To: Mr Tom Burke
The Marine Licence Vetting Committee
Department of the Marine and Natural Resources
Leeson Lane
Dublin 2

20th December 2001

Planning application No PO1/900
The proposed development of Enterprise Energy Ireland Ltd.
at Bellygelly South, Glenamoy, Co. Mayo.

A chara,

After having perused the EIS on the Corrib Field Development (Offshore Field to Terminal), prepared on behalf of Enterprise Energy Ireland by RSK Environment Ltd. we find that much of the information presented in the Terminal EIS is repeated in the Offshore EIS and therefore our comments on the Terminal EIS apply (and are enclosed).

Outlined below are our observations re.the Offshore Field to Terminal EIS and Appendices

Appendix 9.1. (Dispersion Modelling Study carried out by Kirk Mc Clure Morton)

2.5. *"The recorded tidal data for stations A and B show a clear cyclic variation in current speed and direction during both spring and neap tides as expected for tidal waters. The results for the two outer sites C and D do not exhibit such a cyclic variation . . . . .This could be due to the occurence of some form of flow circulation within the bay, however, it is much more likely that this phenomenon results from the inherent difficulty in obtaining reliable current data in areas of slack tidal flows".*

There is a very specific flow circulation within the bay and there is not a simple seaward movement of water in the bay as is evident from (i) E-coli contaminated water from Belmullet sewerage is found on the eastern side of the inner bay at Rinroe pier (ii) Old shells from the extinct oyster beds near Dooncarton Point (the proposed landfall) are deposited every year in the inner bay near Cornboy pier (iii) the simple tidal movement postulated for the Proteus Model is not what happens in the bay, as the tidal race by Rinroe to Cornboy is one hour plus ahead of tidal movement to Sruwaddacon Bay (iv) There is a major naturally occuring blockage to the flow regime within Broadhaven Bay - a whirlpool. This has a centrifugal effect on the surrounding sea and its visible manifestation is a gathering of wrack elements. The natural tide movement and so the transport of particulate matter is landward.

We believe that the real movement of particulate matter is illustrated by the destination of the tracer dye dispersion tests (Proteus Modelling in Broadhaven Bay conduceted by Kirk Mc Clure Morton for Enterprise Energy Ireland Ltd.) conducted in August 2001 and the recent brown-coloured slick

in Broadhaven Bay (whatever the source). These discharges ended up at the head of Sruwaddacon Bay (SPA) in the opposite direction to the open sea which the enclosed photographs show clearly. I enclose also correspondence to date with The Department of the Marine and Natural Resources, The North Western Regional Fisheries Board and The Department of Arts, Heritage, Gaeltacht and the Islands for your information.

The enclosed article in the Western People dated 31/10/01 under the heading "Mystery pollution in Mayo Bay idientified" states that *"The composition of a slick that appeared in Broadhaven Bay last month has been identified as waste mushroom compost, the Department of the Marine and Natural Resources has revealed."* and *"The Department was now satisfied that illegally dumped waste mushroom compost was the source of the pollution"* and *". . . .due to current movements in the sea it could have originated from outside the area"*. The Department of the Marine later retracted the comment that it was waste mushroom compost but have so far not identified or revealed the source of the slick. What is clear is that the discharges were washed ashore towards the inner and upper part of Broadhaven Bay.

2.3. *"To prove stability, the complete model was run for three tidal cycles"* and *"The correlation achieved between the model predictions and field observations of tidal currents and heights is considered sufficient to give confidence that the model is predicting the correct tidal exchange between the various inlets and outer Broadhaven Bay"*. (Executive Summary)

3.6. The fourteen runs are simulations of the potential outfall positions i.e. 10m., 20m., 30m. and 40m. with respect to spring and neap tidal cycles under various simulated weather conditions. *"This series of model runs was* ***intended*** *to determine the impact on water quality in Broadhaven Bay"*. We contend that the metals will be contained within the bay as outlined at 2.5. above irrespective of the outfall positions shown, which incidentally are not shown in their exact locations.

This is not adequate and does not allow for annual tidal cycles or seasonal differences like very high rainfall and subsequent flooding and gale force winds predominantly from a south westerly direction. We would also like to point out that tidal dispersion measured in this way does not directly equate with its ability to dilute various effluents due to parameters such as local mixing, local flowrates etc.

2.5. *"Generally the agreement between the model and field observations is very good with any slight discrepancies easily accounted for in terms of the normal variability of tides"*. What is meant here by slight discrepancies?

"The results for station D were not included in this analysis as the fluctuations in recorded directions and speed were such that this data was not considered sufficiently reliable".

With reference to Sruwaddacon Bay the appendix states ". . . the magnitudes of the tidal currents appear to be slightly underestimated".

"At station C it is not possible to make any meaningful comparison of the duration of the predicted and recorded flood and ebb tidal cycles since the measured results do not exhibit any cyclic variation". etc. etc.

The above comments, which are repeated throughout the study, clearly illustrate that the cyclic variations are not included or taken into account in the overall dispersion modelling study (the naturally occuring blockage to the flow regime within Broadhaven Bay - a whirlpool which has a centrifugal effect on the surrounding sea as described by us elsewhere). These local variations are an integral part of the flow regime of Broadhaven Bay and its associated estuaries and their omission here deems this dispersion modelling study invalid.

3.2. *"The effluent from the proposed onshore gas reception Terminal at Ballinaboy Bridge is predicted to be less dense than the seawater and therefore will initially rise towards the surface following discharge from the submerged outfall. Any resulting effluent plume will therefore disperse at the surface until vertical mixing and wave stirring entrain the effluent into the water column. Hence, the use of dispersion characteristics derived from surface dye release experiments is considered appropriate for similation of the fate of the effluent".*

The fate of the various metal and radioactive elements (including radionucleotides) cannot be compared to that of the tracer dye which exhibits certain parameters unique to its own chemical composition. As each metal including mercury and lead has its own stoichiometry (each has a certain atomic weight and mass) their dispersal rates will differ markedly. The simple tracer dye can only yield an average overall assessment and thus does not directly correlate with the actual dispersal properties of the various elements of the effluent - formation and produced waters and run-off from Terminal etc.

With respect to biotic reservoirs for the accumulation of trace elements, it is widely documented that mercury is of significance in relation to bioaccumulation in both fish and invertebrates. Selenium is highly toxic and cadmium is included on the Black List (List 1) of the European Union. Silver is documented to be of significant toxicity to phytoplankton etc. We refer you to a report by An Taisce (copy enclosed) specifically to section 7.4.1, 7.4.2. and 7.4.3.

3.5. Kirk Mc Clure Morton admit when referring to Table 2 that *"the variation in discharge from the outfall will however be greater than that shown in Table 2 due to the inclusion of rainwater in the discharge, the quantity of which is obviously very variable".*

"Enterprise Energy Ireland have made a committment to providing a sufficient level of treatment to reduce the concentrations of metallic elements in the final effluent to equal to or below the Environmental Quality Standard (EQS) appropriate to each constituent . . ." Enterprise Energy Ireland do not outline how they propose to fulfill this committment. The EQS is the minimum standard which applies to polluted areas. In this pristine environment this cannot be accepted.

Appendix 14.1.

Plate 5 and Plate 6

These refer to Crossing Three and are of interest because the actual crossing itself is not shown. Rather the plates show Crossing Three from the west and from the east. The crossing itself involves traversing 2.5 to 3m of bog and disturbance of trees with the associated siltation and leaching of fertilizers such as rock phosphate and nitrogen into Sruwaddacon Bay. See enclosed letter from the Department of Marine and Natural Resources to Mr Alan Mc Andrew (dated 17/10/00) which states that *"the nutrient retention in such soils (deep peatland) is very poor and*

leads to hugh run-off into adjacent watercourses".

In the Offshore EIS (7.3.3.1.) it is stated in relation to the South Shore of Upstream Crossing Point (i.e Crossing Three) that *"The shore at this point was backed by dense forestry on top of a 2-3m 'cliff' of peat".*

In conclusion we believe that the gas should be processed at the wellhead (our observations on the Terminal EIS address this issue in more detail). The recommendations re. the OSPAR Convention should be complied with given that the technology is available to do so. Our observations re The Terminal and Offshore EISs including the pipeline route also apply in relation to the "Plan of Development"

Bríd Mc Garry

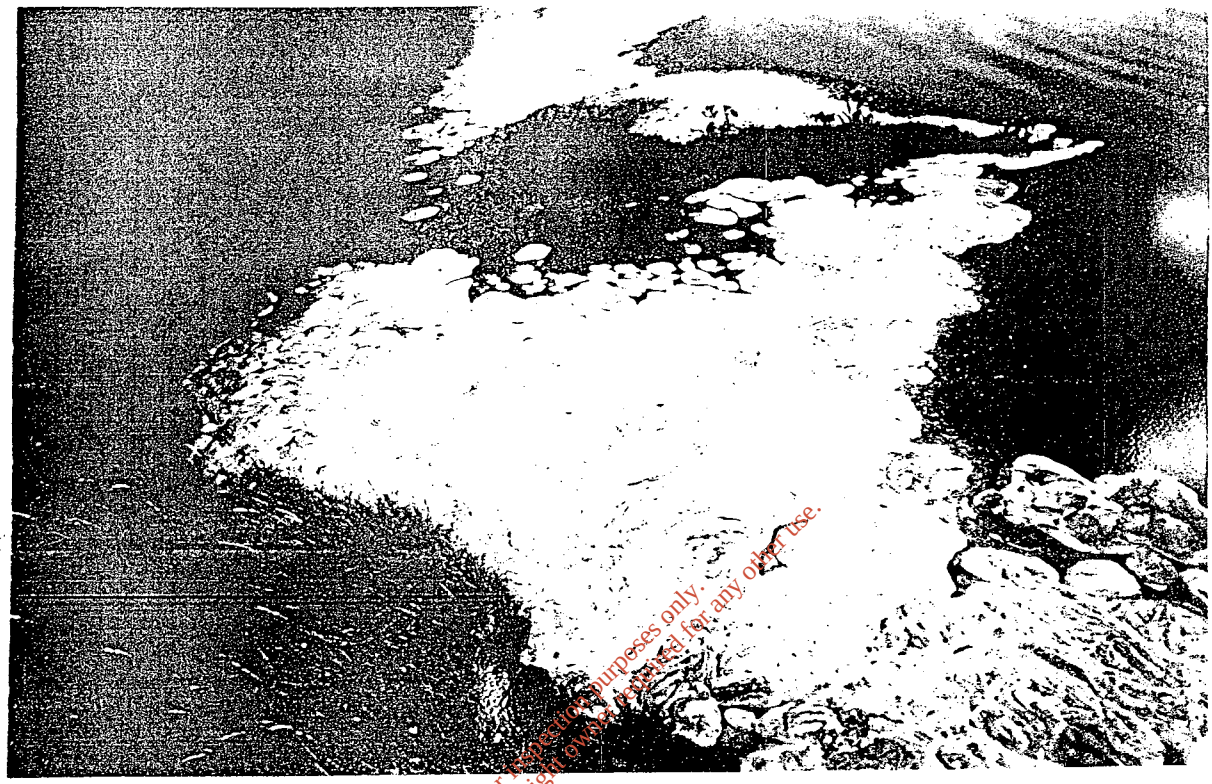
Teresa Mc Garry.

Yours sincerely

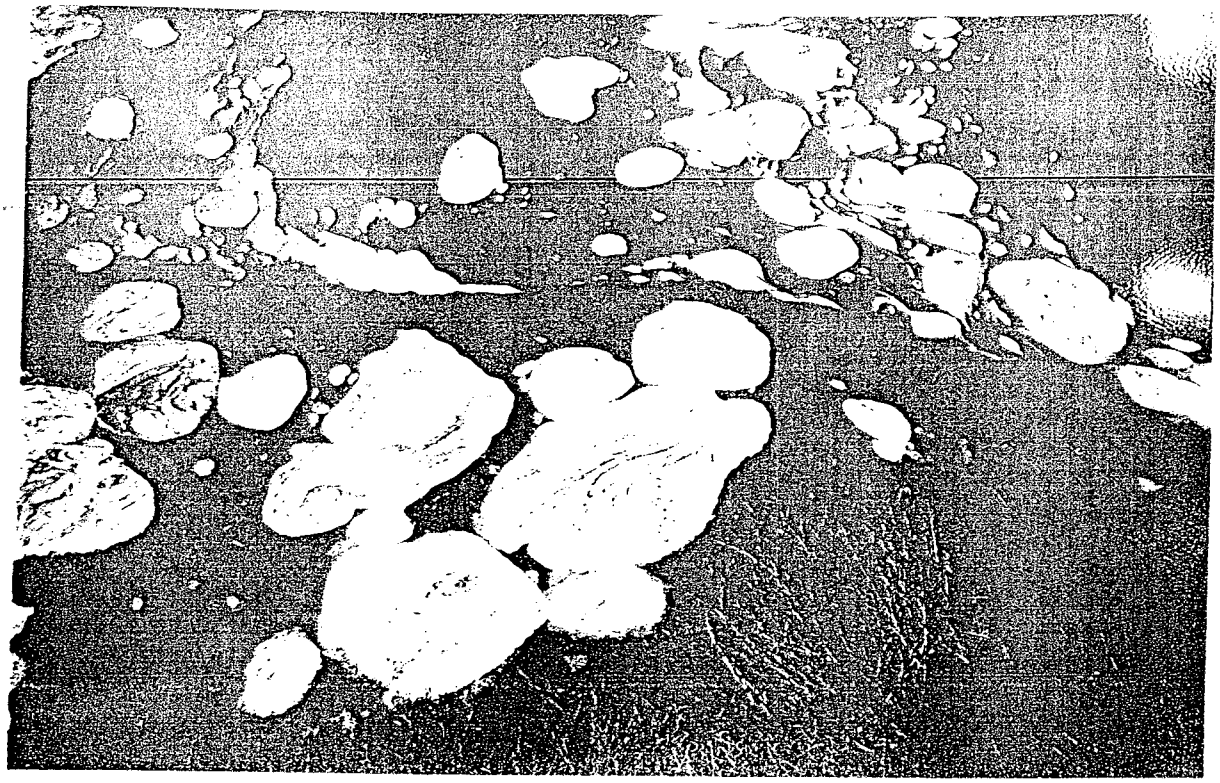
Ms Bríd Mc Garry and Mrs Teresa Mc Garry
Gortacragher, Rossport, Ballina, Co. Mayo

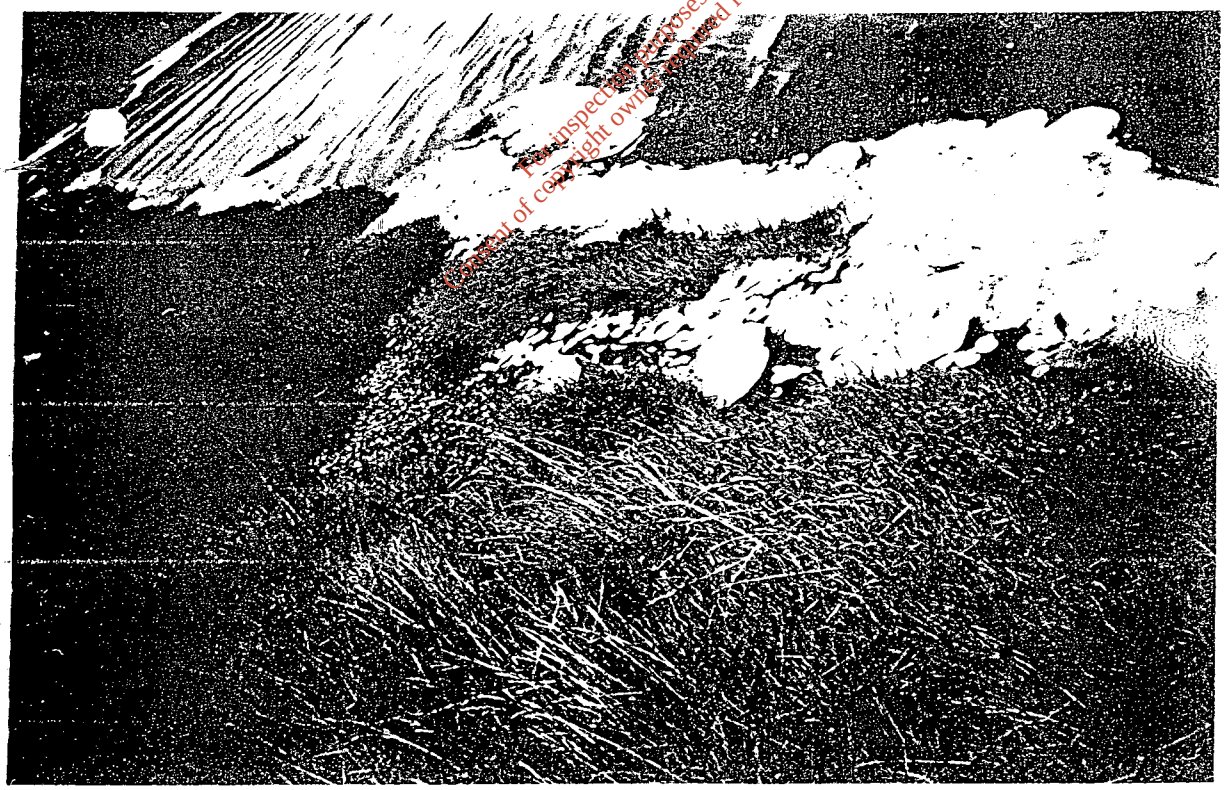
10/9/01

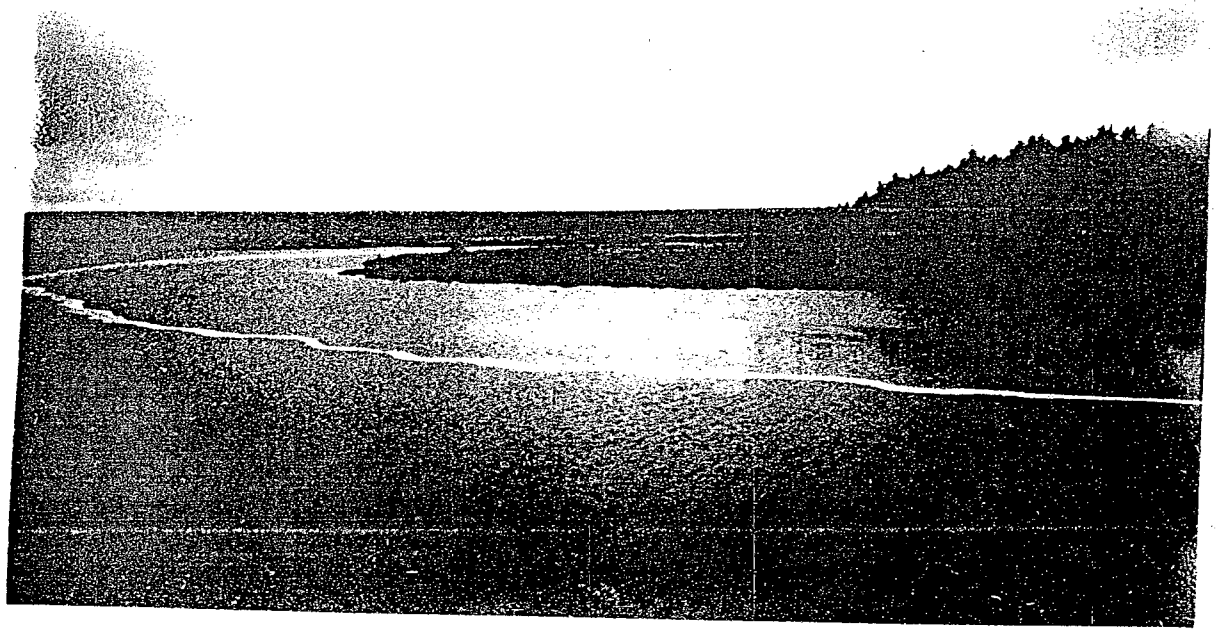
Re: Pollution Modelling in Broadhaven Bay by Enterprise Energy Ireland Ltd.



Appendix 14.1. Actual proposed pipeline "crossing point".

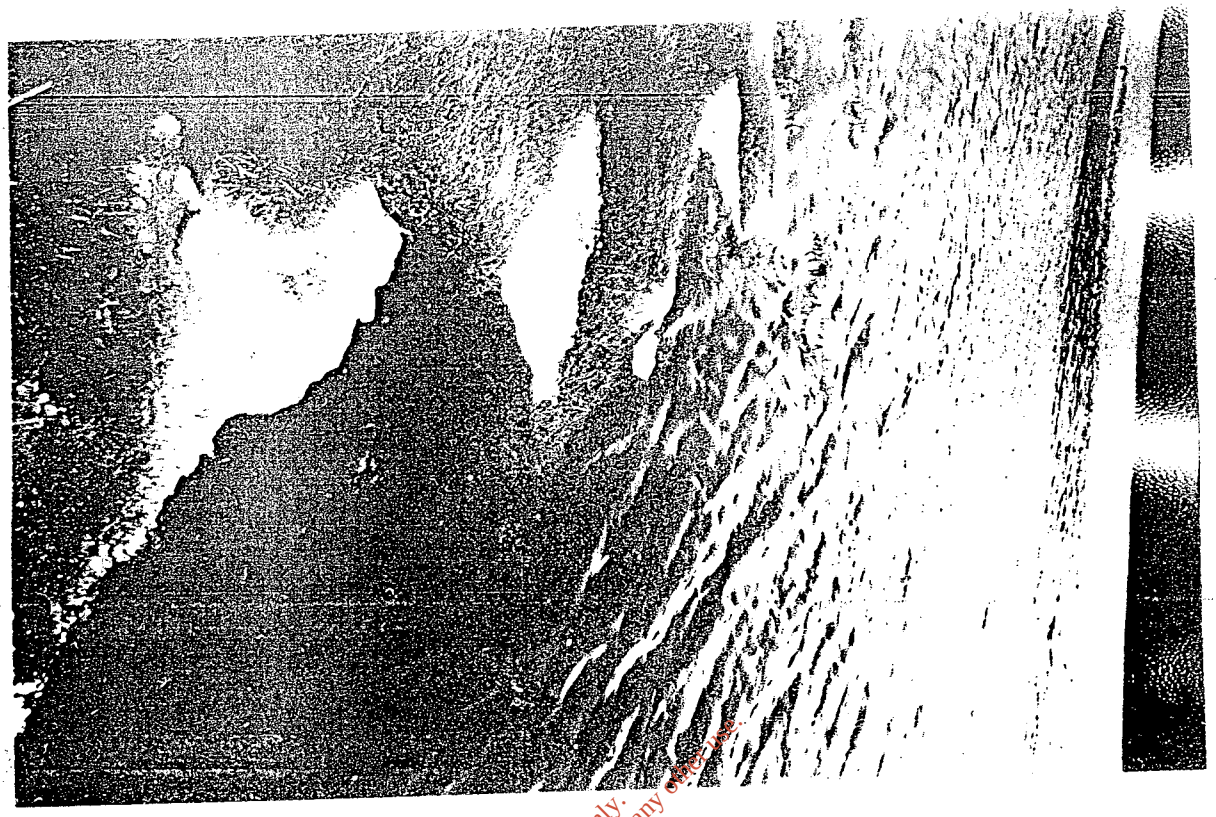






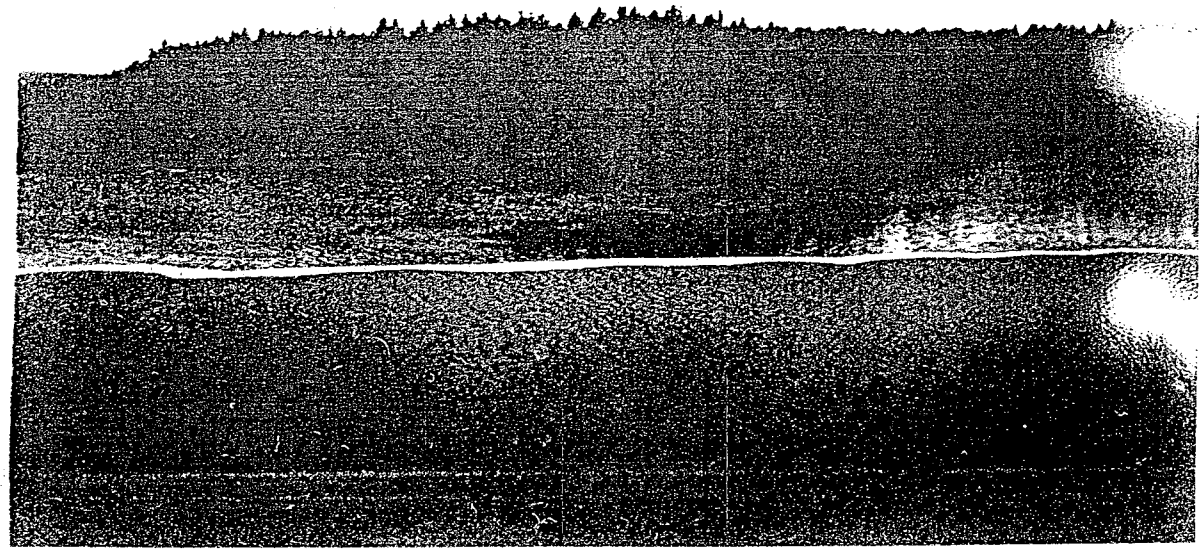
← Flow heading in the direction of the Glenamoy river.

(Key salmonoid catchment area).

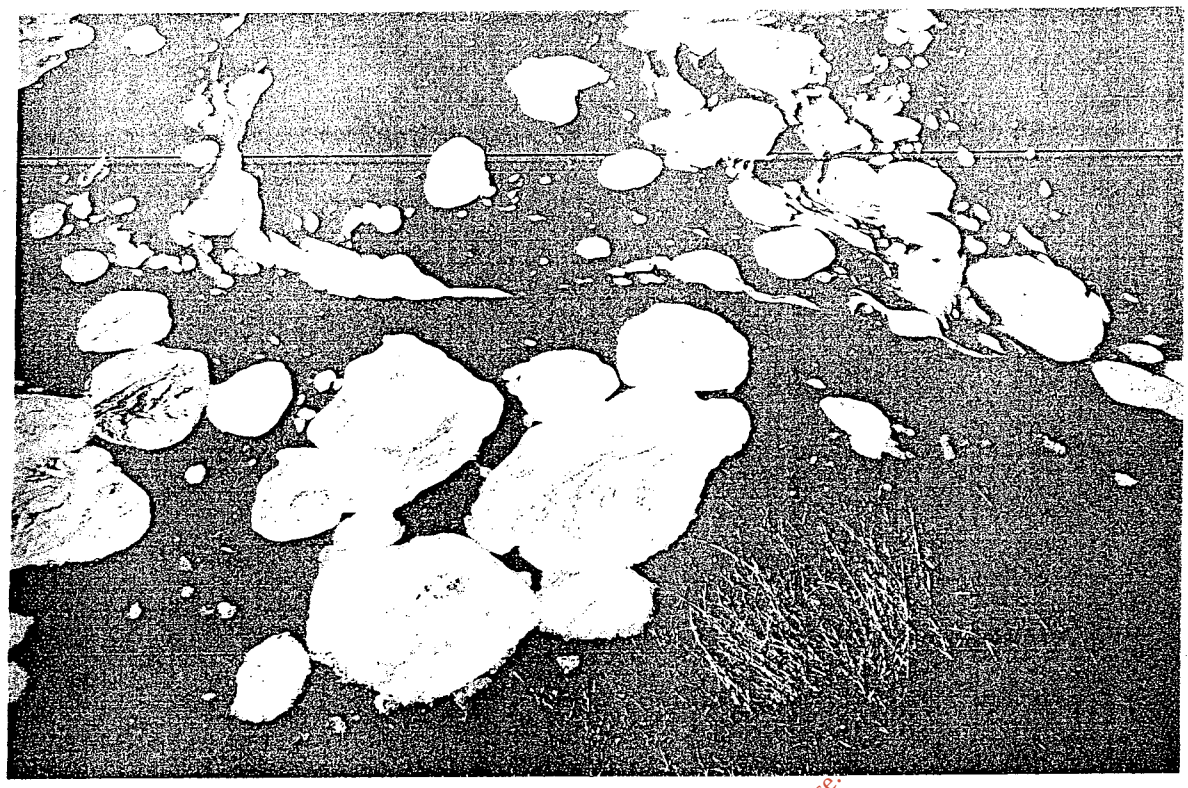


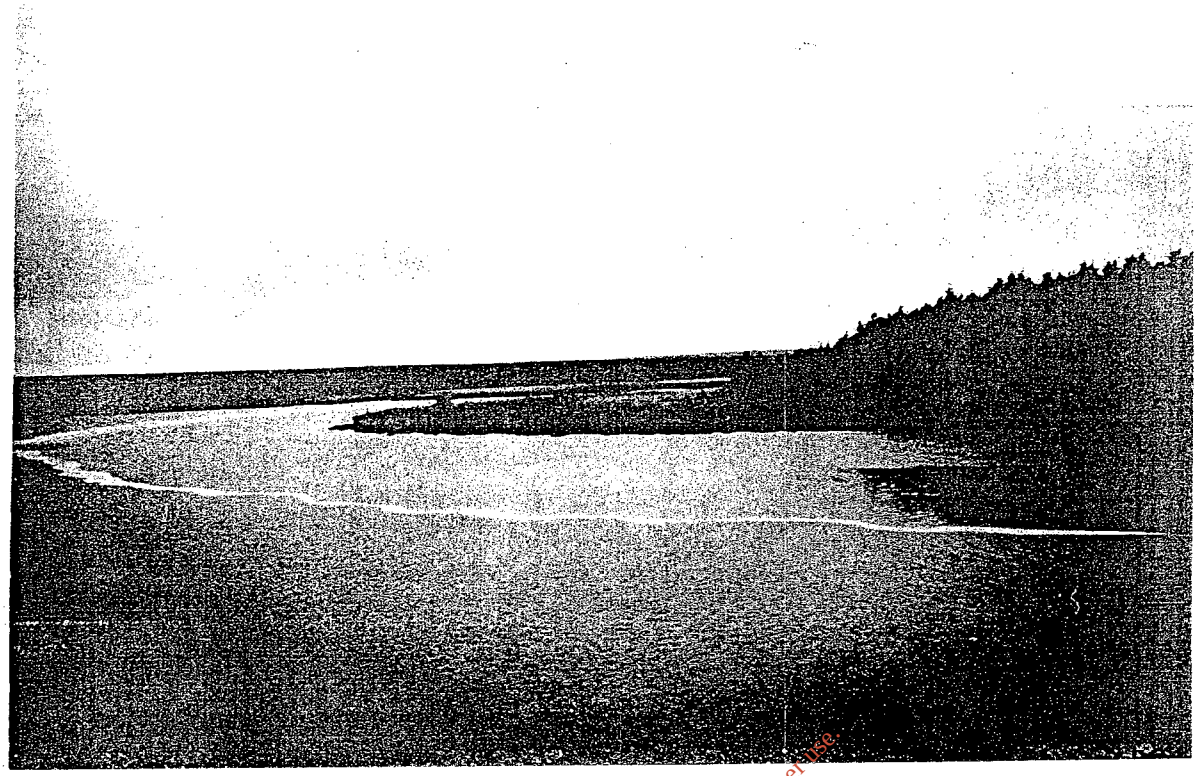
←

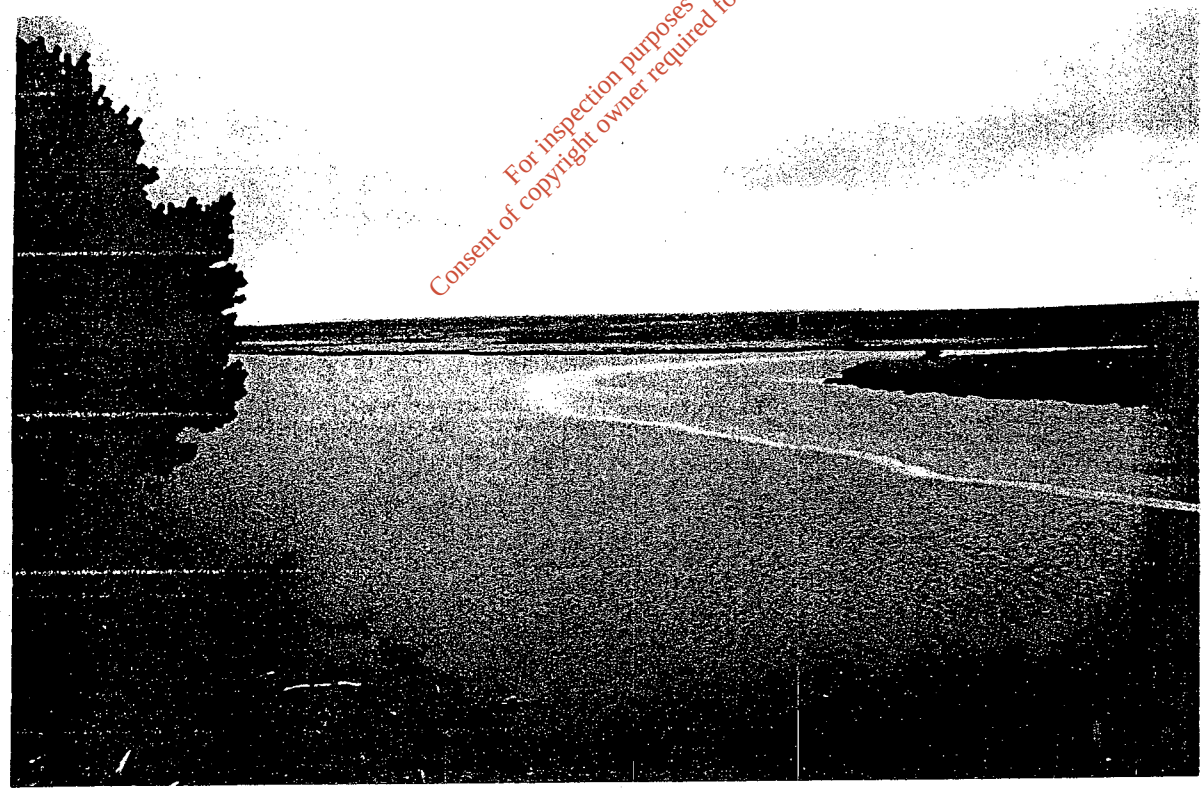
Towards the 'Glenamoy' + 'Mullingnabo' river's Junction point.

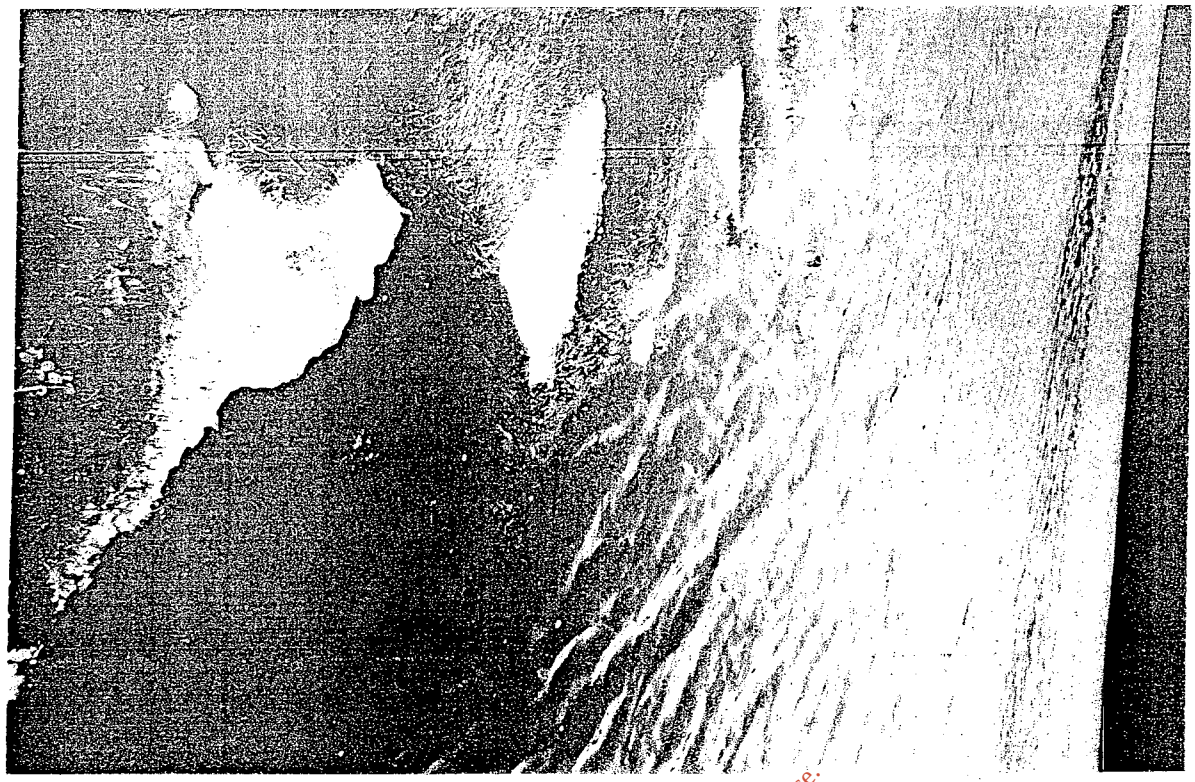


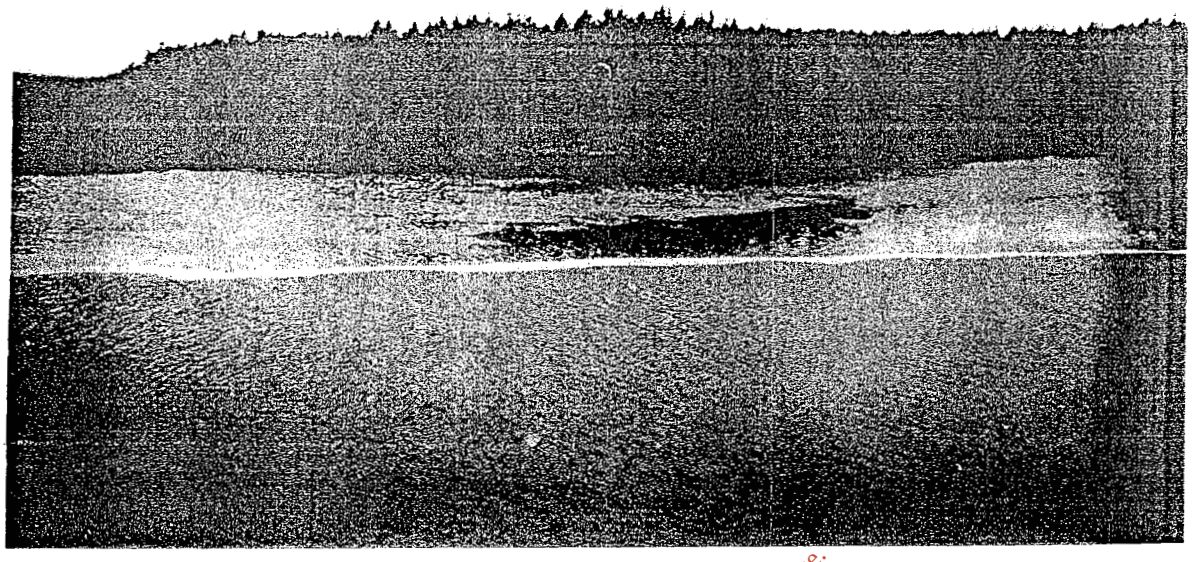
Top + Bottom } Upper 'Smuaddacon Bay' heading in the direction of the 'Glenamay' + 'Muingnabo' river's junction.

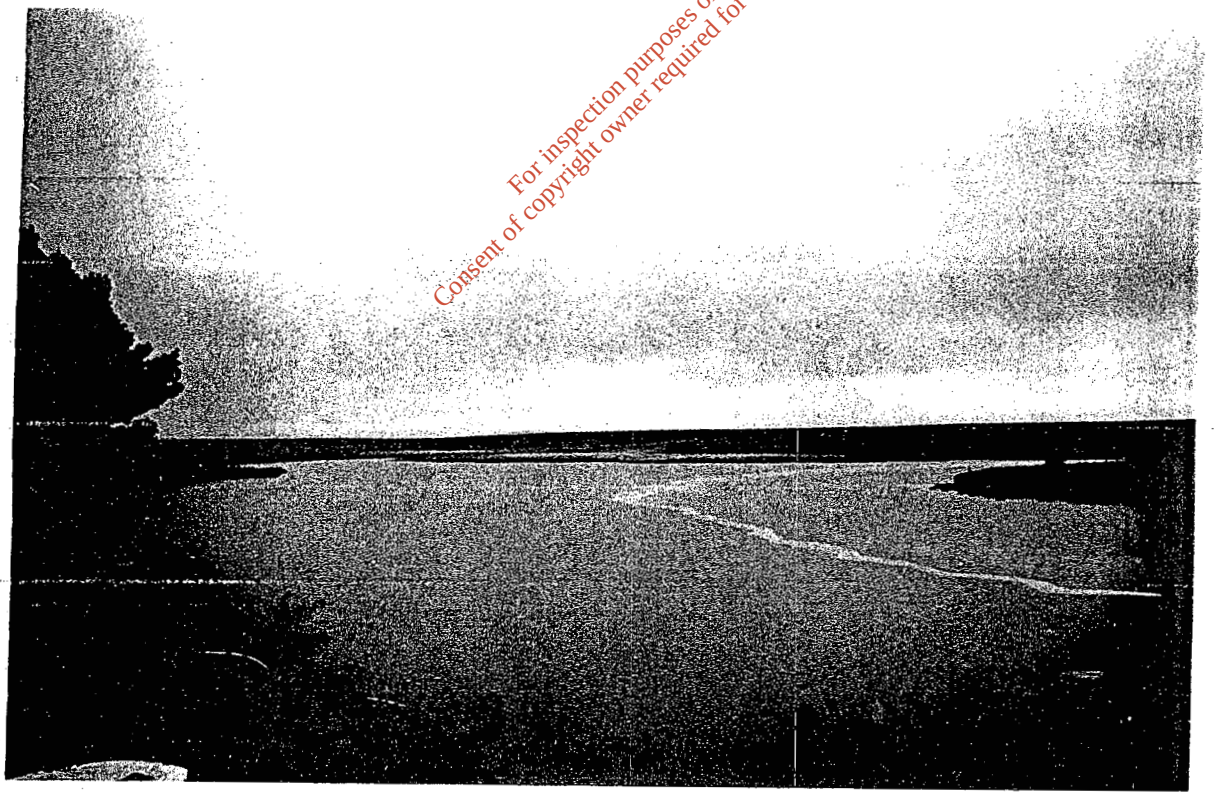






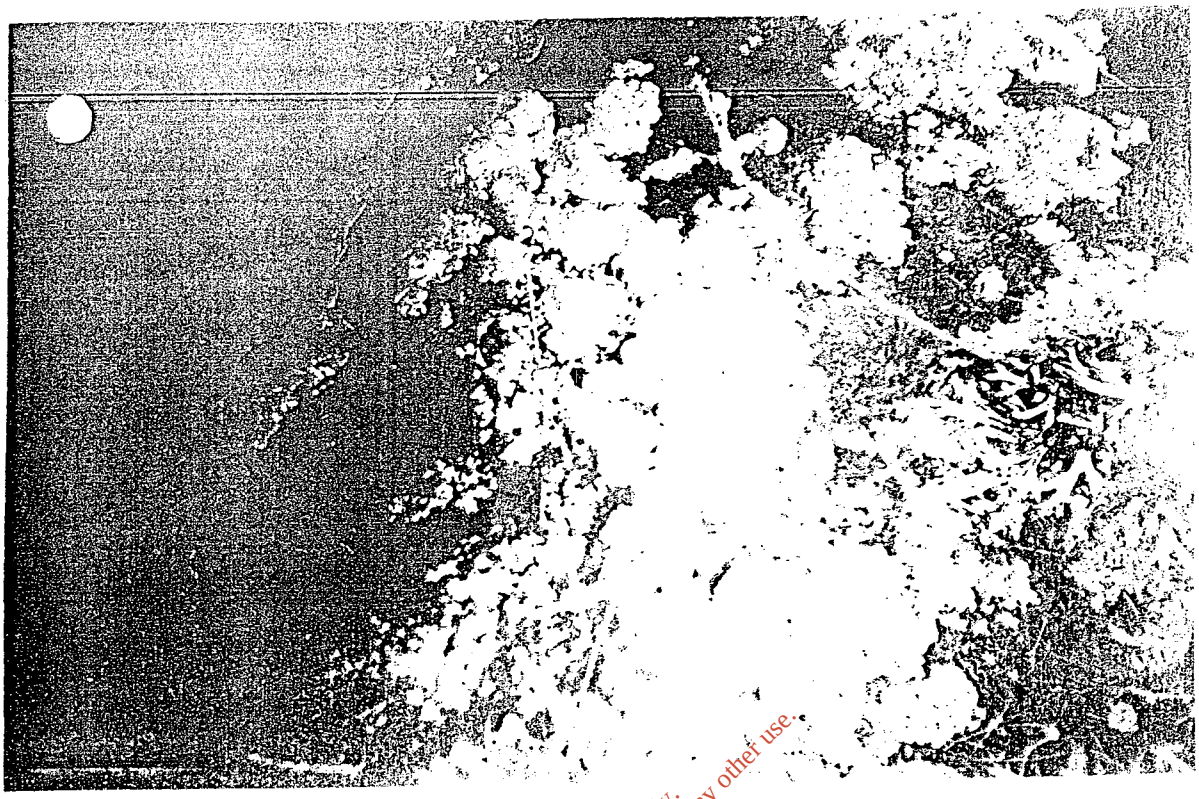


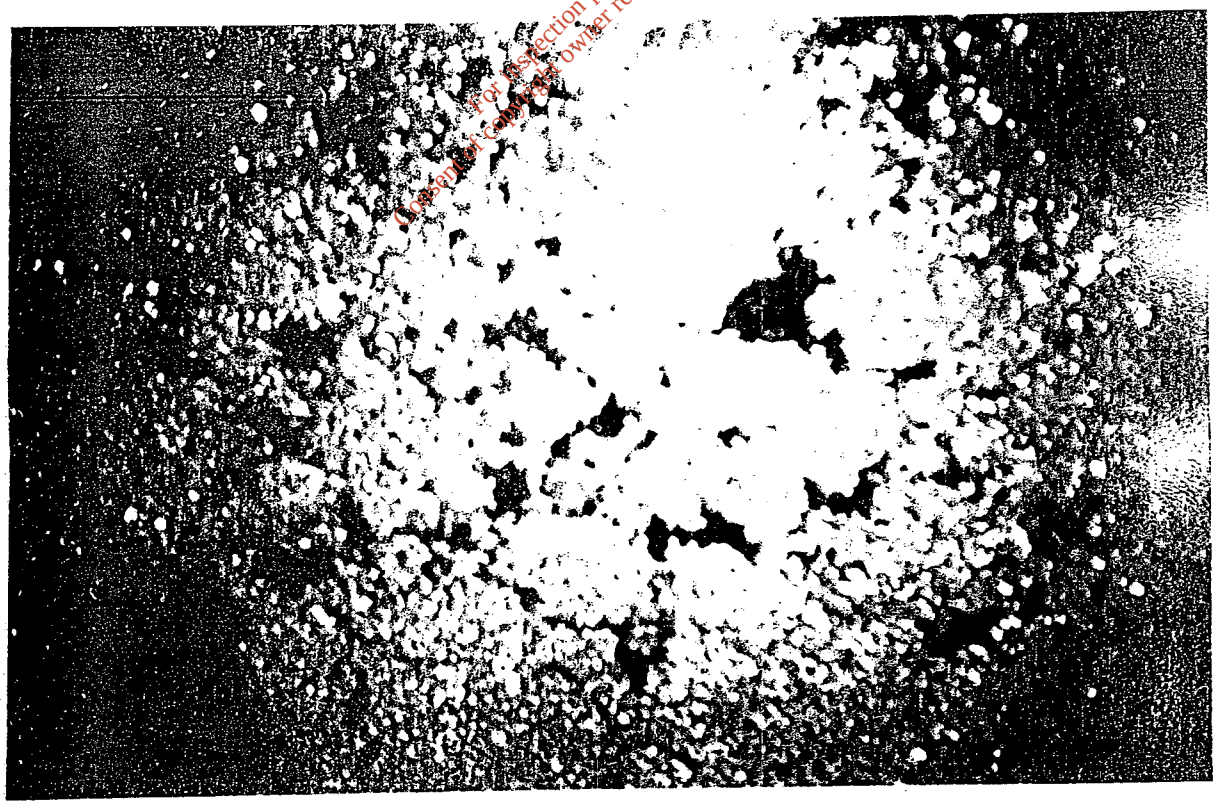


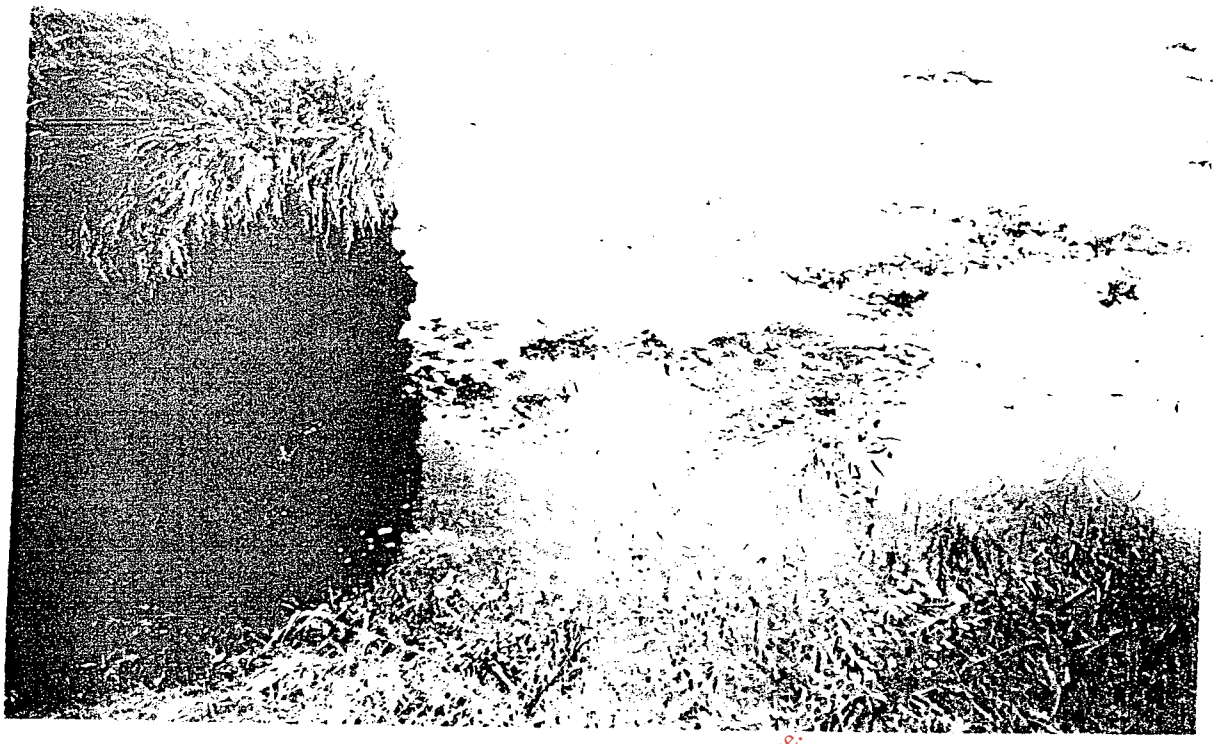


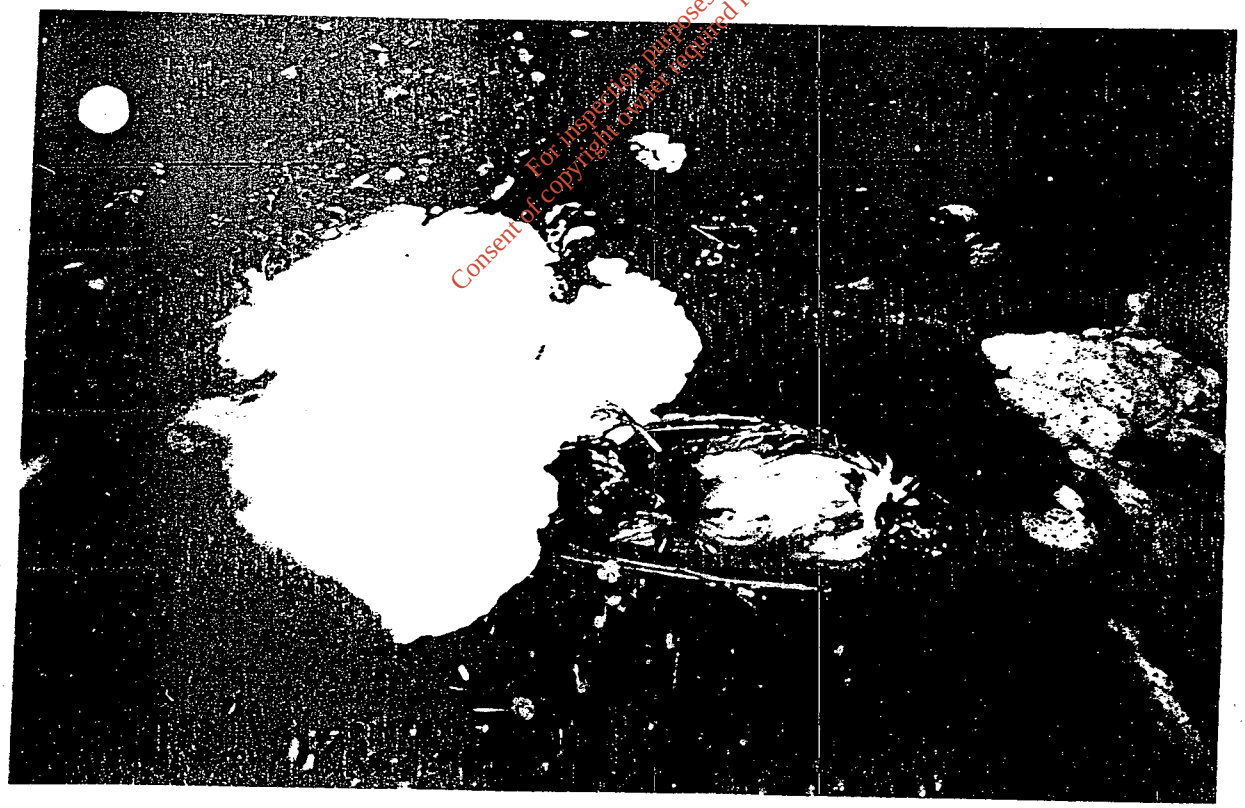
15/10/01

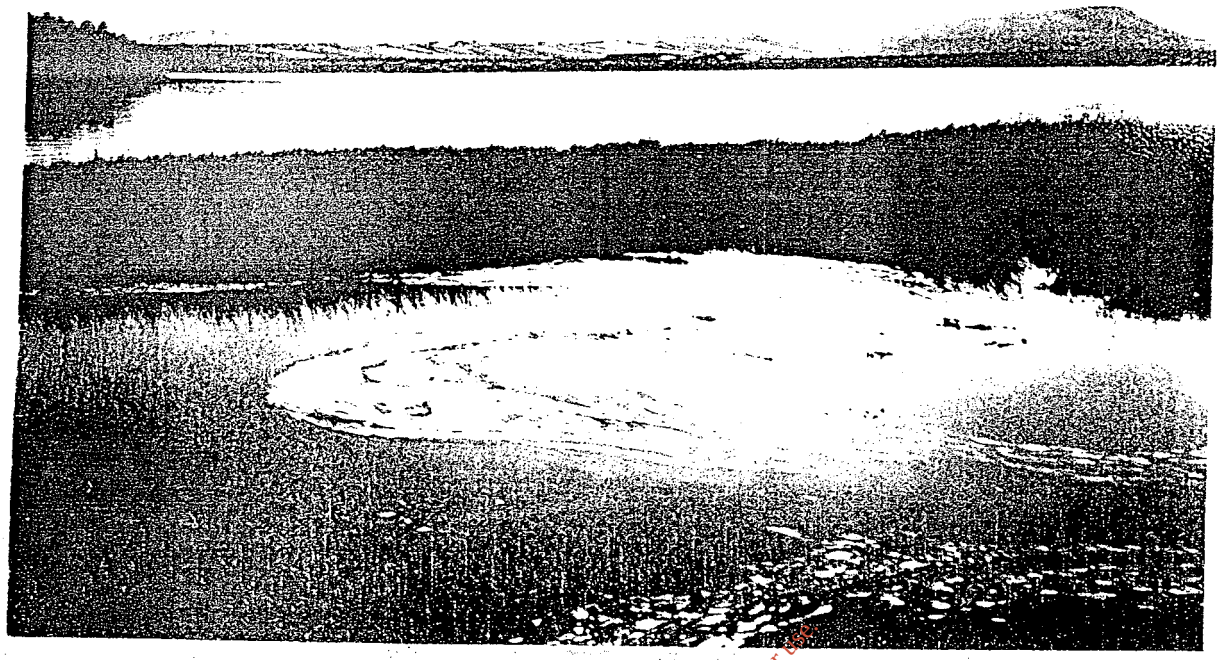
Re: [illegible] insoluble slick.

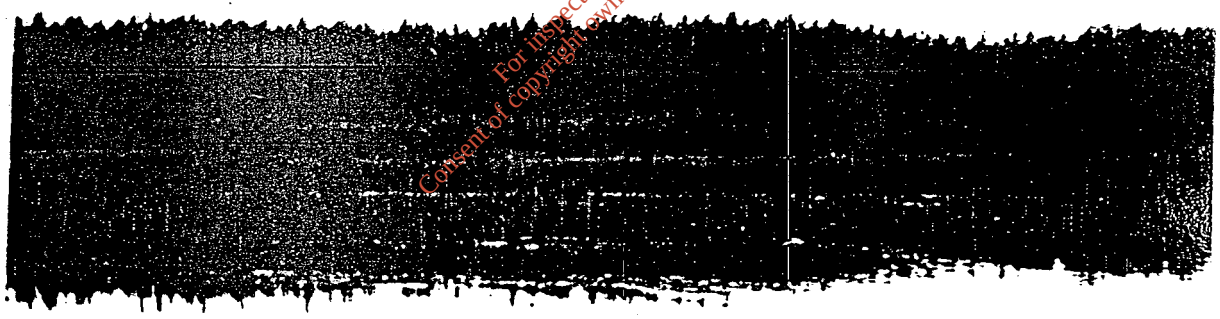


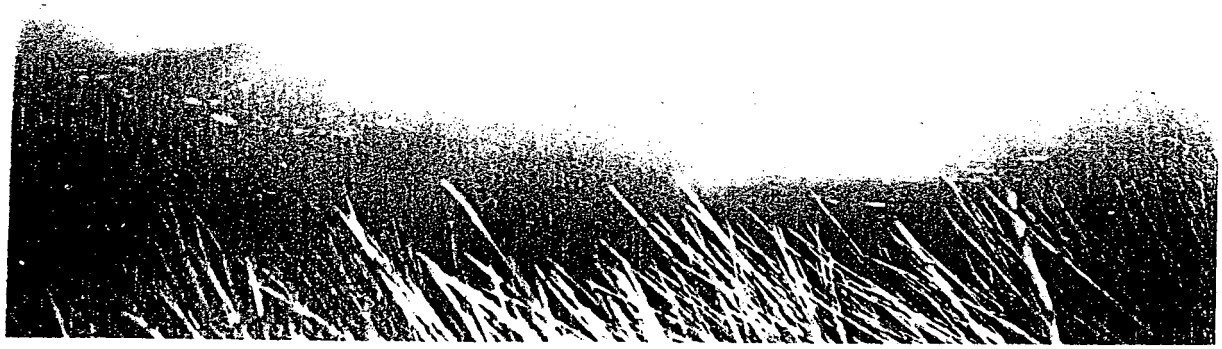




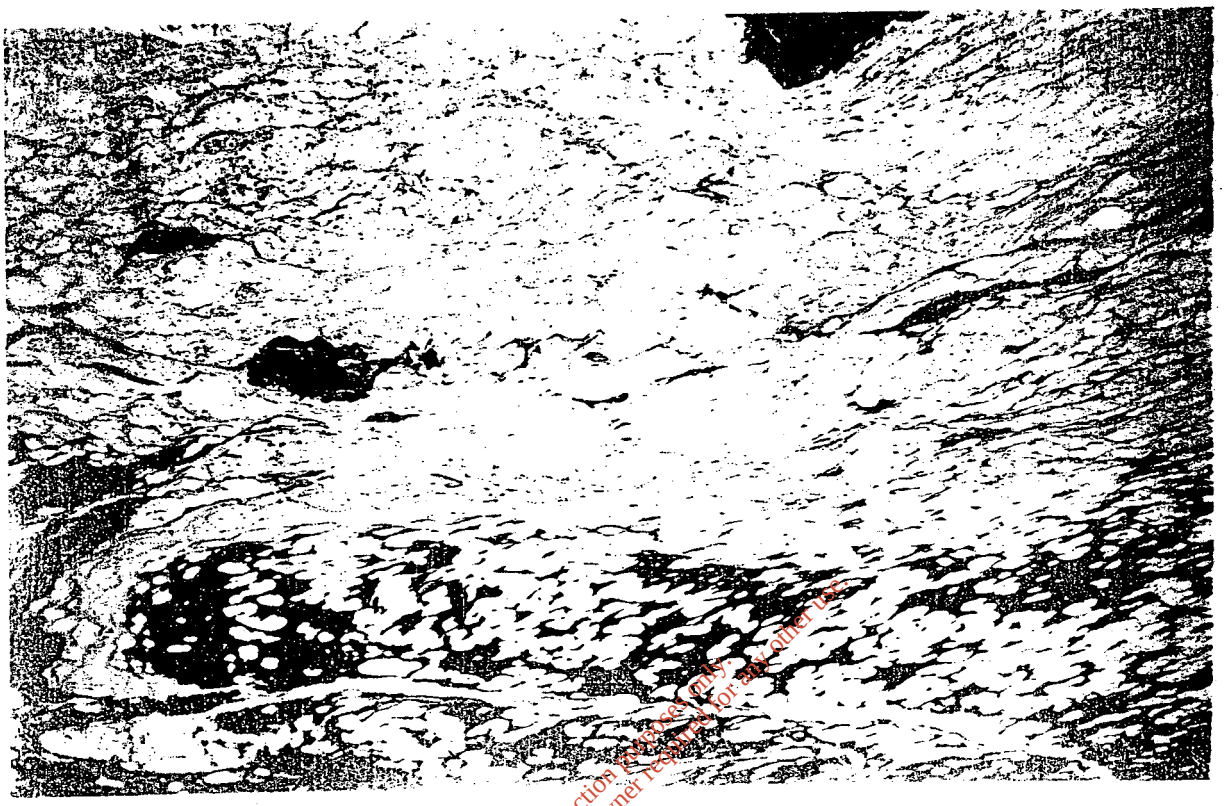


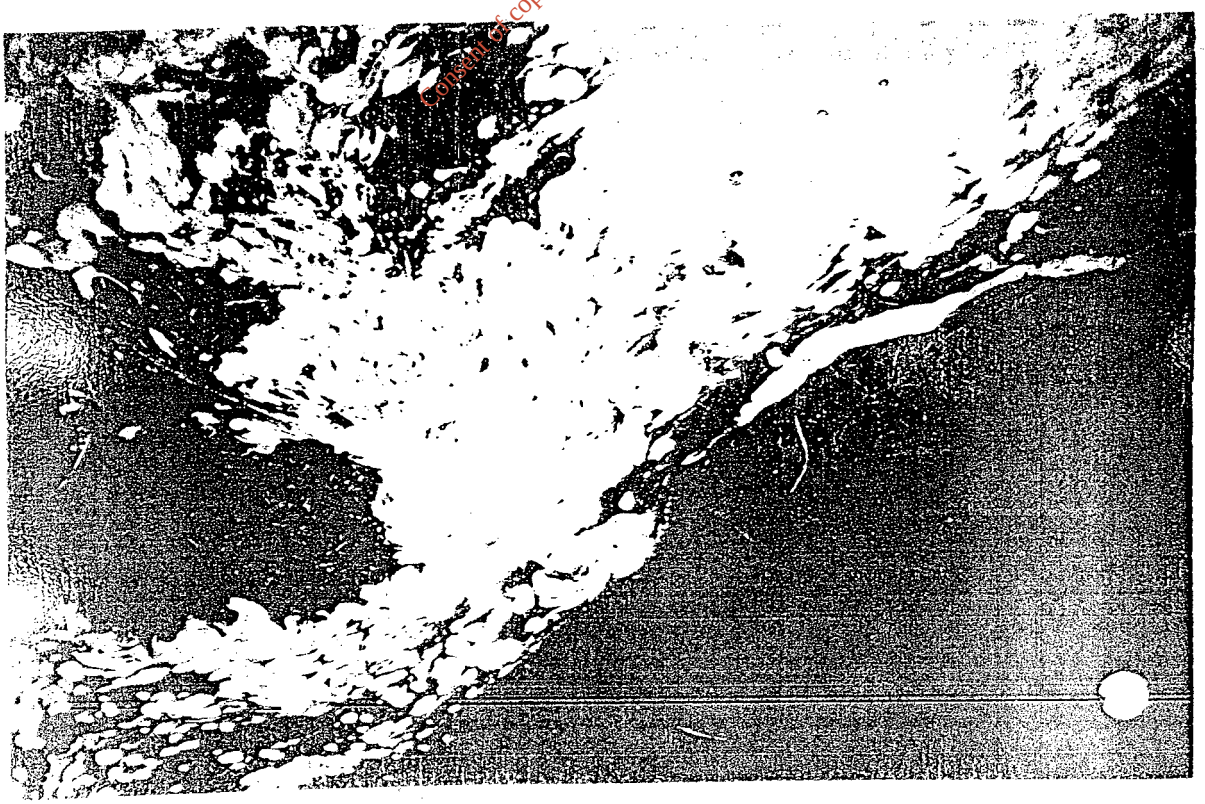


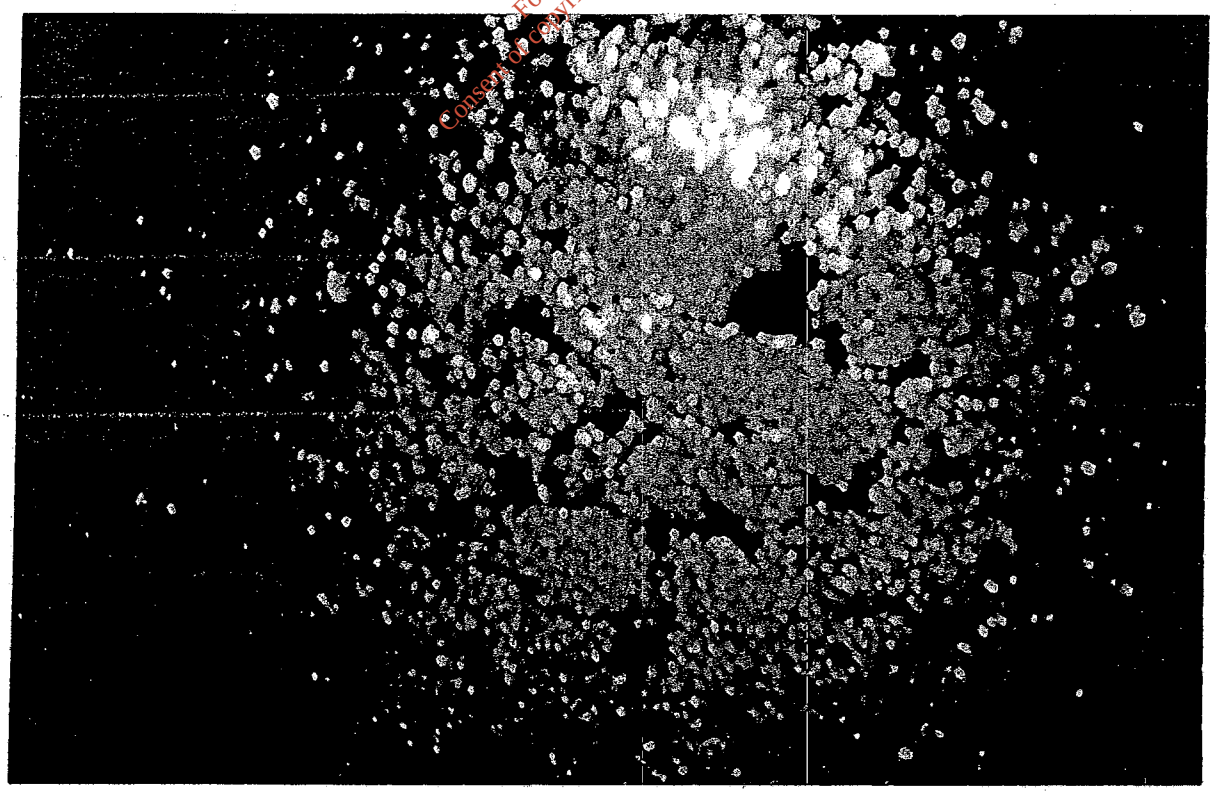


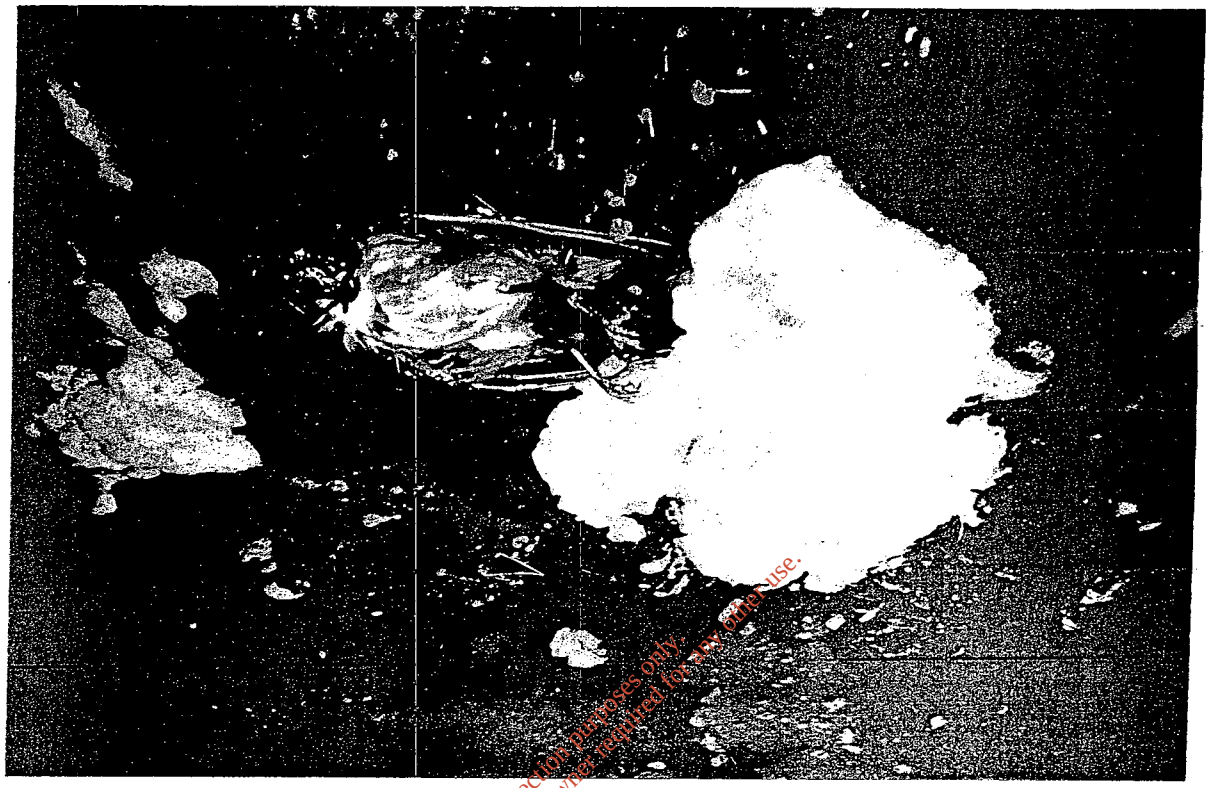


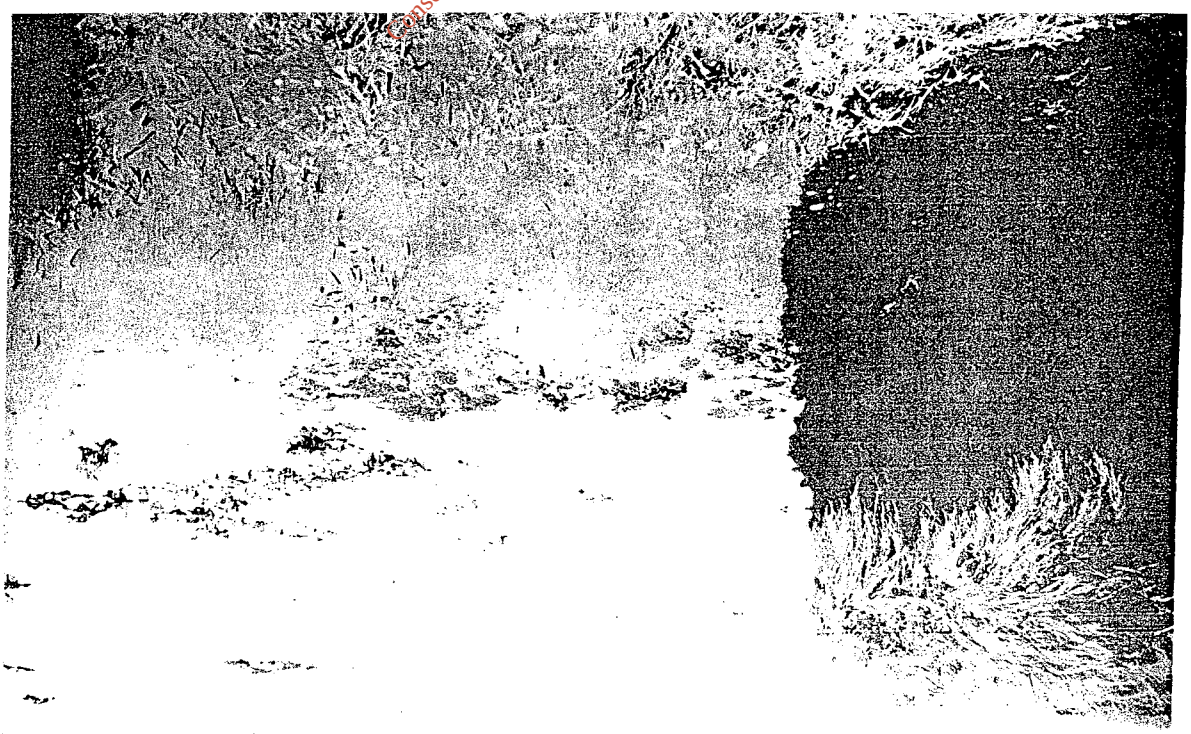
Top + Bottom : Upper "Struwaddacon Bay".

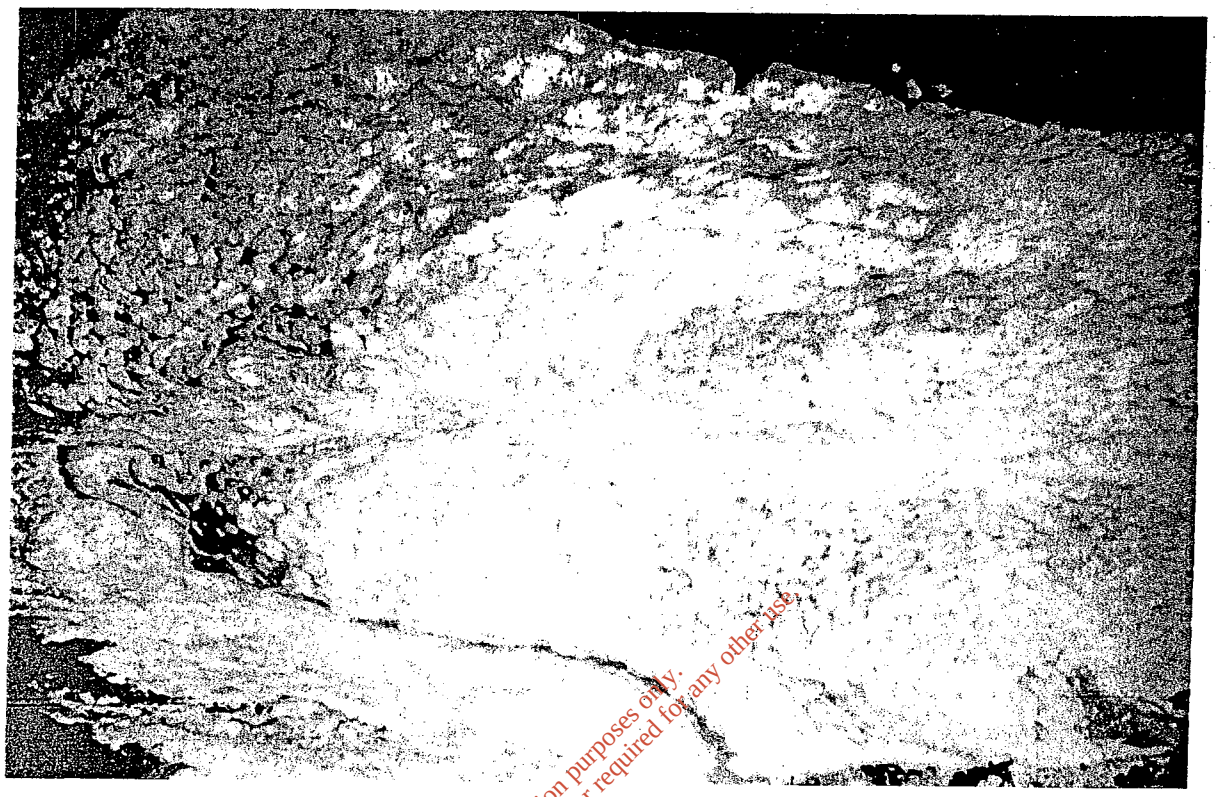


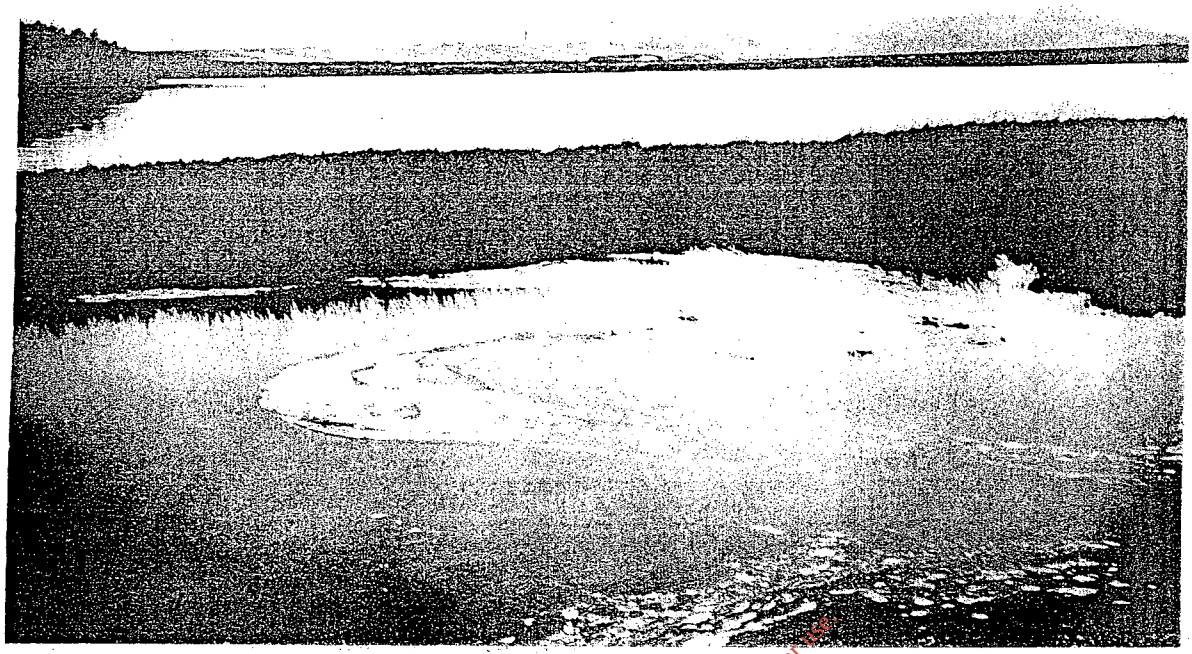


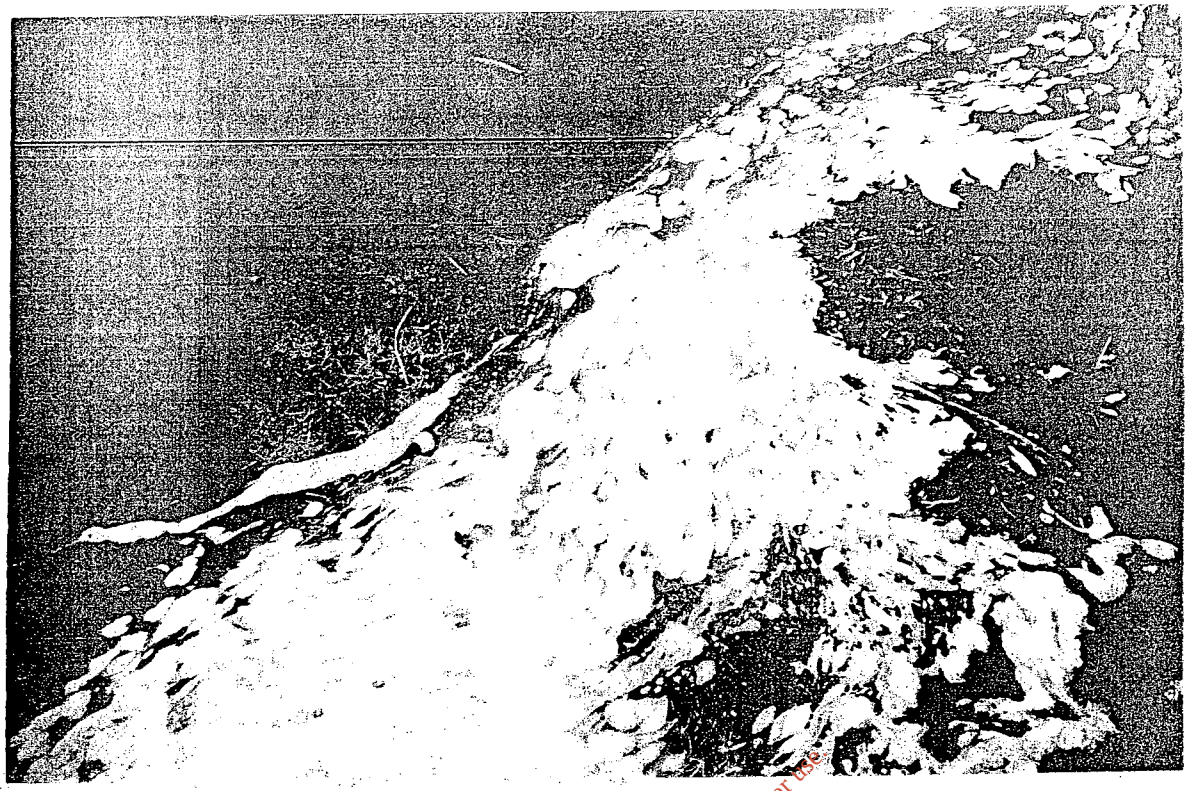


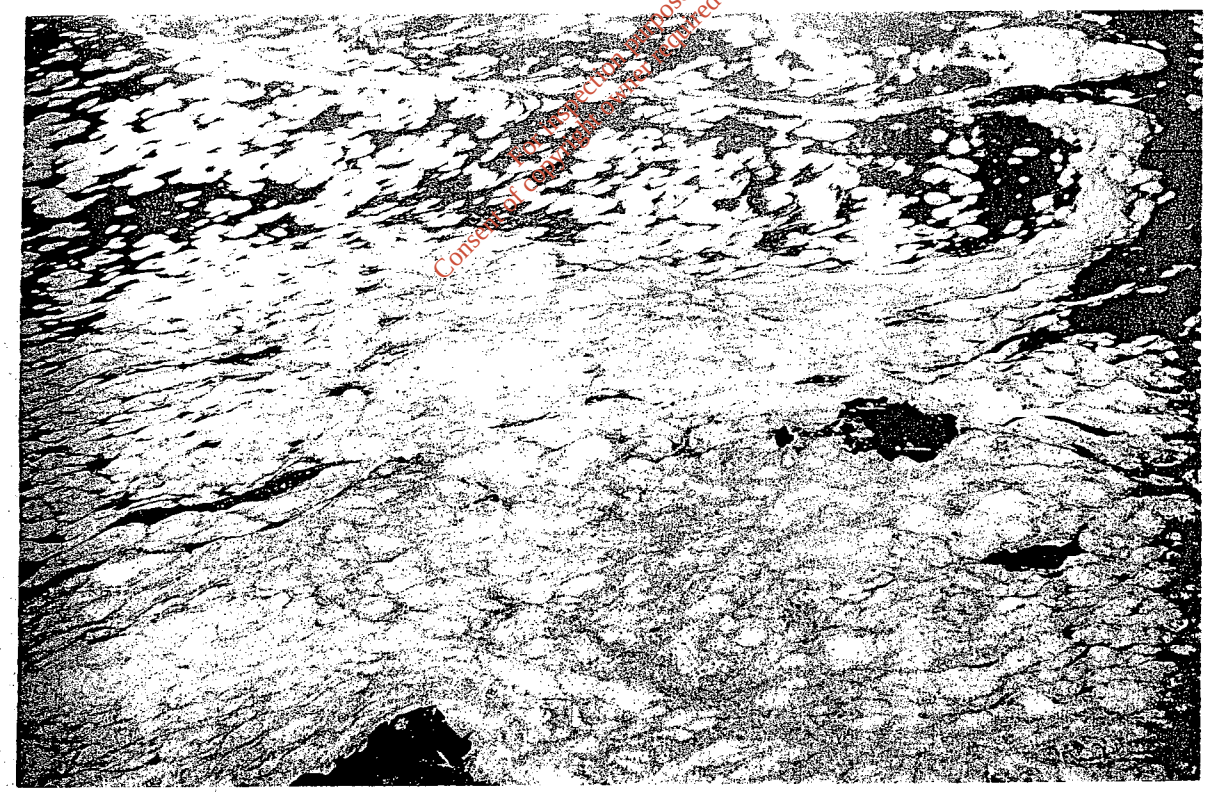


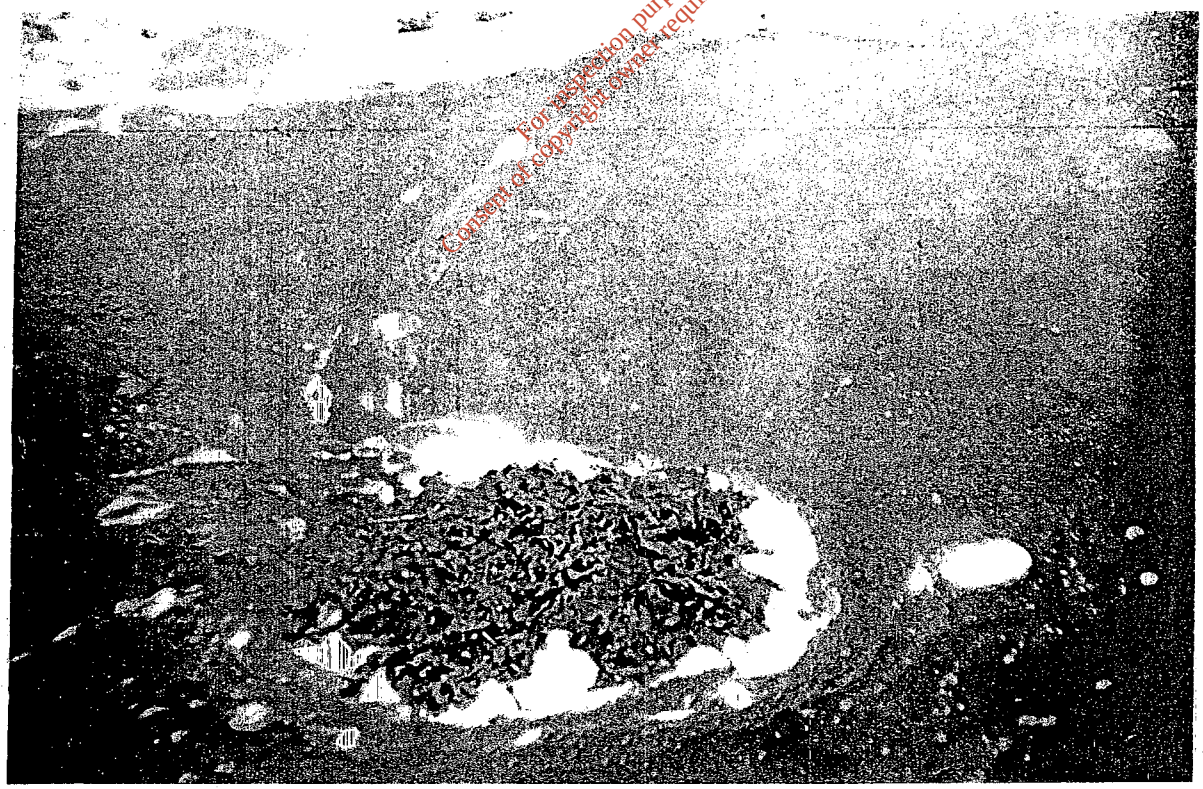












Gortacragher
Rossport
Ballina
Co. Mayo

10th September 2001

Mr. Vincent Roche
The North Western Regional Fisheries Board
Ardnaree House
Abbey Street
Ballina
Co Mayo

Dear Sir,

Re. Proteus Modelling in Broadhaven Bay by Enterprise Energy Ireland Ltd.

Enterprise Energy Ireland Ltd. has recently carried out proteus modelling (to analyise the currents) using a tracer dye in Broadhaven Bay. Since this analysis was undertaken I and others have observed a brown-coloured scum-like substance floating on both sides of Sruwaddacon Bay, an estuary to the south west of Broadhaven Bay. This scum extends as far as the Glenamoy river, which as you know is an important spawning ground for salmonoids etc.

On 05/09/01 (at 2.16 p.m.) I rang Malin Head coastguard services and spoke to John Hegarty, describing in detail to him the nature and extent of the substance and he logged a complaint. John rang me back at 4.00 p.m. and confirmed that he had sent a message by fax to the pollution section of the Department of the Marine and Natural Resources. He stated that the Coastguard Services did not have a role in this capacity.

The North Western Regional Fisheries Board under statutory requirements are obliged to monitor and protect our marine environment. I trust that you will act on the above immediately.

I have taken a sample of this offending substance. I enclose five photographs which illustrate the nature and extent of this pollutant, for your information.

Yours sincerely

Brid Mc Garry

c. c.

Gortacragher
Rossport
Ballina
Co Mayo

15/10/01

Mr Vincent Roche
The North Western Regional Fisheries Board
Ardnaree House
Abbey Street
Ballina
Co Mayo

Re: Brown-coloured insoluble slick

I wish to draw your attention to the fact that I have observed further irregularities along the bay of Sruwaddacon, an estuary to the south west of Broadhaven Bay. I have made you aware of this in previous correspondence dated 10/09/01 and still the Board has taken no action. This latest pollutant extends as far as the Glenamoy and Muingnabo rivers which as I stated previously are key salmonoid spawning grounds.

You informed me in your letter dated 25/09/01 that The North Western Regional Fisheries Board *"does not have responsibility for marine water quality"*. I would like to point out that the above rivers are under the remit of The North Western Regional Fisheries Board with respect to statutory requirements. The Board is obliged to adhere to these requirements to protect our freshwater systems from external pollutants.

I would also like to draw to your attention the fact that Enterprise Energy Ireland had a floating platform facility at the mouth of Sruwaddacon Bay in late September 2001 and since that time I have made the above observations.

I have sent a sample of this pollutant to a laboratory for analysis (as The North Western Regional Fisheries Board have neglected to carry out any analysis to date) and I have a series of photographs (enclosed) which I have distributed to various other individuals and relevant organisations.

Yours sincerely

Brid Mc Garry

c.c

Gortacragher
Rossport
Ballina
Co Mayo

15/10/01

Mr Frank Fahy
Minister for the Marine and Natural Resources
Leeson Lane
Dublin 2

Re: Brown-coloured insoluble slick

I wish to draw your attention to the fact that I have observed a brown-coloured insoluble slick along Sruwaddacon Bay (cSAC and SPA), an estuary to the south west of Broadhaven Bay (cSAC). This latest pollutant extends as far as the Glenamoy and Muingnabo rivers which are key salmonoid spawning grounds.

I would also like to draw to your attention the fact that Enterprise Energy Ireland had a floating platform facility at the mouth of Sruwaddacon Bay in late September 2001 and since that time I have made the above observations.

I enclose copies of correspondence to date with The North Western Regional Fisheries Board. In a letter dated 25/09/01 which I received from Vincent Roche, CEO I draw your attention to paragraph two. Mr John Hegarty informed me that he sent a message by fax to the pollution section of the Department of the Marine and Natural Resources. However, according to Vincent Roche, Mr Hegarty *"reported the incident to the Department's Marine Rescue Co-ordinating Centre"* and that The North Western Regional Fisheries *"Board was not notified of any threat to the Glenamoy river by MRCC in recent weeks or months"*. There is a conflict here, which needs to be clarified.

I have sent a sample of this pollutant to a laboratory for analysis (as The North Western Regional Fisheries Board have neglected to carry out any analysis to date) and I have a series of photographs (enclosed) which I have distributed to various other individuals and relevant organisations. As it is the remit of the Department of the Marine and Natural Resources to protect our marine environment I trust that you will act accordingly.

Yours sincerely

Brid Mc Garry

c.c.

Gortacragher
Rossport
Ballina
Co. Mayo

10/12/01

Ms Katherine Licken
Special Adviser
Department of the Marine and Natural Resources
Leeson Lane
Dublin 2

A chara,

Re. Brown-coloured insoluble slick in Sruwaddacon Bay (SPA) an estuary of Broadhaven Bay (cSAC) in north Co. Mayo

I wish to draw your attention to the above, details of which were conveyed by letter to Minister Frank Fahey of the Department of the Marine and Natural Resources on the 15/10/01. You state in your letter dated 21/11/01 that the Minister has had this matter examined and that Mayo County Council reported back to the Marine Rescue Co-ordinating Centre (MRCC) that there was no indications that the slick was harmful. Allow me to advise you and yours that the substance is still contained within the upper regions of the bay which the enclosed photograph, taken on the 27/11/01 amply demonstrates.

The department is advised that the Environmental Protection Agency (EPA) carried out analysis of a number of samples which they received from a local radio station. "The analysis indicated substantial oxidisable material present in the samples that would indicate the presence of organic matter but it was not possible to identify whether it emanated from land or sea". Quoting the regional EPA headquarters based in Castlebar, Co Mayo the analytical results dated 16/11/01 of the representative sample dated 18/10/01, it was noted that the Biological Oxygen Demand (B.O.D.) (mg/l O2) and the Chemical Oxygen Demand (C.O.D.) (mg/l O2) were 400 and 10,180 mg/l O2 respectively. These results were very high with the latter method representing an immediate assessment of the level of organic matter present as opposed to the B.O.D. method which can take up to five days to obtain results. As the average B.O.D. for raw sewage is 300 mg/l O2 and as the aforementioned exceeded this value this would give a very strong indication as to the serious nature with regard to the deoxygenation of our freshwater and marine environment due to this external pollutant. Yet it would appear that the EPA's regional officers did not bother to visit Sruwaddacon Bay to take representative samples of the offending substance themselves. The % organic matter in the sample was 25.4% according to the analytical results of the EPA. There is no indication given with respect to the inorganic fraction of same, as inorganic compounds are not readily oxidised and thus would not be adequately represented in the aforementioned results.

Attention needs to be drawn to the fact as to why a physical examination of the substance was not recorded. The sample submitted was of a chocolate mousse-like consistency which separated to a good extent from the seawater fraction due to aeration and other parametres such as bulk density, viscosity etc. Even a simple filtration method would have visually shown the analyst that the

substance appeared to be oil based with a greasy texture. More rigorous tests should have been carried out such as bioluminescence and fluorescence analysis and gas chromatography etc. to identify the major organic and inorganic compounds present. This would have been more relevant in this case than the simple regulatory tests carried out which are standard tests that apply in routine analysis of watersamples. In this case the samples submitted required more immediate attention as the offending substance was prevalent after 35 hours and exists to some extent in the bay up to the present day.

Quoting responses by Minister Fahey to Parlimentary Questions 70 and 71 respectively which state that *"No action is necessary in relation to measures taken to clean up the brown slick as it has been broken down by the sea action and dissipated"*. As you will observe from the enclosed photograph taken one week after your letter of 21/11/01, residual components of this pollutant are still very much evident along the upper reaches of the bay, which is an SPA under E.U. legislation.

I would also request under the Freedom of Information Act that you send me a copy of the Department of the Marine and Natural Resources analytical results for this slick, which led the same Department to believe prematurely that the offending discharge was due to spent mushroom compost. When challenged the Department subsequently withdrew this allegation.

With reference to paragraph 3 of your letter you state *"At present the fishery boards are only notified when there is pollution at sea"*. A letter I received from Vincent Roche of the North Western Regional Fisheries Board (dated 25/09/01) informed me that *". . . . the Board does not have responsibility for marine water quality. Neither does it have the same high level of marine expertise as is available in the department itself"*(referring to the Department of the Marine and Natural Resources).

It is the remit of the fisheries board under statutory requirements to monitor and protect our freshwaters. As there appears to be a conflict re. the above I would suggest that the Fisheries Board and the Department of the Marine and Natural Resources organise a meeting so that statutory functions relevant to both parties are outlined. Your statement *"At present the fishery boards are only notified when there is pollution at sea"* directly contradicts that of Vincent Roche's.

I hope this clarifies the matter for you and I await your prompt reply.

Yours sincerely

Brid Mc Garry

c.c.