

APPENDIX 12. PHOTOGRAPHS SUBLITTORAL SURVEY

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APPENDIX 12. PHOTOGRAPHS SUBLITTORAL SURVEY



Plate 12.1. Van Veen grab used for sublittoral sampling.



Plate 12.2. Lough Furnace, ST 1.



Plate 12.3. Pre-sieved sample ST3.



Plate 12.4. Pre-sieved sample ST4.



Plate 12.5. Pre-sieved sample ST5.



Plate 12.6. Pre-sieved sample ST6.



Plate 12.7. Pre-sieved sample ST7.



Plate 12.8. Pre-sieved sample ST8.



Plate 12.9. Pre-sieved sample ST9.



Plate 12.10. Pre-sieved sample ST10.



Plate 12.11. Sieved sample ST10 showing pieces of dead maerl.



Plate 12.12. Pre-sieved sample ST11.



Plate 12.13. Pre-sieved sample ST12.

Plate 12.14. Pre-sieved sample ST13.



Plate 12.15. Pre-sieved sample ST14.

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APPENDIX 13. PHOTOGRAPHS OF FISH SURVEY

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APPENDIX 13. PHOTOGRAPHS OF FISH SURVEY



Plate 13.1. Setting out the beach seine net of fish survey.



Plate 13.2. Setting out the beach seine net of fish survey.



Plate 13.3. Setting out the beach seine net of fish survey.



Plate 13.4. Pulling in beach seine net of fish survey.



Plate 13.5. Pulling in beach seine net of fish survey.



Plate 13.6. Catch from fish survey 1 (FS1), four Pollack, one corkwing wrasse and one prawn.

APPENDIX 14. PHOTOGRAPHS OF OTTER AND SEAL SURVEY

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APPENDIX 14. PHOTOGRAPHS OF OTTER AND SEAL SURVEY



Plate 14.1. Possible otter den at Lisduff.



Plate 14.2. Possible otter spraint at Lisduff.



Plate 14.3. Many seal hauled out at west of Muckinish.



Plate 14.4. Seals entering the water west of Muckinish.



Plate 14.5. Seals in the water west of Muckinish.

APPENDIX 15. CONSULTEES

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APPENDIX 15. CONSULTEES

Table 15.1. List of consultees.

No.	Name	Organisation
1	Alan Stoney	Clew Bay Oyster Co-Operative Society Ltd
2	Dr. E.N. Kirby	National Parks & Wildlife Service (NPWS)
3	Dr. Francis O'Beirne	Marine Institute
4	Dr. Jimmy King	Central Fisheries Board
5	Dr. Ken Whelan	Marine Institute
6	Dr. Marie Dromey	National Parks & Wildlife Service(NPWS)
7	Dr. Russell Poole	Marine Institute
8	Francis O'Donnell	Clew Bay Oyster Co-Operative Society Ltd
9	Kieran Thompson	Newport House Hotel
10	Mary Hannon	Clew Bay Clams Group
11	Niall O'Boyle	Clew Bay Marine Forum Ltd
12	Susan Callanan	National Parks & Wildlife Service(NPWS)
13	Vincent Roche	The North Western Regional Fisheries Board

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APPENDIX 16. CORRESPONDANCE

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Marine Institute
Furnace
Newport
Co. Mayo

telephone 353 98 42300

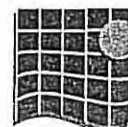
facsimile 353 98 42340

email newport.reception@marine.ie

website www.marine.ie

Mr Brian Beckett,
EcoServe,
Unit 19B, KCR Industrial Estate,
Kimmage, Dublin 12

12th November 2004



Marine Institute
Foras na Mara

Re: *ECOSERVE baseline aquatic ecological studies at Newport, Co. Mayo – assessments in relation to production of an EIS for the proposed Newport waste water treatment plant discharge.*

Dear Mr. Beckett,

Further to your recent letter to Dr Poole and our brief phone conversation some weeks ago I am writing to confirm our views regarding the proposal to relocate the outfall of the Newport Sewage treatment works, including leachate from the Derrinnumera landfill, to the outflow from the Burrishoole system at Rosgibblin point.

As you are aware the Marine Institute, and formerly the Salmon Research Trust of Ireland Inc. and Salmon Research Agency of Ireland, has for the past 50 years operated fish census and biological research programmes in the Burrishoole catchment. Over the past 40 years the continuous monitoring of salmon, sea trout, and eel stocks has been fully quantitative and represents a unique data set of global importance. As a result, the Burrishoole system is regarded as a major European and in the case of Atlantic salmon, a world index site. The Burrishoole data are fundamental to international assessments of stock status for salmon, eel and sea trout as carried out by the International Council for Exploration of the Seas (ICES), the European Inland Fisheries Advisory Commission (EIFAC) and the North Atlantic Salmon Conservation Organisation (NASCO).

The unique habitats contained in the Burrishoole catchment, including its discharge zone into inner Clew Bay, enjoy a high level of protection under various EU Directives and under national legislation. For example the catchment is a Scientific Area of Conservation and its salmon stock is protected under the EU Habitats Directive. Clew Bay itself is designated under the Quality of Shellfish Waters Directive, Water Framework Directive for transitional and coastal waters, and is a candidate SAC. Lough Furnace is now listed as an ANNEX I Priority Habitat under the Habitats Directive, as one of the few permanently stratified (meromictic) lagoon lakes in Britain and

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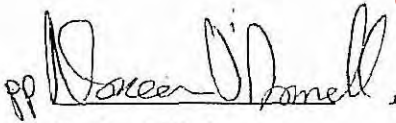
Ireland. Other areas of Clew Bay are also listed as ANNEX I Priority Habitats.

The provision of a wastewater treatment plant for Newport is to be welcomed and will doubtless lead to an improvement in water quality in the Newport River. However, as previously discussed, we have serious concerns regarding the proposed relocation of the outfall from the existing Newport River discharge point to the proposed outfall point at Rosgibblin. We would argue that the discharge of the effluent in this ecologically sensitive area poses a major risk to the status of adjoining area of the bay, the Burrishoole estuary and Lough Furnace. We are particularly concerned regarding the proposed inclusion of effluent from the Derrinnumera dump site. Mayo County Council itself considers the marine outfall to have a potentially significant environmental impact due to the very sensitive nature and international importance of the aquatic environment in the area.

With regard to the EIS, which your company is currently carrying out, we are concerned that the timescale you have been given for sampling is extremely limited and will provide no more than a brief early-winter snapshot of the lower Burrishoole and inner Clew Bay areas. We suggest that a comprehensive EIS would require monitoring of a comprehensive range of tidal regimes and seasonal factors. It should also take into account the current status of a broad range of sensitive aquatic species such as: wild and cultured shellfish, wild and cultured finfish, lobster, shrimp and scallop fisheries.

Despite the above limitations we are anxious to work closely with you and to provide to EcoServe with as much background information as possible on the Burrishoole system. My colleague Dr Poole has forwarded to you, under separate cover, a comprehensive pack of relevant publications and reports. Should you require any additional information or clarification on data already provided, please do not hesitate to contact either myself or Dr Poole.

Yours sincerely,

pp 

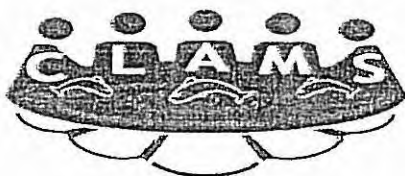
Dr Ken Whelan,

Director,

Aquaculture & Catchment Management Services
Marine Institute
Newport



Bord Iascaigh Mhara
Irish Sea Fisheries Board



Marine Institute
Foras na Mara

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Mr. Brian Beckett
EcoServe
Unit 19B
KCR Industrial Estate
Kimmage
Dublin 12

19th November 2004

Re: EcoServe baseline aquatic ecological studies at Newport, Co. Mayo – assessments in relation to production of an EIS for the proposed Newport wastewater treatment plant (WWTP) discharge.

Bear Brian

Further to our recent meeting in the BIM Newport office, I am writing to you to convey the views of the Clew Bay CLAMS Group in relation to the proposed location of the combined outfall pipe for the Newport WWTP and the treated leachate from Derrinnumera Landfill.

As you are aware Clew Bay is under an Oyster Fishery Order that was granted to the Clew Bay Oyster Co-operative in 1979. In 1994 Clew Bay was designated as shellfish waters under the Quality of Shellfish Waters Regulations of 18 July 1994 (SI No 200 of 1994). Both areas covers the inner part of Clew Bay up to the high water mark. The Bay is also a candidate Special Area of Conservation under the Habitats Directive.

The Group welcomes the proposal for a new wastewater plant in Newport, as it will improve overall water quality by reducing human faecal coliforms and viral loading of the waters of Newport Bay and Clew Bay. However the Group have very grave concern regarding the disposal of leachate into Clew Bay. In addition the Group would question the location of the proposed combined outfall pipe, as it is closer to shellfish beds than the current location of the sewage outfall at Newport Quay. They feel that this proposed outfall will pose a greater threat in this ecologically sensitive area, to the shellfish and fish,

particularly in times of storm surges and when you take into account the volume and contents of the leachate from Derrinnumera Landfill. I have attached the last submission that was forwarded to Mayo County Council outlining the concerns of the Clew Bay CLAMS Group.

With regard to the EIS and the work that EcoServe is currently carrying out, the Group feel that the timescale you have been given for sampling is exceptionally short and inadequate given that it will only give you a brief early-winter ecological picture of the lower Burrishoole, Newport Bay and the inner Clew Bay area. As Mayo County Council itself regards the proposed outfall area to have a potentially significant environmental impact due to the very sensitive nature and international importance of the aquatic environment in the area, a more thorough EIS would seem more appropriate.

Yours sincerely

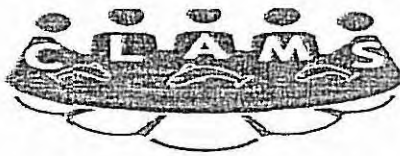


Mary Hannan
Co-liaison Officer
Clew Bay CLAMS Group.

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Bord Iascaigh Mhara
Irish Sea Fisheries Board



Marine Institute
Foras na Mara

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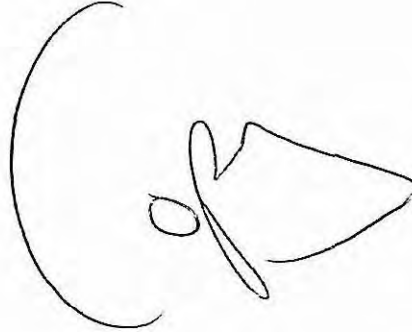
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6th July 2004

Mr. Pat Commons, S.E.O.,
Capital Works,
Mayo County Council,
Aras an Chontae,
Castlebar,
Co. Mayo

Re: Proposed Development of Newport Waste Water Scheme and Derrinnumera Landfill Leachate Disposal

Dear Mr. Commons,

The Clew Bay CLAMS Group wish to thank Mayo County Council for the recent consultation meeting held on 26th May 2004 to discuss the preparation of Environmental Impact Statements for the proposed new Newport Sewerage Scheme and the Sludge Hub Centre and treatment of leachate at Derrinnumera Landfill. Given that there was a time constraint at the meeting, the Group would like the attached concerns and issues to be considered and included in the preparation of both the Newport EIS and Derrinnumera EIS that are being carried out by E.G. Pettitt & Co. and P.J. Tobin & Co. Ltd. respectively.

Aquaculture is an important industry in Clew Bay, involving the farming of finfish and shellfish species. The natural native flat oyster beds in Clew Bay, which are managed by the Clew Bay Oyster Co-operative Society Ltd., are of both national and international importance. As stated in earlier correspondence the Clew Bay CLAMS Group warmly welcomes the provision of a new waste water treatment plant and sewerage scheme for Newport but has grave concerns over the proposed disposal of the leachate from Derrinnumera Landfill into the waters of Newport Bay, including the interim disposal through the new treatment plant in Westport.

As you are aware S.I. No. 200 of 1994 Quality of Shellfish Waters Regulations (EU Directive 923 of 1979 The Quality required of Shellfish Waters) listed Clew Bay as an area of shellfish waters which is in need of protection or improvement in order to support shellfish life and growth. Mayo County Council must comply with the standards of these regulations and with the standards of the Dangerous Substances Regulations S.I. 12 of 2001.

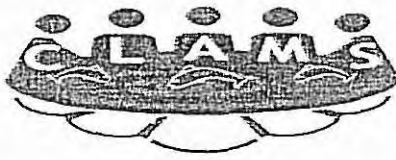
The Clew Bay CLAMS Group look forward to further consultation and co-operation on this matter.

Thanking you

Yours sincerely

Mr. James Ryan, Chairman
Clew Bay CLAMS Group

Cc: Tobin Consulting Engineers, E.G. Pettitt & Co., Clew Bay Marine Forum; Clew Bay Oyster Co-operative, Marine Institute Furnace.



Clew Bay CLAMS Group

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Date: 6th July 2004

Concerns and Questions regarding the:-

- a) Sludge Hub Centre and Marine Discharge of Treated Leachate from Derrinumera Landfill into Clew Bay.
- b) Proposed new Waste Water Treatment Plant (WWTP) in Newport and combined outfall pipe from Derrinumera and Newport WWTP.

a) EIS - Sludge Hub Centre and Leachate Treatment Plant, Derrinumera Landfill Newport and disposal into Newport Bay.

- The EIS should look at the Best Available Techniques available for the treatment of leachate not only in Europe but also in the USA, Canada and other parts of the world to comply with the standards set down in EU and Irish regulations – Quality of Shellfish Waters Regulations S.I. No. 200 of 1994; Dangerous Substances Regulations S.I. 12 of 2001; etc.
- In evaluating available leachate treatment systems the EIS should take into account Derrinumera Landfill site-specific conditions such as rainfall levels over the past 20 year.
- The composition and quantity of leachate is subject to seasonal, and even daily fluctuations, which significantly impacts the design of leachate treatment plants. PH greatly influences the chemical solubility of certain materials. The solubility of many metals increases as pH increases.
- A full analysis of the Derrinumera leachate should be carried out. The CLAMS Group and others are particularly concerned about the possible inclusion in leachate of bacterial and viral contaminants, toxins, dioxins, heavy metals, PCBs and endocrine disrupters. It will be necessary to determine the chemical and physical characteristics of the leachate and predict variations in leachate characteristics over time when selecting the method or methods of treatment. Leachate characteristics and treatability may be affected by landfill expansion and by final closure of cells. Consequently any planned treatment systems should be highly adaptable to accommodate variable chemical and hydraulic loading.
- The EIS should address the annual mass emission per year for many of the substances found in leachate such as metals, PCBs, etc.
- Preferred treatment methods are those that reduce the contaminants in the leachate rather than transferring the environmental problem to another medium.
- The levels of faecal and total coliforms listed on the lab results for the leachate at Derrinumera and for the treated wastewater results at the Castlebar WWTP show very high maximum levels which are unacceptable for discharge into shellfish waters (ref: Tobins Consulting Engineers lab results presented at consultation meeting 26/6/04 - draft table 1A & 1B – Job No. 1134). How is it that Mayo County Council are improving the water quality in Newport Bay by the installation of the new sewerage scheme in Newport but on the other hand they will be reducing water quality with the disposal of treated leachate with high levels of coliforms which may also contain viral contaminants?

- The lab results for Derrinnumera untreated leachate and for the treated wastewater at Castlebar also showed very high levels for BOD, COD, Suspended Solids, all above the wastewater treatment standards.
- In selecting a treatment system Mayo County Council should base the decision upon treatability studies either in an approved laboratory or pilot scale using the actual leachate from Derrinnumera Landfill. Leachate may not behave like other wastewaters and its compositions vary with age of landfill, thus affecting design and operating criteria (e.g. chemical dosage requirements). The EIS should cover future plans for Derrinnumera Landfill and of the proposed Sludge Hub Centre.
- Detailed contingency plans and back up systems for leachate control and its treatment should be put in place, to rule out the possibility of any seepage or discharge of any untreated leachate to local groundwaters, to local freshwater rivers and/or to the marine environment of Clew Bay.
- The Leachate from Derrinnumera Dump must be rendered as clean as best current technology permits before dispatch from Derrinnumera Landfill to either Westport or Newport. Further cleaning of the leachate by filtration and active chemical treatment must take place at Derrinnumera and the material must be removed from the leachate before dispatch and remain in a closed waste cell at the Derrinnumera site.
- Monitoring of the leachate, identifying all constituents must be carried out on an ongoing basis and must be thorough and transparent, with results being available to the public in particular the Clew Bay Marine Forum, the Clew Bay Oyster Co-operative and the Clew Bay CLAMS Group.

(b) EIS - Proposed new Waste Water Treatment Plant (WWTP) and Sewerage Scheme in Newport and combined outfall from Derrinnumera and Newport WWTP.

- It should be noted that with the initial scoping documents for the Newport WWTP did not mention the possible disposal of the leachate through the plant's outfall.
- Is the provision of the Newport sewerage scheme dependant on providing a discharge point for treated leachate from Derrinnumera Landfill?.
- Is the proposed combined outfall pipe at Rosmore required to give the dilution factor for the leachate by the wastewater from Newport WWTP ?.
- Concern has also been expressed that no U.V. treatment equipment is to be installed in the new Newport WWTP. As bacterial and viral contamination in shellfish poses a clear risk to human health the Group request that U.V. equipment be installed in the Newport plant to further reduce final concentrations of faecal coliforms and viruses in the discharge. The Group will request the Department of Communications, Marine & Natural Resources to include the installation of a UV treatment system in Newport WWTP as part of the conditions of the foreshore licence for the outfall pipe.
- Will the EIS investigate higher treatment methods for wastewater such as tertiary treatment systems, as Clew Bay is designated as an area for shellfish production?.
- Will the design of the new WWTP take into account future population growth over the next 20 years or more in the Newport area also taking into account new developments in the town such as the new hotel?.
- Will the new treatment plant have sufficient volume in the holding tanks to deal with storm overflows?.
- Will a system or a notification procedure be put in place by Mayo County Council to inform shellfish producers of storm overflows?.
- The EIS should address the number of storm overflows per year and look at the past 20 years rainfall records.
- Is there going to be a separate drainage system for runoffs from road / street for rainwater to reduce storm overflows through the proposed new Newport sewerage scheme ?.
- The present location for sewage outfall at Newport would be preferable due its distance from shellfish beds.
- From the lab results shown by Tobins Consultant Engineers at the consultation meeting 26/6/04 it appears that the levels of faecal and total coliforms in the leachate from Derrinnumera and in the treated wastewater at Castlebar WWTP are very high. The EIS should address the effective treatment of bacterial and viral contaminants at Derrinnumera to ensure that there will be no deterioration in water quality in Newport Bay and Clew Bay given that there will be new wastewater treatment plant in Newport.

- It should be noted that shellfish and seaweeds are “bio-accumulators” and take up and fix contaminants in their tissues for as long as the contaminants are present in the marine environment. There is a high risk that toxic contaminants from the leachate would accumulate in shellfish and seaweed and enter the human food chain and therefore result in them being unfit for human consumption. In addition there is a risk over time that contamination will affect growth and reproduction, and this is unacceptable to producers particularly the Clew Bay Oyster Co-operative.
- The EIS should take into account seasonal factors for flora and fauna, such as larval counts for the different shellfish and fish species including migratory species of fish and birds.
- EIS should include toxicity testing on marine species. Toxicity limits are equivalent to emission limit values for chemical and physical parameters.
- Baseline studies and a full environmental impact assessment of the receiving waters are required to establish current state of the marine environment before any effluent or leachate material is discharged. The EIA should assess and identify the potential risks to the marine environment from the discharge of leachate and that the marine environment will not be put at risk from any additional loadings from the effluent and leachate.
- What procedures will be put in place to monitor the effects of both discharges?
- The Group is opposed to the proposal that leachate from Derrinmera would be transported to the new treatment plant in Westport on a temporary basis until such time that the new plant in Newport is up and running and pipeline to it from landfill is complete. The disposal of leachate at Westport was not explored in the initial EIA and the plant was not designed to receive leachate. Further studies are necessary to ensure that the marine environment is not affected and that the S.I. No. 200/1994 is not contravened.

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Brian Beckett

From: Niall O'Boyle [innishoo@hotmail.com]
Sent: 30 November 2004 15:53
To: Brian Beckett
Cc: blackshell@eircom.net; murriskshellfish@eircom.net; kevmorrin@excite.com; stoney@iol.ie; efish3@iol.ie; liam.doherty@nutreco.com
Subject: RE: EcoServe baseline assesments - aquatic ecology in the Newport area

Brian,

Further to our meeting, please find attached a copy of a letter to Mayo Co Co outlining our concerns regarding the repositioning of the WWTP outfall pipe and the proposals to discharge landfill and sewage sludge leachates into Clew Bay.

Our primary concern is that these proposals do not adversely impact existing water quality and we feel that the limited duration of the baseline study does not allow for seasonal variations to be ground truthed accurately.

In addition we are concerned that insufficient scientific knowledge exists regarding the long term implications, that substances that are not removed from the leachates prior to discharge, will have on flora and fauna in the area.

This area of Clew Bay has been used as a food production area for many generations and it is imperative to human health that the quality of water is maintained and improved and that the risks posed by the proposals be fully assessed in this context.

In conclusion, our view is that any additional discharges into Clew Bay must be guaranteed to be 100% safe 100% of the time.

Regards,

Niall O'Boyle
Secretary
Clew Bay Marine Forum Ltd.
087 2255440

From: "Brian Beckett" <Brian@ecoserve.ie>
To: <innishoo@hotmail.com>
CC: "Mona McCrea" <Mona@ecoserve.ie>
Subject: EcoServe baseline assesments - aquatic ecology in the Newport area
Date: Tue, 2 Nov 2004 10:24:13 -0000

Dear Niall,

Thanks for your time on the phone earlier. I have attached a copy of the letter I sent to you last week. As mentioned we will be in the area next week and would be available to meet with you if you feel it is necessary having read through our letter. We plan to meet Mary Hannon next week at some stage so maybe we could combine the meetings if that is suitable for you both. I will be in touch with Mary later this week and can suggest this if it suits you?

Best regards,

Clew Bay CLAMS Group

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Alan Drumm, MI Furnace (098) 41107
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6th July 2004

Mr. Pat Commons, S.E.O.,
Capital Works,
Mayo County Council,
Aras an Chontae,
Castlebar,
Co. Mayo

Re: Proposed Development of Newport Waste Water Scheme and Derrinnumera Landfill Leachate Disposal

Dear Mr. Commons,

The Clew Bay CLAMS Group wish to thank Mayo County Council for the recent consultation meeting held on 26th May 2004 to discuss the preparation of Environmental Impact Statements for the proposed new Newport Sewerage Scheme and the Sludge Hub Centre and treatment of leachate at Derrinnumera Landfill. Given that there was a time constraint at the meeting, the Group would like the attached concerns and issues to be considered and included in the preparation of both the Newport EIS and Derrinnumera EIS that are being carried out by E.G. Pettitt & Co. and P.J. Tobin & Co. Ltd. respectively.

Aquaculture is an important industry in Clew Bay, involving the farming of finfish and shellfish species. The natural native flat oyster beds in Clew Bay, which are managed by the Clew Bay Oyster Co-operative Society Ltd., are of both national and international importance. As stated in earlier correspondence the Clew Bay CLAMS Group warmly welcomes the provision of a new waste water treatment plant and sewerage scheme for Newport but has grave concerns over the proposed disposal of the leachate from Derrinnumera Landfill into the waters of Newport Bay, including the interim disposal through the new treatment plant in Westport.

As you are aware S.I. No. 200 of 1994 Quality of Shellfish Waters Regulations (EU Directive 923 of 1979 The Quality required of Shellfish Waters) listed Clew Bay as an area of shellfish waters which is in need of protection or improvement in order to support shellfish life and growth. Mayo County Council must comply with the standards of these regulations and with the standards of the Dangerous Substances Regulations S.I. 12 of 2001.

The Clew Bay CLAMS Group look forward to further consultation and co-operation on this matter.

Thanking you

Yours sincerely

Mr. James Ryan, Chairman
Clew Bay CLAMS Group

Cc: Tobin Consulting Engineers, E.G. Pettitt & Co., Clew Bay Marine Forum, Clew Bay Oyster Co-operative, Marine Institute Furnace.

Council are improving the water quality in Newport Bay by the installation of the new sewerage scheme in Newport but on the other hand they will be reducing water quality with the disposal of treated leachate with high levels of coliforms which may also contain viral contaminants?

- The lab results for Derrinnumera untreated leachate and for the treated wastewater at Castlebar also showed very high levels for BOD, COD, Suspended Solids, all above the wastewater treatment standards.
- In selecting a treatment system Mayo County Council should base the decision upon treatability studies either in an approved laboratory or pilot scale using the actual leachate from Derrinnumera Landfill. Leachate may not behave like other wastewaters and its compositions vary with age of landfill, thus affecting design and operating criteria (e.g. chemical dosage requirements). The EIS should cover future plans for Derrinnumera Landfill and of the proposed Sludge Hub Centre.
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(b) EIS - Proposed new Waste Water Treatment Plant (WWTP) and Sewerage Scheme in Newport and combined outfall from Derrinnumera and Newport WWTP.

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- Will the new treatment plant have sufficient volume in the holding tanks to deal with storm overflows?
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- The EIS should address the number of storm overflows per year and look at the past 20 years rainfall records.
- Is there going to be a separate drainage system for runoffs from road / street for rainwater to reduce storm overflows through the proposed new Newport sewerage scheme ?
- The present location for sewage outfall at Newport would be preferable due its distance from shellfish beds.
- From the lab results shown by Tobins Consultant Engineers at the consultation meeting 26/6/04 it appears that the levels of faecal and total coliforms in the leachate from Derrinnumera and in the treated wastewater at Castlebar WWTP are very high. The EIS should address the effective treatment of bacterial and viral



CLEW BAY OYSTER Co-Operative Society Limited

THE QUAY, NEWPORT, COUNTY MAYO, IRELAND. (098) 41402.

FAX to :

Mr. Brian Beckett,
Ecological Consultancy Services Ltd.,
Unit 19B, KCR Industrial Estate,
Kimmage,
Dublin 12.

Fax no. 01 4925694

Four pages transmitted including this one.

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P. 01



CLEW BAY OYSTER
Co-Operative Society Limited
THE QUAY, NEWPORT, COUNTY MAYO, IRELAND. (098) 41402.

14th November 2004

Dear Mr. Beckett,

Newport Waste Water Treatment Plant and Discharge, Newport, Co Mayo.

Thankyou for your letter of 2nd November inviting input to the literature review for the proposed Newport Waste Water Treatment Plant and Discharge Environmental Impact Statement.

The Waste Water Treatment Plant in Newport is to be welcomed as it will help to reduce from the Newport River system the faecal coliform loading that is currently being discharged into Newport Bay from the town of Newport and the Newport River. Any measures that reduce the level of faecal coliforms, and therefore the risk to public health through consumption of oysters from Clew Bay, and any measures to help to ensure that "A" Grade classification in line with EU Directive 91/472 is achieved in as much of Clew Bay as possible must be pursued.

However, in your letter of 02 November 2004 you state that the EIA is being prepared for "proposed Newport wastewater treatment plant discharge." It is not clear whether the assessment in relation to production of an EIS for the proposed Newport waste water discharge includes assessment of the proposed discharge point in Newport Bay of the effluent from the leachate treatment plant proposed for the landfill site at Derrinumera. Assuming that the leachate effluent discharge point is included in the assessment, then Clew Bay Oyster Co-operative, with regard to the Oyster Fishery (Clew Bay) Order, 1979, wishes to take the opportunity to voice in the strongest possible terms its concerns over the long term consequences of a leachate treatment plant discharge point being installed in Clew Bay, a candidate Special Area of Conservation. To date, it appears that the Mayo County Council's approach has been to pursue dilution of the effluent that emerges into Newport Bay as the means by which "acceptable levels" of contaminants present in the effluent can be achieved after partial treatment of the effluent in the treatment centre proposed for Derrinumera before discharge.

Dilution is not the answer. Dilution does not reduce the addition overall of compounds present in the leachate effluent whether harmful or otherwise to the ecosystem that at the moment supports the population of native oysters. Oysters are filter feeders, and are bio-accumulators, and the introduction of any toxic or noxious substance into the

CBOC to EcoServe, "Assessments in relation to production of an EIS", 19th November 2004.

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P. 02



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ecosystem that supports native oysters must be avoided. It is not only oysters at risk: the delicate and interdependent nature of the entire marine system is at risk with profound and long lasting effects possible from interactions with contaminants both known and unknown. The effects of the discharge will not be seen this year, nor next year, but eventually when sufficient time has passed to allow the quantities of contaminants to accumulate, there is no way of escaping the fact that there will be measurable negative impact. It is impossible to say when this will be, but such a scenario can only be avoided if the leachate treatment plant in Derrinumera is fitted with the technology adequate to remove all contaminants before discharge.

The Clew Bay Oyster Co-operative was founded in 1979, and was granted an Oyster Fishery Order by the then Minister of Fisheries to regulate and maintain the native oyster fishery. The Clew Bay Oyster Co-operative has undertaken a number of biological studies over the years since its founding in 1979, and of relevance to the literature review being carried out by EcoServe are the oyster larvae studies. These larval counts (numbers of individual larvae per 100 litres seawater) are done during the summer months when the larvae are released into the water to begin their pelagic larval phase which can last up to two weeks. The figures for the relevant areas will be forwarded as soon they have been collated.

Early current studies (CBOC 1983) using drogues and surface markers indicate that the overall "set" of the water within Newport Bay is in a northeasterly direction, and this is borne out by the presence and distribution of the fishery itself: if there were good flushing in Newport Bay, then the larvae would not remain within the bay and the oyster fishery would never have had the conditions necessary to have become established originally. The distribution and discrete nature of the primary production beds in the northeastern Newport Bay also demonstrates the relatively closed system that pertains in Newport Bay. Any additional discharge into the Newport Bay system will not be flushed away readily - material from the discharge point will stay in the locality for several days, more so during neap tides and low rainfall, affording increased opportunity for uptake by the biosystem.

Given the potential impact of the proposed developments in Derrinumera, and given the sensitive nature of the system downstream of the proposed developments, the preparation of an EIS is to be welcomed. However it is unfortunate that the gathering of data in support of the EIS has not been extended to include at the very least a twelve month

CBOC to EcoServe, "Assessment in relation to production of an EIS", 19th November 2004.

Page 2

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P.03



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period. The dynamics at work in the bay throughout the course of the year as a result of differing temperature, salinity, tidal cycle, wind, the species present, the quality and composition of the water column, are all unique and have a bearing on the final outcome of any discharge into Newport Bay, and need to be taken into account.

In your letter you ask for details of other mammals that inhabit the local aquatic environment. There are two species that are both listed in the Habitats Directive: the common seal (*phoca vitulina*) and the otter (*lutra lutra*), both of which are present all year round in the immediate area. A walk along the high water mark will produce evidence of otters regularly using their spraint sites, and otters are regularly seen during the fishing season. There is a haul-out site for the seals on Scraw island, west of the point of Inishturlin where in summer time, when the salmon are running up the Newport and Burrishoole rivers, there can be up to fifty seals present. Otter numbers are by their very nature harder to quantify, but the evidence over the last number of years points to a stable and active population.

Yours sincerely,

Francis O'Donnell
Secretary.

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CHOC to EcoServe, "Assessments in relation to production of an FIS", 19th November 2004.

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P.04



CLEW BAY OYSTER Co-Operative Society Limited

THE QUAY, NEWPORT, COUNTY MAYO, IRELAND. (098) 41402.

098-41402

23rd November 2004

Brian Beckett,
Lycamore,
Unit 19B, KCR Industrial Estate,
Lublin 12.

Baseline Aquatic Studies, Newport, Co. Mayo.

Dear Brian,

Please find attached two sheets of larvae counts that I have been able to pick out of the previous years records. They are not continuous as funds available for this work has always been the limiting condition, but they give an indication of the order of magnitude of larvae present in any summer throughout the narrow column in Newport Bay. It goes without saying that the flat oyster is at perhaps its most vulnerable when it is a free-swimming larvae.

Looking through these figures I am reminded of the red-tide event which took place in August 1995 after a period of hot and thundery weather at the same time as the slackest period of neap tides. Anyone who lives on the shore between Ardagh and Inishcuttle and who witnessed this event will confirm the appearance of the anoxic layer at the surface of the intertidal and sublittoral mud/sand/sediment, and the countless numbers of young fish and shellfish which died as a result of the anoxia from the bacterial decay of the plankton

and from which the species which die are the most vulnerable. The following figures are a

Yours sincerely,


Francis O'Donnell,
Secretary.

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P.01



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P. 03

Numbers of Flat Oyster (*ostrea edulis*) larvae per 100 litres seawater.

Year	Rosgibbilleen																					
	June					July					August					Sept						
	10	15	20	25	30	5	10	15	20	25	30	5	10	15	20	25	30	5	10	15	20	
1982																						
1983						17	4	8														
1986																						
1987																						
1988																						
1989																						
1991																						
1992																						
1994																						
1995																						

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Red tide mid week august 1995.
 Heavy mortalities across all species

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CLEW BAY OYSTER Co-Operative Society Limited

THE QUAY, NEWPORT, COUNTY MAYO, IRELAND. (098) 41402.

Numbers of Flat Oyster (*ostrea edulis*) larvae per 100litres seawater.

Year	Newport River																						
	June					July					August												
	10	15	20	25	30	5	10	15	20	25	30	5	10	15	20	25	30	5	10	15	20		
1982													87										
1983																							
1984																						0	
1987						58	0	12	0	16		4						10	221		6	3	1
1988							46	3	20		0	6						18	0		81		
1990																					3		
1991						0	0	0		2	0	2							3	0	0		
1992						0	5	0	3		0	1	3	1	32	11					14		
1993						8	23	10	18	141	17	103	75	9	4	1	12	23	2				
1995							12		5	5	28	14	7	0	0	0	0	0	0	0	0	0	0

Red tide* event. Heavy mortalities across all species

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Marine Institute
Furnace
Newport
Co. Mayo

telephone 353 98 42300

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email newport.reception@marine.ie

website www.marine.ie

10-November 2004



Marine Institute
Foras na Mara

Re: *ECOSERVE baseline aquatic ecological studies at Newport, Co. Mayo – assessments in relation to production of an EIS for the proposed Newport waste water treatment plant discharge.*

Dear Mr. Beckett,

Thank you for your request for information in relation to the EIS for Newport Bay. Below are some introductory remarks and enclosed are copies of the most relevant references. A detailed covering letter will be issued to you in due course.

If I can be of any further assistance please don't hesitate to contact me.

Yours sincerely

Dr. Russell Poole
Section Manager
Aquaculture & Catchment Management Services
Marine Institute
Newport

Marine Institute
Galway Technology Park
Parkmore
Galway

telephone 353 91 730 400

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80 Harcourt Street
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Snugboro Road
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Clew Bay

Clew Bay is a shallow west facing bay of glacial origin. It is well mixed and is under oceanic influence in its outer region. There is a complex current system due to the numerous islands distributed throughout its inner part and the larger Clare Island situated at its mouth. The mainland and island shorelines are generally shingle and boulder above the low tide mark and sand/mud below tide. The Newport and Burrishoole river systems discharge into the north east corner of the bay through long meandering estuaries.

As part of its marine environmental monitoring programme the Marine Institute carries out trace metal and chlorinated hydrocarbon testing of shellfish in Irish waters and data for Clew Bay shellfish is included in these reports (Doc. 5, 6, 7, 10).

The Burrishoole System

A full description of the Burrishoole catchment is given in document 25, which also summarises the main research areas of the Marine Institute's Newport laboratory. Additional surveys of L. Furnace have been carried out in 1969 (Doc. 32) and 1970s (Doc. 4, 11, 12, 13). L. Furnace is a unique habitat and is one of only a few fully tidal "lagoon" lakes in Ireland and in the British Isles. The lake is fully stratified but sea water enters the lough on all tides higher than mean high water neap (2.9m), unless the lake level has been raised by freshwater influxes.

The stratification of the lake is relatively stable with overturns during seasonal inversions of the thermocline being prevented by the halocline. In 1995 following the abnormally warm dry summer, the stratification of L. Furnace temporarily broke down leading to severe deoxygenation of the surface layers, mixing of the hypolimnion and movement of H₂S into the surface waters (Doc. 30). Should contamination from either the waste water treatment plant or the leachate accumulate in the hypolimnion of L. Furnace, such overturns could release these accumulations back into circulation with unknown consequences.

In 2003, an unusual algal bloom was recorded in L. Furnace which resulted in distinct changes in fish behaviour and a kill of eels captured in fyke nets (Doc. 33). Both the algal bloom and the water turn-over in 1995 resulted from unusually warm summers and low summer water levels. Temperatures in May and early June 2004 were again extremely high.

Studies have shown that this transition to sea water leads to increases in stress hormone levels, such as cortisol. The affects of other stressors such as increased sea lice infestation are additive (Doc. 20). Recent research has shown that even trace levels of various chemical contaminants may have significant effects on migrating salmonids (Doc. 29).

Many of these compounds can have synergistic, additive or antagonistic effects. Ref: Research on migratory salmonids, eels and freshwater fish stocks & fisheries, (Potter & Dare, 2003), Science Series Technical Report No. 119. CEFAS UK.

Eels

Eels (*Anguilla anguilla*) have been intensively studied in the Burrishoole catchment (Doc. 16, 21) and a series of papers have been produced throughout the 90s. The tidal portion of the Burrishoole catchment, and many other catchments, contains a sizeable stock of growing, resident eel.

European landings of the brown and silver eel fisheries have been in decline for several decades, at least since the mid-sixties, but the stock may have been in decline before that. Since the early 1980's, recruitment of glass eels has decreased by up to 99% and, more recently, the eel population has been declining by almost an order of magnitude per generation. The causes for the downward trends are yet unclear, but it is likely that anthropogenic factors (particularly fishing, dams & barrages and pollution) were a major cause in the decline of the adult stocks. The timing of the decline in recruitment and fisheries would indicate that factors primarily affecting inland waters (habitat loss and overexploitation) may have negatively affected the stock over a long time period, while relatively minor recent changes in the oceanic phase may have turned the decline into a population collapse (summarised by Dekker 2004).

Globally, the eel stock is outside safe biological limits and the current fishery is not sustainable (ICES 2001). All information indicates that the stock is at a historical minimum. Consequently, the urgent compilation of a stock recovery plan has been advised by ICES and fishing and other anthropogenic mortality should be reduced to the lowest possible level until such a plan is agreed upon and implemented.

- 14 Parker, M. (1977). Lough Furnace, County Mayo; physical and chemical studies of an Irish saline lake, with reference to *Neomysis integer*. *PhD Thesis, Trinity College Dublin*; 341pp.
Observations on *Neomysis integer* Chapter.
- 15 Poole, W.R. (1990). Summer fyke nets as a method of eel capture in a salmonid fishery. *Aquaculture and Fisheries Management*. 21; 259-262.
- 16 Poole, W.R. (1994). A population study of the European eel (*Anguilla anguilla* (L.)) in the Burrishoole System, Ireland, with special reference to growth and movement. *PhD Thesis, Dublin University, 1994*.
- 17 Poole, W.R., Byrne, C.J., Dillane, M.G., Whelan, K. & Gargan, P.G. (2002). The Irish sea trout enhancement programme: a review of the broodstock and ova production programmes. *Fisheries Management & Ecology* 9 (6); 315-328.
- 18 Poole, W.R., Dillane, M.G. & Whelan, K.F. (1994). Artificial reconditioning of wild sea trout (*Salmo trutta* L) as an enhancement option; initial results on growth and spawning success. *Fisheries Management and Ecology*, 1 (3); 179-192.
- 19 Poole, W.R., Dillane, M., DeEyto, E., Rogan, G. McGinnity, P. & Whelan, K. (in press). Characteristics of the Burrishoole sea trout population: census, marine survival, enhancement and stock recruitment, 1971-2003. *Paper presented to international Seas Trout Symposium, Cardiff, July 2004*; 37pp.
- 20 Poole, W.R., Nolan, D. & Tully, O. (2000). Extrapolating baseline blood cortisol levels in trout: modelling capture effects in wild sea trout *Salmo trutta* (L.) infested with *Lepeophtheirus salmonis* (Krøyer). *Aquaculture Research* 31 (11); 835-841.
- 21 Poole, W.R., Reynolds, J.D.R. and Moriarty, C. 1990. Observations on the silver eel migrations of the Burrishoole river system, Ireland. 1959 to 1988. *Int. Revue Ges Hydrobiol.* 75 (6); 807-815.
- 22 Poole, W.R., Reynolds, J.D. & Moriarty, C. (2004). Early post larval growth and otolith patterns in the eel *Anguilla anguilla*. *Fisheries Research* 66 (1); 107-114.
- 23 Poole, W.R., Whelan, K.F., Dillane, M.G., Cooke, D.J. and Matthews, M. 1996. The performance of sea trout, *Salmo trutta* L., stocks from the Burrishoole system western Ireland, 1970-1994. *Fisheries Management & Ecology*, 3 (1). 73-92.
- 24 Wheatley, S. (1988). The flounder *Platichthys flesus* L. in brackish waters: population structure and the effects of changing salinities on the metabolism. *Mod Thesis, Trinity College, Dublin*.
- 25 Whelan, K., Poole, R., McGinnity, P., Rogan, G. & Cotter, D. (1998). The Burrishoole Catchment. In: *Studies of Irish Rivers and Lakes* (ed: C. Moriarty). Pages 191-212.

Other Documents

- 26 Marine Institute, Annual Report, Newport Research Facility, No. 48; 2002; 37pp.
- 27 List of publication relating to salmonids, eels and Burrishoole, Newport.
- 28 NASCO, Plan of Action for the Application of the Precautionary Approach to the Protection and Restoration of Atlantic Salmon Habitat.
- 29 Endocrine Disruption. Marine Institute Memo + references.
- 30 Furnace Fish Kill, Annual Report of the Salmon Research Agency (1995), p17.
- 31 Survey of fish species in Newport Bay 2004 by the Marine Institute: provisional data.
32. de Burgh, M. and Smart, J. 1969. Report on the hydrography of Lough Furnace, and its planktonic and littoral organisms. Appendix I. Annual Report of the Salmon Research Trust of Ireland. Report No. 15. 35-47.
- 33' Phytoplankton bloom, L. Furnace 2003.
- 34 Dietary relations of the Otter (*Lutra lutra* L.) and the American Mink (*Mustela vison* S.) in the Burrishoole Catchment, Co. Mayo.

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Appendix 16 – Marine Institute Literature Review Correspondence

ICES/EIFAC Report of the Working Group on Eels

ICES, 2002

The Irish Sea Trout Enhancement Programme: An assessment of the parr stocking Programme into the Burrishoole Catchment

Fisheries Management and Ecology, 2002

Temporal and Environmental Influences on the Variation in the Sea Trout Smolt Migration in the Burrishoole System

Elsevier/Fisheries Research, 2003

Temporal and Environmental Influences on the Variation in Atlantic Salmon Smolt Migration in the Burrishoole System

Journal of Fish Biology, 2003

Trace Metal and Chlorinated Hydrocarbon Concentration in Shellfish from Irish Waters, 2000

Marine Institute, 2003

Trace Metal and Chlorinated Hydrocarbon Concentration in Shellfish from Irish Waters, 2001

Marine Institute, 2003

Trace Metal and Chlorinated Hydrocarbon Concentration in Shellfish from Irish Waters, 2002

Marine Institute, 2004

The Status of Flounder in the Brackish Water of Lough Furnace

Trinity College, 2002

Lough Furnace, County Mayo – Physical and Chemical Studies

Trinity College, 1977

Summer Fyke Nets as a Method of Eel Capture in a Salmonid Fishery

Aquaculture and Fisheries Mgt, 1990

A Population Study of the European Eel in the Burrishoole System

Trinity College, 1994

The Irish Sea Trout Enhancement Programme

Fisheries Management and Ecology, 2002

Artificial Conditioning of Wild Sea Trout

Fisheries Management and Ecology, 1994

Characteristics of the Burrishoole Sea Trout Populations, 1971-2003

Marine Institute, unpublished

Modelling of the Effects of Capture and Sea Lice Infestation on the Cortisol Stress Response in Trout

Aquaculture Research, 2000

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Observations on the Sliver Eel Mirgrations of the Burrishoole River System, Ireland, 1959 to 1988

Early Post-Larval Growth and Oolith Patterns in the eel *Anguilla anguilla*

Performance of Sea Trout, *Salmo trutta L.*, stocks from the Burrishoole System, Western Ireland, 1970-1994

The Flounder *Platichthys flesus L.* in brackish waters

Studies of Irish Rivers and Lakes

Newport Research Facility, Annual Report 2002

Assorted references papers for salmonid, eels, and Burrishoole, Newport

NASCO Plan of Action for the Application of the Precautionary Approach to the Protection and Restoration of Atlantic Salmon Habitat

Assorted reference papers for Endocrine Disruption

Survey of Fish Species in Newport Bay, 2004

Report on the Hydrography of Lough Furnace and its Planktonic and Littoral Organisms

Dietary relations of the Otter (*Lutra lutra L.*) and the American Mink (*Mustela vison S.*) in the Burrishoole Catchment

Phytoplankton Bloom Lough Furnace

Trinity College, 1990

Elsevier Fisheries Research, 2003

Fisheries Management and Ecology, 1996

Trinity College, unknown date

Marine Institute, 1998

Marine Institute, unknown date

Various

NASCO, unknown data

Various

Marine Institute, 2004

Salmon Research Trust of Ireland, ?

Trinity College Dublin, 1999

Marine Institute, 2003

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