matter please contact the undersigned officer of the Board.

Please quote the above-mentioned An Bord Pleanála reference number in any correspondence or telephone contact with the Board.

Yours faithfully,

Sinéad Moloney
Executive Officer.

ch08.ltr

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Appendix C. Example of a Recently Issued Wastewater Discharge Authorisation Certificate

Athlone, Co. Westmeath

A Wastewater Discharge Authorisation Certificate was issued by the Environmental Protection Agency to Westmeath County Council on the 21st of September 2009.

Average loading to the wastewater treatment plant (WwTP) was estimated as 27,810 PE for 2009 with a increasing to a loading of of 31,300 PE by 2013. It is proposed that the WwTP will be upgraded by December 2014 to a design capacity of 60,000 PE. A significant proportion of the loading to the WwTP arises from non-residential sources. *Table 1 Population equivalent constituents, for 2002 and potential future loadings based on areas zoned for development* contained within the *Inspectors Report on a Waste Water Discharge Licence Application* for the Athlone agglomeration, identifies 44% of the loading to the WwTP arising from non-domestic sources in 2002. Estimates of potential future loading detailed in the table also identify that commercial/industrial loading to the plant will constitute 44% of the overall loading.

The current normal discharge arising from the WwTP is 6,500 m^3/day with a maximum discharge of 17,835m^3/day. The proposed upgraded WwTP will have a discharge rate of 8,400m^3/day but will be designed to accept a hydraulic load of 25,200m^3/day.

The primary discharge point discharges directly to the River Shannon. According to Westmeath County Council, physico-chemical monitoring of the Shannon does not indicate that the current WwTP discharge is having a significant impact on the River Shannon, however it does indicate that the river quality upstream and downstream of the discharge would be in breach of the *European Communities Environmental Objectives (Surface Waters) Regulations, 2009* with respect to Biochemical Oxygen demand and Ammonia. *Table 1 Assimilative Capacity Calculations, for the Primary Discharge Point at Athlone WwTP* outlines the assimilative capacity assessment of the river Shannon arising from the current and proposed future discharge arising from Athlone WwTP. This data has been summarised from *Table 6 Assimilative Capacity Calculations for the primary discharges (SW1(P) using the current and future water quality standards* of the *Inspectors Report on the Wastewater Discharge Licence Application* for Athlone Agglomeration.

Table 1 Assimilative Capacity Calculations, for the Primary Discharge Point at Athlone WwTP.

Parameter	Background (mg/l)	Proposed ELV's for main discharge point	Proposed Contribution from primary discharge (mg/l)	Predicted Downstream Quality (mg/l)	Current Water Quality Standards (mg/l)	EQS's (2015)
BOD (Current)	5	25	0.079	5.079	5	-
BOD (2015)	5	25	0.1	5.1	-	1.5mg/l
$P0_4$-P (Current)	0.03	2	0.002	0.032	0.03	-
$P0_4$-P (2015)	0.03	2	0.0026	0.0326	-	0.035
Ammonia (current)	0.27	5	0.0188	0.2888	1	-
Ammonia (2015)	0.27	5	0.0242	0.2942	-	0.065

As can be clearly identified from *Table 1 Assimilative Capacity Calculations, for the Primary Discharge Point at Athlone WwTP* the background concentrations for BOD and Ammonia are currently in excess of the environmental quality standards (EQS's) outlined for Good Overall Status" in the *European Communities Environmental Objectives (Surface Waters) Regulations, 2009*. However it was accepted by the Environmental Protection Agency that the proposed discharge should be authorised, including a significant increase in the proposed discharge (compared with current normal discharge levels) due to a proposed upgrade of the WwTP. The approval for the wastewater discharge authorisation was based on the following rational:

- The proposed discharge will not result in a significant increase in the background levels of Ammonia or BOD, even after the proposed upgrade of the WwTP. It was predicted that on receipt of BOD arising from the WwTP following the proposed upgrade that the discharge would only contribute 2.5% of the BOD level in the River Shannon (at dry weather flow). It was estimated that the relative contribution of ammonia under the same scenario would be 0.8% of the background concentration;
- The Draft River Basin Management Plan for the Shannon International River Basin District plans to achieve "Good Overall Status" at this stretch of the River Shannon by 2015. The Environmental Protection Agency state in the *Inspectors Report on the Wastewater Discharge Licence Application* for Athlone WwTP that it is considered that if the above mentioned plans are fully implemented they should address pollutant loads in the River Shannon and tributaries and go a long way to ensuring compliance with the Water Framework Directive requirements; and
- In addition the Environmental Protection Agency has outlined that the proposed upgrade works that will be undertaken to expand the capacity of the WwTP in addition to the proposed improvements in the collection system (in combination with the measures as per the Shannon IRBD Draft River Basin Management Plan) should go a long way to ensuring compliance with the Water Framework Directive requirements.