



**Mayo County Council**

# **Derrinnumera Sludge Hub Centre & Leachate Treatment Facility**

**UNSOLICITED ADDITIONAL INFORMATION SUBMISSION**

**WASTE LICENCE APPLICATION REGISTER NO.  
W0021-03**

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**October, 2010**



## Unsolicited Additional Information Submission

**PROJECT:** **Derrinnumera Sludge Hub Centre  
& Leachate Treatment Facility –  
Waste Licence Application Register No.  
W0021-03**

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**Our Ref: MH/MFG/MMcD 1908/1a**

11 October, 2010

Ms Marie O'Connor  
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Licensing Unit  
Office of Climate, Licensing & Resource Use  
Environmental Protection Agency  
Regional Inspectorate  
INNISCARRA  
County Cork

**Re: Application Register Number – W0021-03**  
**Unsolicited Additional Information Submission.**

Dear Ms O'Connor,

Further to your meeting with representatives from Mayo County Council and TOBIN Consulting Engineers, held at Inniscarra on November 11<sup>th</sup> 2009 and subsequent teleconference (with the writer, your good self and Mr Garrick on January 14<sup>th</sup> 2010), we wish to provide clarification on some of the topics discussed:

- 1.0 An Bord Pleanála decision – appraisal of residual issues
- 2.0 Clew Bay designation
- 3.0 Baseline sampling
- 4.0 River crossing – submission from Department of Environment, Heritage and Local Government
- 5.0 Shellfish Characterisation Report
- 6.0 Sludge treatment proposals

Each of the above discussion topics has been responded to individually and in detail. The responses are attached herewith.

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The Unsolicited Additional Information provided herein serves as a supplement to information already submitted as part of this application for a waste licence review. The following document has also been submitted, which has been revised to reflect any necessary amendments arising from the supplementary information (insofar as the additional information may have impinged upon the previous revision of the Non-Technical Summary):

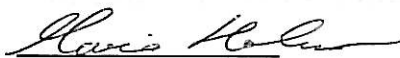
- Volume I: Non-Technical Summary – Derrinnumera Sludge Hub Centre & Leachate Treatment Facility Environmental Impact Statement. [Revision E]

No pre-submitted drawings have been revised for this unsolicited additional information submission. Appendix E contains a new drawing: Drawing no. 1908-2415 (Rev. A) showing proposed receiving environment monitoring locations.

We confirm that the content of the hardcopy form is a faithful reproduction (i.e. identical to) the electronic files on the accompanying CD-ROM.

We hope the information supplied herein provides sufficient clarity to the Agency on each of the issues discussed previously.

Yours sincerely,



MARIA HOLMES

Engineer

cc. **Mr Paddy Mahon, Director of Services, Mayo County Council**  
**Mr Noel Burke, Senior Engineer, Mayo County Council**

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# 1. AN BORD PLEANÁLA DECISION – APPRAISAL OF RESIDUAL ISSUES

**An appraisal is required of the residual issues arising from the An Bord Pleanála decision on the proposed development at Derrinnumera Waste Management Facility. (Responses to same to be provided where applicable);**

A combined An Bord Pleanála Oral Hearing was held in relation to both the proposed Newport Sewerage Scheme and the Derrinnumera Sludge Hub Centre and Leachate Treatment Facility, as many of the issues to be considered were common to both proposals. The hearing was held in Westport, County Mayo on February 5<sup>th</sup>, 6<sup>th</sup> and 7<sup>th</sup> 2008. Arising from that hearing, an An Bord Pleanála (ABP) Inspector's Report, dated June 30<sup>th</sup> 2008, was prepared Mr Daniel O'Connor, relating to the proposed Derrinnumera development.

The issues raised in Mr O'Connor's report related to:

- A. Specifics of Leachate Treatment Technology;
- B. Specifics of Sludge Treatment;
- C. Interim Sludge Drier;
- D. Odour Management;
- E. Inadequacy of baseline water quality data for Newport Bay.

Each issue has been separately addressed in the paragraphs to follow:

## A. SPECIFICS OF LEACHATE TREATMENT TECHNOLOGY:

In Section 6.1 of the Inspector's Report ('Reasons for Refusal'), a conclusion is made that having regard to the Mayo Sludge Plan (2003), the policy and objectives of the Mayo County Development Plan (2003-2009) and the conditions attached to the expansion of the Castlebar Wastewater Treatment Plant, it was considered that the Derrinnumera Sludge Hub Centre and Leachate Treatment Facility would "*constitute necessary development*" and "*would be in accordance with the proper planning and development in the area*".

However, the report goes on to recommend a refusal of the current proposal having regard to:

*"a) The inadequacy of the information provided in the Environmental Impact Statement and in evidence at the hearing regarding the proposed form of leachate and sludge treatment and odour management and*

*b) The inadequacy of baseline water quality data for Newport Bay*

*and having considered the written and oral submissions of objectors prior to and during the oral hearing...".*

Section 5.5.4 of the report states that if the proposal is undertaken successfully and as outlined in the EIS, the development would not be likely to incur significant effects on water quality. However, concern was expressed by the Inspector on the lack of information on the proposed technology for leachate treatment, which was stated to have impeded the appropriate environmental assessment process. Issues regarding the divided responsibility between the Council, the Sludge Hub DBO Contractor and the Newport WWTP DBO Contractor with respect to leachate treatment were also outlined.

Subsequent to the Inspector's recommendations, further work was undertaken in terms of providing detailed proposals for proven leachate treatment technologies that will meet the proposed discharge standards. This information was compiled taking into account results of detailed leachate analysis at Derrinnumera. The information was submitted to the Environmental Protection Agency on May 9<sup>th</sup> 2008 as part of a response to a notice in accordance with Article 14(2)(b)(ii) of the Waste Management (Licensing) Regulations 2004 (395/2004).

The above submission addresses the leachate treatment technology issues arising from the An Bord Pleanála recommendations.

In terms of the treatment standards proposed for the leachate, the ABP Inspector's Report states that the level of treatment appears appropriate, given that it is stated (by Mayo County Council) not to require dilution at the outfall.

## **B. SPECIFICS OF SLUDGE TREATMENT:**

As stated in Section 1 above, the An Bord Pleanála Inspector's Report accepts that the development of a Sludge Hub Centre at Derrinnumera would constitute necessary and proper planning and development. Further specific information on sludge treatment process type and details regarding the possible balance between drying and composting is sought. However, with reference to the latter point, the Inspector acknowledged the advantage of having two sludge treatment methods available on site in the event (intermittent) operational issues with either process.

Section 6.0 below addresses the sludge treatment technology issues arising from the ABP report.

## **C. INTERIM SLUDGE DRIER:**

Mr O'Connor, in his assessment of the development, did not favour the Interim Sludge Drier as a potential interim measure pending completion of a permanent sludge drying facility (Section 5.4 of ABP Inspector's Report), stating that it would be preferable to continue the treatment of sludge in Castlebar in the short-term. The report recommends that an alternative interim arrangement should be devised in the event of approval of the Derrinnumera Sludge Hub Centre.

In accordance with the recommendations of An Bord Pleanála, it is Mayo County Council's intention to continue the current arrangement of dewatering of sludge arising from Castlebar WWTP at



Castlebar. It is also intended that the present arrangement of exportation of dewatered sludge from County Mayo wastewater treatment plants to licensed and permitted sites, located outside of the county will continue insofar as this disposal route is available to the Council or until the permanent sludge drying facility has been completed at Derrinnumera, whichever is sooner.

As stated in Volume II Section 1.2.3 of the EIS, having regard to the temporary nature of a diesel fuelled drier and the fact that its emission characteristics are not as would be expected with a fully engineered drier, the temporary use of the Interim Diesel-fuelled Sludge Drier/Lime Stabilisation Plant would be a non-favoured option. Hence, Mayo Council Council have now provided an undertaking to continue the current sludge handling arrangements as outlined above in the short-term, but in the event that this existing arrangement becomes unavailable before the permanent sludge drier is commissioned, proposals for alternative interim sludge handling arrangement will be put forward to the EPA.

#### D. ODOUR MANAGEMENT:

In Section 5.5.5 of the Inspector's Report, Mr O'Connor expressed concern with respect to odours, making reference to existing odour issues associated with the landfill, the absence of detailed information on the proposed sludge treatment process and the overall management strategy for odour emissions, suggesting a potential link between split responsibility for sources of odour and odour problems. The report concluded that the potential for divided responsibility in relation to odours emanating from the combined landfill/sludge operation is significant and had not been addressed.

More specifically, Section 5.5.5 of the report stated *"...the proposal for the sludge hub centre should be refused based on insufficient information on the process to allow assessment coupled with the problem of divided responsibility for the odour sources"*.

Notwithstanding the above, Section 5.3 of the Inspector's Report stated:

*"...The proposal relating to odours could be considered satisfactory if the process operated as per the prediction of the Local Authority and the level of emissions would be catered for in the review of the Waste Licence which is the subject of a separate application process to the EPA..."*

Therefore, in order to adequately address the concerns relating to odour and to allow assessment of the development, the particulars of sludge treatment infrastructure proposed for Derrinnumera (with specific reference to the treatment technology to be applied to both sludge drying and composting and the emission locations) have been provided in Section 6.0 below.

#### E. BASELINE WATER QUALITY DATA FOR NEWPORT BAY:

In relation to the leachate treatment facility, the report makes recommendations to continue to monitor the water quality in Newport Bay on an ongoing basis prior to any development of the Derrinnumera facilities. This recommendation is made in light of the importance of the aquatic ecology

of the Bay and in consideration of some elevated levels of contaminants noted in the Bay, which were “not clearly directly attributable to any possible source”.

Proposals with regards to baseline monitoring are provided in Section 3.0 below, which address the issues raised by the An Bord Pleanála Report.

## 2. CLEW BAY DESIGNATION

**Clarification is required on the exact grounds for which Clew Bay has been designated a Special Area of Conservation;**

Figure 1 - Appendix A shows the extent of Special Area of Conservation (SAC) designation under the EU Habitats Directive 92/43/EEC, with regards to the Clew Bay Complex. A copy of the Site Synopsis for the Clew Bay Complex (Site Code: 001482) and has been appended herewith.

Clew Bay comprises a complex series of islands and interlocking bays containing a wide variety of marine and terrestrial habitats, with seven habitats present which form part of Annex I of Council Directive 92/43/EEC. Important populations of two mammal species listed under Annex II of Council Directive 92/43/EEC are known to be present within the SAC. The SAC also includes one Red Data Book plant. Thus the site is considered to be of national and international importance, and has been reported as such in the Site Synopsis.

The seven habitats listed under Annex I of EU Habitats Directive 92/43/EEC are as follows:

- Large Shallow Bay
- Lagoon
- Atlantic Salt-meadows
- Drift Lines
- Perennial Vegetation of Stony Banks
- Embryonic Shifting Dunes
- Marram Dunes and Dune Slacks

Important populations of Annex II species that are found in Clew Bay are the:

- Otter; and
- the Common Seal.

Lough Furnace, located to the north east of Clew Bay, forms part of the Clew Bay SAC Complex. This body of water has been defined in the Site Synopsis as a “*deep, stratified, saline lake lagoon*”. The proposed outfall location from Newport Waste Water Treatment Plant will be located to the north of Rosmore Peninsula. The outfall location is adjacent to the Burrishoole Channel, which links Lough Furnace with Clew Bay. Bog Orchid (*Hammarbya paludosa*), a species included in the Irish Red Data Book, is found in Lough Furnace.

In addition, Clew Bay Complex supports a diverse range of wintering waterfowl, including some species listed on Annex I of the EU Birds Directive (2009/147/EC), i.e. the Common Tern, Artic Tern, Little Tern, Barnacle Goose, Great Northern Diver and the Bartailed Godwit.

### 3. BASELINE SAMPLING

**An examination is required of the An Bord Pleanála decision in terms of the background sampling deficiencies referenced therein. The requirement for supplemental background sampling should also be investigated.**

As stated in Section 1.0(E) above, in relation to the leachate treatment facility, the Inspector's Report makes recommendations to continue to monitor the water quality in Newport Bay on an ongoing basis prior to any development of the Derrinnumera facilities. This recommendation is made in light of the importance of the aquatic ecology of the Bay and in consideration of some elevated levels of contaminants noted in the Bay, which were *"not clearly directly attributable to any possible source"*. Section 4.3.2 of the Inspector's Report refers to previous water quality and sediment baseline sampling and slightly elevated levels of copper detected in same. The report also refers to slight levels of hydrocarbons, which was detected in some shellfish tissue samples.

Pre-construction monitoring recommendations were also included in the Inspector's Report relating to the proposed wastewater treatment plant at Newport.

In relation to elevated contaminant background levels in Newport Bay, Volume III Appendix 3 of the EIS for the Newport Sewerage Scheme comprises a report entitled *'Baseline study and impact assessment of the aquatic ecology, sediment and water quality in relation to the proposed wastewater treatment plant and landfill leachate discharges at Newport, Co. Mayo'* prepared on behalf of Mott MacDonald Pettit Limited by EcoServe Ltd. The purpose of the report was to develop a baseline dataset of the existing aquatic ecology, and water and sediment quality, for the receiving environment in terms of treated effluent discharge. The study was undertaken during the period September to November 2004.

Appendix B to this correspondence contains extracts from the Newport Sewerage Scheme EIS, i.e. 'Figure 1.1 – Locations of Littoral Biotope Surveys & Figure 1.2 – Locations of Sublittoral Surveys', which show the locations at which seawater, sediment and tissue (marine algae and shellfish) sampling took place during that study. An extensive suite of parameters was included with the analysis of water and sediment samples from 4 no. locations (ST2, ST5, ST12 and ST14) to provide a dataset of the study area. At the remaining 10 no. locations shown in Figure 1.2 a reduced suite of analysis was undertaken.

Water samples were collected at standard mid water depth at all sites while temperature, salinity, oxygen (in mg/l and % saturation) were recorded in the field at surface, mid-water and one metre above the sea bed at all sites. Results of the analysis have been extracted from Volume III

Appendix 3 of the EIS for the Newport Sewerage Scheme and have been included herewith as Appendix C.

The following text (extract from Newport Sewerage Scheme EIS – Volume II Section 3.3.2.97) provides a summary of the conditions in the existing environment based on the results of the above-mentioned analysis:

*“Concentrations recorded during this survey appear to indicate some elevation in polyaromatic hydrocarbon levels in water in the study area however data collected for water quality generally indicates excellent conditions throughout the study area. Some degradation is apparent in water quality closer to Newport Town, as would be expected because of known existing discharges to the estuarine environment in this area, with levels of a wide variety of heavy metals and other contaminants being detected. Elevated results were detected for Faecal Coliforms in Newport Channel, Silver in Burrishoole Channel and Burrishoole Bay, Barium in Burrishoole Bay and Newport Channel, Manganese in Newport Channel, Strontium in Burrishoole Bay and Iron at all sites. Of particular note were the results indicating the presence of Phenanthrene and Anthracene at the control site and Fluoranthene at southern Lough Furnace, Burrishoole Bay and Newport Channel. All results obtained for 2005 and 2006 to date from the Department of the Marine monitoring of shellfish waters, indicates, that with the exception of faecal coliforms the results obtained were within the mandatory values specified in the European Communities (Quality of Shellfish Waters) Regulations, 2006 (S.I. No. 268 of 2006). Results for shellfish tissue analysis generally indicate an unpolluted status in the study area. Notable results included elevated levels of Copper in samples from Ardagh and Rossgibbilleen, elevated results for the compound Bis(2-ethylhexyl)phthalate in all samples, Total Petroleum Hydrocarbons at Ardagh and microbiological contaminant levels in Burrishoole Channel and Newport Channel. The sediment in the study area was what would have been typically expected with sandier sediments being detected in the Newport Channel indicating the erosive nature of the hydrodynamics in this area. Elevated levels of microbiological contaminants were detected in the Newport Channel area which is likely to result from the relative proximity to the existing septic tanks outfalls in Newport town. In addition elevated results for heavy metals were detected in a number of sediment samples. Levels of other trace organic contaminants (e.g. PAHs, organic pesticides, etc.) were considered to be representative of natural background levels for the study area. Results for seaweed analysis generally indicate an unpolluted status in the study area however, notable results included the presence of Total Petroleum Hydrocarbons in the Burrishoole Channel, elevated levels of Cadmium in Lough Furnace, Zinc and Arsenic in Newport Bay, and microbiological contaminants in particular in the Newport Channel area.”*

The preferred outfall location from Newport Wastewater Treatment Plant, based on hydrodynamic modelling, is in the north embayment between Rossgibbilleen Point and Rosmore Headland (refer to Appendix E). The nearest sampling location to the proposed outfall location, for which there is a full suite of analytical results would be Sampling Location ST5. Sampling locations ST4, ST6 and ST7 are proximate to the proposed outfall location. Littoral Sampling Location IT4 denotes the seaweed sampling location closest to the proposed outfall.

With a view to determining the extent of additional background monitoring required, the EcoServe Report was assessed in terms of contaminants identified in the study area. The results of the baseline monitoring undertaken by EcoServe Ltd, indicated the presence of the following substances in the existing aquatic environment:

#### Water Samples:

- Site ST11(Newport Channel) exhibited a concentration of faecal coliforms above the Shellfish Directive (79/923/EEC) guide value of  $\leq 300$  mpn/100ml.
- Trace concentrations of zinc, arsenic, chromium, copper, mercury, nickel and lead were detected in Newport Bay from sampling conducted by the Department of the Marine in 2005 and 2006 (refer to Appendix C for details).
- Silver was detected at Sites ST3 and ST4 above analytical limits of detection.
- Barium was detected at Sites ST5 and ST12 above analytical limits of detection.
- The manganese concentration measured at Site ST12 was found to be above its corresponding limits of detection.
- Strontium levels ranged from  $10\mu\text{g/l}$  at ST14 (control site) to  $6040\mu\text{g/l}$  at Site ST4.
- Iron concentrations were above laboratory limits of detection at all sampling locations.
- Certain Polycyclic Aromatic Hydrocarbons were detected in throughout sampling locations, i.e. phenanthrene, naphthalene, acenaphthene, fluorine, anthracene, fluoranthene, pyrene, benzo(a)anthracene, chrysene and benzo(b)fluoranthene.

#### Sediment Samples:

- An elevated Total Coliform result was obtained in sediment sampled from ST12
- The following metals were detected at concentrations elevated above the Marine Institute reference (a reference value for typical background levels from historic monitoring data indicating an unpolluted status for Lough Furnace and Newport Bay). These metals were zinc, chromium, arsenic, nickel and silver.
- Levels of other trace organic contaminants (e.g. PAHs, organic pesticides, etc.) were also detected.

#### Shellfish Tissue Analysis:

The determination of water quality, trace metal and chlorinated hydrocarbon concentrations in shellfish waters is carried out by the Marine Institute in part fulfilment of the monitoring requirements of various EU legislation. Samples of native oyster (*O. edulis*), collected in 2002 were analysed for trace metal and chlorinated hydrocarbons – levels of all analytes were low and well within strictest standards.

- During the EcoServe study, elevated concentrations of copper in native oysters (*O. edulis*) samples were  $8\text{mg/kg}$  at Rossgibbilleen and  $11\text{mg/kg}$  at Ardagh. Copper concentrations in blue mussels (*M. edulis*) from the study area were generally below or just above the LOD ( $1\text{mg/kg}$ ) at all sites.

- Arsenic levels were below the LOD (1mg/kg) in the oyster samples however concentrations in blue mussel ranged between 2 and 3 mg/kg at all sites.
- Concentration of zinc in native oysters and blue mussels from the study area were detected above the LOD at all sites as expected. (Mean concentrations of zinc found in mussels in Irish shellfish growing areas in 1994 were 16 mg/kg).
- Semi-volatile organic compounds in shellfish tissue samples from the study area were below the LOD of 0.1mg/kg at all sites, however the compound Bis(2-ethylhexyl)phthalate was detected above the LOD at all sites.
- Levels of petroleum hydrocarbons ranged from below the LOD to 8mg/kg in native oysters from Ardagh.
- Faecal coliform concentrations from blue mussel tissue ranged from 1cfu/10g at the control site to 540cfu/10g at Burrishoole Channel. Total coliforms were detected at a number of locations, particularly in proximity to the existing sewage outfall in the Newport Channel.

#### Seaweed Analysis:

- Cadmium concentrations in brown seaweed (*F. vesiculosus*) were generally below the LOD of 4mg/kg throughout the study area, however cadmium was recorded at 19mg/kg at Site IT2 (in close proximity to Site ST3 – entrance to Lough Furnace), which is substantially elevated above the background concentrations 0.1 – 0.42mg/kg wet weight for West Greenland *Fucus vesiculosus*.
- Zinc was detected in all samples above the LOD of 1mg/kg, ranging from 11 to 49mg/kg.
- Arsenic concentrations in seaweed tissue ranged from 7 to 24mg/kg in the study area.
- Petroleum Hydrocarbons were detected above the LOD (1mg/kg) in the vicinity of the proposed outfall at 4mg/kg.
- In terms of microbiology:
  - Faecal coliforms were detected at Sites IT2, 4, 6, 7, 8 and 10 measured at 46, 6, 25, 6, 389 and 287 cfu/10g respectively.
  - Total coliforms were detected at Sites IT4 and 8 at >2419.2 MPN/10g and at 2 MPN/10g at Site IT9 (control site).
  - Levels of *E. coli* elevated above the LOD (1 MPN/10g) were detected at Site IT8 (68.3 MPN/10g) and *E. coli* was present at Site IT4 at the laboratory limit.

In preparing the Environmental Impact Statements for both developments (Newport WWTP and Derrinnumera Leachate Treatment Facility) a pre and post discharge monitoring programme was proposed. As part of that monitoring programme, it was proposed that samples of seawater and shellfish tissue be obtained on a biannual basis, to commence six months in advance of the commencement of discharge at Rosmore. It was proposed that the frequency of sampling would be subject to review on completion of two years of monitoring post commissioning of the new outfall.

A list of proposed screening criteria for the receiving environment was proposed at that time, however, in light of more recent legislation (i.e. European Communities Environmental Objectives (Surface Waters) Regulations, S.I. 272 of 2009) a review of the list of monitoring parameters is

deemed appropriate, to include additional water quality parameters included in the new legislation. It is proposed that the receiving water screening criteria should be expanded to include the specific pollutants, priority substances and priority hazardous substances as outlined in the 2009 regulations.

A copy of the original list of proposed screening criteria for receiving waters and shellfish flesh has been appended herewith an expanded list of specific pollutants, priority substances and priority hazardous substances (Appendix D). The additional parameters that have been detected during the baseline study shall also be included in the proposed monitoring programme for receiving waters. A list of these additional parameters has been included in Appendix D. The sampling locations originally proposed are still considered appropriate to the proposed development and have been shown on Drawing No. 1908-2415 Rev A, included as Appendix E.

On view of the An Bord Pleanála Inspector's recommendations, it is considered prudent to commence pre-discharge baseline monitoring in line with the proposed monitoring programme for the receiving environment as soon as practicable. We therefore seek approval from the Agency on the monitoring proposals and acknowledge that this may additionally require consultation with the Marine Institute, the DCMNR and the DEHLG and/or other relevant bodies deemed appropriate by the Agency.

#### **4. RIVER CROSSING – SUBMISSION FROM DEPARTMENT OF ENVIRONMENT, HERITAGE AND LOCAL GOVERNMENT**

**A submission was put forward by the Department to the Environmental Protection Agency, dated August 20<sup>th</sup> 2008. An assessment of the issues raised by the submission should be undertaken.**

We refer to a submission, dated August 20<sup>th</sup> 2008, sent by Ms. Mary Boothman, Development Applications Unit of the Department of Environment, Heritage and Local Government to the Environmental Protection Agency, which related to the proposed development at Derrinumerá.

In this correspondence the Department expressed a view that the proposed treated leachate pipeline between the landfill site and the proposed new outfall at Newport would be “*unacceptable*” as currently proposed, due to the close proximity of the pipeline to the banks of the river and in that it crosses the bed of the Newport River and some of its tributaries. The correspondence goes on to state:

*“The assessment of the likely significant effects on the SAC and its conservation objectives, which include maintaining the favourable conservation status of the Annex II species, Freshwater Pearl Mussel, is deficient and does not constitute an appropriate assessment in the sense of Article 6(3) of the EU Habitats Directive.”*

Earlier correspondence, dated January 5<sup>th</sup> 2008, sent by Mr Tony O'Flynn, Development Applications Unit to Mr Daniel O'Connor, An Bord Pleanála Inspector for the Oral Hearing, was attached the above-mentioned correspondence, and Ms. Boothman's later communication stated that the nature conservation concerns of the Department were as set out in the submission to Mr O'Connor.

Mr O'Connor broached the issues of the Department during the hearing, and as a response to the submission from the Department, an alternative method of crossing the Newport River was put forward on behalf of the Local Authority. The alteration was proposed on Day 2 of the hearing, which involved proposing to lay a pipe in the bridge upstream of Newport Town (trench within the bridge on the R311) in lieu of excavating a trench across the riverbed, thus negating the requirement to disturb the riverbed. In relation to this issue, in his subsequent report on the hearing, Mr O'Connor stated that the development would not be likely to impact on the integrity of the Newport River cSAC and the issues raised in this regard did not give grounds for rejection of the proposed development (Sections 5.5.2 and 5.6.14 Inspector's Report).

In conclusion, it is considered that the concerns of the Development Applications Unit of the Department of Environment, Heritage and Local Government in relation to the Newport River SAC have been adequately addressed.

## 5. SHELLFISH CHARACTERISATION REPORT

**A Shellfish Pollution Reduction Plan, Pollution Reduction Programme and Characterisation Report are now published for Clew Bay. Reference is made in these documents to Newport Municipal Wastewater System in terms of risk assessment. A review of these documents is required in the context of the proposed development.**

The above documents have been reviewed in terms of potential consequences for/effects on the proposed development at Derrinnumera.

### Clew Bay Final Characterisation Report

In terms of land based pressures in the Clew Bay Shellfish Catchment Area, Figure 1 below, extracted from the Characterisation Report<sup>1</sup> provides an indication of current point source pressures within the catchment, i.e. arising from the municipal wastewater treatment plants and combined sewer overflows within the contributing catchment. These plants are symbolised based on their risk designations.

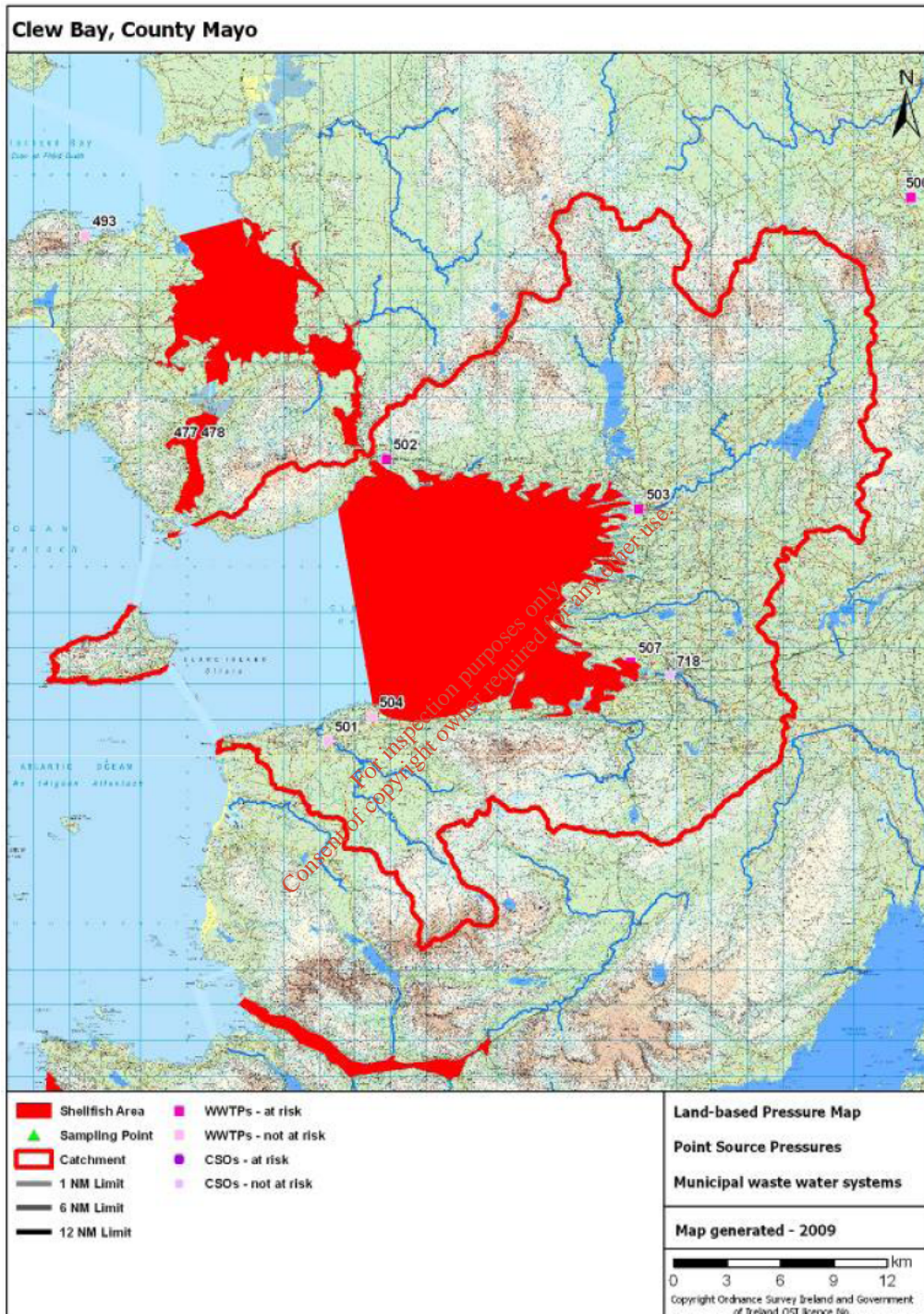
The existing Newport wastewater treatment facilities (Point '503') have been designated as "at risk" of potentially impacting upon shellfish waters. Section 5.2.1 of the Characterisation Report makes further reference to the existing Newport plant (which at present comprises primary treatment only), stating that the plant is currently operating within its design capacity. The report also makes reference to the proposed new plant at Newport.

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<sup>1</sup> 'Characterisation Report Number VI – Clew Bay Shellfish Area, County Mayo'.



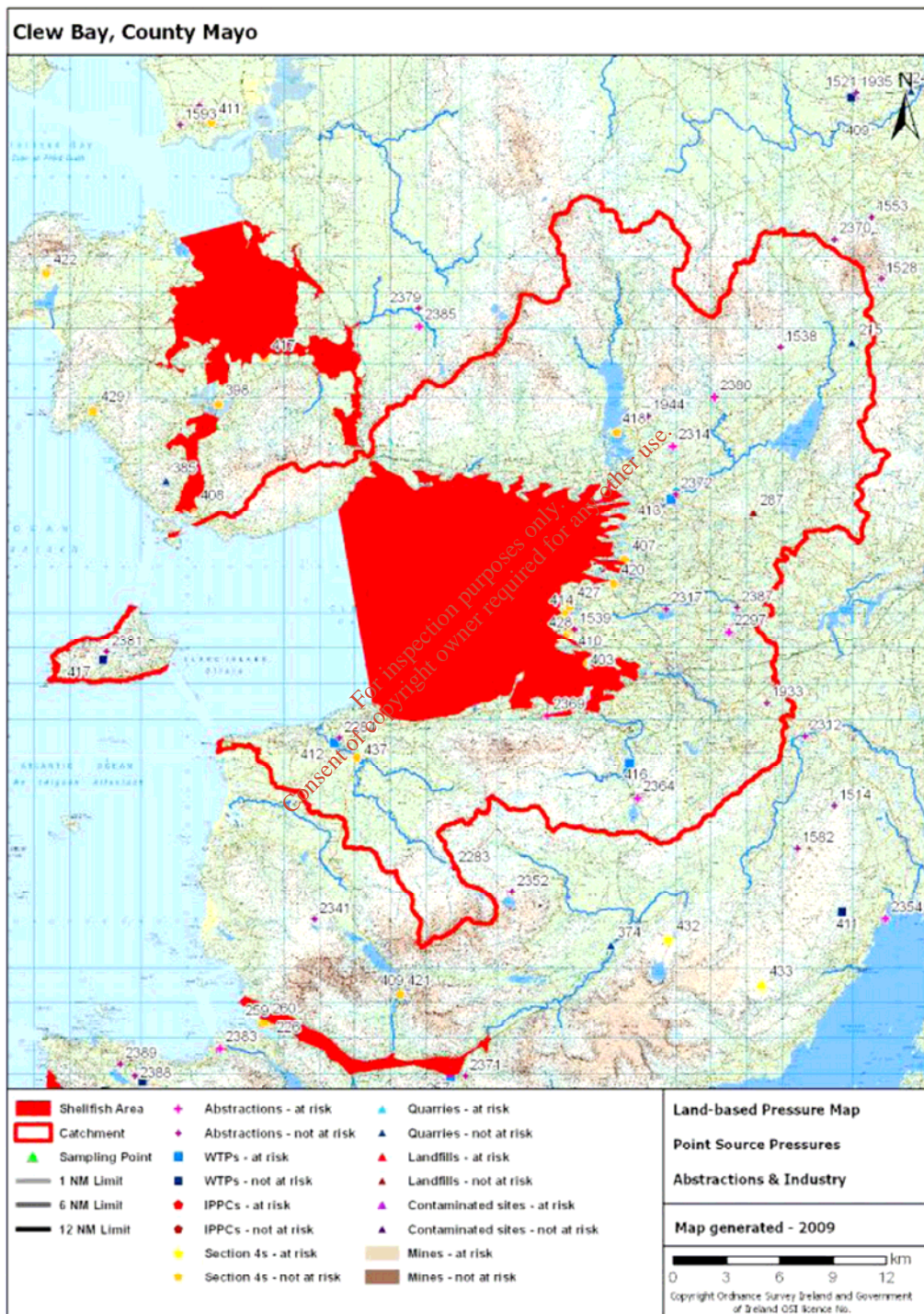
The existing primary treatment units at Newport have been designated as “at risk” due to insufficient plant capacity for future population predictions.



**Figure 1: Land-based Pressure Map – Point Source Pressures: Municipal Wastewater Systems.** (Source: Characterisation Report No. VI – Clew Bay Shellfish Area)

Figure 2 (below), extracted from the Characterisation Report provides an indication of current point source pressures within the catchment, i.e. arising from abstractions and industry. The Derrinnumera

Landfill is shown on this map as Point '287', which has been designated under "Landfills – not at risk" (of potentially impacting upon the shellfish area). Section 5.2.1 of the report states that monitoring of the shellfish area does not indicate any water quality issues likely to be associated with the existing operations at Derrinumera Landfill; hence the facility is unlikely to be affecting shellfish water quality in the shellfish area.



**Figure 2: Land-based Pressure Map – Point Source Pressures: Abstractions & Industry.**  
 (Source: Characterisation Report No. VI – Clew Bay Shellfish Area)

### Clew Bay Final Pollution Reduction Programme (PRP)

The Programme Objective of the Clew Bay Final PRP is for compliance with the standards and objectives established by the Quality of Shellfish Waters Regulations 2006 (S.I. 268 of 2006) (as amended). More specifically, the aim of the PRP is to provide an action plan to address the prioritised list of pressures identified in the Characterisation Report, to help ensure that compliance with the relevant water quality standards is achieved. The PRP will be kept under review by the Minister for the Environment, Heritage and Local Government, having regard to the findings of Marine Institute Annual Monitoring Programmes, particularly with regards to incidences of non-compliance with water quality standards in any particular area.

The current overall status of the Clew Bay Shellfish Area has been reported in the PRP as follows:

- Monitoring undertaken for the purposes of the **Directive 2006/113/EC (Shellfish Waters Directive) and S.I. 268 of 2006 (Quality of Shellfish Water Regulations, 2006)** – does not indicate shellfish water quality issues in the area
- Monitoring for **Directive 2000/60/EC (Water Framework Directive)** – does not indicate any water quality issues in the area
- Monitoring of shellfish flesh for **food hygiene purposes** – indicates low levels of faecal contamination in the shellfish area (the bivalve mollusc production area are classified as ‘Class A’ and ‘Class B’ for the purposes of EC Regulation 854/2004). However, the shellfish are in compliance with the shellfish guideline value for faecal coliforms.

In terms of current conditions in the Clew Bay Shellfish Area Catchment, the PRP concludes that analysis of the Characterisation Report suggests that there are no “key pressures” or “secondary pressures” currently impacting on the shellfish water quality.

Section 5.0 of the PRP deals with Actions Programmes and Measures, which relate to future development only. The measures require, *inter alia*, that:

*“Under Article 4 of the European Communities (Quality of Shellfish Waters) Regulations 2006 (S.I. No. 286 of 2006) (as amended), every public authority that has functions the performance of which may affect shellfish waters shall perform those functions in a manner that will promote compliance with the objectives of this pollution reduction programme and with the objectives of the Shellfish Waters Directive.*

*The functions of particular importance – in light of the objectives of Directive 2006/113/EC and of this PRP – include waste water treatment (licensing and operations), implementation of the GAP Regulations, waste management (licensing and operations), effluent discharge licences, planning and development and building control.”*

Article 4 of the Quality of Shellfish Waters Regulations includes a requirement that public authorities, in the performance of their functions, must ensure, as far as practicable that shellfish waters must comply with the quality standards specified in Schedule 2 of the regulations.

In terms of the Derrinumera development, which will be located within the Clew Bay Shellfish Waters Catchment Area, the proposed discharge standards for treated leachate, as put forward in Volume II, Section 3.4.3.7 of the EIS, have been based on Schedule 2 of the European Communities (Quality of Shellfish Waters) Regulations 2006 (S.I. No. 286 of 2006). The regulations specify environmental quality standards (EQS's), however the discharge limits have been proposed such that these EQS's are actually attained in the pipeline, even prior to discharge the receiving environment. This is an important point, whereby these standards are achieved independently of dilution in the receiving water.

(Ultimately through, the Agency will be required to approve/amend the proposed discharge standards for treated leachate as they see fit in their role as environmental supervisors of the waste licensed establishment and their role in enforcement.)

## 6. SLUDGE TREATMENT PROPOSALS

**Further clarification is required regarding the particulars of sludge treatment infrastructure at Derrinumera, with specific reference to the treatment technology to be applied to both sludge drying and composting, the emission locations and the emission limit values achievable. Confirmation is sought as to whether Mayo County Council wish to proceed with both options, i.e. composting and drying.**

To put into practice a sustainable sludge treatment and disposal strategy, Mayo County Council propose to construct a Sludge Hub Centre to treat all the wastewater and water treatment sludges arising in the county at Derrinumera Landfill Site. The Mayo Sludge Plan (2003) recommended thermal drying of sludge as the preferred technology. The Council wish to have a secondary option of sludge composting available to the Contractor as well.

The Council propose to construct a Sludge Hub Centre to treat all sewage and water treatment sludges in the county, at Derrinumera, achieving a dried pelletised final product, or alternatively a composted consistency, as the end use option requires. They propose to do this by procuring a Sludge Drier under a Design-Build-Operate (DBO) Contract, where the tendering contractor offers equipment to meet the performance specification, in a contract where he will also operate the Sludge Hub Centre for a period of 20 years. Because not all disposal options would require sludge to be dried, and in order to provide an opportunity for sludge to be made available in a less expensively treated form, as a compost, the contract will also include a facility to compost a fraction of the sludge.

### **Schedule of Tanks, Plant & Equipment:**

The following facilities will comprise the Sludge Drying Centre: -

- Sludge Acceptance Area
- Screenings removal including purpose-made skips
- Sludge tanker reception facility
- Electrical sub-stations
- Inlet hoppers or bunkers
- Supplementary Dewatering Treatment for liquid sludges
- Sludge Drying Plant
- Pipelines and Interconnecting Pipework
- Ancillary plant and structures
- Sludge plant residues and condensates treatment
- Biosolids Storage Silos
- Biosolids Bagging and product storage facilities
- Odour extraction and scrubbing facilities

It is expected that 80% of the sludge intake will be treated by the Sludge Drier and 20% will be treated in a composting facility. Dust and odour control facilities will also be an integral part of the drying process. Atmospheric emissions from the drier would be required to comply with TA Luft 2002 requirements.

### **Sludge Drier Technology**

The sludge-drying plant will be designed and constructed in accordance with best national and international practices, including the European Council Directive 94/9/EC – ATEX Directive. Drying will be achieved either by convection drying when hot gas / air is blown through the sludge or by conduction drying whereby the sludge is brought into contact with a heated surface. The sludge drier will be capable of providing a minimum 90% DS final product in a 2-5mm hard round pellet form.

The sludge drier will be handling sludge cake of a variable consistency, over an operating period which is inclusive of all necessary annual downtime, and which is properly served by skilled labour during its operating time at the Hub Centre. The possibility of using landfill gas as an auxiliary fuel will be made available to tendering contractors, and used if found feasible and cost effective, subject to regulatory requirements.

In relation to the particulars of sludge drying process itself, the following description refers to the use of a horizontal drum type drier, which is a common variant of thermal drying.

#### *Process Description:*

Appendix F shows in diagrammatic form the typical sludge drying process.

Wet sludge is directly pumped to the Wet Product Silo, while at the same time; recycled dried product is fed to the Recycling product silo. Sludge from both silos is then sent forward at a controlled rate to the mixer. A paddle type mixer converts the wet and dried sludge to a homogenous state. A feed screw conveys the mixed sludge to the sludge-drying drum.

The mixed sludge, already in granular form, comes in direct contact with a stream of heated air in the drying drum. The heated air is produced by the furnace and burner, which can be powered by biological or natural gas. The drier would usually consist of a steel horizontal rotating drum or similar. A series of blades evenly arranged on the internal walls of the drum would transport the product within the drum.

The dried product, mixed with the process air, enters a pre-separation chamber and polycyclone system. An air compressor feeds more air into this unit. Coarse particles are separated in the pre-separation chamber, while medium and fine particles are separated in the polycyclone.

Separated moist air is sent forward from the polycyclone via a delivery fan to the saturator scrubber. Washing and condensing of the process air occurs in the saturator, which is equipped with internal spray nozzles to remove the finest particles remaining. Wastewater from this process is then discharged from the system to the leachate treatment process. Scrubbed air then exits the saturator and enters a centrifugal fan. About 90% of the total process air is recycled to the furnace via this centrifugal fan, while the balance enters, via a second centrifugal fan, a biofilter for odour removal. This balance is then emitted to the atmosphere.

The sludge product separated by the pre-separator and the polycyclone is extracted by a dried product extraction screw and a rotary valve. Dried product then enters a transport screw, followed by a bucket elevator, followed by a sieve feeding screw and sieve. The dried product is then sent on for either recycling or on for bagging, or both, depending on the needs of the plant. Screw conveyors would be arranged so that each screw conveyor can feed either direction to the recycled sludge screw conveyor or final product screw conveyor. The portion of dried sludge to be recycled will be transported from the recycled sludge screw conveyor to a bucket elevator and screw conveyor back to the recycled product silo for mixing with incoming wet sludge. The portion of dried sludge to be sent on for final product packaging will be transported from the final product screw conveyor to a bucket elevator to the dried product storage silo.

With regard to the final product, a diverting valve allows either discharge into an indoor skip or to the bagging system. Skips are generally provided for emergency use in case of downtime of the bagging unit.

#### ***Emissions from Sludge Drier Process:***

With the provision of a sludge drier at Derrinnumera, there would be two likely emissions points:

1. Sludge drier condensate discharge from saturator scrubber to leachate treatment facility. The emission limit values would then relate to emissions from the main leachate treatment facility discharge, discussed in the previously submitted 'Response to notice in accordance with Article 14(2)(b)(ii) of the Waste Management (Licensing) Regulations', dated May 2008.
2. Process air from biofilter unit connected to sludge drier process.

### **Tunnel Composting System:**

Tunnel composting is considered to be the best suited, most efficient and reliable amongst composting treatment options for the treatment of municipal sludge. A typical tunnel composting facility will comprise the following

- Tunnel Composting Area
- Compost Refinement/Storage Area
- Process Control System (temperature sensors and moisture control)
- Air Management
- Water Management

Tunnel composting is generally a four-week process. With this treatment technology there is usually an approximate 40% mass reduction of the input sludge, with up to 90% evaporation of the moisture initially contained in the sludge. As with the conventional sludge-drying plant, dust and odour control facilities will be incorporated in the design of the tunnel composting system, with the composting buildings being maintained at a slight negative pressure to prevent air escape. A biofilter would be installed, through which all collected process air would be emitted.

### **Emissions from Tunnel Composting Unit:**

With the provision of a tunnel composting facility at Derrinurea, there would be one emission to air:

1. Process air from biofilter unit connected to composting tunnel building.

### **Air Emissions Control:**

In terms of sludge drying and composting processes, biofilters can be applied as successful means of odour abatement and air emission control. Biofilters containing sea-shell media tend to be utilised at sludge drying plants to specifically target Volatile Organic Compounds and Hydrogen Sulphide. Peat filters are typically utilised at composting plants to target ammonia and Volatile Organic Compounds.

Literature sourced from industry has been included in Appendix G, which provides supplementary data on some of the biofilter units available on the market at present.