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CORK COUNTY COUNCIL

ENVIRONMENTAL IMPACT STATEMENT

FOR

BANTRY SEWERAGE SCHEME

NON TECHNICAL Summary

BANTRY, CO. CORK

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February 1992

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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 outfall, so as to provide the town of Bantry with appropriate preliminary and secondary wastewater 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. From an environmental standpoint, this proposed improvement of the urban wastewater treatment scheme is necessary to protect public health from the continued discharge of untreated wastewater directly into Bantry Harbour; protect and enhance the highly productive and economically important commercial shell-fish operations within the harbour (e.g. mussels and scallops), and protect and preserve the natural environment and ecology of the harbour from continued degradation.

Currently, wastewater treatment provided prior to discharge consists solely of coarse screening of the effluent at the existing pump house. As proposed, new wastewater transmission mains would extend from the existing pump house/outfall location to a new treatment plant site located near Blue Hill. Up to six Dry Weather Flows (DWF) would be treated and discharged via a gravity-feed outfall main to the proposed discharge point located near "the Narrows" portion of Bantry Bay (see Fig. 1).

The primary Directive governing this project is 91/271/EEC concerning urban wastewater treatment. The Directive was issued in May 1991 and defines regulations for discharges to freshwater, estuaries and coastal waters. Article 77 of this EC document requires that discharges produced by a municipality having a population equivalent (PE) of 2,000 or more to freshwater estuaries shall have secondary treatment. Bantry Town has a PE of 6,000; it is proposed to treat the wastewater to a standard which complies with the EC Directive requirements.

Other EC Directives that are applicable and relevant to municipal wastewater discharge into a marine environment are: 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 shell-fish waters.

This 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.

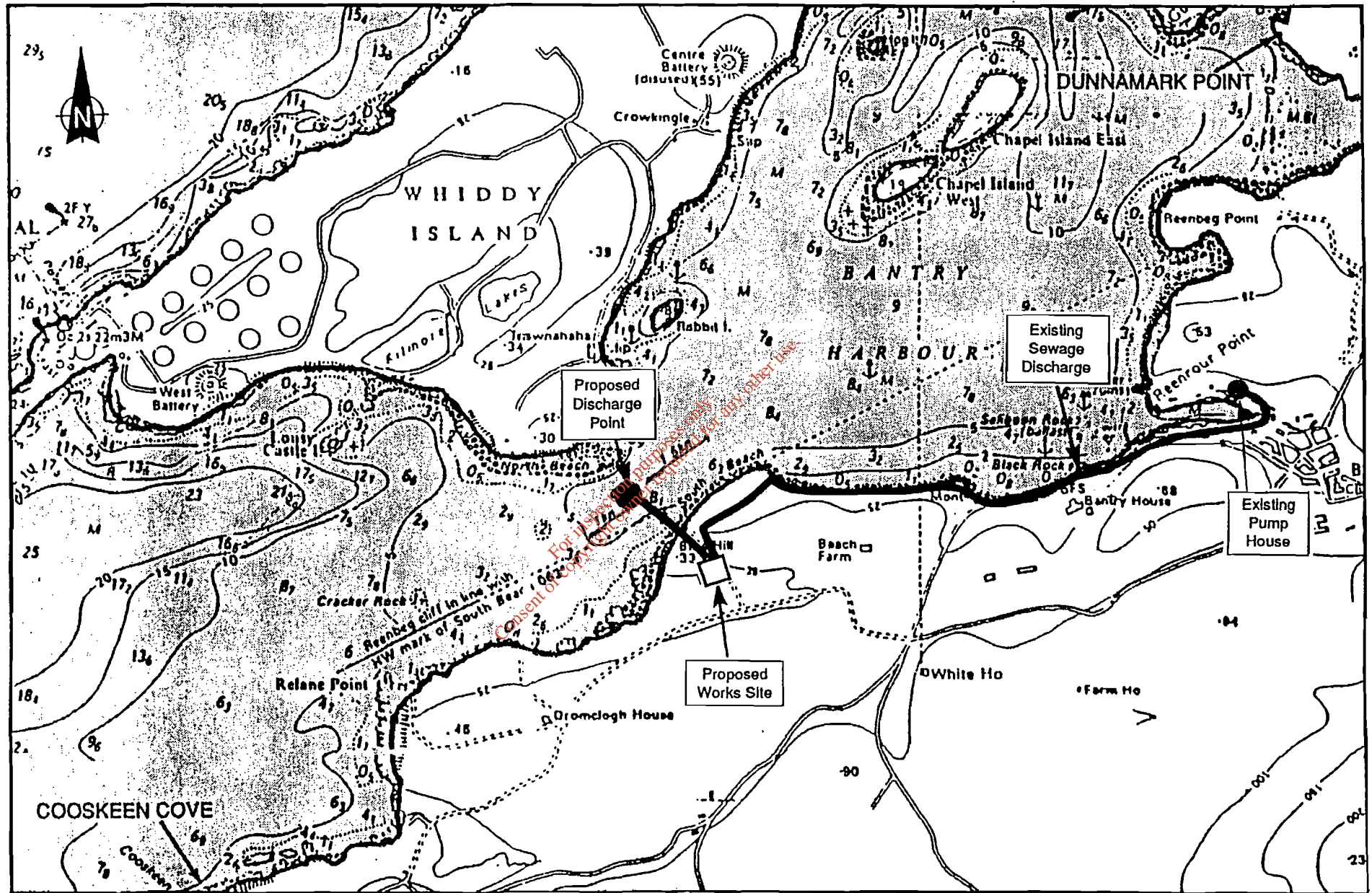


Figure 1
 PROPOSED BANTRY SEWERAGE SCHEME

This EIS concludes that the proposed development will result in improvement of the water quality of Bantry Harbour in the vicinity of 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 the commercial shell-fish beds, thereby promoting general long-term enhancement of this viable and productive resource.

This project will also 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 pipeline 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 to flora and fauna, air quality, noise levels, water quality, and the cultural heritage can be satisfactorily mitigated to reduce or eliminate potential environmental impacts.

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1. DESCRIPTION OF THE PROPOSED DEVELOPMENT

1.1 EXISTING FACILITIES

The existing sewage 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 diameter 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 1 Km east of the pumphouse along Cork Road.

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

The existing sewage collection scheme can be divided basically into two separate sections: namely, a northern section along Glengarriff 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 pumphouse. Both sections contain an overflow structure that allows flows in excess of six DWF to overflow into nearby rivers and into the harbour.

The storm water runoff in Wolfe Tone Square is collected by means of two 350mm diameter newly-laid storm sewers which carry storm water by gravity directly to the inner harbour area. There is to be provision for these storm water pipes to discharge to the existing pumphouse through the combined town sewerage scheme in the event of having storm and high tides occurring simultaneously.

1.2 PROPOSED FACILITIES DESIGN AND LAYOUT

As proposed, the new sewerage scheme would involve the construction of a new wastewater treatment works, new transmission mains, and a new treated-effluent submarine outfall to serve the current sewered portion of Bantry Town. The proposed treatment plant will include preliminary and secondary treatment as required by EC Directives. As illustrated in Figure 1, design and layout of the proposed facilities are as follows:-

PUMPHOUSE: 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 6DWF to the new treatment works and all overflows in excess of 6DWF directly into the harbour via the existing rising main and discharge outfall.

TRANSMISSION MAIN: The new transmission main would extend from its current terminus at the pumphouse along the Cork Road and follow the foreshore area to the site of the new treatment works near Blue Hill. This route is approximately 3 Km in length and would be buried 1-2 metres deep.

The foreshore route was considered preferable to a route following the Cork Road to the Westlodge Hotel and then southerly past the Ardeevin House to Blue Hill and the air strip. 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 work 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 wastewater 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. 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 tidal holding tank. The remaining 3 DWF will be given 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 an approved Cork Co. Council landfill site.

TREATED EFFLUENT OUTFALL: The proposed location for the treated effluent outfall in Bantry Harbour is approximately 200 metres from shore in the vicinity of "the Narrows" in approximately 6.5 metres of water. The treated effluent outfall main will commence at the treatment works site and proceed north-northwest along the airstrip road, past the landing strip, and into Bantry Harbour. The route of this main will not create long-term impacts to the current use of this

road, because it will be restored following construction. The outfall main will be entrenched into the bottom of the harbour, and a diffuser will be installed to provide optimum diffusion and dilution of the treated effluent.

Assessment of the biological and bacteriological concentrations at all bathing areas and areas designated as shell-fish waters, as conducted by E.G. Pettit & Co. 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 in the event of emissions to the bay from other sources being satisfactory.

1.3

EMISSIONS TO THE ENVIRONMENT

Emissions to the environment from the proposed sewerage scheme will include discharges into Bantry Bay (e.g. treated effluent and overflow storm waters) as well as emissions into the air (e.g. odours, noise). Sludge, produced as a byproduct of wastewater treatment, will also be produced.

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 via storm sedimentation tanks prior to discharge into Bantry Bay. Any storm flows in excess of six DWF will be discharged directly into Bantry Bay via the existing pumphouse and outfall. In addition, storm water from Wolfe Tone Square will continue to be discharged directly into the inner harbour area.

Odour emissions from the proposed sewerage scheme will occur from the treatment works site only and will be attributable primarily to the aeration tanks and the sludge-processing operations. Under optimum conditions of treatment and operating efficiencies, 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 cattle pastures in the vicinity of the treatment works.

Noise emissions resulting from construction activities (e.g. equipment, trucks, trenching etc) will be minor and short-term in duration. Noise emissions from the operation of the 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 serves as a natural noise barrier.

Sludge will be produced via the proposed treatment processes (e.g. settling, secondary treatment). Due to the relatively modest size of the proposed scheme, the amount of sludge produced will not be large. It is anticipated that approximately 6 cubic metres of sludge cake will need to be removed from the facility every 3-4 days. This waste product will be disposed of in an approved municipal landfill site.

In effect, the proposed scheme will result in the significant reduction in the emissions of wastewater into Bantry Bay and considerable improvement to water quality. Secondary emissions (e.g. noise, odours, dust, sludge etc.) will be insignificant.

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2. SUMMARY OF ENVIRONMENTAL IMPACTS

2.1 HUMAN ENVIRONMENT

Impacts to human beings and the human environment from this type of project may typically involve effects on population (proximity and numbers), human activities, land-use patterns (e.g. residential, commercial), agriculture, the local economy, tourism, traffic and transportation, and visual resources. In general, the project as proposed will result in no significant negative impacts and will, in actuality, result in generally positive impacts to human resources such as the local economy (e.g. commercial fisheries) and public health.

The proposed project will have no direct impact on current population and development patterns but may indirectly promote growth via extension of wastewater mains to previously undeveloped areas. In the case of residential development, a slight increase in population may result. Impacts on human activities, such as fishing, water-related recreation, and general enjoyment of the Bantry Harbour, will be positive due to the elimination of the discharge of untreated wastewater. Human activities involving enjoyment of the coastline and foreshore area will be temporarily disturbed during construction; however, mitigation and restoration measures will ensure that this area is restored to its original condition and result in no long-term negative impacts.

The proposed sewerage scheme will cause long-term impacts to the land use of the proposed 1.01 hectares site of the treatment works, resulting in a change from an old-field orchard and spruce plantation to a municipal/industrial-type use. The location of the treatment works may limit future potential development of adjacent parcels (particularly for residential use), but this area does not currently exhibit high development pressure and would not reasonably be expected to in the near future. Impacts to nearby grazing and agricultural land will be insignificant. Land-use patterns on a town-wide basis would not be directly affected, although future extension of wastewater mains could promote development of certain uses (i.e. residential, industrial) in selected areas.

Impacts to the local economy are anticipated to be generally positive due to the improvement of water quality and its subsequent positive effects on the local commercial shell-fish industry. The continued viability of this industry, including over 150 full-time, part-time, and seasonal jobs, is critical. Wastewater from Bantry Town constitutes the largest single discharge into Bantry Bay. Discharges from other sources e.g. agricultural - remote residential contributions etc., also contribute to the necessity

for the present shell-fish purification plants. The implementation of this scheme is a necessary and productive step in ensuring the future viability, productivity, and vitality of this industry.

Impacts to tourism will likely not be significant, but the projected improvements to water quality in the harbour could likely encourage use and enjoyment of this resource (e.g. fishing, boating, bathing).

Construction of the proposed scheme will result in a short-term temporary increase in traffic due to the movement of construction equipment and machinery, but, such a traffic increase will last for the duration of construction only. Operation of the treatment works will result in an insignificant increase in vehicular traffic accessing the facility. Any increase will be attributable to the one full-time employee who will work at the facility and to trucks and service vehicles making deliveries or removing wastes (e.g. sludge). Sludge removal will require one truck trip every 3-4 days.

This increase in traffic will not cause traffic volume problems along local roads. In general, trucks associated with the treatment works will not be large (5 cubic metres), and thus traffic-related inconveniences will be no more severe than current situations experienced with the movement of farm equipment or local truck traffic.

Impacts to visual resources will not be significant due to the relatively secluded nature of the treatment-works site and its location surrounded by trees and shrubs. The treatment works will not be visible from Bantry Bay, the inner harbour, or the town centre. The transmission mains and outfall will not be visible following construction.

2.2

FLORA AND FAUNA

Implementation of the proposed Bantry Bay Sewerage Scheme will have short and long-term minor effects on the flora and fauna associated with the various components of the scheme.

Construction of the proposed treatment plant will result in the permanent conversion of approximately 1.01 hectares of native vegetation to municipal/ industrial use. This impact will be relatively minor due to the human-influenced nature of the existing communities (early successional old-field, hedgerow, old orchard and spruce plantation) and the relative abundance of such habitat in the general vicinity of the treatment works site.

The wastewater transmission main that will convey wastewater from the existing pumphouse to the treatment

works will cause short-term minor impacts to terrestrial and littoral marine resources. The first approximately 1.5 Km of the transmission main will be installed within the existing Route N71 wayleave, thus avoiding impacts to flora and fauna. The main then diverges from the road into the Bantry Harbour foreshore area. The relatively protected and low wave-energy environment in this portion of foreshore has allowed for the development of a biologically rich benthic community within the intertidal zone. This rich community promotes utilization of the foreshore area by a variety of shorebirds and waterfowl. Operation of heavy equipment for trenching and pipe installation will result in direct and indirect impacts to flora and fauna such as shell-fish and crustaceans during construction. Immobile organisms such as mussels, oysters, clams, limpets, and various algae will experience direct mortality and disruption of substrata characteristics. Nearby benthic and pelagic communities may be affected by sedimentation resulting from disturbance and suspension of marine sediments in the water column. The zone of sedimentation impacts is expected to be minimal due to the generally coarse nature of the sediments (i.e. sand, gravel and cobbles).

Construction activities will temporarily preclude usage of the area by a variety of shorebirds and waterfowl that exploit the resources of the foreshore area. Avifauna, fish, molluscs and crustaceans are expected to reoccupy the foreshore area shortly after cessation of construction activities. Recolonization of benthos after trenching is generally very rapid depending upon the magnitude and season of the disturbance. Full recovery of the intertidal benthic community is expected to be realized within two years.

At approximately 1.6 Km the wastewater transmission main will leave the foreshore area and transverse a maintained grassy area adjacent to an existing airstrip. Impacts to flora and fauna in this community will be insignificant and limited to the period of construction.

The last 0.19 Km of the transmission main will be routed along an existing roadway, thus avoiding impacts to flora and fauna.

The treated effluent discharge main will convey treated effluent to a discharge point in Bantry Bay. The land-based portion of this main will be routed along an existing roadway and, as such, will not affect flora and fauna. The submarine portion extending across the floor of Bantry Bay to the discharge point will cause temporary minor impacts to benthos during construction as a result of disturbance of bottom sediments.

The proposed action is expected to result in overall improved water quality in Bantry Harbour due to reductions in nutrient, BOD, and bacteriological loadings, thus improving conditions for marine flora and fauna. Discharge of secondary treated wastewater at the proposed discharge point in the Narrows area of Bantry Bay is expected to have no adverse impact on marine flora and fauna in the immediate vicinity of the discharge. BOD, nutrient, and bacteriological concentrations will be in attainment of EC guidelines for such parameters in marine waters. Results of mathematical modelling of bacteriological and biological concentrations conducted by Irish Hydrographic Surveys Ltd. conclude that no significant impacts to marine flora and fauna will occur that would require implementation of tertiary treatment and/or disinfection/sterilisation.

Secondarily-treated wastewater discharged in the Narrows of Bantry Bay will not affect existing shell-fish nurseries in the north end of Bantry harbour. Furthermore, areas southwest of Whiddy Island proposed for future shell-fish cultivation by the Bantry Fish Farming Co-Operative Society, Ltd. will not be affected by the proposed action. The siting of the diffuser structure at the effluent outfall is not anticipated to affect ship navigation, due to the depth of the water (6.5 meters), and the fact that the area in question is not dredged.

2.3

AIR QUALITY AND NOISE LEVELS

The proposed Bantry Bay Sewerage Scheme will have short-term and long-term minor effects on air quality and noise levels.

Construction activities will cause minor degradation of air quality due to construction-vehicle exhaust emissions and generation of fugitive dust. These impacts will be restricted to the construction phase.

Construction of the proposed facilities will also result in temporary increases in the ambient sound environment in the immediate vicinity of the project site. These impacts will be restricted to the construction phase.

Operation of the facility will create wastewater-related odours in the immediate vicinity of the operating plant. This impact is expected to be minor and is unlikely to represent a nuisance to nearby residences, the closest of which is approx. 175 metres to the northwest.

Operation of the facility will create a slight increase in ambient sound levels in the immediate vicinity of the plant. However, this noise will be far below nuisance levels at the nearest noise-sensitive areas and will not preclude wildlife from using the vegetated areas adjacent to the site.

2.4 LANDSCAPE

The landscape of the project area consists primarily of a coastal/marine environment, flat to gently rolling topography, and a mixture of vegetation from grassy to wooded areas. A portion of the proposed route of the wastewater transmission main traverses a rocky intertidal zone that includes productive habitat for many marine species. In the vicinity of the proposed route, many manmade features influence the landscape, including the Bantry House, the Cork Road, an airstrip, and a cemetery. The portion of the route from the pumphouse to the air field is relatively level, but inland elevations quickly rise in several areas as hills and generally rolling terrain predominate. The proposed location of the treatment works is an upland area near the top of a hill in an old orchard area surrounded by trees and shrubs. The landscape of this site is significantly different from that of the foreshore route of the wastewater transmission main.

The proposed sewerage scheme will not significantly impact the landscape of the project area. Impacts to the foreshore area due to the construction of the wastewater transmission main will be temporary, limited generally to the period of construction, and can be mitigated so as to reduce or eliminate potential impacts. Landscape-related impacts from the construction and operation of the treatment works will generally not be significant for the following reasons:-

- Only a relatively small land area will be needed (e.g. 1.01 hectares)
- The site is visually screened from nearby roads (and thus is not visually perceptible to a large number of people)
- The site is located on top of a hill inland from the coastal area (and thus is not visible from Bantry Bay)
- The project will not require substantial site grading (thus not impacting existing topography or natural land features).

2.5 GEOLOGY AND SOILS

The West Cork region of Ireland is characterised by rolling hills to low mountains underlain by carboniferous slate and Upper Old Red sandstone

deposited during the Paleozoic period. Superficial geology in the Bantry area consists of Black Slate formation bedrock overlain by glacial till of variable thickness and composition.

The proposed Bantry Bay Sewerage Scheme components will be situated on relatively level sites, thereby minimising the need for grading and topographic alteration. Exploitation of significant mineral resources will not be precluded by development of the proposed project.

Construction of the proposed sewerage scheme will result in long-term and short-term minor impacts to soil resources. Long-term loss of soil productivity will occur in the areas directly covered by the wastewater treatment works facilities. Adjacent areas disturbed during construction will be recontoured, fertilized and revegetated, thus minimising long-term impacts to soil productivity.

Since the majority of the wastewater and effluent mains will be aligned along existing roadways or along the foreshore, little soil disturbance will occur. Construction of the segment of wastewater main across the area adjacent to the airstrip will result in temporary disturbance to soil resources. Impacts will be minimised by segregating topsoil from over the trench and revegetating with a suitable conservation seed mixture. Some soil compaction may occur due to operation of heavy machinery, but this impact is of minor concern because the area is maintained in an idle, grassy state not utilized for agricultural activities.

2.6 HYDROLOGY AND WATER QUALITY

The proposed Bantry Bay Sewerage Scheme will have long-term and short-term minor effects on water quality.

Construction of the land-based components of the scheme may result in some temporary degradation to Bantry Bay water-quality in the immediate vicinity of the construction activities. This impact would be caused primarily by overland storm-water flow transporting disturbed soil particles into adjacent receiving waters. This impact would be minimised by implementation of sedimentation - and erosion-control measures and limited to the period of construction. Groundwater resources are not expected to be affected by the proposed action.

Construction of the submarine portion of the wastewater transmission main and the treated effluent outfall main will cause temporary minor impacts to water quality resulting primarily from the suspension of disturbed

sediments into the water column. This impact will be minor and related primarily to the period of construction and shortly thereafter, until the sediments have stabilised.

The proposed Bantry Sewerage Scheme will cause a long-term improvement of water quality conditions in Bantry Bay, particularly in Bantry Harbour, as a result of the proposed secondary treatment of urban wastewater. Up to 1.4 million litres per day of raw wastewater is discharged into Bantry Harbour, containing a total of approx. 360 kg of 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 treat the wastewater to EC Directive standards, which will result in approx. 95% reduction in BOD, suspended solids, and total phosphorous and an 80% reduction in faecal coliform bacteria and total nitrogen. This significant improvement of wastewater quality, in conjunction with a discharge site outside the main body of Bantry Harbour that will allow for improved mixing and dispersion of wastewater, will result in a long-term improvement of water quality in the inner harbour and the Bantry Bay ecosystem as a whole.

2.7

CULTURAL HERITAGE

The proposed Bantry Bay Sewerage Scheme is located in a region with a long history of human occupation dating to Celtic times. This cultural history is reflected in the numerous known archaeological resources in the general vicinity of Bantry Town. Such cultural resources include prehistoric ring forts and standing stones, as well as more recent historical buildings, batteries, and cemeteries.

Notable cultural resources within 0.8 Km of the project components include a standing stone in the Townland of Beach; a ring fort on Blue Hill in the Townland of Beach; a garden feature, a graveyard, a friary, and an iron-working site in the Townland of Abbey; and the Bantry House in the Townland of Seafield.

Of these, the ring fort on Blue Hill, located approximately 175 metres northwest of the treatment works site, is the closest to the proposed project.

The proposed treatment works will be located adjacent to the ruins of a mid-19th. century farm house and associated outbuildings and may result in some disturbance to this historic structure. However, cultural resources of this sort are common in the region and not considered of major cultural importance. No known significant cultural resources will be affected by construction of the proposed sewerage scheme. Unknown cultural resources encountered during the construction phase will be

fully evaluated by an archaeological expert.

Aboveground components of the treatment works will have no major negative aesthetic impact on surrounding known cultural resources.

2.8 MATERIAL ASSETS

Material assets likely to be affected by construction and operation of the proposed sewerage scheme include existing recreation resources and recreational potential; development potential; and the assimilative capacity of Bantry Bay.

Recreational resources likely to be affected include primarily water-related activities such as boating, fishing, and bathing, and land-related activity such as tourism at the Bantry House and walking along the shoreline. The proposed project will likely result in improved fishing and bathing (e.g. direct water-contact) activities due to improved water quality. The project will result in negative short-term impacts on the use of the shoreline and foreshore area due to construction of the transmission main; however, the impacts will be temporary and will only occur during construction activities.

Recreational potential will generally be improved due to the provision of wastewater treatment that will improve water quality and the local fisheries resources.

In addition, by allowing future development to occur without degrading the environment (via wastewater discharge), the development potential of Bantry Town will be enhanced. The provision and/or exclusion of sewers and wastewater treatment capacity also allows the local authority the opportunity to identify certain areas for growth, or for limited growth. Extending sewers to a particular area, for instance, will allow development (e.g. residential, commercial, or industrial) to occur within the new "service area" without the need for on-site wastewater treatment, thus providing an opportunity to encourage or discourage development where desired.

Implementation of the proposed sewerage scheme will result in generally positive effects on the assimilative capacity of Bantry Bay by effectively eliminating the discharge of raw, untreated wastewater from Bantry Town into the harbour. This will allow for an improved capacity to assimilate natural inputs, as well as other pollutants or sources of wastewater discharge.

WASTE DISPOSAL

Waste products will be generated via the construction and operation of the proposed sewerage scheme. Construction-generated wastes will typically include concrete and pavement (from roadways), brush, rocks and wood. These materials are not considered harmful or toxic and thus will be available for use as fill material. Wastes generated from the operation of the scheme will include grit, screenings, and sludge. All screenings and grit removed will be washed, compacted, and bagged prior to disposal. All sludge drawn off will undergo thickening and dewatering. Grit, screenings, and "sludge cake" will be disposed of in a nearby Cork County Council landfill site. All sludge generated at the treatment works is aerobically stabilised within the extended aeration system prior to draw off. All other waste material (e.g. used process chemicals, cleaning supplies) will be disposed of in an approved manner.

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3. IMPACT AMELIORATION

In general, impacts related to the construction and operation of the proposed sewerage scheme will be largely beneficial to the bay, the inner harbour, the local economy (e.g. the Shell-fish industry), and the public health and enjoyment of water-related resources. Negative impacts and effects will be minor and largely related to construction activities. These short-term and temporary adverse impacts will largely affect flora and fauna resources, air quality and noise levels, water quality, and possibly cultural heritage resources. Appropriate amelioration and mitigations measures to reduce or eliminate these minor impacts are summarised below.

3.1 FLORA AND FAUNA

Impacts to terrestrial flora and fauna will be minor and associated primarily with the treatment works site and the portion of the wastewater transmission main adjacent to the existing airstrip. Construction of the proposed treatment works will result in the conversion of approx. 1.01 hectares of old field/orchard and spruce plantation cover types to municipal/industrial type use. Although a net loss of vegetative cover will occur, the communities to be affected are of common types and are well-represented in the surrounding area.

Impacts to terrestrial flora associated with the installation of the wastewater treatment main will be short-term and minor. During construction, the existing herbaceous community will be removed from the transmission main right-of-way. Following construction, topsoil will be restored across the disturbance area, and the site will be fertilised and reseeded to an acceptable herbaceous community. Preconstruction uses of the area will be permitted; thus, no long-term impacts will result.

Construction of the proposed treatment works will result in a permanent conversion of wildlife habitat, thereby causing localised impacts to wildlife populations. This impact is expected to be minimal due to the relatively common types of habitat to be disturbed and the availability of similar habitat adjacent to the proposed site. No special ameliorative actions will be required to minimise impacts to fauna at the treatment works site.

Construction of the foreshore portion of the wastewater transmission main and the submarine portion of the treatment effluent outfall main will have short-term minor impacts to avifauna and marine organisms. Impacts to marine flora and fauna can be largely ameliorated by a combination of timing restrictions, minimisation of disturbance area, and implementation

of environmentally sound construction practices.

Construction of the proposed facilities affecting the marine environment should be scheduled to avoid fish and bird migration periods and to coincide with periods of lowest biological activity in the intertidal zone. To this end, construction would be best implemented during the winter months.

Construction in the foreshore area will be conducted only during periods of low tide (3 to 4 hours per day) so as to minimise disruption of sediments and creation of turbidity plumes. The proposed construction technique will utilise a tracked backhoe to dig the pipeline trench. Approximately 20 to 30 metres of trench will be excavated at one time. The pipeline will be installed and the trench backfilled each day before flood tide. Despite this precaution, some turbidity and sedimentation of adjacent areas will occur. However, impacts from suspended solids and sediment on fish, plankton, and benthos are expected to be minor and short-term in duration.

Impacts to flora and fauna in the intertidal zone will also be minimised by reducing the area of disturbance to that essential for safe operation of equipment and stockpiling of trench spoil. Construction access will be limited to specific, well-defined corridors, and construction materials and equipment will be stored outside of the intertidal zone. Construction should be completed as promptly as possible and the areas of disturbance restored to original contours.

Pipeline installation within the foreshore area will be aligned as closely as possible to the seawall delineating the adjacent uplands (approximately 4 metres). This action will minimise impacts to the rich middle intertidal zone community and increase the daily working time, thus increasing the rate of installation.

Potential long-term impacts to marine benthos in the vicinity of the effluent outfall will be ameliorated by the installation of a diffuser structure that will facilitate dispersion and natural assimilations of the effluent.

3.2 AIR QUALITY AND NOISE LEVELS

The proposed Bantry Bay Sewerage Scheme will have minor impacts on air quality and ambient noise levels in the vicinity of the project.

Construction activities will create temporary increases in air emissions, fugitive dust, and noise levels in the project vicinity. These impacts will be limited to the construction phase. Construction-related

noise impacts will be ameliorated by proper mufflers on construction equipment and undertaking construction activities during normal working hours.

Air-quality impacts will be minimised by maintaining equipment in efficient operating condition to reduce exhaust emissions. In addition, fugitive dust will be suppressed as needed by watering of dry dust-producing areas.

Operation of the wastewater treatment works will create a low-level increase in the ambient noise level in the immediate vicinity of the treatment works. This operating noise is not expected to be perceptible at the nearest noise-sensitive areas, which are at least 175 metres distant. Low-level noise emissions will be buffered by natural tree and shrub vegetation surrounding the site. Additional vegetative buffering may be installed if it is necessary to reduce noise levels further.

Operation of the proposed treatment works will result in emission of wastewater-related odours in the immediate vicinity of the plant. Such odours will be kept to a minimum through efficient operation of the new plant. Wastewater odours are not expected to be perceptible above background agricultural odours at the nearest residences.

3.3

WATER QUALITY

Impacts to Bantry Bay water quality caused by potential overland stormflow transport of disturbed soil particles will be minimised by employing sound erosion-control and soil conservation practices during construction. Such practices include installation of silt fencing around disturbed areas, installation of sediment retention basins, and revegetation with a seed mixture containing a quick cover component.

Water-quality impacts to Bantry Bay resulting from construction activities in the foreshore will be short-term and minor. Such impacts will be minimised by employing actions discussed in Section 3.1 ameliorating impacts to marine flora and fauna.

Potential minor localised impacts to water quality in the immediate vicinity of the treated-effluent outfall will be minimised by installation of a diffuser to maximise mixing and dilution. Any minor localised water-quality degradation in "The Narrows" area will be vastly offset by the overall improvement in the water quality of Bantry Harbour anticipated as a result of the proposed action.

3.4

CULTURAL HERITAGE

The proposed Bantry Bay Sewerage Scheme will not affect known cultural resources either directly or indirectly. However, the potential always exists to inadvertently impact unknown resources during construction activities. If such resources are encountered, work will be temporarily stopped until additional analysis can be conducted. Unknown cultural resources encountered during the construction phase will be fully evaluated by a qualified archaeologist familiar with the cultural resources of the region. Amelioration of impacts to such presently unknown resources will be implemented as needed based on the recommendation of an archaeological expert.

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4. SUMMARY OF ALTERNATIVES

4.1 ENVIRONMENTAL COMPARISON OF ALTERNATIVE SITES/ROUTES

In order to identify and evaluate viable project alternatives, a comparative alternatives analysis was conducted by Ecology and Environment. This analysis examined four sites for the treatment works, three routes for the wastewater transmission main, three routes for the terrestrial portion of the treated effluent outfall main, four routes for the submarine portion of the treated effluent outfall main, and two locations for the discharge point. The purpose of this analysis was to evaluate and compare each of the alternative sites/routes from a purely environmental standpoint.

Based on this alternatives analysis, and upon engineering and cost data, a preferred design scheme was selected by E.G. Pettit & Co. This preferred scheme is identified and addressed throughout this EIS.

Alternative components, as discussed in the alternatives analysis and highlighted below, are illustrated in fig. 2.

4.2 TREATMENT WORKS ALTERNATIVES

Treatment Works Alternative Site 1 is located approximately 2.01 Km west of Bantry Town on the northwest corner of the intersection of the Dromclogh Road and the airstrip/beach access road. Treatment Works Alternative Site 2 is located approximately 92m north of Alternative Site 1 on the west side of the airstrip/beach access road. Treatment Works Alternative Site 3 is located on a level, grassy area adjacent to the existing airstrip, and Treatment Works Alternative Site 4 is located along N71 about 0.8 Km west of Bantry Town (adjacent to the Bantry House).

4.3 TRANSMISSION MAIN ALTERNATIVES:

Transmission Main Alternative Route 1 extends from existing pumphouse along Harbourfront Road (Route N71). At approximate 1.5 Km point the road diverges from the waterfront and traverses southeasterly up a gentle grade. At approximate 2.2 Km point the Route N71 intersects a secondary road oriented in an east-west direction. At this point, Alternative Route 1 turns west on the secondary road and proceeds 0.8 Km to Treatment Works Alternative Site 1 at the intersection of the Dromclogh Road and the airstrip-beach access road. If Treatment Works Alternative Sites 2 or 3 were to be selected, Transmission Main Alternative 1 would continue north along the airstrip/beach access road to either of the respective sites. If Treatment Works Alternative Site 4 was selected, Transmission Main Alternative Route 1

would continue north along the airstrip/beach access road to either of the respective sites. If Treatment Works Alternative Site 4 was selected, Transmission Main Alternative Route 1 would extend along Route N71 for about 215m from the existing outfall site to Treatment Works Alternative Site 4.

Transmission Main Alternative 2 begins at the existing pumphouse, extends approximately 1.5 Km along Harbourfront Road (Route N71), then diverges slightly north off the road and on to the foreshore area. The transmission main would extend along this area for approximately 1.1 Km to the edge of the airstrip. To minimise impacts to marine organisms, the pipeline will be installed as high on the shore as possible, preferably above the high-tide line. If Treatment Works Alternative Site 3 was selected, the main transmission line would extend approximately 0.4 Km across the airstrip property to the site. If Treatment Works Alternative Sites 1 or 2 were to be selected, the alternative transmission main would extend an additional 0.3 and 0.2 Km respectively, along the airstrip access road.

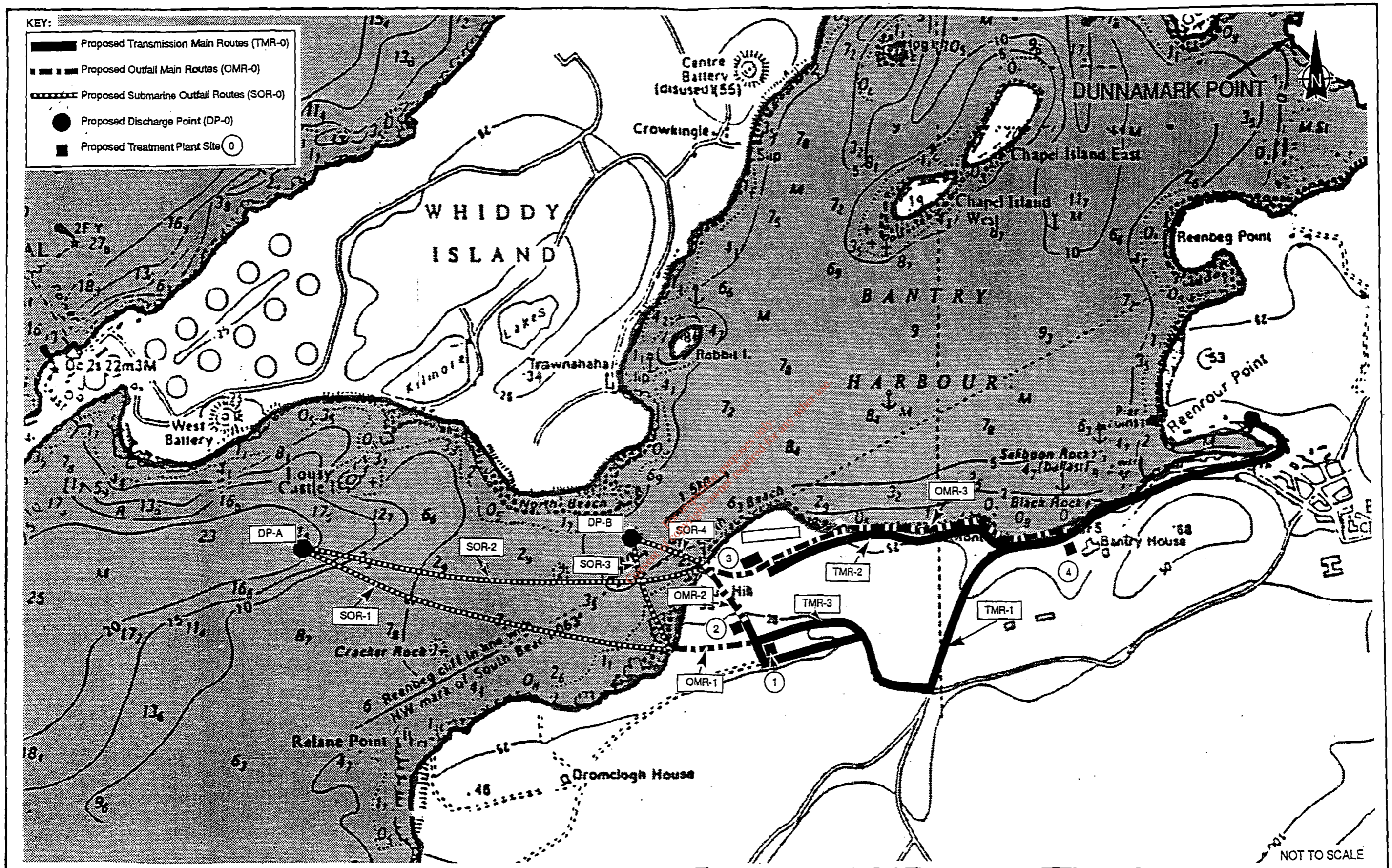
Transmission Main Alternative 3 is the same as Alternative 1 up to approximately 2.5 Km. At this point, the proposed pipeline diverges from the road in a northwesterly direction and transverses along a hollow on clear-cut forestry lands.

4.4

TREATED EFFLUENT OUTFALL MAIN ALTERNATIVES

Treated Effluent Outfall Main Alternative 1 could be used for both Treatment Works Alternative Sites 1 and 2. The terrestrial portion of the outfall main would utilise an area of open, active farmland that slopes gently down to the west and out to Bantry Bay. This area appears to be reclaimed salt marsh or mud-flat land that has been segregated from Bantry Bay by construction of a berm at the bay shore. Impacts to farm soils and a freshwater Phragmites marsh in the area would be best minimised by excavating an existing drainage ditch across the site and installing the pipe in the bottom of the ditch. At the end of the land-based portion of the outfall, the pipeline should diverge slightly north to minimise construction through marsh and avoid disturbances to a shallow intertidal gravel bar offshore.

Treated Effluent Outfall Main Alternative 2 would transport treated wastewater from either Treatment Works Alternative Site 1 or 2 to the shore of the bay, where it would be conveyed to one of the discharge points. This alternative, which would be installed within the airstrip access road, would not require acquisition of wayleave.



Treatment Effluent Outfall Main Alternative 3 would convey treated sewage from Treatment Works Alternative Site 4 to the submerged outfall point. As illustrated in Fig. 2, this outfall alternative would essentially follow the same route as Transmission Main Alternative 2 and result in the same types and magnitudes of impacts.

Regarding the submerged portions of the various alternative submerged-outfall pipelines, the primary differences between these alternatives are related to overall length, which will be reflected in engineering and construction costs. Disturbance to the benthic marine ecosystem is also a concern. Submerged Treated Effluent Outfall Main Alternatives 1 or 2 would convey treated wastewater to the deep-water discharge point southwest of Lousy Rocks (Discharge Point A). Submerged outfall pipes for alternatives 1 and 2 are each approximately 2.9 Km in length.

Submerged Treated Effluent Outfall Main Alternative 3 would convey treated sewage from land-based Outfall Main Alternative 1 to Discharge Point B. This alternative is approximately 1 Km in length. This alternative would result in less disturbance to estuarine sediments than outfalls main alternatives 1 or 2. However, Alternative 3 is oriented perpendicular to the direction of tidal currents in Bantry Bay and may be more subject to erosion and interference with bottom marine-organism migration.

Submerged Treated Effluent Outfall Main Alternative 4 would convey treated wastewater from land-based Outfall Mains 2 or 3 to Discharge Points B in Bantry Bay. This outfall alternative is the shortest of the submarine pipelines 0.6 Km and has similar advantages and disadvantages as Submerged Treated Effluent Outfall Main Alternative 3.

4.5

OUTFALL LOCATIONS

Based on hydrographic studies conducted in Bantry Bay by Hydrographic Surveys, Ltd. two alternative discharge points have been identified as potentially suitable. The first of these, Discharge Point A, is located southwest of Lousy Rocks in approximately 40 m of water. The second, Discharge Point B, is located in the narrow channel north of the airstrip, in about 6.5m of water. As discussed in the accompanying Preliminary Report, there is more than adequate assimilative capacity for the discharge at both locations. Based on the assessment of the likely implications on the receiving waters and taking into account existing and future conditions, uses and development plans of the bay area, discharge Point B has been chosen as the optimum location for the treated effluent discharge.