

## **9. LAND, FLORA AND FAUNA.**

### **9.1 BASELINE.**

#### **9.1.1 General Location and Surrounding Habitats.**

The existing sewage treatment plant is situated on reclaimed land on the southern side of Dublin Port, and adjoining the intertidal area of Sandymount Strand. The reclaimed ground in the vicinity supports a varied vegetation of cultivated or disturbed land. This consists of amenity grassland and shrub and tree planting at the ESB generating station at Poolbeg and at Dublin Corporation sewage treatment plant. Elsewhere, unused industrial reclaimed land is developing ephemeral/short perennial vegetation, with some areas of scrub. The general area of Dublin Port is known for its transient flora, including alien species introduced with imported cargoes (Reynolds, 1988, 1990, 1992). Irishtown Nature Park lies to the south of the sewage treatment plant, separated from it by a narrow area of derelict industrial land. The park was developed in 1986-87 on a former tiphead for builder's rubble, some of which was already vegetated. The remaining area was shaped and seeded with a wild flower meadow mix, and some trees and shrubs were planted.

There is a small area of fore-dune vegetation where a sandy shore extends above high tide level adjacent to Irishtown Nature Park. The intertidal area of Sandymount Strand is part of the Bull Island and Dublin Bay site complex, which is internationally important for wintering waterfowl (geese, ducks and wading birds) and post-breeding concentrations of terns. Mooring dolphins in the port area near the storm water overflow tanks are used as nesting sites by common and arctic terns. Bull Island and the entire intertidal area of Dublin Bay are proposed for designation as Natural Heritage Areas by the National Parks and Wildlife Service; most of the area is also designated as a Special Protection Area under the Birds Directive 79/409/EEC.

#### **9.1.2 Vegetation and Habitats of the Existing Sewage Treatment Plant.**

The vegetation and habitats of the existing sewage treatment plant are shown in Figure 9.1. Habitats are described in accordance with NCC Phase 1 habitat survey methodology (1990), and plant species names follow Scannell and Synnott (1987). The site occupies two parcels of land, separated by a paved roadway.

### **Neutral Grassland.**

The storm water overflow tanks, located on the northern side of the roadway, are surrounded by neutral grassland vegetation which is mown occasionally. The main grass species present are false oat-grass *Arrhenatherum elatius*, cock's foot *Dactylis glomerata*, common couch grass *Agropyron repens* and red fescue *Festuca rubra*. Other herbaceous species present include indicators of disturbed ground; bastard cabbage *Rapistrum rugosum*, tall melilot *Melilotus altissima* and common mallow *Malva sylvestris*. Ribwort plantain *Plantago lanceolata*, creeping buttercup and *Ranunculus repens* and red clover *Trifolium pratense* also occur. The grass is mown occasionally. Scrub vegetation of elder *Sambucus nigra* and bramble *Rubus fruticosus* agg. with nettle *Urtica dioica* is developing along the wall separating the site from the road.

### **Ephemeral/Short Perennial Vegetation.**

Ephemeral/short perennial vegetation has developed on an unused portion of the sewage treatment plant along the western site boundary. There are patches of bare ground and items of small plant, among which have developed a vegetation cover of opportunistic plant species and grasses, with occasional shrubs of the butterfly bush *Buddleia davidii*. This vegetation is unmanaged, and includes common couch grass, Yorkshire fog *Holcus lanatus* and cock's foot, with bastard cabbage, tall melilot and some teasel *Dipsacus fullonum*.

### **Amenity Grassland**

Amenity grassland comprises a sown sward of ryegrass *Lolium perenne* and white clover *Trifolium repens*, regularly mown and managed as lawn areas. The main area of amenity grass is located in the north eastern portion of the main sewage treatment plant site (Figure 9.1.), with smaller areas adjoining the administration buildings, internal roadways and primary settlement tanks.

### **Species Rich Amenity Grassland.**

This is located on the southern side of the site, where less frequent mowing has encouraged the development of a more species rich amenity grassland type. In addition to ryegrass and white clover, red clover, yarrow *Achillea millefolium*, ribwort plantain, bird's foot trefoil *Lotus corniculatus* and creeping buttercup occur.

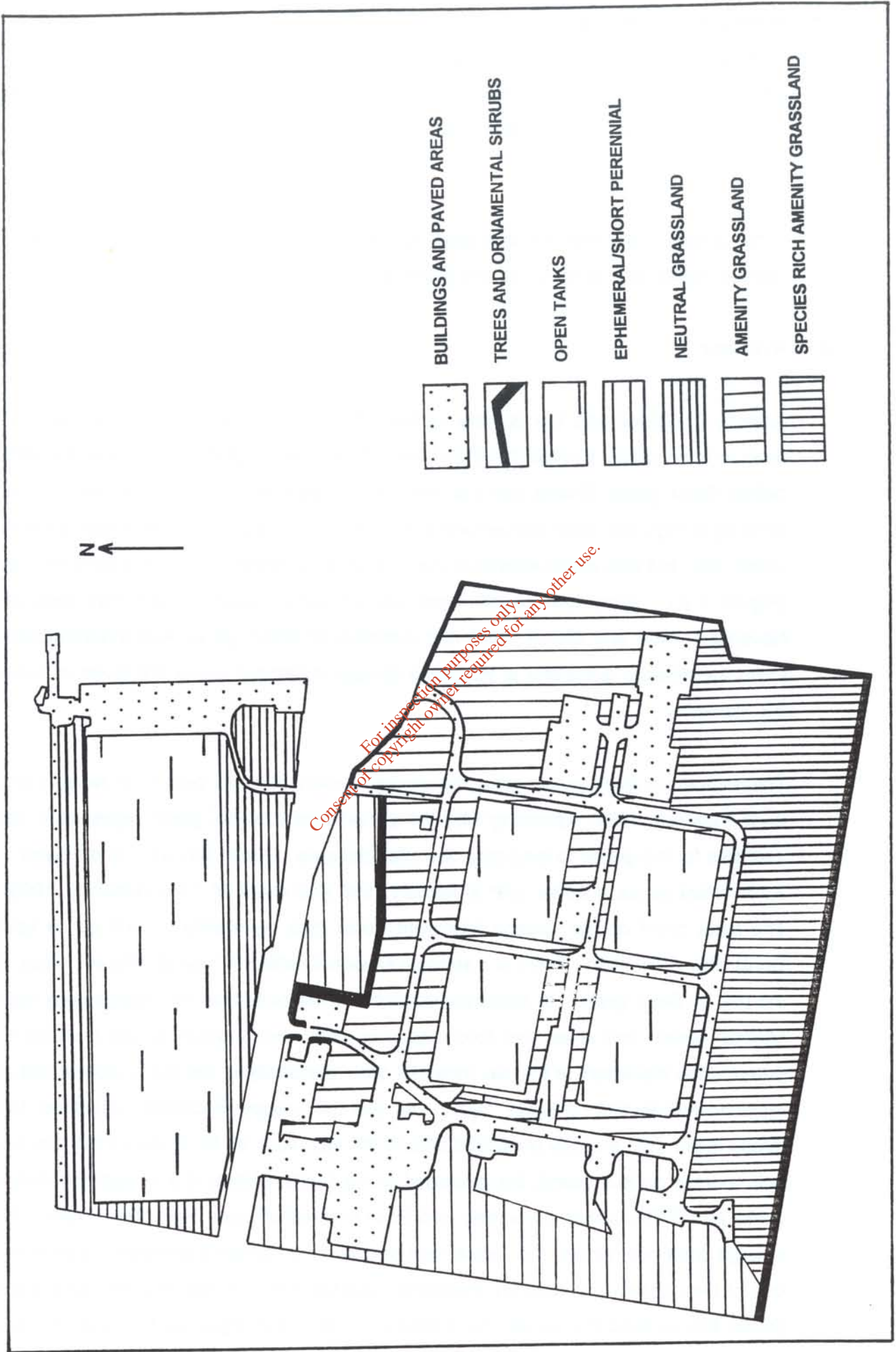


FIGURE 9.1. HABITATS ON THE EXISTING RINGSEND SEWAGE TREATMENT WORKS.

### **Trees and Ornamental Shrubs.**

The main area of ornamental shrub planting is located around the car parking area, and along the wall separating the site from the derelict Pigeon House Fort site. The site boundary to the northeast, east and south is planted with young willow, sycamore, ash and birch trees.

Other areas of the site are occupied by the primary settlement tanks, storm water overflow tanks, and by buildings and paved areas.

### **9.1.3 Avifauna.**

Amenity grassland and the primary settlement tanks are the main habitats used by birds in the existing sewage treatment plant. The amenity grassland is used by light-bellied Brent geese *Branta bernicla hrota* and oystercatchers, both for feeding and roosting at high tide. Both species are associated principally with the intertidal areas of Dublin Bay, but also make extensive use of amenity grassland habitats around the bay (Figure 9.2.). Waterfowl counts were carried out in South Dublin Bay between November 1994 and March 1995, the numbers of Brent geese and oystercatchers using the amenity grassland at Ringsend sewage treatment works are given in Table 9.1. hereafter.

The numbers of Brent geese using the sewage treatment works peaked in January and early February 1995, coinciding with the period during which green algae were not available for the geese to feed on in the intertidal area. Dublin Bay as a whole holds c. 2,200 Brent geese in winter, with a January 1995 total count of 1,800 (Delaney, 1996). The peak count on the sewage treatment works thus represents c. 14% of the total Dublin Bay population. There is a strongly seasonal pattern of use of different areas of the bay by Brent geese. In September/October, most birds feed on *Zostera* beds near Merrion Gates, and when this food supply is exhausted substantial use is made of green algae elsewhere in the bay intertidal area, principally in the Bull Lagoons and at Monkstown/Seapoint (O'Briain, 1991). As this food supply becomes exhausted, the geese move onto amenity grassland around the bay, such as St. Anne's Park, the two golf courses on Bull Island, the grassland along Clontarf Road, the sewage treatment works and ESB grounds at Poolbeg, and Sean Moore Park (see Figure 9.2.). Within the sewage treatment works, the geese feed principally on amenity grassland, with minor use of the species rich amenity grassland. Substantial numbers of geese also leave Dublin Bay to feed in Kilcoole, Co. Wicklow. When green algae start to grow in early

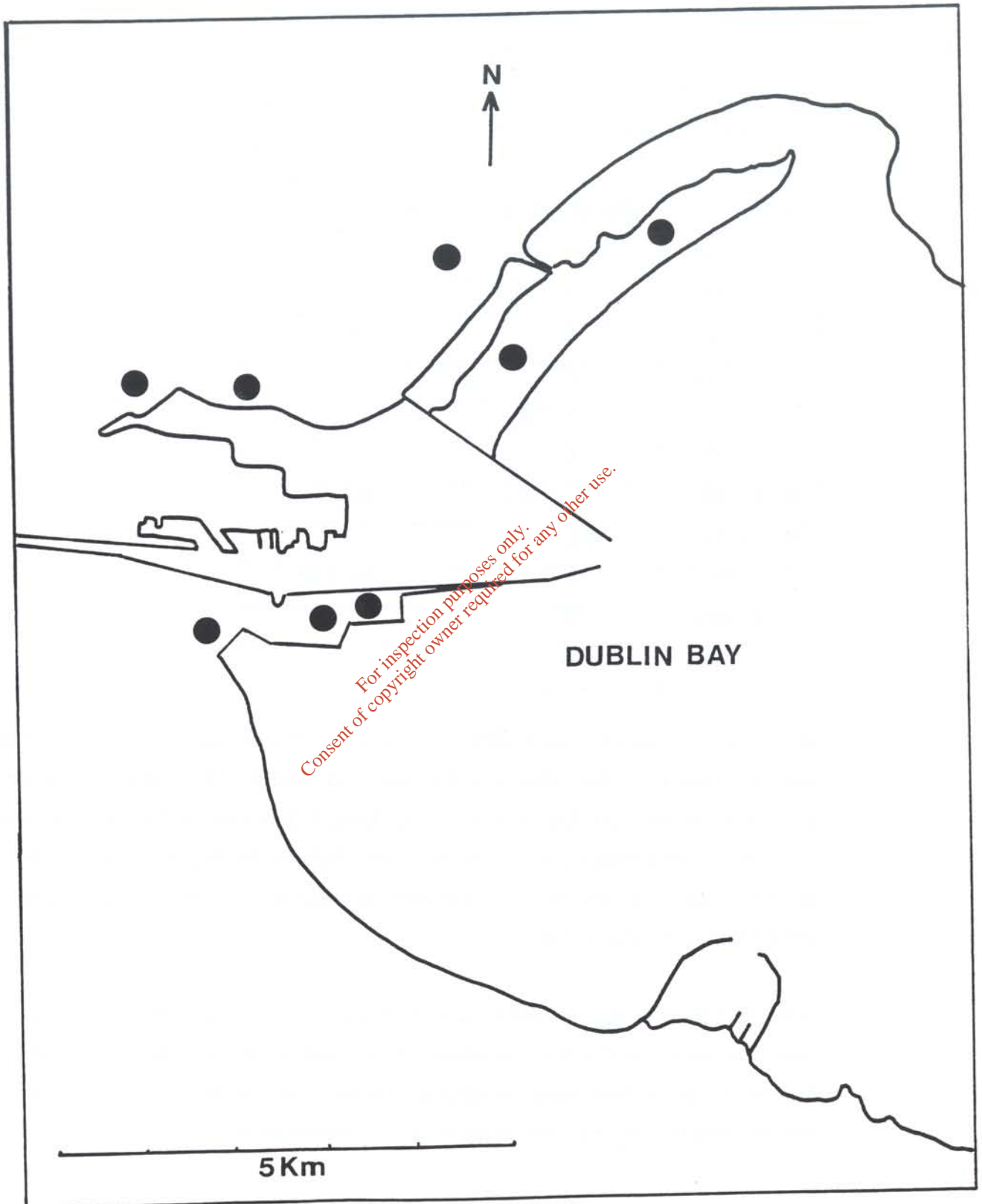


FIGURE 9.2. AMENITY GRASSLAND SITES USED BY BRENT GEESE AND OYSTERCATHERS AROUND DUBLIN BAY.

spring, geese resume feeding in the intertidal areas and salt marsh at Bull Island, and grassland feeding becomes less important.

**Table 9.1.** Numbers of Brent geese and oystercatchers recorded on amenity grassland on the Ringsend sewage treatment works between November 1995 and March 1996. Figures in parentheses represent each count as a percentage of the total count for each species recorded in south Dublin Bay.

DATE	BRENT GEESE	OYSTERCATCHER
14.11.1994	117 (57)	0
20.11.1994	9 (4)	102 (31)
20.12.1994	0	94 (22)
30.12.1994	0	14 (2)
11.01.1995	235 (100)	0
29.01.1995	0	41 (17)
06.02.1995	140 (100)	120 (30)
06.02.1995	250 (95)	10 (2)
26.02.1995	0	20 (12)
13.03.1995	0	0
23.03.1995	0	0

Oystercatchers feed throughout the intertidal area of Dublin Bay, and make substantial use of grassland sites adjoining the bay and also further inland in mid-winter, particularly when high tide occurs during daylight and use of the intertidal area is restricted. The sewage treatment works is used both for feeding and roosting, the birds are assumed to be feeding on earthworms (see Quinn and Kirby, 1993), and feed on the amenity grassland areas.

Gulls visit the sewage treatment works to feed on the primary settlement tanks. The main species present is the black-headed gull, with lesser numbers of common gulls and herring gulls. Gulls were not counted systematically on the site, but total numbers are estimated to vary from less than 50 up to a maximum of c. 200.

Starlings have been recorded on amenity grassland in the sewage treatment works, other species occurring in small numbers include blackbirds and pied wagtails. Skylarks, linnets and meadow pipits which were recorded in Irishtown Nature Park may

visit the species rich amenity grassland and ephemeral/short perennial vegetation in the sewage treatment works.

#### **9.1.4 Other Fauna.**

Mammal tracks were not found within the sewage treatment works site, although foxes have been seen by Dublin Corporation staff in the Pigeon House Fort area and are assumed to also visit the site. Invertebrate fauna were not surveyed; the limited range of habitats present suggest that the fauna is species poor.

### **9.2 CHARACTERISTICS OF THE PROPOSAL.**

The proposed expansion of Ringsend sewage treatment works will replace the existing low level works and open tanks with substantially taller, enclosed structures. The total area covered by the proposed plant will reduce the area of grass dominated and ephemeral/short perennial vegetation by c. 28 to 35%. Three typical process options are under consideration; activated sludge with alkaline stabilisation, sequencing batch reactor with sludge drying - no digestion and BAF with sludge drying and digestion. These options involve different degrees of site fragmentation.

### **9.3 IMPACTS.**

The main impacts on flora, fauna and habitats arising from the proposed development are the reduction in vegetation cover and open water. As open water is present principally as primary sewage, its loss as a habitat is not significant and is not considered further in this EIS.

Reduced vegetation cover will affect neutral grassland, amenity grassland, species rich amenity grassland and ephemeral/short perennial vegetation. These categories will be subject to slightly different impacts by the different process options. Existing tree and ornamental shrub plantings are not expected to be impacted by any of the process options.

#### **9.3.1 Significance of Impacts on Flora.**

No rare or protected plant species occur on the site. The species present are common and widespread, impacts on flora are not significant.

### 9.3.2 Significance of Impacts on Fauna.

Fauna using the site are impacted through a general reduction in the extent of grassland habitats, and also through an alteration in site layout such that the larger areas of grassland in the southern and north eastern portions of the site are reduced in size and/or fragmented by individual items of plant. These impacts are significant for Brent geese, which can use the site in numbers exceeding international importance (> 200 birds, i.e. more than 1% of the total population). Impacts on oystercatchers are locally significant. Both species prefer amenity grassland for feeding; oystercatchers making rather more extensive use of this habitat since they use the existing narrow strips of amenity grassland around the primary settlement tanks. These areas are generally avoided by Brent geese. Amenity grassland currently covers 19% of the site, of which c. 70% (13 % of the total site area) is used by Brent geese. The extent of existing habitats, and the changes arising from the proposed development, are given in Table 9.2. below.

**Table 9.2.** Estimated changes in the percentage cover of different habitats arising from the proposed development.

Habitat	% Cover of Existing Site	% Cover on Proposed Site
Open water	30	0 - 17
Buildings and paved areas	11	35- 64
Amenity grass	19	12 - 16
Species rich amenity grass	19	10 - 13
Neutral grass	11	8 - 11
Ephemeral/short perennial	10	6 - 8
Total vegetated area	59	36 - 48

#### Short-Term Impacts on Brent Geese.

During the construction phase of the development, habitat loss is likely to be greater than in the long-term, because of construction activity occupying a larger portion of the site, and through disturbance. In a worst case scenario in which the site is entirely unsuitable for geese during the construction phase, the number of Brent geese using south Dublin Bay are likely to be reduced in mid-winter. There would, therefore, be a potential reduction in total numbers in Dublin Bay, with geese re-distributing to other east coast sites. The impact on population levels depends on the availability of other



sites, their carrying capacity for geese, and potential conflict with other land uses (amenity, agriculture, development etc.). As a worst case, c. 1% of the Irish wintering population would be impacted during the construction phase, and since Ireland holds virtually all of the wintering population of the Canadian Arctic breeding population of light bellied Brent geese, this scale of impact is internationally significant. Construction phase impacts may extend for one or two winter seasons after structures are complete, while geese habituate to the new site layout.

#### **Long-Term Impacts on Brent Geese.**

Changes in the vertical profile of the site arising from the proposed development may deter Brent geese from using the site in the long-term, through altering flight lines into the site. Changed plant layout and decreased cover of preferred amenity grassland, as a worst case scenario, would render the site entirely unsuitable for geese. This could result in long-term displacement of c. 1% of the total population of light bellied Brent geese from the south Dublin Bay area in mid-winter as described above, with long-term impacts on overall population levels depending on the availability of alternative sites as described above.

### **9.4 IMPACT MITIGATION.**

#### **9.4.1 Overview.**

The impacts of the proposed development are most significant for Brent geese, with lesser impacts on oystercatchers. Other fauna and flora are not impacted significantly. A number of mitigation measures are proposed, aimed at reducing impacts on Brent geese which make significant use of the site between November and February inclusive. The process options under consideration vary somewhat in their impact on the total vegetated area, but when mitigation measures reducing site fragmentation are taken into account, there is less difference between the options. The fact that geese use the site should not, therefore, form the basis for selecting between process options.

#### **9.4.2 Mitigation Proposals.**

With a view to ensuring that geese in numbers comparable with present levels can be accommodated for feeding purposes the following mitigations are proposed.

### **Short-Term.**

The Contractor re-developing the works will be required to provide, wherever possible, areas of amenity grassland to be available as a feeding area during the season from November to March. However, if insufficient suitable land can be made available on the site Dublin Corporation will undertake to provide an area of c. 2 ha. within 2km radius of the existing treatment site as an alternative feeding area.

### **Long-Term.**

The layout of the works will be configured, where possible, to allow areas of 2 ha. in a location which ensures a maximum possible continuous area as free open space to be seeded with ryegrass and managed to maintain goose usage at rates comparable with the present level. Site boundary tree and shrub area will be designed and managed to achieve a maximum height of 3-4m leaving the boundary relatively open for birds flying into the site.

Short and long-term proposals will be examined by Dublin Corporation and their ecological advisors to ensure that adequate design considerations are made and that the proposals are fully implemented.

The mitigation measures listed above would provide for the continued existence of areas of amenity grassland seeded with ryegrass preferred by geese. The vertical profile of the new structures may result in residual impacts on goose use but it is estimated that current levels will be maintained in the long-term. However, Brent geese in Dublin Bay are habituated to feeding in relatively confined sites, and it is anticipated that in the long term this species will continue to use the sewage treatment works site because of its low disturbance levels and proximity to the intertidal and marine area of Sandymount Strand.

## **10. MARINE FLORA AND FAUNA.**

### **10.1 BASELINE.**

Dublin Bay Water Quality Management Plan examines in detail the interaction of Water Quality, the Benthos and the Intertidal Zone. The findings of the DBWQMP in relation to each are summarised below:

#### **10.1.1 Water Quality.**

##### **The Estuary.**

There has been an appreciable improvement in conditions in the Liffey Estuary since the early 1970's, notably in relation to deoxygenation, BOD and ammonia levels. Excessive levels of the latter two parameters were recorded only in the vicinity of the Ringsend outfall.

##### **The Offshore Waters.**

The offshore waters, with the exception of the area immediately east and northeast from the Liffey mouth, generally show the least impact by the waste discharges. The maximum nutrient levels are higher than in the open Irish Sea.

#### **10.1.2 The Sediments and Benthos of the Deepwater Zone.**

The investigation of the infaunal community structure shows a diverse and rich fauna in the south east of the study area, and less diverse fauna just south of the Baily and at the inshore locations.

#### **10.1.3 Quality of the Intertidal Zone.**

##### **Green Macro-Algae.**

Studies of green macro-algae showed that Enteromorpha, members of the Ulvales group, are by far the dominant species. It appears that the green algal biomass may have increased in the north Bay areas since the 1970's.

### **The Ectocarpus Problem.**

The main constituent of the large algal deposits that have occurred on the beaches of the Bay, notably Dollymount, in recent years is not the green alga described above but the brown alga *Ectocarpus siliculosus* originating in offshore waters. The hypothesis explaining the *Ectocarpus* phenomenon also depends on particulate organic matter as a carrier of nitrogen and phosphorus.

## **10.2 IMPACT OF THE DEVELOPMENT.**

The DBWQMP adopts the Environmental Quality Objectives (EQO) approach to water quality management. The protection of uses associated with the EQO is by means of Environmental Quality Standards (EQS). The list of Quality Standards for Dublin Bay extracted from the DBWQMP is reproduced in Volume 2, Appendix A.

Chapter 6 discusses the achievement of discharge consent levels from Ringsend STW consistent with compliance with DBWQMP water quality standards. The impact of the development will therefore be the furthering of the steps consistent with the achievement of the environmental quality objectives including:

- \* Protection of fish and shellfish populations.
- \* Protection of fisheries as a human food source.
- \* Protection of other existing aquatic life.

Complementary to this is the achievement of the priority objectives set out in the DBWQMP as follows:

- \* **Ectocarpus:** reducing the occurrence of deposits of algae, in particular *Ectocarpus*, on recreational beaches (eg. Dollymount, Shelly Banks), to the extent that these deposits are indirectly attributable to waste inputs to the Plan area; in particular to reduce the supply of particulate organic matter to the areas colonised by the tubeworm *Lanice* thereby aiming at reducing the availability of anchorages and mineralised nutrients required for the development of *Ectocarpus*.

- \* **Green Macro-Algae:** ensuring that effluents and related inputs do not give rise to excessive growths of green macro-algae in the Bull Island lagoons or the Tolka Estuary; the aim is to achieve a reduction in the anthropogenic contribution to these growths by reducing the particulate content of sewage effluent as a source of nutrient to the sediments and thence to the algae.
  
- \* **Fisheries/BOD/DO:** ensuring that excessive dissolved oxygen deficits do not occur in the waters of the Liffey Estuary, and that the dissolved oxygen standards are met; thereby protecting the zones of passage of migratory fish.
  
- \* **Other Fisheries:** Protection of other existing fisheries in the Plan area.

### 10.3 OTHER POSSIBLE IMPACTS.

The original scheme involving the reclamation of 28 ha. as outlined in Chapter 4 would have required a quantity in excess of 1.0 million cubic metres of fill material. This material would have most likely been sourced by marine dredging either nearby in Dublin Bay or further offshore. This dredging operation could have impacted on marine flora and fauna. As it is no longer proposed to carry out such dredging it is not anticipated that there will be any negative impact on marine flora and fauna associated with the Treatment Works construction.

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## 11. BIRDS IN THE INTERTIDAL AREA.

The proposed reclamation of 28 ha. of land from Dublin Bay to the east of the present treatment works required consideration in terms of its effects on the avifauna in the intertidal area of southern Dublin Bay. To this end a study was carried out over the winter of 1994/1995 to establish bird numbers and dispersions.

The present proposal of constructing Ringsend STW entirely on the site of the existing works will not impact on the intertidal area.

For information purposes the baseline study is shown in Volume 2, Appendix F.

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## 12. AMENITY.

### 12.1 AMENITY USAGE.

The following review gives an overview of amenity usage in the area from examination of published reports. The field surveys carried out for this study then focus on those areas of particular importance identified in the local site area.

#### 12.1.1 Review Of Previous Studies.

##### 12.1.1.1 Dublin Bay Water Quality Management Plan : Technical Report No. 1.

The Dublin Bay Water Quality Management Plan identified nine district zones in and around the plan area as shown Figure 12.1. Of particular relevance to this study are Zones 3, 4 and 5. Zone 3 includes the area from North Bull Wall including North Bull Island; Zone 4 is the area between North Bull Wall and Great South Wall and Zone 5 extends from the Great South Wall to Seapoint.

##### **Redrock to North Bull Wall (Zone 3)**

Recreational activities include sailing, board sailing, rowing, canoeing, angling, beach activities (inc. sunbathing, walking, paddling and swimming), walking, jogging, picnicking, golf, bird-watching and sand yachting. Over 10,000 people may be involved in these activities at peak periods.

Kilbarrack Sailing Club and Sutton Dinghy Club are based in the Sutton Creek area. Small beaches are located at Redrock and Sutton Strand. Both attract small numbers of beach users.

The North Bull Island is an area of significant ornithological, botanical and zoological interest. It is designated as an official bird sanctuary, as a UNESCO Biosphere Reserve and a National Nature Reserve. Dublin City Council has recently adopted the North Bull Island Amenity Order.

Bull Island functions as an urban park and seaside resort. Facilities include Dollymount Strand, two golf courses, the Bull Island Interpretative Centre and Dollymount Sea Scouts. Over 10,000 people may be present on the island during peak periods. The area is of exceptional scientific interest because of its flora and fauna, particularly its

birdlife. It is a designated conservation area and has high research and educational value. About 20,000 people per annum visit the Bull Island Interpretative Centre.

The North Bull Wall is used as a promenade and for angling.

The report stated that Zone 3 is in an area of high recreational capability and that there is significant development potential to facilitate even greater numbers of recreational uses, particularly through better management of the Bull Island.

It further stated that the North Bull could be more fully utilised if the quality of water particularly on its south-side was improved.

#### **North Bull Wall to Great South Wall (Zone 4).**

Recreational activities include yachting, cruising, sailing, rowing, canoeing, water polo, swimming, angling, walking, jogging and picnicking. Over 1350 people may be involved at peak periods.

Clontarf Promenade is intensively used for walking, cycling and football practice. Clontarf Yacht and Boat Club has premises on the sea front. The City Sailing Club and East Wall Water Sports Group use the area for a range of water-based activities.

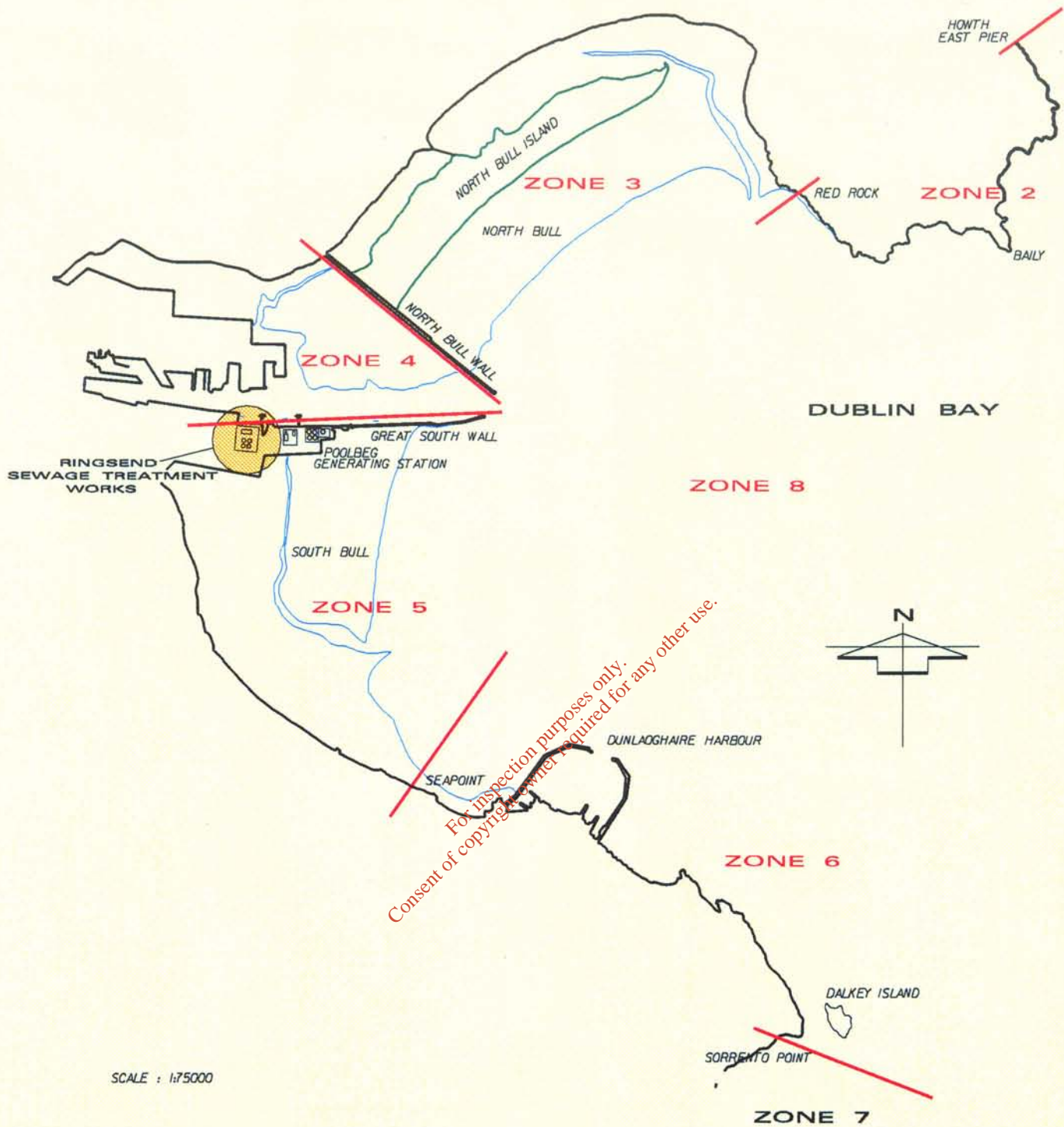
The Poolbeg Yacht and Boat Club uses the Liffey estuary in the vicinity of the Eastlink Bridge for sailing activities. The area is also used for skiff rowing and canoeing. The East Link Road is a popular walking and viewing area. The tidal reaches of the Dodder are used for angling. The river is designated as a conservation area in the Dublin City Development Plan 1991.

Irishtown Nature Park is an area of scientific interest mainly due to its birdlife. It is used by walkers, joggers and cross-country runners.

The report stated that in terms of its existing resource base and facilities Zone 4 is of moderate recreational capability.

#### **Great South Wall to Blackrock (Zone 5).**

This is a zone of moderate recreational use and has limited development potential.



**FIG. 12.1**  
**DUBLIN BAY WATER QUALITY MANAGEMENT PLAN**  
**RECREATIONAL ZONINGS**

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Recreational activities include board sailing, angling, beach activities (including sunbathing), jogging, picnicking, bird-watching and passive recreational use (e.g. sitting in cars). Over 3,000 people may be involved at peak periods.

The Great South Wall provides a panoramic view of Dublin Bay and is used as a promenade and for angling.

Shelly Banks is a small beach used for swimming and board sailing. At peak periods up to 700 people may be in the vicinity.

Sandymount promenade is used intensively for walking and general relaxation. The large expanse of the intertidal zone together with concerns about water quality and litter deter significant use of Sandymount Strand for swimming purposes. Merrion Strand is used mainly by bait diggers, walkers and some horse riders.

Though the inter-tidal area of Merrion Strand is an area of scientific interest due to its birdlife, its research and educational values have not been developed.

Boosterstown Marsh is designated an area of regional scientific importance by the Wildlife Service. It is the only fresh water-brackish marsh between Dublin and Greystones with significant birdlife and some rare plant species present. No recreational usage figures are available.

The report stated that Zone 5 is an area of moderate recreational capability in terms of the range of activities and the number of participants that it supports and that its development potential, particularly for water based recreation is limited.

#### **12.1.1.2 A Study of Bull Island, Co. Dublin - An Foras Forbartha, 1979<sup>(14)</sup>.**

Bull Island is an important recreational facility for the people of Dublin due to its recreational resources and proximity.

The beach is the island's most important recreational resource. Activities include swimming, bathing, paddling, games, picnicking, sunbathing, walking, jogging, fishing, exercising dogs, learning to drive, use of sand yachts and small hovercraft. Beach activities take place mostly during May, June, July and August.

The salt marsh and mud flats have small recreational use, mainly related to nature study and bird watching.

The North Bull Wall is a popular promenade. It is also used for bathing and fishing. It is an important means of access to Bull Island.

A sea scout troop is based beside Bull Bridge. It uses the waters around Bull Island for sailing and canoeing. Other activities that take place close to the shore are bathing, swimming, fishing and water-skiing. The large area of water that dries out at low tide restricts boating activities.

Bull Island serves as an important educational amenity. It is used by primary, secondary and third-level students for field work in biology, geology and geography. Groups such as the Dublin Naturalists Field Club, the Irish Wildbird Conservancy, the Geographical Society of Ireland as well as school and university natural history clubs use the area on a regular basis.

#### 12.1.1.3 Dublin Bay Amenity Study - Brady Shipman Martin - 1974<sup>(15)</sup>.

Dublin Bay and Killiney are the principal locations for outdoor recreation for the population of the whole metropolitan area.

An estimated 150,000 people are engaged in activities on a normal summer Sunday afternoon within the study area. Informal recreational activities are concentrated at the outer extremities of the bay, contrasting with a declining use of the inner bay area.

Upwards of 12,000 people participate in boating activities in the bay. Boating club memberships continue to grow. Activities such as boating or fishing attract as many spectators as participants.

The most intensively used beach in the study area is Dollymount. On Sunday afternoon, the peak period of usage, there are as many people on Dollymount Strand as on all the other beaches in the study area added together. The highest count recorded in a beach usage survey at Dollymount was 2,612 persons at 6 p.m. on a Sunday .

The east side of Blackrock Baths was found to be the most popular bathing place between Seapoint and Sandymount. The west side is also used for bathing, as are Williamstown and Booterstown. Merrion Strand has a low usage. Litter is a problem here. Sandymount strand retains some quality as an area for bathing and sunbathing. Dollymount beach is popular along its entire frontage.

Ringsend Park has special value in its position relative to the industrial and commercial uses which surround it.

Clontarf Promenade is used for walking. The peak user count of 120 persons was recorded at 5 p.m. on a Sunday.

## **12.2 AMENITY USAGE SURVEY.**

### **12.2.1 Overview.**

Amenity usage in the immediate vicinity of Ringsend is largely confined to the Great South Wall, Irishtown Park and the beach adjacent to Poolbeg (Figure 12.2). In order to assess baseline amenity usage two surveys were undertaken:

- Traffic/pedestrian counts
- Spot checks on numbers utilising amenity locations

Access to the aforementioned sites is via Pigeon House Road. Irishtown Park has a second access point from Beach Road. The baseline traffic surveys (Chapter 15) carried out at the East Link Roundabout and on Pigeon House Road (at Poolbeg Generating Station site entrance) gave figures for access to Pigeon House Road for the following 2 days:

- (i) Sunday, 23rd July 1995 - predominantly amenity traffic.
- (ii) Tuesday 25th July 1995 - predominantly work related traffic.

Both days were dry and sunny. Amenity traffic levels of the same order of magnitude occurred on both days (341 cars from the roundabout to beach area on Sunday, 260 cars from roundabout to beach area on Tuesday) but with higher levels on Sundays, as expected. All of the traffic was directed towards the beach area, with only 2 vehicles (1 pedal cycle and 1 motorcycle) going specifically to Irishtown Park.

It is probable that the traffic figures given represents a high level of usage because the surveys were carried out in the summer holiday period with optimum weather conditions.

### 12.2.2 Amenity Usage Survey.

Spot checks were carried out along the Great South Wall and in Irishtown Park on Sunday, 23rd July coinciding with the traffic survey referred to in 15.3.2. Between the hours of 3.00pm and 4.00pm, a total of 40 persons were counted along the Great South Wall. In Irishtown Park during the same time period 8 persons passed through the park including 1 family unit (4 persons).

Pedestrian figures for the Pigeon House Road for Sunday, 23rd July comprised 1 child and 6 adults over the survey period of which 5 were observed between the hours of 3.00 and 4.00 pm.

These low usage figures confirm the results of the traffic and pedestrian surveys. Furthermore, they indicate that those people who utilise the park tend to access via the Beach Road entrance rather than the Pigeon House Road entrance.

During the corresponding period total (two-way) vehicular traffic usage comprised 68 cars and 4 pedal cycles.

It is likely that because of its central city location the Great South Wall would also be utilised frequently during the winter in favour of more distant recreation locations. This was confirmed by spot checks during the second week of January 1996 which showed that the number of people walking there may be as high as 60 at any one time. This suggests a winter usage in excess of the summer counts but confirms that the overall number of people using the Great South Wall is quite low and of the same order of magnitude in both summer and winter.

Given the proximity of the Great South Wall, the beach area and Irishtown Park to Dublin City Centre amenity usage recorded during the surveys was low. Irishtown Park in particular appears under-utilised. Possible reasons for this could include its location in an area perceived to be 'industrial', its lack of accessibility by car and a lack of awareness of the existence of the park by the public at large. There is a case for concluding that the relatively low usage, particularly of the Great South Wall is a



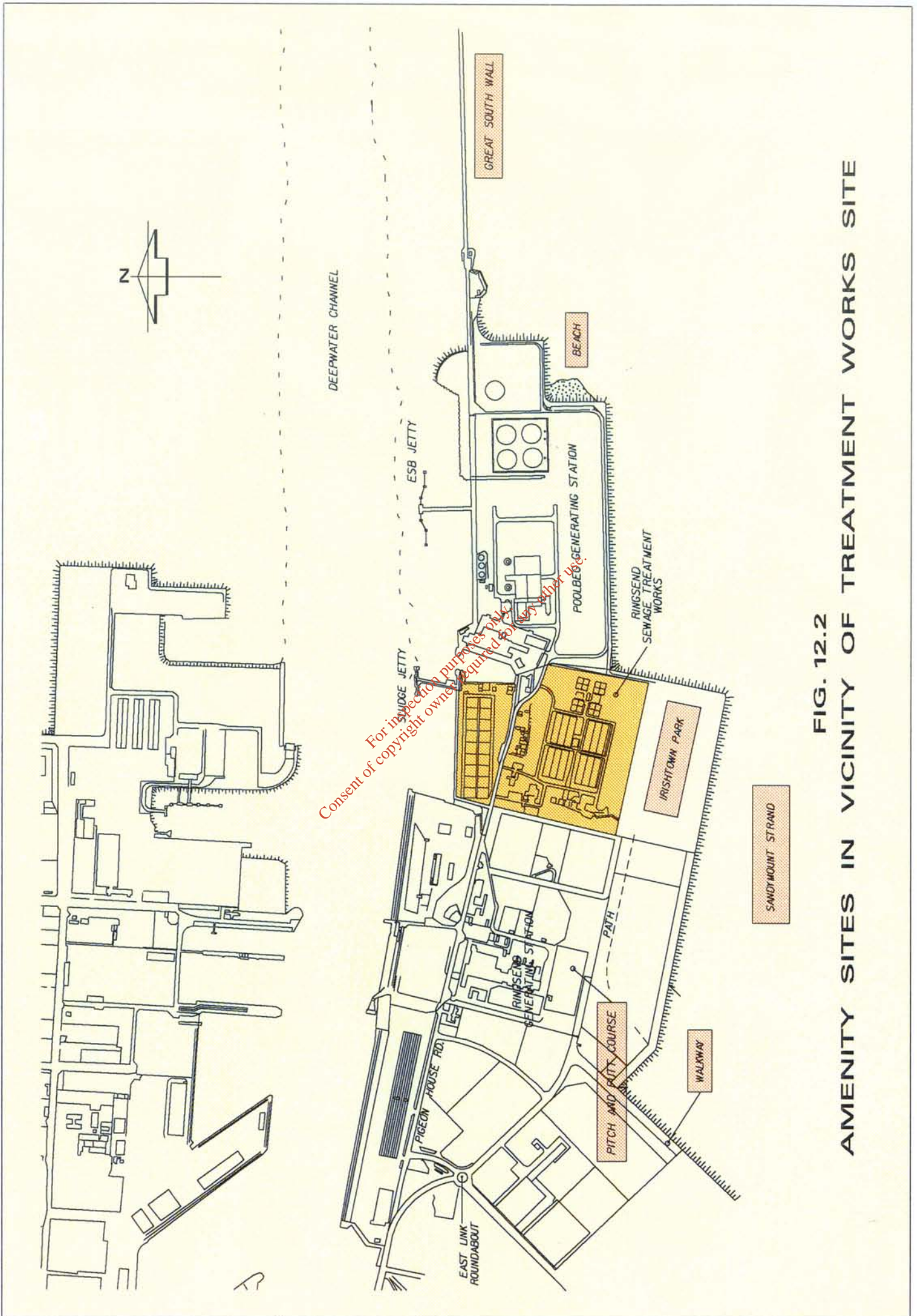


FIG. 12.2 AMENITY SITES IN VICINITY OF TREATMENT WORKS SITE

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positive fact. Low usage preserves its special unique quality and avoids possible degradation from overuse.

## **12.3 IMPACTS.**

### **12.3.1 Water-Based Activities.**

The provision of secondary treatment for the sewage arisings at Ringsend will result in a substantial improvement in the water quality in Dublin Bay. A mathematical model has been carried out to assess the impact of the upgraded facilities on water quality in the estuary. The detailed results of the model are presented in Chapter 6. The results show that the quality of the receiving estuary waters will be significantly improved in terms of BOD load and faecal coliform numbers upon provision of the upgraded treatment facilities. The quality of waters adjacent to the North Bull Wall will also improve. It is proposed that these bathing waters will be monitored throughout the bathing season. It is in fact the aim of Dublin Corporation that Dollymount Strand will achieve Blue Flag status upon implementation of the upgraded treatment at Ringsend.

### **12.3.2 Land-Based Activities.**

The principal impact will be the significant decrease in odours emanating from the site. This will considerably enhance the overall quality of the area and make walking and angling along the Great South Wall more pleasurable.

The other main impact of the development on land-based recreation will be the increase in traffic volumes along the main access route to the Great South Wall and in particular along Pigeon House Road. As discussed in Section 15.5.1 this increase will be well within the road capacity. No increase in traffic will occur immediately adjacent to the Great South Wall itself.

## **12.4 CONCLUSION.**

The proposed provision of upgraded treatment at Ringsend will result in a significant improvement in the water quality in Dublin Bay and more particularly the estuary. Water quality will meet the Bathing Water Regulation standards at Dollymount Strand.

There will be a significant reduction in odour levels compared to the situation now prevailing.

There will be a slight increase in traffic volumes utilising Pigeon House Road but there will be no increase in the immediate vicinity of the Great South Wall.

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## 13. NOISE.

### 13.1 INTRODUCTION.

The potential impacts of noise from the proposed upgrade to the STW relate firstly to site demolition and construction, and subsequently to the long term operation of the new facility. These potential noise levels have been compared to existing ambient levels of noise.

### 13.2 AMBIENT NOISE SURVEY.

In order to evaluate the potential impact of construction and operational noise levels, an ambient noise survey was undertaken during the summer of 1995 using a Type 1 integrating sound level meter calibrated immediately before and after the measurement exercise. The measurements consisted of a number of representative 15 minute samples at selected receiver locations covering the sensitive periods from early morning to late evening.

The receiver locations covered by the survey comprised the following sites:

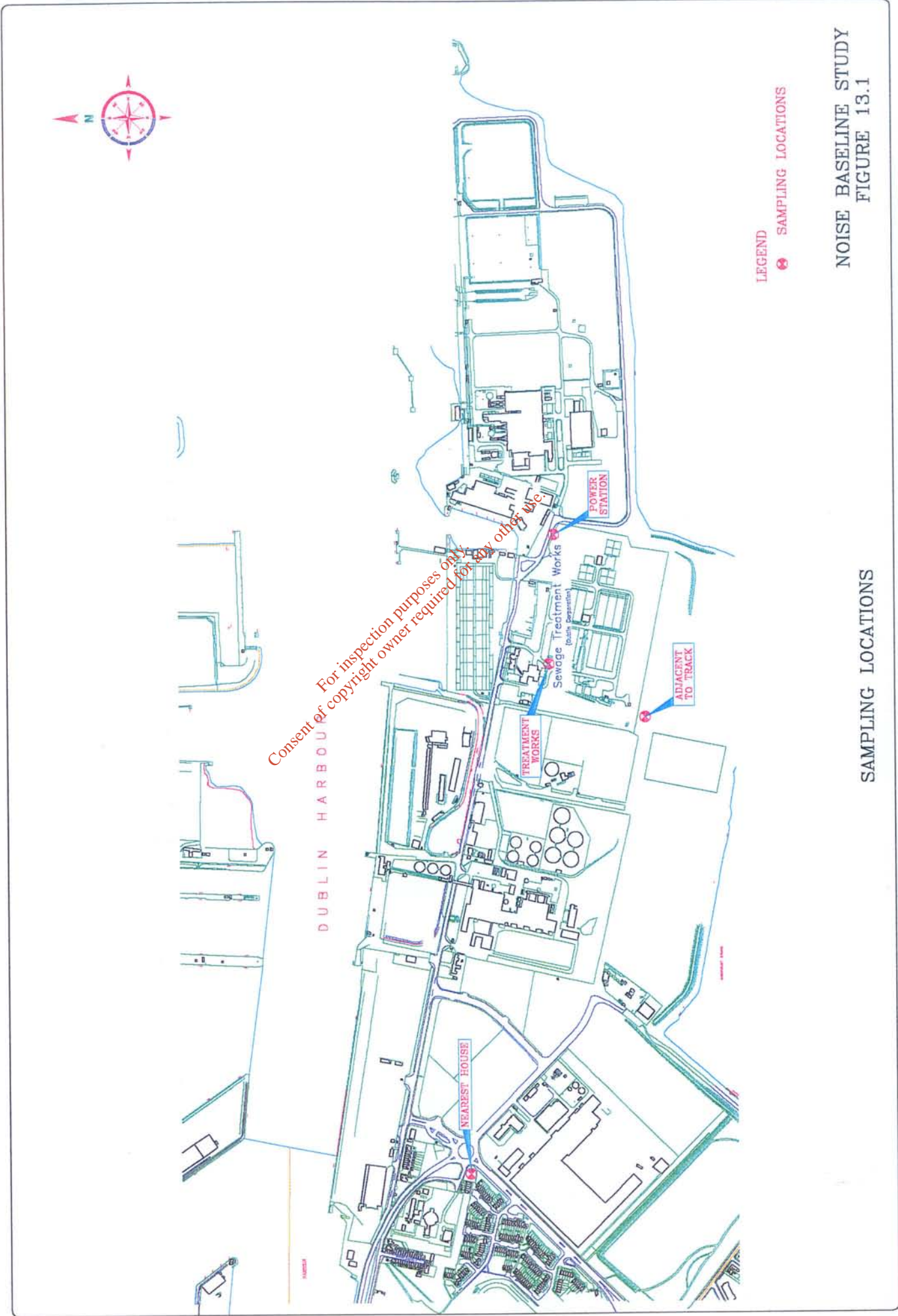
1. Adjacent to housing in Irishtown at the junction between Bremen Grove and York Road.
2. Immediately north of Irishtown Park on the track to the south of the STW.
3. Ringsend STW site.
4. Power Station to the west of the site.

The noise levels recorded at each site are documented hereafter in Table 13.1. For reference purposes, a description of noise units used in this report is presented in Volume 2, Appendix G. Figure 13.1 indicates the receiver locations.

**Table 13.1 - Existing Ambient Noise Levels, dB**

Location	Start time for 15 minute sample	L <sub>Aeq</sub>	L <sub>Amax</sub>	L <sub>A90</sub>
1. Housing at Irishtown	0756	62.6	74.2	58.1
	1247	60.8	78.8	56.0
	1533	61.5	79.3	57.4
	1605	61.2	75.2	55.4
	2158	56.5	67.7	52.3
	Avg.	60.5	75.0	55.8
	2. Irishtown Park	0704	47.0	53.6
1147		46.5	60.0	45.2
1426		48.5	56.1	44.7
1724		45.2	59.2	41.3
2051		46.3	57.6	44.7
Avg.		46.7	57.3	44.3
3. Ringsend STW		0643	52.5	57.8
	1122	55.0	62.3	53.5
	1404	56.4	80.4	53.5
	1703	51.5	61.7	50.1
	2118	50.0	64.1	49.1
	Avg.	53.1	65.3	51.5
	4. Power Station	0730	55.0	75.6
1101		57.5	77.4	51.2
1451		55.8	74.9	47.6
1642		62.7	79.8	47.7
2134		57.9	79.8	47.5
Avg.		57.8	77.5	48.5

The main contributors to the ambient noise levels were traffic noise, particularly at site 1, and various industrial machinery at sites 3 and 4. The amenity area at Irishtown Park (site 2) experienced the lowest noise levels of all sites monitored. The highest levels typically arose in the area of residential development itself and demonstrate how ambient noise levels in this area are influenced more by the local sources such as road traffic than by the more distant industrial sources or the existing STW. As is to be expected, the data also demonstrates a general lowering of noise levels in the housing



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area during the later evening period, though at the other sites noise levels are more constant due to the presence of plant and machinery likely to be operating continuously.

### 13.3 CONSTRUCTION NOISE.

#### 13.3.1 General.

Disruption due to construction can be defined as a temporary nuisance and annoyance to people in the area, which can occur between the start of construction works and the commissioning of new plant on site. Potential impacts are likely to be:

- Construction noise and vibration arising from the demolition and construction of facilities on the site; and
- Construction traffic moving material and workers to/from the construction site compound.

The main impacts during on-site construction are expected to be noise from plant machinery and on-site construction traffic. Calculations of construction noise were made following the procedures set out in 'Noise Control on Construction and Open Sites', BS5228, 1984<sup>(16)</sup>. Noise calculations were made for each construction activity and results (presented below) are expressed as  $L_{Aeq}$  (12 hour) dB equivalent continuous noise levels, which is a standard unit used to express construction noise. Although there is no formal noise limit for construction activities, standards which have been commonly applied to large civil engineering contracts (such as national road and rail projects, and urban development projects) tend to fall in the range of 70 to 75 dB  $L_{Aeq}$  (12 hour) for daytime construction activities.

In the absence of specific details on the phasing of works at this stage of the STW design, noise levels have been calculated in distance bands from the site boundary. Details of typical construction plant noise levels are given hereafter in Table 13.2. The source sound power level and the percentage of the working day that the plant will typically be operating (the % on-time) enable noise levels to be calculated at any selected receiver locations. Worst case noise levels have been derived by assuming plant will be operating at the nearest point to sensitive receivers, i.e. at the site boundary, and by assuming that there will be no 'soft ground absorption', i.e. noise will

be travelling over reflective hard ground or water. Similar construction activities and plant are likely to be employed whatever the final design option for the STW, therefore, the predicted construction noise levels are considered to be applicable to any of the design options for this site.

**Table 13.2: Typical Construction Plant Noise Levels**

Plant	Sound Power Levels (dB)	Percentage On-time
Compressors	102	100
Welding Generators	70	70
Pneumatic breaker	109	30
Crane	102	50
Wheeled loader	104	65
Earth moving	113	50
Supply vehicles	108	50
Piling (non-driven)	115	60
Truck concrete mixer	108	50
Poker vibrators	112	75

### 13.3.2 Demolition.

For the purpose of assessing noise impacts during on-site demolition works, it was assumed that the construction activities are likely to involve the use of pneumatic breakers and compressors to remove concrete structures, and the use of a crane and/or tracked loader to move material into dump trucks for transport off-site. The likely noise levels from these activities, calculated in accordance with the procedures described in paragraph 13.3.1, at various distances from the site boundary, are shown below:

**Table 13.3 - Variation of Demolition Noise with Distance**

Distance from site (m)	10	50	100	200	500	1000
Construction Noise L <sub>Aeq</sub> (12 hour) dB	81	67	61	55	47	41

Since the main areas of sensitive development closest to the site are about 1 km distant, it is evident from the above predicted noise levels that the demolition works will not have an adverse noise impact. Noise levels at sensitive development will be

significantly lower than both the ambient noise level at each receiver location and below the commonly applied limits for noise control purposes, i.e. construction noise limits such as 75 or 70 dB  $L_{Aeq}$  (12 hour). Irishtown Park is closer to the site and will experience higher noise levels of 60 dB(A) or more though the impact will be temporary.

### 13.3.3 Construction.

The noisiest on-site activities during construction will tend to relate to works involving any earthmoving, piling and concreting. The likely noise levels from these activities, at various distances from the site, are again shown below:

**Table 13.4 - Variation of Construction Noise with Distance**

Distance from site (m)	10	50	100	200	500	1000
$L_{Aeq}$ (12 hour) dB:						
Earthmoving	82	68	62	56	48	42
Piling	85	71	65	59	51	45
Concreting	84	70	64	58	50	44

Again, at the distances of sensitive development from the site, construction noise levels will remain below both the ambient noise levels and the typical noise control limits and, therefore, not give rise to nuisance for local residents. Likewise, due to the distances present between the construction works and sensitive development, both ground and airborne vibrations will be attenuated and not give rise to nuisance or risk of building damage.

In the case of any night-time construction activities, e.g. the possible operation of dewatering pumps, noise control limits are commonly lowered to values of about 65 dB  $L_{Aeq}$  for evening periods and 50 dB  $L_{Aeq}$  for night-time, e.g. national projects involving night-time possession works near railways. The indication from the above noise predictions for the noisiest activities is that in the event of any night work, these lower noise limits are still likely to be met at sensitive development. However, appropriate regard should be given to matters such as forms of mitigation if and when night working becomes evident.

#### 13.4 OPERATIONAL NOISE.

Operational noise from STWs is not normally a problem, particularly where intervening distances are as great as they are at Ringsend. The lack of any historical records of noise complaints relating to the existing works tends to confirm this. New plant will also tend to be quieter than older models.

However, tonal characteristics associated with certain plant which operates continuously, or intermittently throughout the night-time, for example gas blowers etc., can lead to problems during the quieter night-time periods for any dwellings which otherwise experience very low background noise levels. In such cases, BS4142 'Method for rating industrial noise affecting mixed residential and industrial areas'<sup>(17)</sup> can demonstrate that complaints are justified. In order to prevent such situations arising, it is recommended that appropriate regard be given to the type and design of enclosure for plant such as gas blowers, during the detailed final design of the plant.

Since there is no history of noise complaints associated with the present site, and, taking account of the large distances between the site and residential development, and the fact that appropriate measures to attenuate noise can be accommodated during the detailed design of the facility, **it is considered that operational noise will not have an impact on nearby development.**

## 14. SOCIO ECONOMIC.

### 14.1 INTRODUCTION.

The socio-economic impacts of the development may be considered at a number of levels:

- \* Statutory
- \* Perceptions
- \* Cost Benefit
- \* Material Assets
- \* Employment and Income

### 14.2 STATUTORY REQUIREMENTS.

The statutory requirements dictating that the development take place and the limitations associated with levels of treatment are described in detail in Section 2 of this statement. Dublin City Development Plan 14.6.2 has as an objective the provision of a secondary wastewater treatment plant at Ringsend. Dublin Corporation's Development Plan and those of the three local authorities contiguous to the city in those areas forming Greater Dublin promote development which is dependent on an adequate collection system and an appropriate treatment regime for sewage prior to discharge.

The population to be served by the new treatment works at Ringsend is 0.9 million at present rising to an estimated 1.2 million in 2040 as outlined in Chapter 3. In addition to the entire area under the jurisdiction of Dublin Corporation Ringsend STW will serve the following urban areas:

- \* Dun Laoghaire-Rathdown County Council - The coastal area of Dublin Bay as far as Killiney and Coliemore and the areas with an outer boundary described by Dalkey, Deansgrange, Stillorgan, Ballinteer and Rathfarnham.
- \* South Dublin County Council - the urban areas encompassed by Rathfarnham, Tallaght, Clondalkin, Balgaddy and Lucan.
- \* Fingal County Council - Clonsilla, Blanchardstown, Mulhuddart, along the M50 corridor, Dublin Airport, Belcamp, Kilbarrack and Portmarnock.

\* Meath County Council - Ashbourne, Dunboyne and Clonee.

Figure 14.1 describes the catchments graphically.

### 14.3 PERCEPTIONS.

Chapter 7.1 (Odour) highlights the situation pertaining at present in relation to the range of areas which may perceive malodours from Ringsend STW, and that these areas may extend greater than 1km from Ringsend STW.

Chapter 12 (Amenity) juxtaposes this with the apparent contradiction that despite the malodours the area of the South Wall and the associated walks and, in summer, small beaches are popular with local and city wide residents.

In this context the proposal that Ringsend STW have odour removal systems will be of a significant positive impact to the populace.

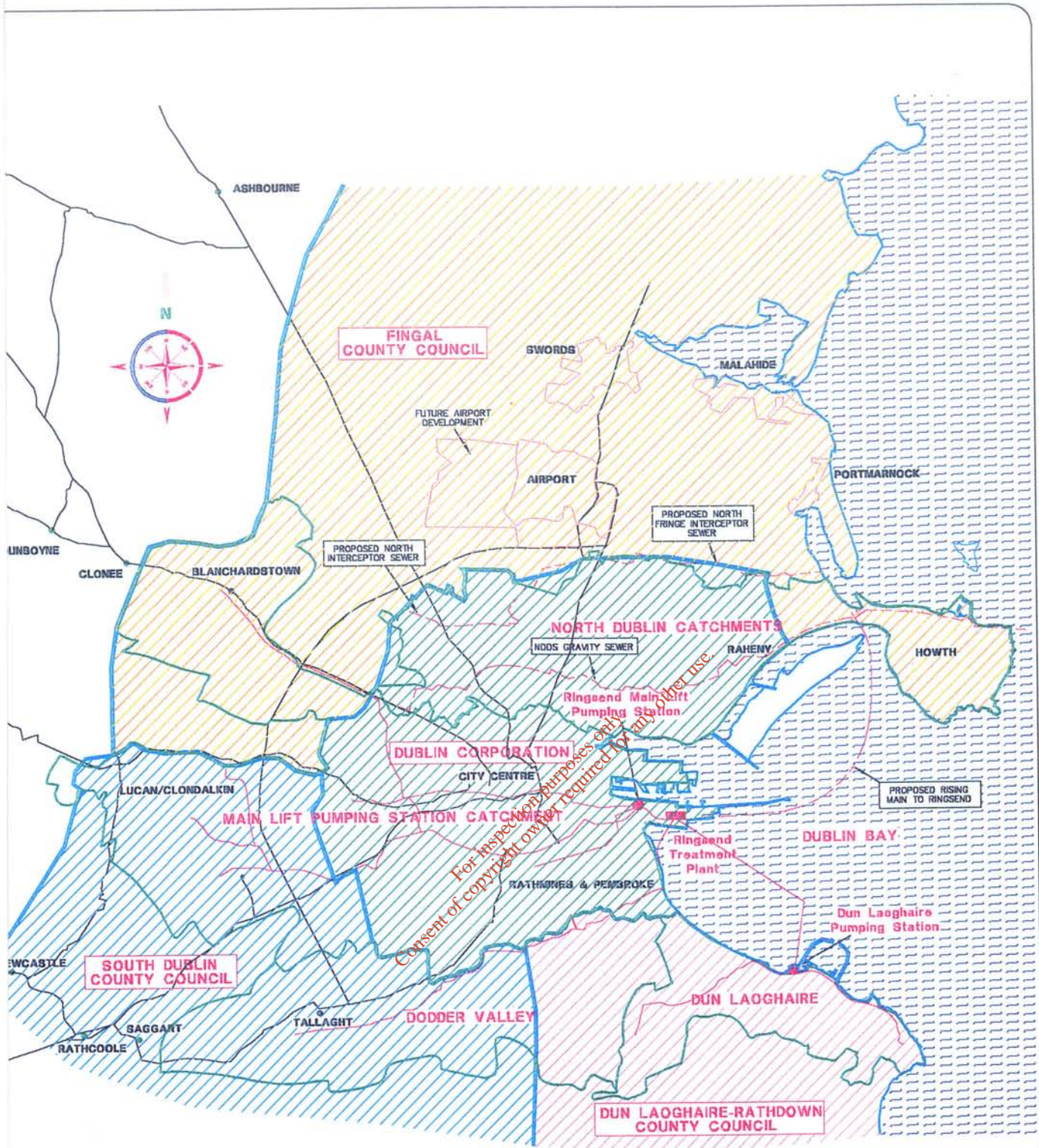
Furthermore one of the principal points of entry to Ireland for tourists, Dublin Ferryport, is immediately north of Ringsend STW on the north bank of the River Liffey. The odours associated with Ringsend STW in its present configuration can be clearly detected at the Ferryport Terminal and Marshalling Areas. Such odours are not the ideal first impression and 'Céad Míle Fáilte' to arriving visitors nor the ideal 'Fáilte Abhaile'. The odour limiting proposals will rectify this.

In a similar vein the existing storm tanks of the original 1906 works project an image of extreme dereliction. As outlined in Chapter 8 Visual Impact the development of the site is likely to remove such dereliction without imposing overly dense building development.

### 14.4 COST BENEFIT.

A Cost Benefit Analysis (CBA)<sup>(18)</sup> was prepared for the Ringsend Treatment Works as then envisaged in June 1993 following the completion of the Preliminary Design Report.

The CBA considers the scheme under two headings 'Market Sector' and 'Non-Market Sector'. 'Non-Market Sector' relates primarily to public Health and the Environment.



**LEGEND**

MAIN SEWERS	
PROPOSED SEWERS	
CATCHMENTS	
ROADS	
LOCAL AUTHORITY BOUNDARIES	

COMBINED CATCHMENT AREAS

FIGURE 14.1

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Not surprisingly the benefits to these areas will be considerable considering that they are the primary reasons for the implementation of the project.

The 'Market Sector' is considered under Tourism, Industry, Commercial, Fisheries and other benefits.

#### **Tourism Benefits.**

Dublin as the Capital City with its numerous historical and cultural attributes has long been one of the most important tourist locations in Ireland and the industry has flourished notwithstanding the inadequacies of waste water treatment and discharge into the bay. With the improvement in water quality in Dublin Bay a potential exists for the expansion of water based tourism and leisure activities. Fulfilment of this potential would lead to a further expansion of the tourist industry and accompanying infrastructural developments.

#### **Industrial Benefit.**

Dublin has the highest industrial output of all the counties in Ireland. Industry has developed in the present regime where raw industrial discharges are accepted by Dublin Corporation for treatment at the existing treatment works or discharge off the Nose of Howth depending on geographical location.

From the position where by it is considered inappropriate and/or statutorily proscribed to further pollute Dublin Bay with industrial or other discharges it is clear that industrial development in the City and County of Dublin would be severely restricted.

Having adopted the 'Polluter Pays' principle and accepting and charging for treated, partially treated or raw industrial waste for treatment at Ringsend and by constructing the facilities for appropriate treatment Dublin Corporation will have put in place one of the key mechanisms for the continued industrial development of the City and County.

The CBA considers that this key mechanism attributes up to 2% of the increase in Value Added to the economy.

#### **Commercial Benefit.**

Dublin is the principal commercial centre in Ireland and has a thriving commercial sector servicing a large retail and industrial base.

The growth in the commercial sector is dependent on growth in areas such as residential populations, tourism and industry. As outlined in Chapter 3 the contributing resident population is expected to grow; similarly with Tourism Benefits and Industrial Benefits above, and accordingly a growth in the Commercial Benefit can be expected. The CBA considers that up to 2% of the Value Added to the Commercial Section may be attributed to the project.

### **Fisheries Benefit.**

The improvement in the quality of water in Dublin Bay resulting from the implementation of this project at Ringsend is expected to act as a stimulus for growth in the fisheries activity in the bay, which at present is very limited. Shellfish that occur include crab, lobster, prawn, shrimp, scallop and cockles. Bord Iascaigh Mhara (The Irish Fisheries Board) consider that significant growth in shell fisheries will occur when the water quality is improved. In particular a good market for cockles has been developed in a number of countries in Europe and it is expected that this will be a significant growth area.

Improved water quality standards will also result in more species of fish entering the bay area. Mackerel, for example, are no longer to be found in the bay, but would be expected to return to cleaner waters. Salmon and trout use the bay as a habitat, while acclimatising to the change in water from saline to freshwater, on their migratory journeys.

The CBA estimates that the Value Added by the project to the fisheries could increase from £2,000 to £230,000 in 2024.

### **Other Benefits.**

Other benefits are considered at two levels, the benefits arising from the Re-use of Sludge as required under the Urban Waste Water Directive 92/271/EEC and Residential and Professional Benefits.

### **Sludge Reuse.**

Sewage sludge contains valuable nutrients and soil conditioning properties. Treated sludge can potentially be re-used as a fertiliser/soil conditioner in a range of disposal outlets. Agriculture and forestry are two such outlets which have been employed successfully overseas.

A rational basis for estimating the monetary value of the sludge product would be to compare its nutrient value per tonne with the equivalent inorganic fertiliser cost. On this basis, Teagasc estimate a maximum value of IR£19 per tonne dry solids, assuming typical nutrient concentration derived from analysis of Irish municipal sludge samples.

#### **Residential and Professional Benefits.**

The provision of adequate sewage treatment prior to discharge of treated effluent is the final link in the chain in development zoning for residential development. With the completion of Ringsend STW allied to the construction of adequate collection systems new development areas can be exploited to accommodate the anticipated increased population. Benefits accruing from this will follow the construction of new housing developments with associated infrastructure impacting on construction firms, manufacturers and suppliers. Professional services refer to solicitors, architects, engineers which provide a Value Added contribution to the economy.

#### **Cost Benefit.**

The costs and benefits attributed in the CBA showed, commencing in 1993 for the construction period and a 25 year operating period, an Internal Rate of Return (IRR) of 9.2%.

### **14.5 MATERIAL ASSETS.**

#### **14.5.1 Development Site.**

The expanded treatment works at Ringsend will be constructed entirely within the curtilage of the existing works. The consequences of this are:

1. That no additional land needs to be reclaimed from Dublin Bay to accommodate Ringsend STW.
2. That none of the other landowners in the vicinity of Ringsend STW loses any part of their holding; a consequence of such a loss might be to reclaim equivalent land from Dublin Bay.

3. Dublin Corporation do not have to purchase, compulsorily or otherwise lands in North County Dublin for the construction of a new treatment works. Such lands as might have been used for this purpose may be used for agricultural, industrial, commercial, residential or amenity uses as zoned by Fingal County Council.
4. Dublin Port have obtained a Harbour Works Order permitting the construction of a new berthage north of the line of the old Ringsend Harbour out as far as the existing sludge jetty. The re-development of the existing storm tanks (1906 works) will limit the extent to which shore facilities can be provided adjacent to the new berthage but it is unlikely to affect the viability of the berth development.
5. Dublin Port proposes to reconfigure some of the roads in the port area to improve the operational effectiveness of some of its working and storage areas. At present Dublin Port retains ownership of a number of roads in the port area - Whitebank Road and Shellybanks Road. The remainder are taken in charge by Dublin Corporation. The impetus provided by Ringsend STW development allied to the desirability of reducing or removing construction traffic on the Pigeon House Road would be the trigger for the completion of these works as mutually beneficial to Dublin Port and Dublin Corporation.
6. A total of 4 nr 220kV and 3 nr 110kV high voltage cables and a 400mm dia. high pressure gas main cross the site interconnecting the Poolbeg Power Station with the transformer and distribution hub at the Ringsend power station. The re-development of Ringsend STW site, depending on the final layout, may require the relaying of such services.

#### **14.5.2 Present Assets.**

To the extent that it is considered viable in accommodating a new works on the site of the old one as much as possible of the present elements of the treatment works will be retained. In particular the existing administration buildings and workshops are likely to be retained.

The sludge ship, the Sir Joseph Bazalgette will become surplus to Dublin Corporation's requirements when sludge dumping at sea ceases towards the end of 1998. Dublin Corporation is at present considering the options for the disposal of the vessel.

## **14.6 EMPLOYMENT AND INCOME.**

### **14.6.1 Construction.**

In the course of the construction of Ringsend STW it is estimated that 1100 man years of direct employment and 550 man years of indirect employment will be generated.

### **14.6.2 Operations.**

In its present configuration up to 22 people are employed in Ringsend STW. Some of these are shared with other facilities and the present employment is approximately equivalent to 16 full-time positions. The future works is likely to employ up to 30 full-time positions with an annual wage bill at 1996 prices of the order of IR£1 million.

The employment profile in the new works is likely to be similar to the present involving managerial, scientific (scientists and laboratory technicians), skilled trade (fitters, electricians, carpenters) and plant attendants (shift teams) the preponderance being at the managerial and scientific level.

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## 15. TRANSPORT.

### 15.1 INTRODUCTION.

The proposed treatment facilities at Ringsend will give rise to only very small increases in traffic levels. These traffic increases will mainly be associated with sludge treatment.

Transportation of sludge from the sewage treatment works, by road, to locations for off-site disposal will be required. The routes utilised will depend upon the final disposal destinations of the treated sludge. Disposal options being examined include land restoration, agricultural and forestry disposal. Disposal outlets in County Dublin and the ten adjacent counties, namely Carlow, Kildare, Kilkenny, Laois, Louth, Meath, Offaly, Westmeath, Wexford and Wicklow, are being considered.

To arrive at final disposal destinations it is envisaged that one or more of the National Primary Routes will be utilised specifically, the N1, N2, N3, N4/N6, N7/N8/N9, N11 and N81.

These main national routes will have to be accessed from Ringsend via Dublin City. The road network in the vicinity of the site is shown in Figure 15.1. The alternative route options for access to the national road network are presented in Volume 2, Appendix H.

The traffic impacts associated with sludge disposal are dealt with in EIS No. 4 - Sludge Transport and Disposal and are not considered further in this EIS.

### 15.2 TRAFFIC VOLUMES ASSOCIATED WITH PROPOSED DEVELOPMENT.

The traffic generated by the proposed sewage treatment facilities will comprise three main elements:

- (i) Staff Transport/Maintenance and Ancillary Activities (long-term).
- (ii) Transport associated with sludge treatment processes.
- (iii) Construction traffic (short-term).

### **15.2.1 Staff Transport/Maintenance and Ancillary Activities.**

It is estimated that the number of staff employed at the site will increase from the 16 to 30 (Section 14.6). Some traffic will also be associated with maintenance activities, delivery of supplies, contractors and visitors to site.

Liquid tankered waste will continue to be brought to the site as at present (15 tankers/day). Therefore, there will be no change in traffic volumes associated with this activity.

A figure of 50 vehicles per day has been assumed to cover staff movements and ancillary activities.

### **15.2.2 Transport Associated With Treatment Works Operations.**

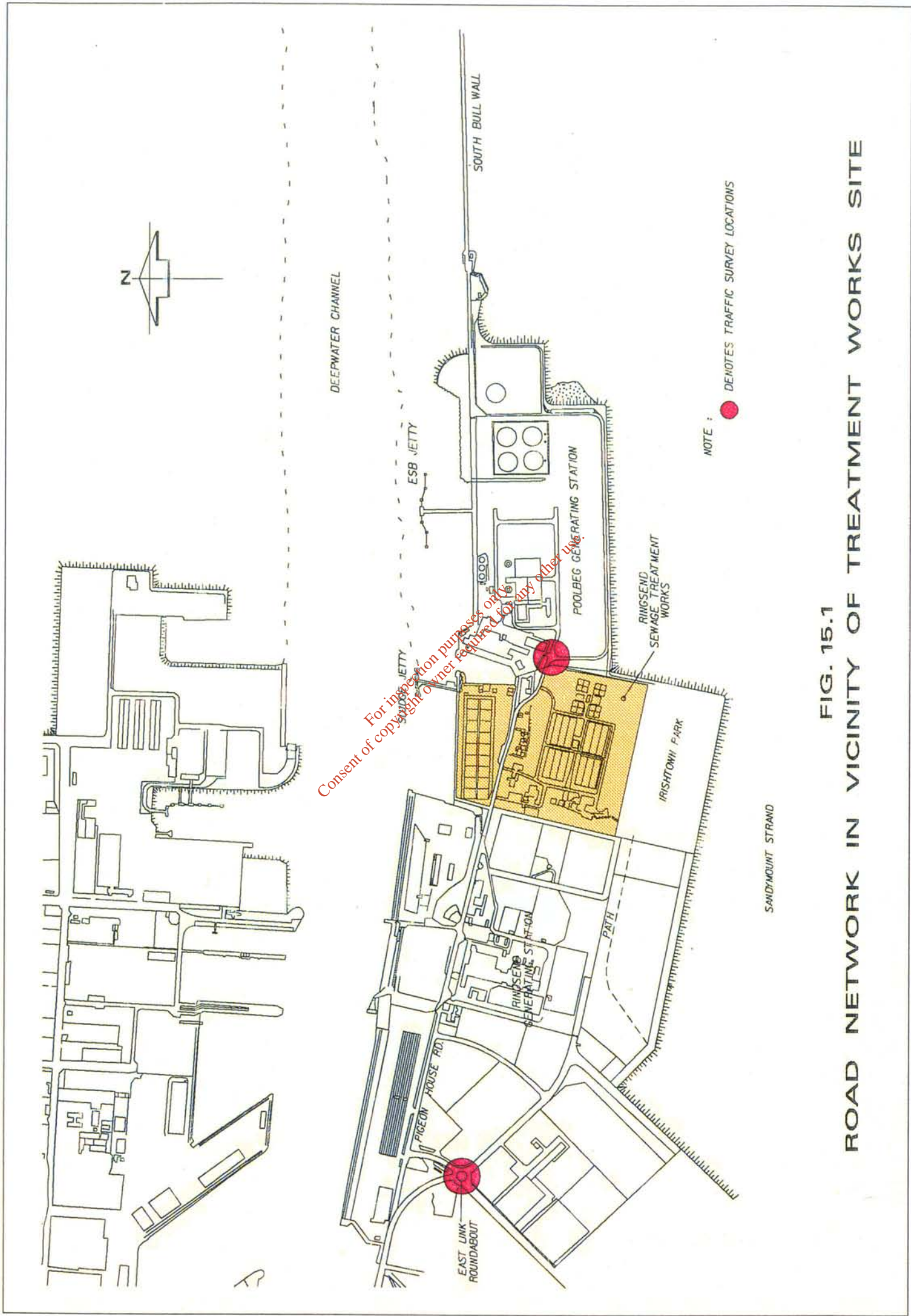
The only traffic which will be associated with the treatment work operations will be associated with sludge treatment. As discussed in Sections 3.9 and 3.10, a number of sludge treatment options including alkaline stabilisation are being considered. If the alkaline stabilisation process is selected it will give rise to inward movements of additives for stabilising the sludge. It is estimated that 1,165t per week of admixture would be delivered to the site. Assuming a vehicle payload of 20t the weekly number of vehicle movements would be 118. This equates to 20 movements per day for a 6 day working week or 24 per day for a 5 day working week.

### **15.2.3 Traffic Associated with Construction Activities.**

Much of the site works for the sewage and sludge treatment works will comprise the installation of large plant items which involve once-off deliveries. It is envisaged that these deliveries will be made by ship to the jetty at Ringsend.

The main construction traffic will be associated with removal of excavated material from site and deliveries of concrete to site. It is estimated that over the three year period from January 1998 to December 2000 it is estimated that the number of removals/deliveries to the site will be of the order of 22,500 which equates to 45,000 truck movements. Averaging truck movements over the 3-year period gives 15,000 truck movements per annum. Assuming 250 working days in each year gives an average daily truck movements as 60.





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NOTE : ● DENOTES TRAFFIC SURVEY LOCATIONS

FIG. 15.1  
 ROAD NETWORK IN VICINITY OF TREATMENT WORKS SITE

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Traffic volumes will not be uniform throughout the construction period. Much of the traffic will be associated with bulk excavation and large concrete pours and will occur early during the construction period.

In order to take this into account a peaking factor of 10 has been applied to the average daily traffic movements to give peak movements of 600/day.

It is estimated that up to 200 cars associated with construction staff would access the site each day. This equates to 400 vehicle movements. These car movements will be concentrated in the early morning and late afternoon with an estimated 200 movements between 7.30 and 8.00hrs. and 200 movements between 17.30 and 20.00 hrs each day.

#### **15.2.4 Summary.**

The estimated peak number of vehicle movements during the construction period is 1,000/day. The peak number of hourly movements which arises during the construction period, is  $200 + 600/8 = 275$ .

Operational traffic will comprise staff related traffic and sludge treatment related traffic. The estimated associated vehicle movements =  $100 + 24 = 124$  per day.

### **15.3 RECEIVING ENVIRONMENT.**

#### **15.3.1 Route Description.**

The Ringsend Treatment Works site is adjacent to the Port of Dublin and a number of container marshalling yards. It is therefore close to one of the most heavily trafficked areas in the city. There has been considerable investment in road infrastructure around Dublin in recent years and an orbital motorway is substantially complete except for the Southern Cross section. However, there continues to be severe congestion in the centre of Dublin and the adjacent built-up areas and heavy goods vehicles leaving the port area are forced to traverse urban areas to gain access to the national road network. Proposals to link the port area into the national road network by constructing a port access route are at planning stage but have yet to be approved.

### 15.3.2 Traffic Volumes.

#### *Vicinity of Ringsend Site.*

In order to assess the baseline traffic volumes two pre-selected sites were surveyed between 8.00am and 6.30pm on two dates in July 1995 and classified traffic counts were compiled and summarised.

The aim of the surveys was to assess typical work and amenity traffic and the dates chosen were Tuesday 25th July for predominantly work traffic and Sunday 23rd July for predominantly amenity traffic. Traffic counts were made at the East Link Roundabout and just beyond the entrance to Poolbeg at Pigeon House Road. The second location was chosen specifically for the purpose of assessing traffic en route to the beach, Irishtown Nature Park and the Great South Wall. The results are shown in Table 15.1.

**Table 15.1**  
**Traffic Counts in the Ringsend Area**

<b>Vehicles</b>	<b>Tuesday</b>	<b>Sunday</b>
Using Roundabout	18,333	9,837
Roundabout to Pigeon House Road	1,305	550
Pigeon House Road Beyond Poolbeg	260	341

It should be appreciated that the level of traffic on Pigeon House Road is very low given its proximity to the city centre and its location within a recognised industrial area.

The survey confirmed that traffic on Pigeon House Road is very much less than its theoretical capacity and is insignificant compared to the total using the East Link Roundabout.

Queuing times for heavy goods vehicles accessing the East Link Roundabout from the Pigeon House direction were also assessed. Only one heavy goods vehicle (HGV) came onto the roundabout on Sunday 23 July and did not have to wait. 130 HGVs were timed coming onto the roundabout (using video replay). The average waiting time was 6 seconds and the maximum was 55 seconds.

Detailed traffic survey data is presented in Volume 2, Appendix I.

### ***Within Dublin City.***

The publication 'National Roads and Traffic Flows 1995<sup>(19)</sup>', of June 1996 prepared by the National Roads Authority estimated the Annual Average Daily Traffic (AADT) for the national routes within Dublin City as shown in Table 15.2.

**Table 15.2**  
**Annual Average Daily Traffic(AADT) Estimates for National Routes**  
**Within Dublin City**

<b>National Route</b>	<b>AADT</b>	<b>HGV Percentage</b>	<b>Site Location</b>
N1	38,468	11	End of M1, Santry
N2	20,440	8	North Circular Road
N4	30,849	18	St. Johns Road West
N7	12,271	21	Inchicore

## **15.4 TRANSPORT IMPACTS.**

### **15.4.1 Road Capacities**

#### ***Ringsend Area***

The Ringsend site is located adjacent to Poolbeg Power Station and adjacent to Dublin Port. It is well served by roads that currently handle heavy freight vehicles.

The results of the traffic survey indicated that traffic on Pigeon House Road is very much less than its capacity and that the traffic which will be associated with the construction and operation of the treatment works will be insignificant compared with the traffic using the East Link Roundabout. Specifically the percentage increase at the East Link roundabout associated with construction will be 5.5% and associated with operational phase will be 0.7% approximately.

#### ***Dublin City.***

Until road access between the orbital motorway and the port area is improved all heavy goods traffic will have to pass along the existing road corridors, many of which pass through residential areas. It is possible that restrictions on heavy goods vehicle movements, for example during hours of darkness or during peak periods, may be introduced.

Outside the Ringsend area, the increase in vehicle movements expected on any one route will be insignificant in comparison to general traffic movement.

#### **15.4.2 Noise.**

The incremental noise effects in the Ringsend area and within Dublin city will not be significant.

#### **15.4.3 Odour.**

Sludge treatment produces a material that is stabilised to reduce pathogen levels and controls odours. Treatment does not fully remove the readily digestible fraction of the solids that tend to give rise to odour. Therefore it is proposed that the treated sludge be kept covered during storage and transport. Particular care to avoid odour nuisance will be required at points of loading and unloading.

#### **15.4.4 Dust.**

Because the treated sludge product will be covered during transport dust nuisance will not arise.

To minimise accumulation of dust on vehicle wheels, wheel cleaning facilities will be provided at Ringsend.

#### **15.4.5 Road Safety Impacts.**

The transport operation involves travel by HGV's adjacent to Ringsend within Dublin City.

The data contained in Table 15.3 is taken from the annual reports on traffic accidents compiled and published by the National Roads Authority<sup>(20)</sup>. From 1994 to 1995, the estimated number of personal injury accidents (PIA) per 10 million vehicle kilometres in County Dublin increased from 4.5 to 6.6. The percentage of PIAs involving HGV's has remained relatively constant at approximately 10% over the past five years.

**Table 15.3**  
**Traffic Accident Data County Dublin 1991 - 1995**

Year	Accident Estimate per 10 Million Vehicle kms	Total Number of Accidents	Number of Accidents Involving HGV's	Percentage of Accidents Involving HGV's
1995	6.6	3,228	325	10.00
1994	4.5	1,932	197	10.20
1993	4.2	1,755	178	10.10
1992	4.4	1,753	192	11.00
1991	4.8	1,951	204	10.40
Annual Average	4.9	2,214	219	10.34

Table 15.4 details accident rates for those sections of national routes within County Dublin<sup>(21)</sup>. The rates have been converted from million vehicle miles to 10 million vehicle kilometres. Since this data was originally compiled significant improvements have been completed for a number of these roads which are included in the proposed transport routes, and it is assumed will have impacted positively on road safety.

**Table 15.4**  
**PIA Rates For National Route Sections Within County Dublin**  
**(excluding city) 1984 - 1987**

Accident Rate per 10 Million Vkm			
National Route	Low	High	Average
N2	0.62	3.12	1.1
N4	0.00	5.62	2.03
N7	1.25	3.12	2.03

The worst case figure derived from Tables 15.3 and 15.4 is 6.6 personal injury accidents (PIA) per 10 million vehicle kilometres. This figure has been applied to give a conservative estimate of the likely impact within Dublin City and on National Primary Routes.

During the construction phase, based on a calculated yearly travel distance of 800,000km comprising return journeys of 40km for deliveries/removals to and from site and return journeys of 10km for staff/visitors, the potential PIA increase arising is predicted at 0.52 per year.

During the operational phase, based on the calculated yearly travel distance of 918,820km, comprising return journeys of 200km, the potential PIA increase arising is predicted at 0.60 per year.

#### **15.4.6 Impact of Development on Public Health.**

Treated and untreated sewage sludge is routinely transported by road in other European countries and it is not considered to be an unreasonable risk to public health. The use of covered vehicles will be an added protection in this regard.

#### **15.4.7 Impact of Development on Air Pollution.**

Air pollution issues related to traffic arise from the emission of carbon monoxide (CO) by vehicles. The Manual of Environmental Appraisal (UK) has set a standard of 9ppm CO concentration averaged over an 8 hour period and a 1 hour peak concentration of 35ppm, as being an acceptable kerbside value. To put this in context, a flow of 1,000 vehicles per hour, operating at an average speed of 40km/hr would give a kerbside CO concentration of 2.4ppm. The relationship is linear so halving the flow would halve the CO concentration level. Relating this to the development related traffic it is evident that air pollution from traffic will not be a significant environmental impact.

#### **15.4.8 Amenity Impact.**

The effects on amenity arise from the larger amount of traffic on roads than would otherwise be the case in the absence of the operation.

During the construction phase, excluding staff movements the average number of vehicle movements per hour will be 7.5 and peak numbers over limited periods will be 75. There will thus be perceptible levels of increased traffic on Pigeon House Road during part of the construction phase.

During the operational phase, excluding staff movement, the estimated number of trucks which will utilise any length of the road in one hour is 3. The impact of the treatment works operation on amenity will therefore be insignificant.



It is emphasised that no increased traffic associated with the proposed development will occur adjacent to the main amenity sites of Irishtown Park and the Great South Wall.

#### **15.4.9 Bird, Vermin and Insect Nuisance.**

The sludge product will be covered during transport and during storage to minimise risk of bird, vermin and insect nuisance.

#### **15.4.10 Mitigation Measures.**

Appropriate traffic management should be undertaken to avoid nuisance during the construction period.

#### **15.4.11 Conclusion.**

The predicted impact of the increased road traffic on road capacity is not significant on any of the routes examined and will have minimal effect on the reserve capacities of the roads in question. The predictions show that the potential risk of accidents occurring is low.

The increase in traffic congestion will be significant on Pigeon House Road during the construction period, particularly between 7.30 and 8.00hrs. and 17.30 and 20hrs. The implementation of a traffic management plan will help to limit any nuisance risk.

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16. CLIMATE.

The construction of the expanded Ringsend STW is not expected to have any impact on climate.

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## **17. HERITAGE.**

### **17.1 INTRODUCTION.**

The various architectural and engineering structures in and around the present day sewage treatment works arose from 5 stages of development listed below:

- A. The Great South Wall 1715-1790
- B. The Pigeon House Harbour and Hotel 1766-1795
- C. The Pigeon House Fort 1798-1813
- D. The sewage pumping station and precipitation tanks 1899-1906
- E. The electricity power station 1901-3

#### **17.1.1 Natural Topography.**

The natural ground surface prior to the projects listed above comprised of tidal sand banks flanking both sides of the Liffey estuary, known as the North and South Bulls. The sand banks stretched from Ringsend to Monkstown and stretched into the estuary as far as the present position of the Poolbeg Lighthouse. On the northern side of the estuary, they encompassed the area between Ballyboughil and Howth. The North Bull was separated from the South Bull by a distance of a half mile in the centre of Dublin Bay, forming a channel used for shipping. Part of the latter was called Poolbeg from which the name of the area is derived.

At low water the sand was exposed and an enormous area of dry land filled Dublin Bay. By the eighteenth century, the sand increasingly encroached on the bay, and on the shipping channel to Dublin Port, making navigation to it increasingly difficult.

#### **17.1.2 Archaeological Remains.**

The build up of sands is either entirely natural or the consequence of the developments outlined in 17.1.1. There is no indication that there had ever been prehistoric or medieval activity of any duration on them.

#### **17.1.3 Historical Remains.**

The area has a particular significance in more recent history as it is the focus of several large engineering projects of outstanding stature, in addition to being the site of a military fort. The latter has an importance in the more general Irish political history of the late eighteenth and nineteenth century. The engineering projects, on the other

hand, are evidence of a more specific aspect of Irish history, but are nonetheless of particular significance from a local and international point of view.

#### **17.1.4 The Great South Wall 1715-90.**

Work began on the construction of the Bull Wall in 1715 at the behest of the Ballast Office. The latter was established in 1708 to facilitate navigation through the Liffey and its estuary, and it was intended that the new wall would retain the South Bull, thereby aiding navigation to the port. The wall comprised initially of two lines of stakes placed 100 yards apart stretching out to the present day Poolbeg lighthouse from Ringsend. A channel twenty feet wide between the stakes, was filled by long piles, set in three rows, driven into the natural sand. The gap between the piles was then filled with stones and hurdles. The piling was completed by the 1730's and a floating lighthouse established at its end in 1736.

The upkeep and repair of the timber piles proved costly and necessitated the replacement of the outer stakes with stone walls. Work began on them in 1753. A base was established near part of the channel called the Green Patch, including the erection of a Blockhouse for the storage of tools and equipment. Supervision for the maintenance of the Blockhouse was vested in a John Pidgeon, and his association with the area has lent his name to the harbour and the hotel. A stone wall was illustrated in 1756 by John Rocque, who named it the 'South Wall', linking Ringsend and the Blockhouse area only. The roadway over it became known as the Pigeon House Road. Work on the stone wall continued until 1790 when it finally reached the lighthouse. It is undoubtedly one of the outstanding engineering achievements of its time.

#### **17.1.5 The Pigeon House Harbour and Hotel 1766-1795.**

The relative safety of navigation through the estuary brought about by the Bull Wall encouraged the Ballast Office to approve the construction of two wharves in 1766 near the Blockhouse. It was intended that the wharves would enable cross-channel ships to disembark there, rather than at the rival Howth and Dun Leary ports. In 1795, it was enhanced by the magnificent Pigeon House Hotel, to accommodate arrivals from the often harrowing journeys across the Irish Sea.

#### **17.1.6 The Pigeon House Fort 1798-1813.**

Commercial activity around the harbour was brought to an abrupt end when it was taken over by the War Office in 1798. The hotel was commandeered for officers quarters and several other buildings were built for the convenience of the garrison,

including the officers and their families. Plans were drawn up in 1805 for an elaborate fort with massive battlements to protect the entrance of the harbour from Napoleonic invasion, but the latter threat receded considerably after Nelson's victory at Trafalgar, and the battlements were never constructed.

Instead, the more modest device of stout walls was erected around the perimeter of the garrison buildings including an armoury and storage for state bullion. The domestic preoccupation of the garrison was underlined by the position of the cannon and fort loopholes, many which were trained inland, facing the south wall road, or across the bay, with an eye to local rebellion as much as foreign invasion.

#### **17.1.7 The Sewage Pumping Station and Precipitation Tanks 1898-1906.**

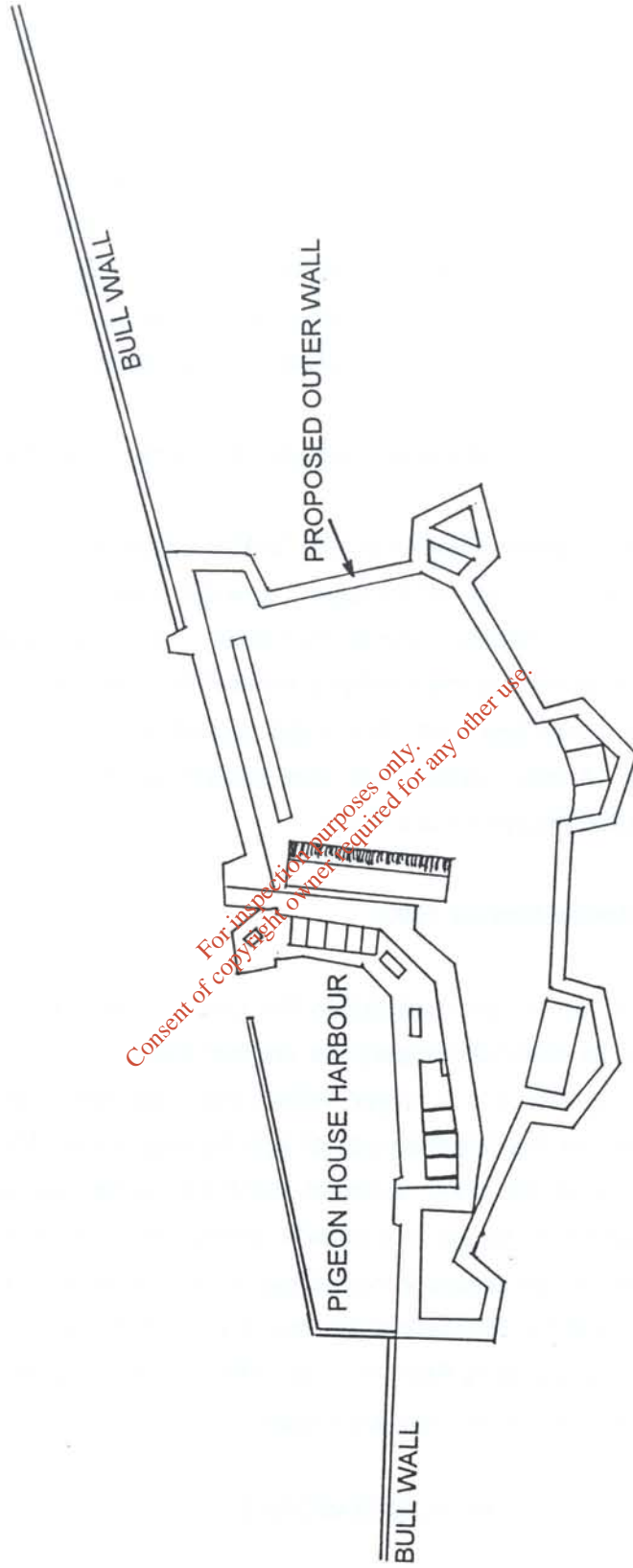
The harbour and fort were procured by the Dublin Corporation in 1898 primarily for the purpose of facilitating a new and modern sewage system. A pumping station was constructed west of the harbour, and an iron sewer conveyed the waste to the concrete precipitation tanks where the material was treated for disposal. The tanks were built in the harbour after it had been almost entirely reclaimed, leaving only the eastern part open to the sea. A new harbour wall was placed across it from the tip of the jetty directly across to the Pigeon House Road.

#### **17.1.8 The Electricity Power Station 1903.**

The acquisition of the fort and harbour by the Dublin Corporation provided space with which to upgrade its electricity supply. Its original station at Fleet St. (built 1892) was running at over capacity and a larger station was required to keep up with the ever increasing demand for this latest source of lighting and power. The new station was up and running by 1904. Its outer walls of red-brick, enhanced with granite copings, enclosed the huge boiler house and turbine rooms. An impressive 150 foot high red-brick chimney climbed up beside it. Numerous additions were made to the structure up to the 1940's. In 1965 the foundations for the new oil powered Poolbeg station were laid nearby, and two great towers 680 feet high lofted up. It supplied electricity from 1971 and the old station stood down two years later.

### **17.2 CHARACTERISTICS OF PROPOSED WORKS.**

The proposal to upgrade the existing sewage treatment works primarily involves lifting the existing facilities and replacing them with more modern equipment. In addition it is proposed to replace the precipitation tanks, now redundant, with upgraded tanks in the



PLAN OF PIGEON HOUSE FORT 1805 (N.T.S.)



old harbour. The works are therefore confined to the area limiting the existing works on the south and north side of the Pigeon House road.

### **17.3 IMPACT OF PROPOSED WORKS.**

The proposed development encompasses the upstanding remains of the 1813 fort including its walls and buildings, part of the South Bull wall, and the larger portion of what was the Pigeon House Harbour. It does not include the Pigeon House Hotel.

#### **17.3.1 The 1813 Fort.**

The existing remains of the fort comprise of a portion of its outer wall, and a small but largely extant two storey building, on the south side of the road. Apart from the hotel, all other structures to the east of the extant building seem to have been entirely obliterated, presumably during the course of constructing Poolbeg station and, more recently, the existing sewage works. Nearly all the features between the outer wall and the road have been flattened although the outline of several structures can be seen on the ground or on the wall itself. This latter portion of the site is adjacent to the existing sewage works and is to be excluded from the development as whole.

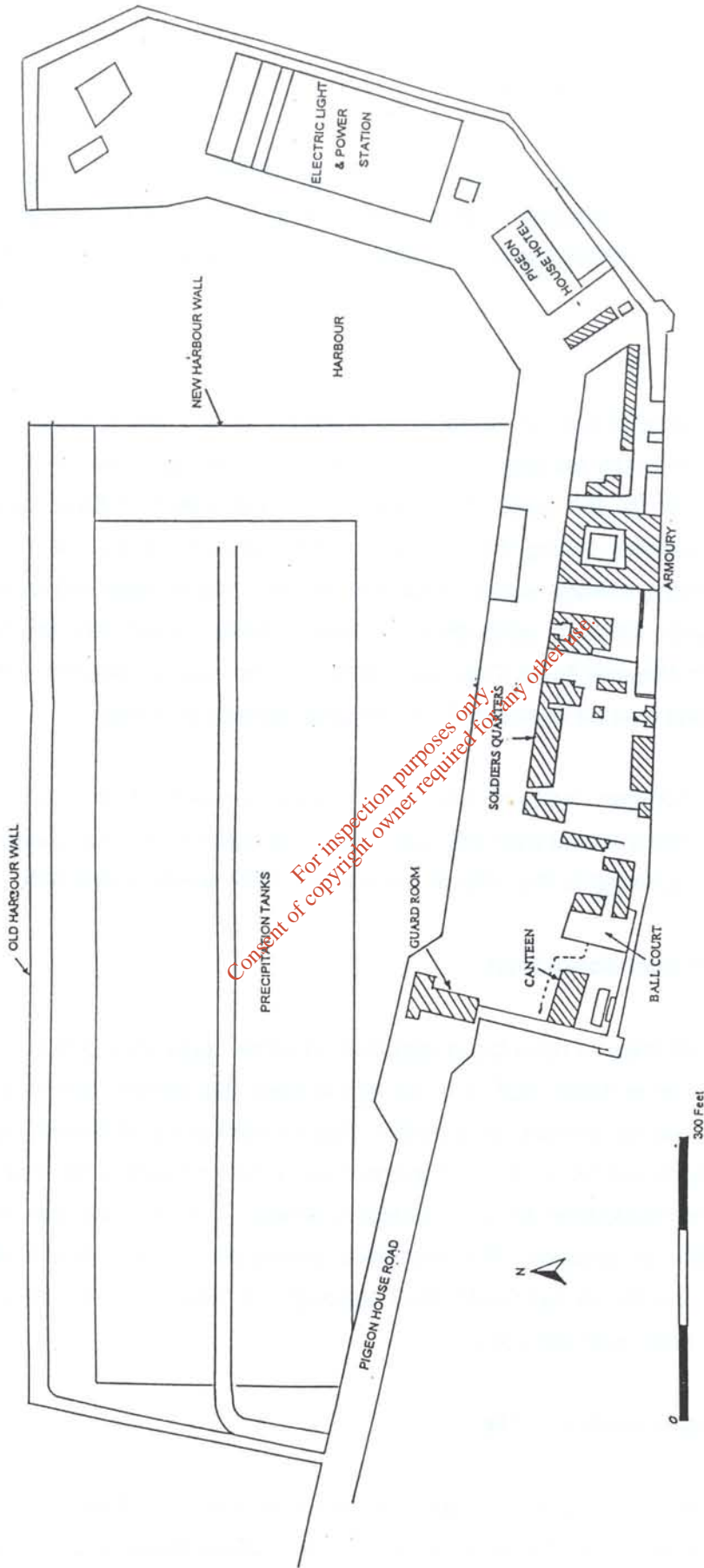
On the other, northern side of the road, limited remains of the gatehouse and guardroom are clearly visible from the roadway. Loopholes for cannon overlook the old harbour, stretching round to the hotel in many parts of the existing side wall.

#### **17.3.2 The 1716-1790 Great South Wall.**

The Bull Wall was likely to have been disturbed at some stage during the course of the initial sewage scheme 1899-1906, and during the later upgrading in the modern era for the purpose of laying sewers or siphons. Such disturbance, however, is probably localised and there seems no doubt that the historic Great South Wall is largely intact and provides the foundation for the existing roadway. This includes the present day side walls visible at present. The proposed development does not envisage any material impact on the Great South Wall although the operation of heavy plant and machinery may endanger parts of it.

#### **17.3.3 The Pigeon House Harbour 1766.**

The eastern side of the harbour, under the Pigeon House is outside the development area. On the western side, the removal of the precipitation tanks, and their substitution by modern ones, as envisaged, will occur within the line of the old harbour walls. It is



PLAN OF PIGEON HOUSE FORT & ENVIRONS 1906

not known if the original harbour walls survive as the present concrete surface of the wall encircling the tanks obscures the partially visible stone base. The presence of a stone base raises the possibility that the original jetty is extant underneath.

#### **17.4 MITIGATION.**

Measures to mitigate the effects of the development on heritage are greatly influenced by the degree of public interest as expressed in the present public policy and legislation.

##### **17.4.1 Public Policy and Statutory Legislation.**

Dublin Corporation is committed to retaining the features of historical importance as far as practicable. Consequently, the Pigeon House Hotel is listed for preservation and the area as a whole has been earmarked a 'Conservation Area' of the Dublin Development Plan 1991, particularly with a view to retaining the character and setting of the area around the Hotel.

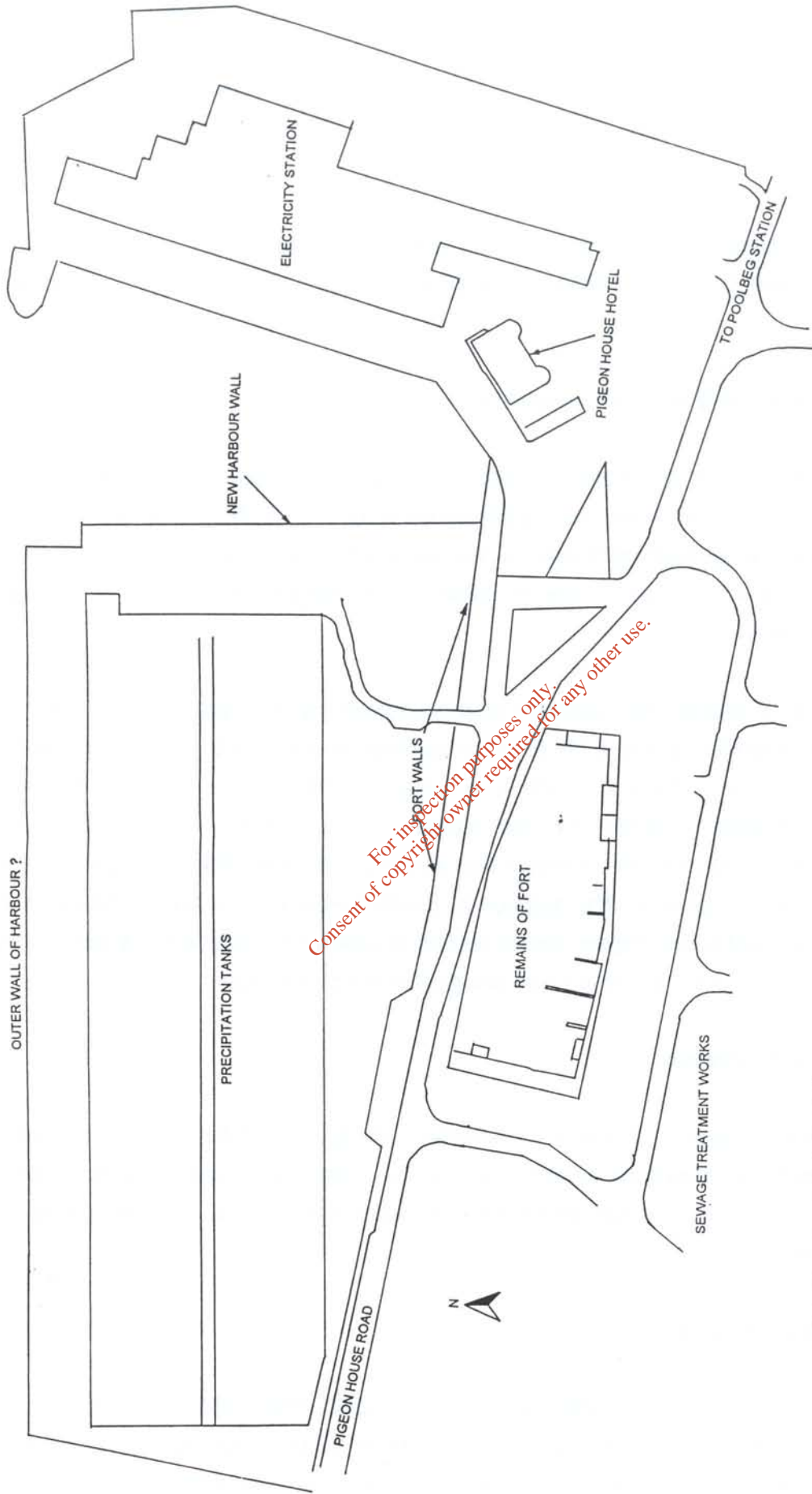
There is not at present any statutory protection given by the Department of the Arts, Culture and the Gaeltachta to the heritage buildings and structures outlined in Section 1. However, *The Heritage Act 1995* established the Heritage Council on a statutory basis to 'propose policies for the identification, protection, preservation and enhancement of the national heritage' and enabled it to designate buildings in public ownership for preservation. The decision of Dublin Corporation to accord the status of conservation area to the Pigeon House and its environs fully complements the outlook of the Heritage Council and any future designation if it should occur.

##### **17.4.2 The Pigeon House Fort.**

Care should be taken to avoid any inadvertent damage to the fort remains by heavy plant or machinery during the course of works. The most appropriate measure would be to clearly demarcate the fort structures and make them 'out of bounds' during the general works.

##### **17.4.3 The Great South Wall.**

The boring through, or truncation of, the Great South Wall, under the existing road should be kept to a minimum. Care should be taken to avoid damage to its limestone side walls and coping stones. Should any damage occur, the walls ought to be fully reconstructed in keeping with the original.



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**PLAN OF PIGEON HOUSE & ENVIRONS AT PRESENT**

#### 17.4.4 The Pigeon House Harbour.

It has yet to be established to what extent the original harbour walls are present under the concrete perimeter of the precipitation tanks. A qualified archaeologist/architectural historian could be engaged to examine the documentary evidence and the existing walls with a view to preserving the old walls should they exist.

#### 17.4.5 Summary.

Table 17.1 below summarises the mitigation measures associated with the heritage of the area.

**Table 17.1**  
**Mitigation Proposals**

Item	Element	Mitigation	Comment
Pigeon House Fort	Outer walls and building remains	To be preserved	
The Great South Wall	Side walls and wall below roadway	Damage to side wall to be avoided	
Pigeon House Harbour		To be preserved if extant	Archaeological or architectural historian to be present at construction

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## 18. CONSTRUCTION.

### 18.1 OUTLINE PROGRAMME.

The construction period for Ringsend STW is dictated by a number of requirements:

- **Statutory Deadlines.**

- \* 31st December 1998 for the installation of a sludge treatment process to allow the cessation of Dumping of Sludge at Sea.
- \* 31st December 2000 for the commissioning of the plant to achieve the required level of treatment to the discharged effluent.

- **Procurement Constraints.**

Procuring Ringsend STW under a Design Build Operate (DBO) contract means that the time allowed to tenderers in preparing their tenders must allow for an adequate period for the design of the works. Given that this is likely to be one of the largest plants of its kind in Europe this design time period will have to be as generous as possible. Additionally, having a large number of tenderers preparing expensive DBO submissions for the project is unfair to contracting organisations. Therefore a pre-selection and shortlisting process will take place in advance of the invitation to tender for the main works.

Achieving the 31st December 1998 deadline for sludge treatment is likely to be problematic if tied to the main works. As a consequence the interim sludge treatment will be procured separately with a view to achieving the target completion date.

A programme is presented in Figure 18.1 which indicates the timescales associated with the main elements of achieving the target dates.

### 18.2 MITIGATION.

The degree of nuisance for a particular individual depends on a number of factors apart from the extent of work. The physical distance from a section of the works, weather

conditions, type of plant being used, time of day and ground conditions will all be relevant.

In order to minimise the environmental impact of construction activity the following measures will be taken:-

- Designers will be required to make provision for the limitation of environmental impact during the construction period.
- All work will be carried out by experienced Contractors working under particular Conditions of Contract, including provision for impact minimisation during construction.
- All work will be supervised by experienced professional Engineers to ensure Specification compliance.
- The Contract Conditions will provide for measures to limit nuisance.
- Public safety will be of paramount importance and only contractors with good track records in this regard will be chosen to carry out the work.
- Good safety practices will be enforced at all times.

All the work will be carried out under the overall supervision of the City Engineer, his staff and Project Advisors with the assistance of specialist Engineers and Environmental Scientists.

### **18.3 VISUAL.**

The principal entities relating to the project which may have visual impacts are:

- i) Tower cranes and other cranes used on the site will breach the skyline.
- ii) During winter working periods site lighting will be provided. In the context of the existing site lighting and the proliferation of high level flood lighting to adjacent areas the effect of this working lighting will be minimal.



*Dublin Bay Project*  
**RINGSEND TREATMENT WORKS EXPANSION**  
**ENVIRONMENTAL IMPACT STATEMENT**

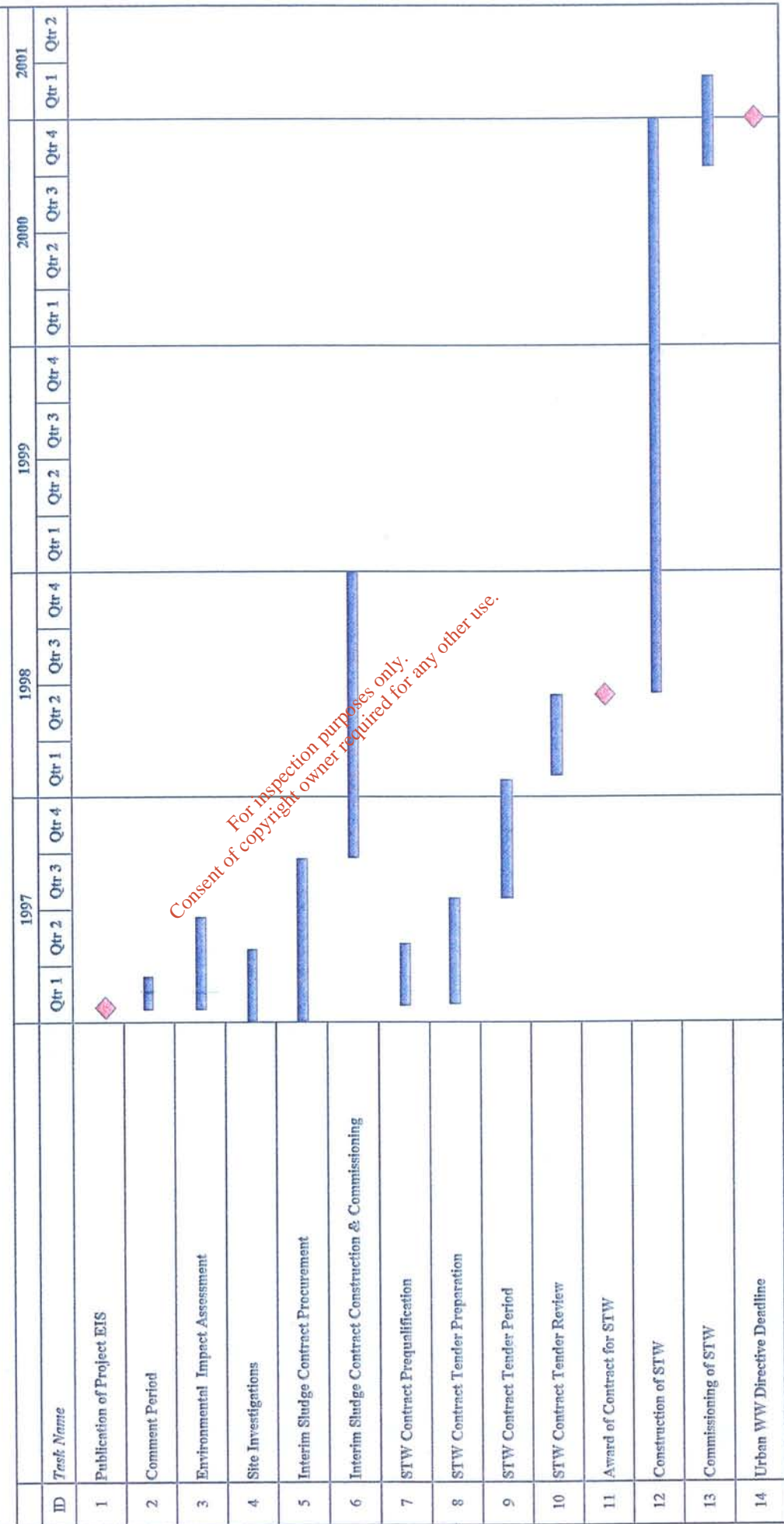


Figure 18.1 Proposed Project Implementation Programme

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- iii) Accommodation units and materials storage containers for contractors are likely to be erected near the periphery of the site.

#### **18.4 NOISE.**

Construction noise is considered in detail in Chapter 13.

#### **18.5 VIBRATION.**

Vibration may emanate from the site as the result of demolition and piling works. Such works are relatively commonplace in the general area of the port surrounding Ringsend STW site and are carried out without any significant impact to existing buildings. Given the large areas and separating distances low impact is not surprising.

The Fort buildings which are outside the boundary of Ringsend STW site are the closest and most susceptible to damage. The Contractor will be required to propose work methods consistent with the limitation of vibrations at the Fort to the Requirements of BS 7385 Part 2 'Evaluation and Measurement for Vibration in Buildings from Ground-borne Vibration'. The Contractor will be required to monitor the levels of vibration in the Fort and make amendments to his work methods as appropriate to ensure compliance with the standard.

It is not anticipated that any other structures will be significantly affected by vibrations.

#### **18.6 TRAFFIC.**

The impact of the movement of labour and materials to and from the site is discussed in Chapter 15.

#### **18.7 DUST.**

A potential for the generation of dust and subsequent nuisance arises from a number of construction activities. Many of these activities, e.g. demolition, will be localised in nature and unlikely to affect areas outside the boundary of Ringsend STW. Trucks leaving sites tend to soil roads at site exists and dust nuisance arises in dry weather with high levels of traffic movement. Mitigation of this nuisance will require that the Contractor on site will be required to put in place a wheel washing and road cleaning

programme in the first instance to prevent the spread of soiling materials and in the second instance to remove them if they are spread.

## **18.8 SITE DRAINAGE.**

It is envisaged that many, if not all, of the below ground construction activities will require pumping of water to allow them be carried out in the dry. Construction of the earlier 1980's works and the associated Site Investigations suggest that no chemical contaminants are likely to be encountered.

Tenderers for the main works contracts will be presented with full geotechnical information and chemical analysis of the ground and materials likely to be encountered in constructing the works. They will be required to describe their methods for dealing with them on an overall basis and on location specific bases. The primary criteria for the acceptance of the methods will be:

- The effectiveness of removal of soil particles from the water; all settleable materials to be removed from the flow prior to discharge.
- No discharges of contaminating chemicals will be permitted.

## **18.9 EFFLUENT DISCHARGE.**

Responsibility for the control of effluent through Ringsend STW during the construction period will rest with the Contractor. A crucial element in the selection of the winning tender will be the proposals contained therein for the continued operation of the existing plant. Central to this requirement will be the premise that discharge quality will not be inferior to the quality standards achieved in the present operation of the existing plant.

## **18.10 EMPLOYMENT.**

It is estimated that the project will create 1100 man years of direct employment and approximately 50% or 550 man years of indirect employment in the implementation of the project. Much of the work in relation to the project is likely to be highly specialised, particularly in relation to the manufacture of plant and machinery. Furthermore, it is likely that the Contractor or consortium awarded the work will be international in its operations. Accordingly it can be expected that some portion of the employment will be

generated in other EU member states or elsewhere. Given the nature of the funding for the project such an occurrence should be anticipated.

Notwithstanding this, however, in view of the considerable workforce available to Irish contracting operations and the considerable cost advantage in the utilisation of a local workforce it is inevitable that most of the employment benefit will be experienced in Ireland and locally in the Dublin region.

#### **18.11 ECONOMIC.**

In addition to the cost benefits outlined in Chapter 14 economic benefits can be expected to accrue during the construction. In addition to the manufacturing and employment benefits highlighted above a number of additional benefits should accrue:

- \* Local businesses will be in a position to provide services to the site.
- \* The influx of workers from outside the city and country will result in a requirement for board and lodgings and will result in an increased income for those providing them.
- \* Associated with this influx and also the construction operations as a whole will be an increase in spending, particularly social spending, in the vicinity of Ringsend STW.

#### **18.12 EXISTING SERVICES.**

As outlined in Chapter 14 a number of high tension electricity cables, a large diameter high pressure gas main and existing main sewers transverse the site of Ringsend STW. The designers of these works will be required to include them in their design and make appropriate provision for dealing with them. The nature of any amendments, in addition to the associated costs, will have been agreed with the service companies and included in the tender cost for assessment in relation to all the elements of the development.

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**LIST OF RELEVANT LESIGLATION**

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## LIST OF RELEVANT LEGISLATION

- European Communities: (Environmental Impact Assessment) Regulations, S.I. 349 of 1989.
- Council Directive of 27 June 1985 on the Assessment of the Effects of Certain Public and Private Projects on the Environment (85/337/EEC) O.J. No. L 175/40.
- Local Government (Planning and Development) Regulation 1994, S.I. 86 of 1994.
- Council Directive of 21 May 1991 concerning Urban Waste Water Treatment (91/271/EEC), O.J. No. L 135/40.
- Environmental Protection Agency Act, 1992 (Urban Waste Water Treatment) Regulations 1994 (S.I. 419 of 1994).
- Quality of Bathing Waters Regulations, 1992 (S.I. 155 of 1992).
- Council Directive of 8 December 1975 concerning the Quality of Bathing Waters (76/170/EEC), O.J. No. L 31/1.
- European Communities (Use of Sewage Sludge in Agriculture) Regulations, S.I. 183 of 1991.
- Council Directive of 2 April 1979 on the Conservation of Wild Birds (79/409/EEC).
- Council Directive of 21 May 1992 on the Conservation of Wild Fauna and Flora (92/43/EEC).
- Council Directive of 26 November 1990 (90/679/EEC) on the protection of workers from risks related to exposure to biological agents at work (seventh individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC).
- The Heritage Act 1995.
- Local Government (Water Pollution) Act 1977, S.I. 1 of 1977.
- Local Government (Water Pollution) (Amendment) Act 1990, S.I. 21 of 1990.

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