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CORK COUNTY COUNCIL

ENVIRONMENTAL IMPACT STATEMENT

FOR

BANTRY SEWERAGE SCHEME

BANTRY, CO. CORK

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CORK COUNTY COUNCIL

ENVIRONMENTAL IMPACT STATEMENT

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INTRODUCTION

The proposed Bantry Sewerage Scheme involves the construction and operation of a new wastewater treatment works, with associated transmission mains and a new treated effluent outfall, to provide the town of Bantry with appropriate preliminary and secondary sewage treatment capabilities. In addition, the proposed project will satisfy the requirements of relevant European Community (EC) Directives regarding the treatment and discharge of urban wastewater. This proposed improvement of the urban wastewater treatment scheme will serve to protect public health from the continued discharge of untreated wastewater directly into Bantry Harbour, to protect and enhance the highly productive and economically important commercial shellfish operations within the harbour (e.g. mussels and scallops), and to protect and preserve the natural environment and ecology of Bantry Bay from continued degradation.

Currently, up to 1.4 million litres per day of urban wastewater is discharged into Bantry Harbour, containing a total of approximately 360 kg of biochemical oxygen demand (BOD), 410 kg of suspended solids, 20.5 kg of phosphates, 67 kg of nitrogen, and 1.4×10^{14} faecal coliform bacteria. The proposed treatment system will result in a 95% reduction in BOD, suspended solids, and total phosphorous, and an 80% reduction in faecal coliform bacteria and total nitrogen.

Treatment provided prior to discharge currently consists solely of coarse screening of the effluent at the existing pump house. As proposed, a new wastewater transmission main will extend from the existing Pumphouse location to a new treatment plant site located near Blue Hill. Pursuant to the proposed design, up to 6 DWF of urban wastewater would be treated and discharged via a gravity-fed outfall main to the proposed discharge point located near "the Narrows" portion of Bantry Bay (see Fig. 1-1).

The primary Directive governing this project is 91/271/EEC concerning urban wastewater treatment. This Directive was issued in May 1991 and defines regulations for wastewater discharges to freshwater, estuaries, and coastal waters. Article 7 of this EC document requires that municipalities having a population equivalent (PE) of 2,000 or more and that discharge urban wastewater to fresh water or estuaries, shall have secondary treatment. The Bantry Sewerage Scheme has been designed to serve a population of 5,000 PE by treating wastewater to a secondary standard which complies with the urban wastewater Directive 91/271/EEC. In addition to this level of treatment, and with the overall aim of minimising possible future eutrophication of the bay, nitrification/denitrification and phosphorous removal will be incorporated into the treatment process. As such, total phosphorous will be treated to a level of 2 mg/l and nitrogen to 15 mg/l.

Other EC Directives that are applicable and relevant to municipal wastewater discharge into a marine environment are,

6,000

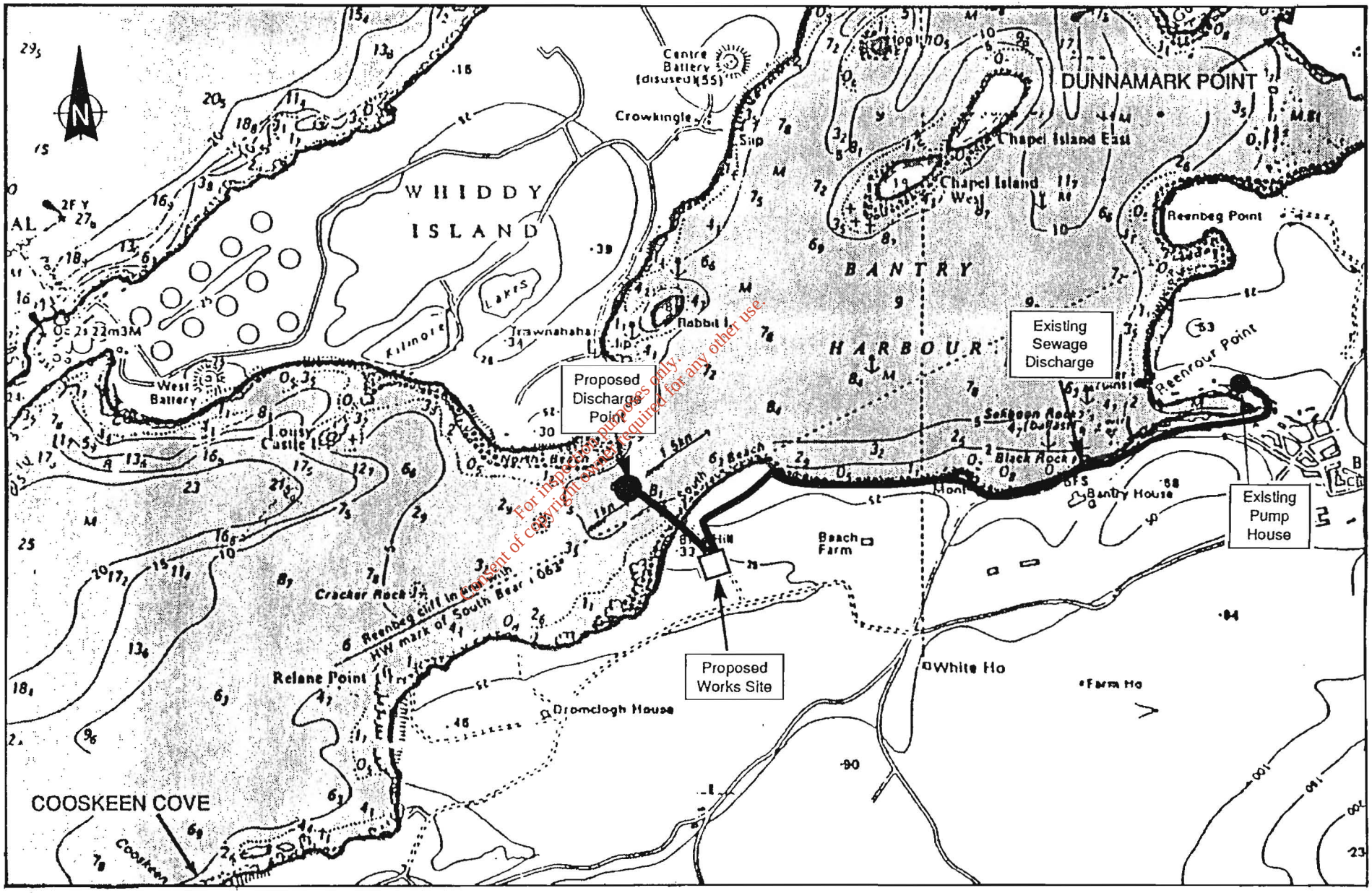

Figure 1-1
PROPOSED BANTRY SEWERAGE SCHEME

76/160/EEC, concerning the quality of bathing water; 76/464/EEC, on pollution caused by certain dangerous substances discharged into the aquatic environment, and 79/923/EEC, on the quality required of shellfish-producing waters.

The standard laid down by the EC Directive in regard to shellfish-producing waters provides only a general indication of acceptable water quality. It is the responsibility of the appropriate organisations within the EC Member States to ensure the protection of consumers of shellfish products. The relevant organisation in Ireland, the Shellfish Monitoring Group of the Department of the Marine, have decided that the water quality standards for shellfish-producing waters established under the U.S. National Shellfish Sanitation Programme are best suited to Irish purposes. This programme covers bacteriological, toxicological, chemical, physical, and inter-agency administrative procedures in the handling and commercial trade of molluscan shellfish and is being used as a model by an increasing number of European countries.

The system classifies shellfish-producing waters into three distinct categories: "Approved", "Conditional", or "Restricted".

Shellfish harvested from approved waters do not require purification or any other treatment. Purification is essential for those shellfish harvested from "Conditional" waters. When shellfish are taken from "Restricted" category waters, they must be pressure-cooked.

Bantry Bay currently falls into the "Conditional" category; The proposed sewerage scheme however should ensure that the bay water quality will come within the "Approved" category, provided emissions to the bay from other sources are satisfactory.

The Environmental Impact Statement (EIS) has been prepared pursuant to EC Directive 85/337/EEC on "the Assessment of the Effects of Certain Public and Private Projects on the Environment". This Directive requires that an Environmental Impact Assessment be conducted on a wide range of proposed projects (including wastewater treatment plants) if certain conditions are exceeded or if an EC Member State considers that such a study is required. The most important regulations implementing the Directive are the European Communities (Environmental Impact Assessment) Regulations 1989 SI No. 349, 1989 and the Local Government (Planning and Development) Regulations 1990 - SI No. 25, 1990.

This EIS concludes that the proposed development will result in significant improvement of the water quality of Bantry Harbour near Bantry Town due to the discontinuation of the discharge of raw, untreated urban wastewater. This project is expected to improve water quality in and around commercial shellfish areas, thereby promoting general long-term enhancement of this viable and productive resource. Improved water quality will also enhance bathing, angling, public health, and other

water-contact-related uses.

This project will, however, cause short-term adverse impacts to the manmade and natural environment due to construction of the new facilities. These impacts will be temporary in duration and, in general, occur during construction periods. Such temporary impacts will involve construction-related noise and impacts to flora, fauna, and air quality due to disruption of the near-shore area during construction of the transmission main along the Bantry Harbour coastline; traffic obstructions due to construction vehicles and installation of wastewater pipelines along roadways; and water-quality impacts (e.g. increased turbidity) due to construction of the outfall mains and outfall.

In general, the impacts of the proposed sewerage scheme will be positive, with minor construction-related negative impacts of temporary duration. All adverse effects on flora and fauna, air quality, noise levels, water quality, and the cultural heritage can be satisfactorily mitigated to reduce or eliminate potential environmental impacts.

Specific engineering information and calculations regarding the treatment system and design, as well as the construction of the proposed sewerage scheme, are provided in greater detail in the Preliminary Report for the Bantry Sewerage Scheme. This EIS is primarily concerned with the potential environmental impacts of construction and operation of the proposed development, whereas the preliminary report is primarily focused on the facility design and treatment methodologies.

1. DESCRIPTION OF THE PROPOSED DEVELOPMENT

1.1 EXISTING FACILITIES

The existing sewerage collection scheme in Bantry Town is a combined system. Wastewater in the entire collection system flows by gravity to the existing pumphouse situated on the Old Quay at the western end of Wolfe Tone Square. From the pumphouse, the wastewater is pumped via a 250mm C.I. rising main to the existing outfall pipe at Black Rock. The existing outfall is located 50 metres from shore in Bantry Harbour, approximately 1km east of the Pumphouse along the Cork Road. An emergency overflow, 450 mm in diameter, connects the Pumphouse directly with the inner harbour.

The only means of treatment currently provided before discharge to Bantry Harbour is coarse screening at the pump house. No biological or chemical treatment of the wastewater is performed.

The existing sewerage collection scheme can be divided into two separate sections: a northern section along Glengariff Road, and a southern section along New Street to Ardnageehy Road. Pipe diameters vary from 150mm at the extremities to a 750mm inlet at the pump house. Both sections contain an overflow structure that allows flows in excess of 6 DWF to overflow into nearby rivers and Bantry Harbour.

The stormwater runoff in Wolfe Tone Square is collected by means of two 350mm newly laid storm sewers that carry storm water by gravity directly to the inner harbour area. Under the proposed scheme there will be provision for these storm water pipes to discharge to the existing Pumphouse through the combined town sewerage scheme in the event of having storms and high tides occurring simultaneously.

Table 1-1 provides relevant data on the existing sewerage scheme.

TABLE 1-1

RELEVANT DATA ON THE EXISTING
BANTRY SEWERAGE SCHEME

Present DWF at Pump House	8	L/s
Current pumping at Rising Main 6 DWF (excess of 6 DWF to Inner Harbour)	48	L/s
Present DWF at Northern Overflow Chamber	3.2	L/s
6 DWF	19.2	L/s
Present DWF at Southern Overflow Chamber	3.43	L/s
6DWF	20.58	L/s
Present storm flow (including DWF)	118	L/s
Catchment area	3.844	acres

Key:

DWF = Dry Weather Flow

L/s = Litres/second

1.2 SITING AND DESIGN OF PROPOSED FACILITIES

As proposed, the new sewerage scheme would involve the construction of a new wastewater treatment works, new wastewater transmission main, and a new treated-effluent marine outfall. The proposed treatment works will include preliminary and secondary treatment as required by EC Directives.

1.2.1 SITING AND DESIGN

The development of the proposed sewerage scheme involved a multi-step process aimed at determining system needs and identifying appropriate actions to meet these needs. This process involved the following methodology:

- An analysis of the existing system
- A review of applicable EC Directives and Regulations regarding wastewater treatment
- An identification of potentially feasible designs involving transmission and treatment alternatives
- The completion of a comparative alternatives analysis from both an engineering and environmental perspective; and
- The selection of a preferred scheme that accomplishes project objectives.

As illustrated in Fig. 1-1, siting and design of the proposed facilities are as follows:-

PUMPHOUSE

The design DWF for the proposed system is 15.76 l/s. The maximum design flow to the pumphouse is 163.8 l/s, or approximately 10.4 DWF. It is proposed that the existing coarse screens be replaced by open-channel disintegrator units upstream of the sump. New pumps will be installed to pump up to 6 DWF to the new treatment works and all flows in excess of 6 DWF will be pumped directly to the harbour via the existing rising main and discharge outfall.

WASTEWATER TRANSMISSION MAIN

The proposed wastewater transmission main would extend westward from its current terminus at the pumphouse along the Cork Road. At the cemetery, the route diverges from the road and follows the foreshore area to the airstrip before proceeding inland to the site of the new treatment works near Blue Hill. This route is approximately 3.0 km in length and would be buried 1 to

2 metres deep. The wastewater transmission main will consist of 250mm PVC or asbestos-cement pipe and will be located a maximum of 1.5m from shore.

The foreshore route was considered preferable to a route following existing roads (i.e. the Cork Road to the Westlodge Hotel and then southerly past the Ardeevin House to Blue Hill and the airstrip). Several factors contributed to this conclusion, including reduced pumping head, reduced pumping costs per annum, reduced pump capital costs, reduced wastewater pipeline construction costs, and fewer construction-related constraints (i.e. traffic inconveniences, scarce space for construction operations, and access problems for the local residents).

TREATMENT WORKS SITE

The proposed treatment works site is a 1.01 hectares parcel of land located along the west side of the Airstrip Road near Blue Hill at an elevation of 18 metres OD. This site is currently an old orchard and spruce plantation, is relatively level, and is obscured from the road by trees, shrubs, and an abandoned farm house. The elevation of the site allows for a gravity feed of treated effluent to the proposed outfall location in Bantry Harbour.

The scheme will be designed so that 6 DWF will be pumped directly to the treatment works, where preliminary treatment will consist of mechanically back-raked screens followed by a vortex-type grit removal system. Of this 6 DWF, 3 DWF will be overflowed downstream of the preliminary treatment works and discharged to a storm-water settlement tank before discharge to the new outfall via the proposed 1020m^3 tidal holding tank. The remaining 3 DWF will be provided with full secondary treatment. As proposed, secondary treatment will consist of extended aeration incorporating nitrification/denitrification and simultaneous phosphate precipitation.

All screenings and grit removed will be washed, compacted, and bagged. All sludge drawn off will undergo thickening and dewatering, with the resultant "sludge cake" being disposed of at a Cork County Council landfill site.

A schematic plan layout of the proposed treatment facility is shown in Figure 1-2.

TREATED EFFLUENT OUTFALL

The proposed location for the treated effluent outfall in Bantry Bay is approximately 250 metres from shore in the vicinity of "the Narrows" in approximately 6.5 metres of water. The treated effluent outfall pipe will commence at the tidal holding tank within the

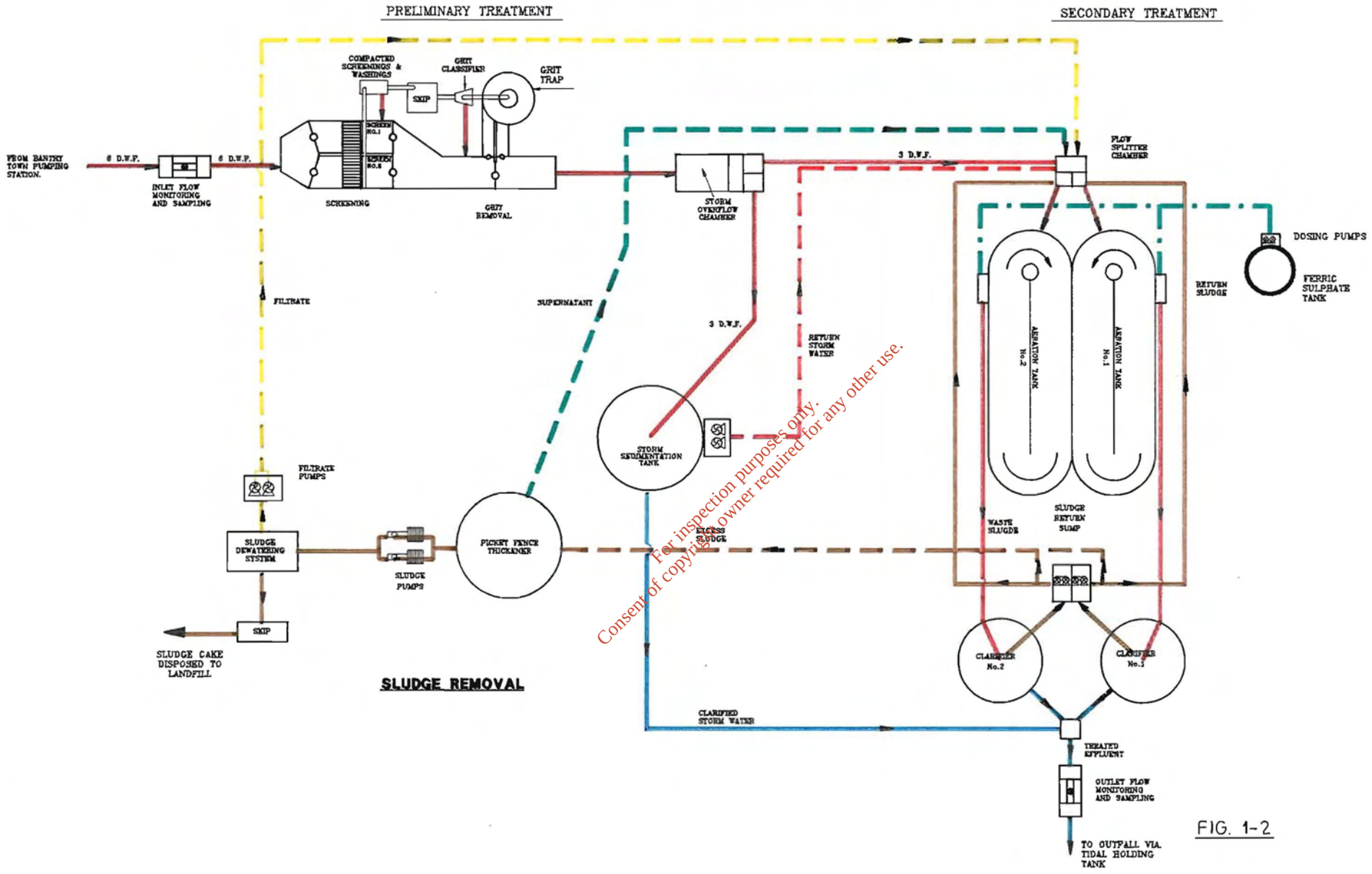

FIG. 1-2

REV	DATE	DESCRIPTION	LOC	DRN.	CKD.
0	Nov. '91	INITIAL ISSUE		J.A	J.McS

LEGEND

- Raw Influent
- Clarified Effluent / Clarified Storm Water
- Sludge / Sludge Return / Backwashings Return
- Waste Sludge
- Filtrate
- Supernatant
- Ferric Sulphate

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CONSULTING ENGINEERS & ARCHITECTS

CLIENT & PROJECT
CORK COUNTY COUNCIL
BANTRY SEWERAGE SCHEME

DRAWING TITLE
SCHEMATIC PLAN OF WASTEWATER TREATMENT PLANT OPTION 1
EXTENDED AERATION
CAROUSEL TYPE

DATE	DRAWN	CHECKED	SCALE	JOB NO.	DRG. NO.	REV.

treatment works site and proceed north-northwest along the airstrip road, past the airstrip, and into Bantry Bay. The route of this outfall will not create long-term impacts to the current use of this road because the road will be restored following construction. The outfall pipe will be entrenched into the Narrows channel bed, and a diffuser system will be installed to provide optimum diffusion and dilution of the treated effluent.

The top of the diffusers will be no more than 1 metre from the bay bed, thereby allowing 5.5 metres of shipping clearance. This depth is sufficient to accommodate ship traffic through the area.

Assessment of the predicted biological and bacteriological concentrations at all bathing areas and areas designated as shellfish waters, as found by mathematical model simulations carried out as part of the marine outfall survey, reveals that for the proposed effluent discharge location, the EC guideline limits are more than adequately fulfilled. In addition, an assessment of the predicted concentrations resulting from discharges from the proposed scheme reveals that an improvement in the water-quality in the bay area, sufficient to come within the approved category, will be achieved provided emissions to the bay from other sources are satisfactory.

1.2.2 CONSTRUCTION AND COMMISSIONING

Construction of the proposed wastewater transmission main from the existing pumphouse to the site of the proposed treatment works (approximately 1.8 km) will utilise the open-trench construction procedure. The trench will be excavated using a backacter machine on tracks. The 250mm pipe will be buried 1 to 2 metres deep, and the trenches will be backfilled and restored to pre-existing topography.

In the upland portions of the route, including along N71 (the Cork Road) and near the airstrip, the entire trench will be excavated. Fine gravel and pea gravel will be imported and used as a bed material on which the pipe will be laid. Restoration will include repairing any affected road macadam and restoring the grade and surface conditions.

In the foreshore portion of the route, from the cemetery to the airstrip, the construction methodology will be altered to limit construction-related impacts (soil erosion, sedimentation, turbidity, etc). The main will be excavated and installed in sections during low tidal periods to limit the flushing of disturbed sediments into Bantry Harbour. A backacter will be used to excavate only the length of trench in which

the main can be laid in each low-tide period. Sections will be backfilled each day following construction.

It is anticipated that the foreshore portion of the transmission main can be constructed in 20 to 30 metre sections per day and that construction of the entire wastewater transmission main will take approximately one month.

Construction of the submerged portion of the treated effluent outfall pipe will be accomplished by trenching, laying the pipe, and backfilling the trench to pre-existing benthic conditions. Pipe will be fitted and assembled on shore and dragged into place as segments are completed. Completion of this portion of the effluent main is expected to be completed within nine months.

The entire 1.01 hectare treatment works site will be cleared. Minor site-grading may be needed, but this will not affect the general topography of the area. It is anticipated that construction of the treatment works will be completed within a minimum of nine months and will be completed concurrently with the transmission main.

Based on current construction estimates, approximately 15 man-years of employment will be required to construct the proposed sewerage scheme. This figure may approach 20 man-years depending on potential construction-related constraints such as inclement weather, unavailability of materials or machinery as scheduled, or unforeseen complications (i.e. discovery of previously unknown archaeological sites). Measures to ameliorate the impacts of construction activities are discussed in detail in Section 4 (Impact Amelioration) of this EIS.

Construction of the Bantry Sewerage Scheme components will take approximately nine months. Commissioning of the sewerage scheme, including treatment works, is expected within 12 months from the beginning of construction.

1.2.3 OPERATION

Operation of the treatment works (including pumping, treatment, and discharge) will be monitored and controlled by a compact motor control centre (MCC) panel, linked to field sensors/electrodes complete with some manual control actions. It is anticipated that one full-time person will be required to operate the facility.

Operation of the facility will result in the generation

of sludge and other emissions to the environment (i.e. odours, noise, treated effluent). These emissions are addressed in detail throughout this EIS and in the Preliminary Report.

1.2.4 PROPOSED WASTEWATER TREATMENT

In order to satisfy the applicable EC Directive, the proposed treatment works will include preliminary and secondary treatment. Based on the results of a model simulation of bacteriological and biological concentrations carried out as part of the marine outfall survey, it is concluded that no form of tertiary treatment and/or disinfection/sterilisation is needed.

As proposed, preliminary tretment will be in the form of mechanically back-raked screens followed by a vortex-type grit-removal system. All screenings and grit removed will be washed, compacted, and bagged. Preliminary treatment will take place at the proposed treatment works, but it is also proposed that the existing screens at the pumphouse be replaced by open-channel disintegrating units upstream of the sump.

Up to 6 DWF will be pumped directly to the preliminary treatment works. Three DWF will be overflowed downstream of the preliminary treatment works and discharged to a storm-water settlement tank before discharge to the new outfall via the proposed tidal holding tank. The remaining 3 DWF will be carried forward from preliminary treatment for full secondary treatment.

Secondary treatment will be in the form of extended aeration incorporating nitrification/denitrification and phosphate precipitation. As proposed, the treatment system will result in a 95% reduction in BOD, suspended solids, and total phosphorous, and an 80% reduction in faecal coliform bacteria and total nitrogen. Based on the preliminary and secondary treatment technology provided, the treated effluent discharged will contain approximately 20 mg/l of BOD, 30 mg/l of suspended solids, 2 mg/l of total phosphorous, and 15 mg/l of total nitrogen.

1.3 EMISSIONS TO THE ENVIRONMENT

Emissions to the environment from the proposed sewerage scheme will include discharges into Bantry Bay (e.g. treated municipal effluent and overflow storm waters) as well as emissions into the air (e.g. odours, noise). Sludge, produced as a byproduct of sewage treatment, will also be produced. The discharge of wastewater from Bantry Hospital entering the sewer collection system is also a concern due to potential

bacteriological and viral contaminants.

1.3.1 MUNICIPAL WASTEWATER

The design DWF for the proposed Bantry Bay Sewerage Scheme is 15.76 l/sec. The maximum design flow at the pumphouse is 10.4 DWF, or 163.8 l/sec.

As a result of this development, up to 3 DWF of secondary-treated effluent will be discharged into Bantry Bay, and up to an additional 3 DWF of overflow will be treated through a storm sedimentation tank prior to discharge into Bantry Bay. Any storm flows in excess of 6 DWF will be discharged directly into Bantry Bay via the existing pumphouse and outfall.

The design standards will achieve 20 mg/l BOD, 30 mg/l suspended solids, 2 mg/l total phosphorous, 15 mg/l of total nitrogen, and an 80% reduction in faecal coliform for the treated municipal effluent.

The final discharge of treated effluent from the treatment works (up to 6 DWF i.e. 3 DWF secondary treated effluent and 3 DWF treated stormwater) will be via the proposed tidal holding tank and marine outfall. The point of discharge from the outfall will be located in the Narrows portion of Bantry Bay.

1.3.2 STORM-WATER DISCHARGE

Since the existing sewer network in the Bantry area is a combined system, very large quantities of surface water are carried through the collecting system to the existing pumping station during storm conditions. In an effort to minimise the amount of storm water required to be carried to the new wastewater treatment plant, an assessment of the likely implications of discharging quantities of storm water overflow to the Alley and Mill rivers and the inner harbour area was carried out by E.G. Pettit & Co. Ltd. For the purpose of this EIS, this assessment is summarised herein. For further details, refer to the Preliminary Report.

Three locations exist within the current scheme where storm water overflows could be discharged. These locations are as follows:-

- The existing storm overflow chamber on Marino Street discharging to the Alley River, a tributary of the Mill River

- The existing storm overflow chamber on William Street discharging to the Mill River, and

- The existing town outfall discharging to the inner harbour.

In assessing the potential for utilising the Marino Street overflow chamber as part of the proposed scheme, both the biological and bacteriological effects on the receiving waters were considered. The main criteria adopted for choosing a suitable dry weather flow setting for the storm overflow was that at no time should the storm discharge raise the BOD of the receiving water by more than 1 mg/l outside the mixing zone. It was found that by setting the retention capacity of the chamber at 9 DWF, the 1 mg/l BOD limit would not be exceeded at any time.

The results indicate that the maximum increase in BOD in the Alley River would be 0.95 mg/l. It is expected that this maximum level would be attained on no more than seven occasions per year and would last for no longer than 30 minutes. Furthermore, it should be noted that the point of discharge to the Alley River is within the culverted section of the river upstream of its confluence with the Mill River. Upon reaching the Mill River, further dilution would reduce the maximum resultant BOD concentration to 0.19 mg/l.

A similar analysis was carried out for the existing storm overflow chamber at William Street, which currently discharges under storm conditions to the Mill River, downstream of the confluence with the Alley River. Due to the much larger assimilative capacity of the Mill River compared to the Alley River, it was found that a retention capacity of 6 DWF would be sufficient to ensure that the resultant increase in BOD in the receiving waters would not exceed 1 mg/l.

The results reveal a maximum expected increase in BOD of 0.39 mg/l due to the combined effect of the two storm overflows; this level is well within the guideline limit and implies that the suggested storm overflow settings for both chambers will not adversely affect the biological conditions of the receiving waters.

In terms of bacteriological contamination due to the discharge of excess urban wastewater from these two existing storm overflows, assessment was based on the likely resultant faecal coliform (fc) levels at two critical locations within the inner bay area (i.e. Reenrour Beach and the mussel farm northeast of Whiddy Island).

It has been found that due to the large dilution available in the Mill River, the resultant concentrations of faecal coliform per 100 ml discharging to the harbour via the Mill River will be less than 1% of the total concentration discharging to the harbour via the existing outfall under the same storm conditions. It can be concluded, therefore, that

the likely bacteriological effects due to the retention of these two storm overflows are negligible compared with the effects of a simultaneous discharge via the existing outfall.

It is recommended that, for the reasons described above, the two existing storm overflows be retained subject to modifications being carried out to the overflow weirs and throttle pipes. The modifications should be carried out such that the chambers conform to the flow regimes specified in this Report.

The third location for discharging stormwater, the existing Bantry Town outfall, is located at Black Rock and extends approximately 50 metres from the shoreline. The main problem associated with this discharge concerns the levels of total/faecal coliform bacteria that would result at the two critical locations described above.

1.3.3 ODOURS AND NOISE

Odour emissions from the proposed Bantry Sewerage Scheme will occur from the treatment works site and will be attributable primarily to the aeration tanks and the sludge storage and processing operations. Under optimum conditions of treatment and operating efficiency, relatively little odour should be perceived in the general area. Due to the relatively secluded nature of the treatment works site, it is anticipated that no odour will be perceptible along the shore or at nearby residences, particularly above background agricultural odours associated with the pastures in the vicinity of the treatment works.

Stabilised sludge will be removed from the site every four to five days. Trucks transporting the sludge will avoid populated areas to the extent possible and be washed following each transport so as to minimise any odours from the trucks.

Noise emissions resulting from construction activities (e.g. equipment, trucks, trenching etc.) will be minor and short term in duration. Any noise impacts will be minimised by permitting construction only during daytime hours. All trucks, equipment, and machinery will be maintained and installed with mufflers where appropriate to limit noise emissions. Noise emissions from the operation of the treatment works will occur but will be insignificant due to the projected levels of noise in relation to the distance to nearby noise-sensitive receptors and the flora around the site, that serve as a natural noise barrier.

1.3.4 WASTE DISPOSAL

Wastes generated during construction will include clearing debris (brush, stumps, rocks etc) from site preparation and debris (concrete, asphalt, wood, metal scrap etc.) generated during facility construction. All vegetative waste, including branches, small trees, and stumps, will be chipped and used as a mulch to limit erosion on exposed areas prior to reseeding. Other construction-related wastes will be disposed of off site either in an approved landfill or as fill material in land reclamation efforts.

Stabilised sludge will be produced by the proposed treatment processes (i.e. extended aeration). Due to the relatively modest size of the proposed scheme, the amount of sludge produced will not be large. Sludge will be thickened, dewatered, and stored on site in a covered trailer pending removal by truck. The stabilised sludge cake will contain approximately 15% solids. It is anticipated that approximately 6 cubic metres of sludge will need to be removed from the facility every three to four days. This waste product will be disposed of in an approved municipal landfill and will not be used for land-spreading on agricultural lands. Sludge will be periodically analysed for chemical, biological, and viral components prior to disposal in order to ensure that improper disposal and subsequent emission of potentially dangerous substances does not occur.

1.3.5 HOSPITAL WASTEWATER

The Bantry Regional Hospital currently has a capacity for 110 patient beds and 25 full-time residents, for a maximum total of 135 patients, including a two-bed isolation unit. The hospital uses an average of 400,000 gallons of water per month, which it discharges directly into the town sewerage system without any pretreatment. The primary concern regarding the discharge of hospital wastes is the potential presence of viral contamination.

Samples of hospital wastewater were collected from two locations within the Bantry municipal sewage collections system adjacent to the Bantry Regional Hospital. Wastewater samples were also collected at the Bantry Pumphouse. All of these samples were subjected to bacteriological and viral analyses so as to establish concentrations of potentially hazardous pathogens.

Analytical results of this sampling effort revealed that human enteric viruses were at concentrations below the detection limit in all of the 5 litre samples taken. This suggests that no pretreatment of hospital wastewater is required prior to discharge into the

municipal system. As a safeguard however, it is proposed to provide a separate drainage system for the 2 acute intensive care wards in the hospital. Wastewater from these wards will discharge to a new septic tank and soakway system.

1.3.6 DISCHARGE VIA EXISTING OUTFALL

The design philosophy adopted with regard to determining the maximum permissible discharges from the existing outfall was that the maximum faecal coliform concentration in the vicinity of the designated bathing area shall not exceed the guideline limit of 100 fc/100 ml. With regard to the shellfish areas, the design objective was to minimise the levels of faecal coliform such that the producing waters reach the approved category. To fall within the approved category, the shellfish-producing waters would have to demonstrate a geometric mean value of 14 fc/100 ml or less.

In determining the final faecal coliform concentrations, the concentration of the initial waste discharge was based on a raw effluent concentration of 1×10^7 fc/100 ml. For varying tidal and climatic conditions, the effects of discharging in excess of 3 DWF, 6 DWF, and 9 DWF via the existing outfall were assessed and the results tabulated.

The results reveal that discharges in excess of 3 DWF would, under both calm and windy conditions, cause faecal coliform bacteria concentrations at Reenrour Beach to exceed the guideline limits for bathing waters. Under wind conditions, a general concentration of about 10 fc/100 ml would result at the shellfish mariculture zone northeast of Whiddy Island. Although this level would satisfy the criteria for the "Approved" category, account must also be taken of the potential influence of the proposed treatment plant outfall further out in the harbour.

For discharges in excess of 6 DWF, the guideline limit of 100 fc/100 ml for bathing waters is exceeded only slightly at Reenrour Beach under windy conditions at low water. The resultant faecal coliform bacterial concentrations at the main shellfish-producing zone reach a maximum of about 5 fc/100 ml under windy conditions only. Under calm conditions, the resultant concentrations are nil.

It should be noted that discharges in excess of 6 DWF to the inner harbour via the existing outfall would be far less frequent than discharges in excess of 3 DWF. Furthermore, it can be expected that the majority of discharges would occur during the wet months of the year when, presumably, the bathing water would not be in use by the public.

For discharges in excess of 9 DWF, the improvement in the resultant concentrations is only slight when compared with discharges of greater than 6 DWF.

While a better water-quality standard may be attainable by discharging in excess of 9 DWF only, the level of improvement does not justify the estimated additional costs associated with pumping 9 DWF to the new wastewater treatment plant.

The potential biological effects of storm water overflow discharges from the existing outfall were also considered. The limiting factor adopted here, similar to what was done for the storm overflow chambers, was that the discharge should not raise the BOD of the receiving waters outside the mixing zone by more than 1 mg/l. It was determined that by installing a diffuser on the existing outfall, BOD levels would effectively be reduced to within the guideline limit.

It is recommended that, for the reasons outlined above, wastewater flows in excess of 6 DWF be pumped to the inner harbour via the existing outfall subject to a new diffuser being installed. Up to a maximum of 6 DWF shall therefore be pumped to the new treatment works.

Everything goes to Black Rock.

Replace pumps in

6 DWF Pumps

> 6 DWF → 10.4 DWF

4.4 DWF goes to Black Rock.

> 10.4 DWF dumped locally