

Environmental Impact Statement

For

North Lotts Dublin Docklands

Planning Scheme 2002

Draft Amendment No. 1

Prepared by

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On behalf of



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Foreword

This Environmental Impact Statement (EIS) was prepared on behalf of the Dublin Docklands Development Authority on the likely effects on the environment of proposed amendment No. 1 to the Planning Scheme dated July 2002.

This EIS has been prepared by Cunnane Stratton Reynolds in association with a team of consultants identified overleaf.

All practicable efforts were made at the design stage of this project to mitigate against the likely effects of the proposed amendments on the environment.

Contributors

The contributors to this EIS in order of topic are as follows:

Air Quality and Dust	AWN Consulting
Archaeology	Cultural Resources Development Services
Built and Architectural Heritage	Paul Arnold Architects
Climate	AWN Consulting
Energy	Cunnane Stratton Reynolds
Flora and Fauna	Robertson and Associates
Geology and Soils	Walsh Goodfellow
Human Beings	Cunnane Stratton Reynolds
Landscape and Visibility	Cunnane Stratton Reynolds
Noise and Vibration	AWN Consulting
Retail Impact	Cunnane Stratton Reynolds
Sunlight and Daylight	ARC Consulting
Transport, Traffic and Parking	Boreham Consulting Engineers
Water	AWN Consulting

Non Technical Summary

This Environmental Impact Statement (EIS) is prepared by Cunnane Stratton Reynolds with the assistance of a team of consultants covering a broad range of disciplines.

This EIS accompanies proposed Amendment No. 1 to the Planning Scheme approved in July 2002. The key elements comprising Amendment No. 1 as distinct from the approved planning scheme are:

- (a) The increase in height of the landmark building from 60m to 100m at parapet level (maximum overall height 130m).
- (b) Physical expansion of the Point Depot and increase of its capacity from 8,500 to 12,000 people.
- (c) Provision for the extension of the LUAS line to Point Square.
- (d) Reconfiguration and expansion of retail activities.
- (e) Provision of social infrastructure.

This EIS outlines proposed Amendment No. 1, describes the receiving environment and highlights key issues in relation to impact, amelioration and mitigation of the amendment. Amendment No. 1 covers a relatively confined area namely zone 7 of the adopted Scheme.

Human Beings

The impact that the proposed amendment to the North Lotts Planning Scheme 2002 would have on human beings was considered with reference to the following:

- Population – profile and trends
- Employment – labour force profile
- Community – services and amenity

The population of the Amendment area would rise to over 1,000 on completion of development proposed under the Amendment. The proposed Amendment provides for 184,644m² of commercial floorspace, comprising office, retail, hotel, entertainment and other uses such as restaurants and cafes, etc. This will be a significant source of employment, both skilled and unskilled, full-time and part-time for the Docklands area and city as a whole. Given the integration of commercial and residential land-uses the Amendment represents a sustainable form of development. The mix of uses in the proposed Amendment would provide a variety of facilities to serve the existing and future populations of the Amendment area and wider Docklands including a large supermarket, a significant amount of comparison retail floorspace, smaller shops, restaurants, health facilities, childcare centres and leisure facilities, etc.

Flora and Fauna

Overall the site is already heavily influenced by human activities. There is a low diversity of habitats within the site as well as a low diversity of plant species. The habitats are listed as follows:

- Grassland and Marsh Habitat
- Amenity Grassland (GA2)
- Cultivated and Built Land
- Buildings and Artificial surfaces (BL3)
- Coastland
- Tidal rivers (CW2)

A small number of buildings were deemed to be suitable for bats as they are sheltered and also have old roofs with obvious access points.

The overall development of the area is likely to have direct negative impacts upon fauna and flora but the removal of some opportunistic vegetation will not be of any significance. Positive impacts will be achieved

by effective landscaping including planting a range of flora in open spaces that will increase the overall abundance and diversity of vegetation in the area. The construction of new drainage networks will provide positive indirect impacts upon the Liffey which is prone to the adverse effects of contamination from old surface water drains. The loss of the vegetation found within the area cannot be avoided but is regarded as being insignificant. Impacts upon bats will be avoided by pre-demolition surveys and appropriate relocation measures.

Geotechnical, soil and ground contamination

Dublin Docklands Area Strategic Environmental Assessment of the Draft Masterplan (2003) outlined the general geology of the docklands area and stated that a desktop study of former land uses within the docklands area suggests that some contamination of groundwater may have occurred in the past. Some recent site investigations involving the sampling of both soils and ground water in the North Lotts zone did not display signs of any large levels of contamination which would be of environmental concern.

However, the extent of contamination will only become evident upon the carrying out of site-specific surveys. As with the geological aspects, contamination testing is highly recommended in all sites for each stage of development. These should be undertaken in accordance with BS5930:1999 'Code of Practice for Site Investigations' and BS10175:2001 'Investigations of Potentially Contaminated Sites – Code of Practice'

Any unearthed contamination will require some form of intervention depending on the levels observed prior to any development taking place. Furthermore, the development of some sites may require design against landfill gas emissions. These remediation measures may require a licence granted by the Environmental Protection Agency under the Waste Management Act 1996 for treatment and/or removal to disposal sites under strict internationally accepted standards.

Water

The River Liffey is a sensitive water course. If the site is found to be contaminated, the remediation of the site will entail excavation of contaminated materials and handling and movement of these materials on site.

Surface water generated during the construction phase, from excavations and from run off at the site, could potentially be contaminated and could impact on the receiving water environment. Some dewatering of excavations may be required, which may involve pumping groundwater from the site. This water may be potentially contaminated and will be tested prior to discharge to the foul sewer.

Contaminated ground and surface water during the construction phase may require discharge to the foul sewer system.

If the site is found to be contaminated, the remediation of the site will lead to a long-term positive impact on the surface water bodies bordering the site.

The predicted impact on the foul drainage system is long term and positive due to the removal of surface water discharge from the foul sewer system.

The overall predicted impact on the potable water supply system is neutral and long term.

Air Quality and Climate

There is the potential for a number of emissions to the atmosphere during the construction and operation phases of the development. The potential impact of these emissions was assessed under the following headings:

- Heat Balance In The Area
- Macroclimate
- Modification Of Atmospheric Conditions

Levels of traffic-derived air pollutants will not exceed the ambient air quality standards both with and without the development in place. Greenhouse gas emissions, as a result of the proposed Amendment, will be insignificant in terms of Ireland's obligations under the Kyoto Protocol. The size and nature of the development and the nature and volume of emissions will have no significant impact on atmospheric conditions.

Noise and Vibration

During the construction phase of the project there will be some small impact on nearby residential properties due to noise emissions from site traffic and other activities. However, given that the development site is in an urban area next to several busy roads, it is considered that the various noise sources will not be excessively intrusive. Furthermore, the application of binding noise limits and hours of operation, along with implementation of appropriate noise & vibration control measures, will ensure that noise & vibration impact is kept to a minimum.

There are four primary sources of noise in the operational context:

- building services plant;
- car parking;
- deliveries in the service yard;
- additional vehicular traffic on public roads; and finally,
- noise emanating from the extension of the Point Depot.

Building services plant is unlikely to cause unacceptable noise to residential or commercial occupants within or directly adjoining the development. The enclosed nature of the car parks will ensure that the impact at noise-sensitive residences both within the development and in the surrounding areas is negligible. Deliveries to a service yard can be a source of noise disturbance, with the greatest potential impact being at night-time. Means of reducing the potential noise impact of service yard activities include careful selection of the location and orientation of the yard, erection of barriers and enclosing the yard. During the detailed design of the expanded Point Depot venue (ie) from 8,500 to 12,000 people capacity, consideration will be given to limiting music noise breakout to noise sensitive locations in the vicinity of the proposed Amendment area. The building envelope will be designed and constructed such that noise emissions associated with entertainment events will be within recommended criteria. Assuming the increase in traffic movements associated with a Point Depot event will be equivalent to the increase in capacity of the venue (ie. 8,500 to 12,000) this will result in an increase of traffic noise along existing public roads of the order of 1.5dB. Such an increase would be imperceptible and the associated noise impact is not significant.

Energy

The basic electrical, gas and telecommunications infrastructure is already in place.

The use of high specification materials which minimise the consumption of energy will be promoted in the context of proposed Amendment no. 1. The proposed amendments will not impact significantly more than the previously approved scheme of 2002. The development of the proposed Amendment will be undertaken in accordance with Part L of the Building Regulations 1997 - 2002

Landscape and Visibility

The landscape and visibility assessment has found that the landscape impact of the proposed development would be of medium significance and beneficial to the receiving environment. In recognition of its strategic location the Amendment site is identified in the Dublin Docklands Master Plan (2003) and Managing Intensification and Change – A Strategy for Dublin Building Height (2002) documents as suitable for a landmark high building. It provides an opportunity for the affirmation and reinforcement of the emerging high intensity mixed use city centre character area which is sought by national, regional and local policy.

The proposed development makes optimal use of the significant development potential of the Amendment site, and reflects/responds to the evolving character of the receiving environment landscape.

Although much of the amended Scheme is of a scale consistent with recent local developments it is inevitable that the proposed high building will be highly visible from locations within the receiving environment. However, the assessment shows that the majority of sensitive (historic) city centre locations will be unaffected by the proposed high building. For the most part visual impact will be beneficial, however great the magnitude of change, and therefore appropriate to a portion of the city undergoing a rapid and dramatic land use, landscape and visual transformation. In conclusion the LVIA finds that the proposed alteration to the North Lotts Scheme (2002) and the high building envisaged is appropriate.

In reviewing the potential cumulative impact of the Scheme with tall buildings proposed within the City and Docklands area in particular, it is noted that such cumulative impacts enhance the above results and where the potential dominance of the North Lotts Scheme and its tall building is viewed in the context of similar developments locally, this potential dominance is generally mitigated against i.e. the Scheme is best judged against the changing cityscape particularly in its immediate environment. This inter-relationship is most beneficial when the Scheme is viewed in the context of the proposed Grand Canal tower with which it forms an informal “gateway” and wider landmark at the mouth of the River Liffey.

Sunlight and Daylight

The shadow analysis indicates that the proposed development has the potential for a significant impact on the industrialised areas of Dublin Port to the east and the Iarnród Éireann lands to the north of the subject site, with shadows extending large distances in the afternoons and evenings throughout the year.

The proposed development also has a potentially slight to significant impact on residential areas in East Wall to the northwest of the planning scheme area, but these impacts are limited to periods at or near the winter solstice.

Shadows cast to the west will fall within lands which are part of the North Lotts planning scheme resulting in moderate impacts.

Certain buildings within the Amendment area may be subject to negative impact on the daylight received in those rooms.

Transport, Traffic and Parking

The transport, traffic and parking assessment addresses the following:

- The anticipated movement of people (broken down into proportions of pedestrians, cyclists, public and private bus users, heavy rail, LUAS, and car users),
- The integration of the site with the surrounding area (i.e. the level of current and future multi modal transport accessibility to the Amendment site),
- The ability of existing infrastructure to accommodate predicted increases in traffic,
- The future transportation proposals that will impact on the proposed development,
- Adequacy of the minimal car parking numbers being provided; and,
- The integration of the site with the surrounding area in terms of linkages and transportation.

Parking provision for the residential and office elements of the development will be in accordance with the requirements of the approved 2002 North Lotts Planning Scheme. The proposed provision of a 700 space public car park, (for public use only), which would also cater for any operational parking requirements, to serve the entire site with a mix of uses such as retail, restaurants and pubs, leisure, hotel and also theatre/auditorium, is in itself considered a 'cap' on the amount of traffic which will access the development. This restriction on available parking will encourage the use of other sustainable modes such as the Luas, bus, cycling and walking and may also encourage the practice of parking in the city centre car parks and using public transport to access the site.

Properly designed, tested and controlled servicing access and arrangements will be required throughout the site in order to ensure the development operates in an efficient and safe manner. In particular HGVs access routes should be segregated from pedestrian and cycle areas.

Retail Impact

The proposed amendment to the North Lotts Scheme includes the provision of a District Shopping Centre of circa 25,000m² net floor area. It is proposed that this District Shopping Centre will incorporate both convenience and comparison retail floorspace and will serve the projected residential population of the North Lotts and wider Dublin Docklands Area. The provision of a District shopping centre is consistent with the provisions of both the approved 2002 Planning Scheme for North Lotts and is accords with the policies and objectives of the Dublin City Development Plan 2005-2011.

The District Shopping Centre would provide approximately 3,500m² of net convenience or foodstore floor area consistent with the Retail Planning Guidelines for Local Authorities. The balance (approximately 22,000m² net floor area) will be taken up by comparison retail consistent with its function as a district shopping centre.

We indicate that the catchment area of the North Lotts Amendment Area is currently being served primarily by a combination of the retail facilities of Dublin City Centre and the existing district shopping centres within the catchment area, i.e. Phibsborough, Rathmines and Merrion. There are presently no significant retail facilities within the North Lotts area.

This retail impact assessment shows that the projected population of the catchment area and, particularly, the Docklands Area, provide sufficient capacity to justify the proposed District Shopping Centre.

The proposed District Shopping Centre would be consistent with the Retail Planning Guidelines 2000 and would not have a negative impact either directly or cumulatively on Dublin City Centre or the existing district shopping centres.

Archaeology

There is one recorded archaeological monument within the subject area namely the quay at North Wall Quay/Custom House Quay (DU018:020(564)). Prior to the canalisation of this section of the River Liffey in the early 18th century, this area would have been situated on the foreshore of the Liffey estuary. The

possibility exists for the discovery of archaeological material associated with the use of the estuary during the prehistoric and medieval periods including fish traps and other fishing structures, dug out boats and brushwood, hurdle or timber trackways. Recent archaeological monitoring undertaken at a site at North Wall Quay has revealed a primary shoreline associated with the River Liffey and the remains of at least two fish-traps dating to the Mesolithic period. There is a possibility of uncovering quay walls and revetments of different periods, constructed of either stone or wood also exists as does the uncovering of basements and other structural remains of 18th or 19th century date.

There is a possibility that the development could impact on a recorded archaeological monument (DU018:020(564)) and previously unrecorded material or finds could be encountered during ground disturbance phases associated with the subject scheme. Thus it is recommended that a programme of further archaeological mitigation be undertaken as follows:

Liaison

The developer will be required to give notice to and consult with the city archaeologist, National Monuments Section and other relevant authorities regarding the nature of specific works associated with the scheme and the proposed archaeological mitigation planned.

Monitoring

Monitoring by a suitably qualified archaeologist(s) should be undertaken during the ground disturbance phases of the scheme.

Should any archaeological features or material being uncovered during the course monitoring or any phase of the construction works, works should cease immediately, and the National Monuments Section of the Department of Environment, Heritage and Local Government should be informed. Time must be allowed for a suitably qualified archaeologist(s) to inspect and assess any such material. If it is established that archaeologically significant material is present full archaeological excavation and recording will be required. Adequate financial and logistical provision should be made for any such archaeological excavation, related post excavation, testing and/or conservation work and for publication of the results. The recommendations given here are subject to the approval of the National Monuments Section of the Department of Environment, Heritage and Local Government.

Built and Architectural Heritage

The Point Depot

Increasing the capacity of the Point to the necessary extent is not possible without significant alteration to the building.

The amended Planning Scheme sets out to favour the retention of the building fabric while acknowledging that the proposed augmented use would involve a significant alteration to the building and seeks to establish volumetric guidelines and mitigatory measures in parallel with encouraging the continuation of the existing use.

Interventions of the order indicated in the worked example would only be justified in the context of retaining and enhancing the existing use.

Other major public or civic uses could be accommodated without intervention of this scale or could be accommodated elsewhere. Consultations with heritage organizations were based on the concept of sustaining the existing use. Alternative locations for the existing use were also discounted, having been explored by DDDA. Alternative uses for the Point Depot in the event that the existing use is terminated have not been identified.

Excepting the latter portion of Principle 1, adherence to the Guiding Principles will generate the necessary architectural composition and will allow the impact of a large expansion to the Point Depot to be mitigated.

Nos. 91-94 North Wall Quay

In regard to nos. 91-94 North Wall Quay it is stated in the Architectural and Heritage Survey that that it would be possible to make a new street without the demolition of the entirety of the single storey façade. Instead it would be possible to demolish the first, second and third bays of the surviving structure thus achieving the required roadway.

The retention of the office building and a representative architecturally complete and coherent portion of the building would minimize the negative aspects of this part of the amended scheme.

The approved Planning Scheme 2002 (3.3.2) states:

“The Authority will permit the demolition of the freestanding façade of No’s 91 – 94 North Wall Quay. The exceptional circumstance justifying its removal is the construction of the new north-south street serving the area”.

It is not proposed to demolish the office building at 91 – 94 North Wall Quay.

1.0.0 INTRODUCTION

1.1.0 BACKGROUND

This Environment Impact Statement (EIS) has been prepared by Cunnane Stratton Reynolds to accompany Proposed Amendment No. 1 to the approved scheme for redevelopment of the North Lotts area. It is prepared on behalf of the Dublin Docklands Development Authority (DDDA).

1.2.0 STATUTORY CONTEXT

The revised planning scheme for the North Lotts area has been carried out under section 25 of the Dublin Docklands Development Authority Act 1997.

This Environmental Impact Assessment to accompany the proposed Amendment has been prepared under Section 26 of the same Act. The DDDA shall, before submitting the amended scheme to the Minister for the Environment pursuant to section 25 (4), have regard to this EIS and to the views of Dublin City Council and interest persons in relation to the effects on the environment of the proposed amendment.

This EIS complies with EU law and with the Irish Environmental Impact Assessment Regulations from 1999 onwards.

1.3.0 THIS EIS AND AMENDMENT NO. 1 TO THE 2002 PLANNING SCHEME

This EIS should be read in conjunction with Proposed Amendment No. 1 June 2005 which has been prepared for the DDDA by Brady Shipman Martin, and assisted by Paul Arnold Architects and Horan Keogan Ryan Architects.

Other than those specifically identified in the proposed Amendment the existing policies and provisions of the 2002 Planning Scheme remain in effect. Additional policies and provisions reflect the updating of policies since the 2002 scheme.

1.4.0 PURPOSE OF THE EIS

This EIS is an assessment of the likely significant positive and negative impacts of proposed amendments on the receiving environment which is a relatively small area of the larger area the subject of the 2002 scheme. This EIS should also be read in conjunctive with the previous EIS for the larger scheme most of which remains unaffected by proposed Amendment No. 1. The previous EIS for the original scheme was prepared by Urban Initiatives and is dated August 2001.

In general terms, the purpose of this particular EIS is to: describe the nature of the existing environment; describe the nature and extent of proposed Amendment No. 1; identify the likely significant impacts of the Amendment on the receiving environment; and finally, to outline any measures necessary to mitigate against any potential negative impacts.

Environmental Impact Statements are generally prepared to accompany planning applications for full planning permission and are therefore prepared in relating to specific and detailed development proposals. This EIS, however, prepared for the amendments of the original Planning Scheme, by definition cannot be as detailed. This document therefore must balance the need to meet statutory requirements and be as robust as is feasible to reflect the generic and strategic nature of both the proposed Amendment and the original planning scheme.

1.5.0 SCOPING

A scope exercise was conducted to establish the range of issues to be considered by this particular EIS. The scope of this EIS was established by consultation with the DDDA, Dublin City Council, the community and interested parties during the preparation of the proposed Amendment. From the scoping exercise it was evident that the key issues would relate to visual impact, wind effect, daylight / sunlight, transport and traffic impacts, impact upon architectural heritage, and finally, retail impact.

1.6.0 EIS STRUCTURE

This EIS is structured as follows:

Section 2.0	Description of the Proposed Amendments
Section 3.0	Alternatives Considered
Section 4.0	Specified Information and Forecasting
Sections 5.0- 18.0	Effects on the Environment
Section 19.0	Interaction of the Foregoing
Section 20.0	Construction Phases

2.0.0 THE PROPOSED AMENDMENT

2.1.0 AREA DESCRIPTION

The area of the North Lotts Planning Scheme proposed to be amended is shown in Figure 2.1.1. The area comprises a parcel of land at the eastern side of the North Lotts Planning Scheme, bounded to the south by North Wall Quay, to the north by Sheriff Street Upper and to east by the East Wall Road. The Amendment area covers approximately 6 hectares.

The area equates with Zone 7 in the approved North Lotts Planning Scheme. The objectives for Zone 7 are to consolidate its use and profile as a cultural and entertainment destination; create a high-density residential neighbourhood; provide a district retail centre; and develop a public square.

The primary use and focal point in the area is the Point Depot Theatre. Other uses in the area include enterprise, light industry, storage and a service station at the north eastern corner of the site. There is also a freight rail line running through the area, which is proposed to be discontinued. The Point Depot is a protected structure as are elements of a commercial building 91 – 94 North Wall Quay.

The character of the area is informed by its former use as a place of storage and distribution as evidenced by the warehouse type buildings that predominate and surrounding large areas of open space. This is the part of the North Lotts area that abuts the eastern boundary of the Dublin Port, which functions as an important element of national infrastructure.

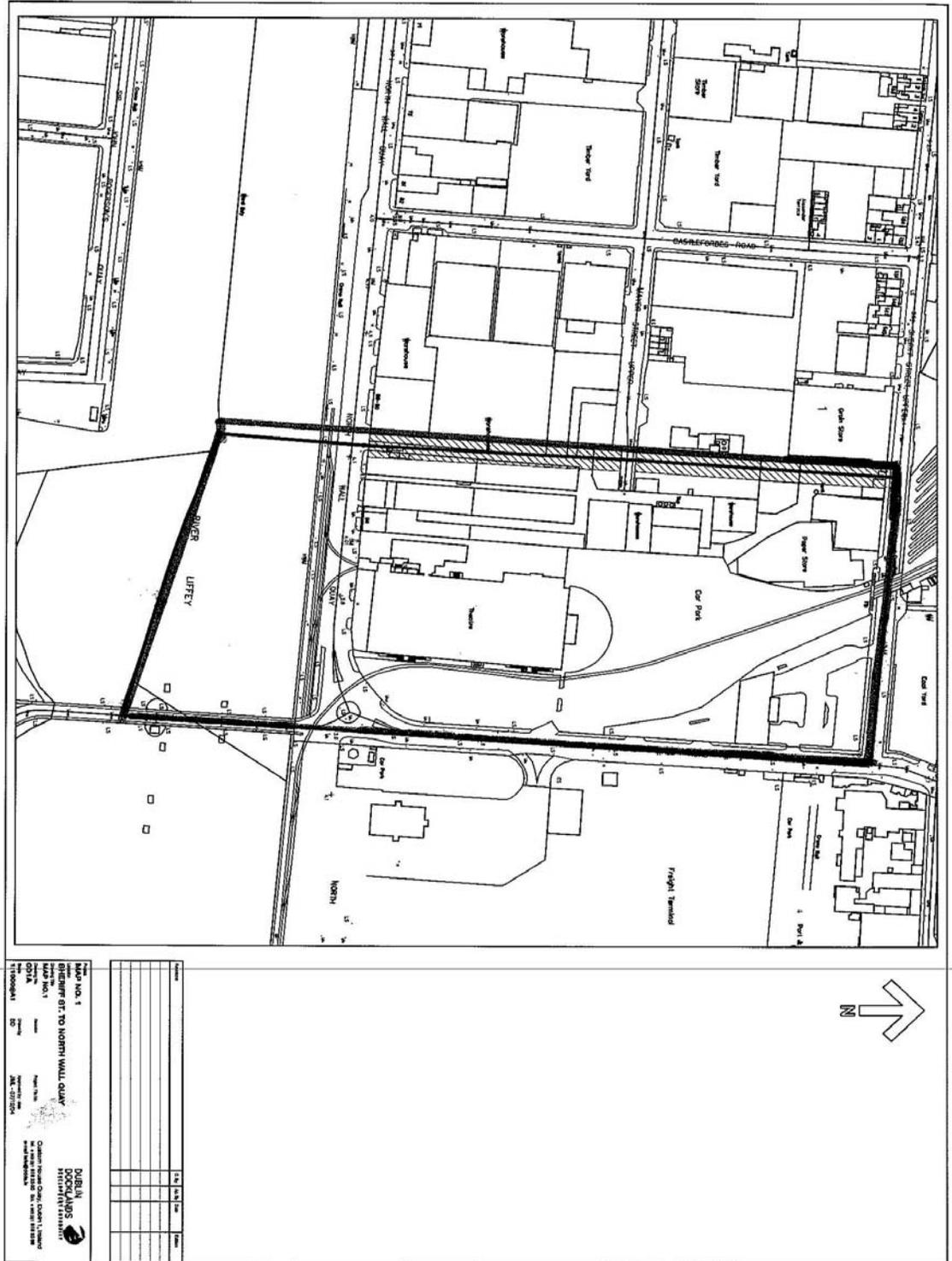
The Amendment area benefits from its strategic location close to the city centre, the IFSC and the residential area of East Wall and its potential as a key part of a redeveloped North Lotts area is underlined by its availability of space and its established function as a cultural and entertainment venue.

2.2.0 DEVELOPMENT DESCRIPTION

It is proposed to make the following fundamental changes to the North Lotts Planning Scheme under Amendment No. 1:

- a) Increase the height of the landmark building from 60m to 100m at parapet level (maximum overall height 130m);
- b) Expand the Point Depot venue;
- c) Provide for the extension of the LUAS line to Point Square;
- d) Amend the scale and location of the district retail centre; and
- e) Provide social infrastructure.

Figure 2.1.1 The Amendment Area



Landmark Building

It is proposed to develop a landmark tower building at the end of Mayor Street on the eastern boundary of the Amendment area. The landmark building will be of a height of approximately 130 metres comprising approximately 27 floors and accommodating the following possible uses: hotel; offices; and retail. The design of the building will be of a high standard reflecting the requirements for it to relate to and integrate with other buildings in the area and to provide the North Lotts area and the wider Docklands area with a landmark identity.

Point Depot

The Point Depot, as a significant entertainments and events venue, is one of the principal uses within the North Lotts area and is an important city-wide amenity. Under the proposals to develop the Point Depot, it is envisaged that its capacity will increase to 12,000 from its current capacity of 8,500 persons and that the necessary access and service provisions for such an expansion will be incorporated into its future design. In order to reflect its status as a protected structure, the expansion of the Point Depot will be sensitively carried out under the supervision of a suitably qualified conservation specialist.

Luas

It is proposed to make provision to accommodate a potential extension of the Luas line through the subject site and it is anticipated that this route will follow the original proposed line through the Amendment area. This will serve to strengthen the connection between the proposed Point village and the rest of the city in a sustainable manner.

District Retail Centre

The Amendment area will accommodate a district retail centre in the northeastern corner. This district centre will comprise approximately 25,000m² of convenience and comparison retail floorspace and will meet the retail needs of the projected future population of the North Lotts area as well as the existing and future needs of the wider Docklands area.

Social Infrastructure

The Amendment provides for the accommodation of a public leisure centre / swimming pool, crèche, medical centre and library.

2.3.0 PLANNING POLICY CONTEXT

Planning policy can be broken down into national, regional and local.

National Policy

Residential Density Guidelines

These Guidelines outline national policy in relation to residential development. The Guidelines recommend relatively high residential densities for inner city sites, advising a plot ratio of between 1.0:1 and 2.5:1. North Lotts, and in particular the Amendment area would be included in this

category. The Guidelines outline a range of standards and controls for residential development at higher densities.

Retail Planning Guidelines 2000

The Retail Planning Guidelines provide the framework for local authorities in the preparation of development plans and the assessment of planning applications for retail development. These Guidelines impose a net sales floorspace cap of 3,500m² on new individual convenience food stores in the Greater Dublin Area.

Regional Policy

Regional Planning Guidelines for the Greater Dublin Area

The Regional Planning Guidelines for the Greater Dublin Area set out to address the following key themes:

- Provide for the accommodation of economic and population growth within the Greater Dublin Area in a sustainable manner.
- Improve the quality of life of communities by reducing the average journey time to work.
- Promote the delivery of employment to the development centres in the Hinterland Area.
- Facilitate the delivery of significantly more residential accommodation in the Metropolitan Area
- Facilitate the continued delivery of improved public transport services.
- Promote the delivery of affordable housing generally and particularly in the Metropolitan Area.
- Promote the integration of development planning and transport planning in the Greater Dublin Area.
- Present the Greater Dublin Area as an attractive and successful European City Region having an extensive and integrated single market for jobs and housing.

Fundamentally relevant to the circumstances of the site of the proposed amendments is the stated objective within Dublin City Centre whereby: "Development within the Metropolitan Area will be consolidated, with a much-enhanced multi-modal transport system. For Dublin City Centre, this will require a further increase in overall residential development densities, the delivery of well-designed urban environments, as well as measures to ensure priority for public transport."

Retail Planning Strategy for the Greater Dublin Area 2001

This Strategy confirmed the Point Village as a district centre. Further implications for the proposed amendment of this policy document are discussed in Section 15.0.0 'Effect on the Environment: Material Assets – Retail Impact'.

A Platform for Change Strategy 2000 – 2006, DTO 2000

This Strategy promotes an integrated public transport network, strategic but limited road network improvements, sustainable traffic and parking policies, freight management

policies, cycle and pedestrian networks, demand management policies and guidance on complimentary land-use policies.

The Strategy includes the construction of a second rail corridor (Interconnector tunnel) through the city centre of Dublin and through the Docklands by 2010. The extension of the Luas to the Point is scheduled for completion in the period 2003 to 2006 in this Strategy.

Local Policy

Dublin City Council 2005-2011

The overall aim of this Plan is set out as follows:

“The aim is to ensure that Dublin remains an attractive, vibrant location for industry, commerce, recreation and tourism and continues to be a major focus for economic growth within the country”

Chapter 2.0.2 of the Draft Plan states the following in relation to the Docklands:

“The city is now embracing extensive underused docklands areas north and south of the river to the east of the city core where high quality mixed use urban quarters exploit the presence of water and bring the city in closer relationship to the river Liffey and Dublin Bay.”

In relation to the Docklands, the Dublin City Development Plan also states that the Dublin Docklands Area Master Plan 2003 outlines a strategy for the sustainable social and economic regeneration of the Area.

Most of the Dublin Docklands is zoned as Z14 in the Dublin City Development Plan, which seeks “the social, economic and physical development or rejuvenation of an area with mixed use of which residential and Z6 would be the predominant uses”. The objective of zoning Z6 is “to provide for the creation and protection of enterprise and facilitate opportunities for employment creation”.

The Amendment area is zoned as Z4 for which it is an objective “to provide for and improve mixed-service facilities”. This zoning designation is primarily aimed at the development of a district centre, which would comprise convenience and comparison retail floorspace and would serve a significant catchment area. The Plan states that a diversity of uses should be promoted to maintain the vitality of the district centre throughout the day and the evening and, in this regard, opportunities should be taken to use the levels above ground level for additional commercial/retail/services or residential use.

The ‘permissible’ uses within Zone Z4 are as follows:

Amusement/leisure complex; ATM; bed and breakfast; betting office; buildings for the health safety and welfare of the public; car park; car trading; childcare facility; civic offices community facility; cultural/recreational building and uses; education; enterprise centre; garden centre; guest house; halting site; home-based economic activity; hotel; hostel; industry (light); live work units; media recording and general media-associated uses; medical and related consultants; motor sales showroom; office (max 600m²); open

space; open space; park and ride facility; petrol station; place of worship; public house; restaurant; science and technology based industry; shop (district); shop (neighbourhood); takeaway; and training centre.

Other uses 'open for consideration' are as follows:

Advertisement and advertising structures; civic; amenity/recycling centre; conference centre; embassy; factory shop; financial centre; funeral home; garage (motor repair/service); household fuel depot; nightclub; outdoor poster advertising; shop (major comparison); warehousing (retail/non-food); retail park; warehousing and office (max 1200m² (restriction not applicable to prime urban centres); and internet café.

The quay frontage to the south of the Amendment area, known as the Campshires, is zoned as Z9, which carries the objective of 'preserving, providing and improving recreational amenity and open space'.

To the east of the Amendment area, the land is zoned as Z7, which aims to 'provide for the protection and creation of industrial uses and facilitate opportunities for employment creation'.

The rest of the North Lotts Planning Scheme area, to the west, is zoned as Z14, for which it is an objective "to seek the social, economic and physical rejuvenation of an area with mixed use, of which residential and Zone 6 would be the predominant use".

Dublin Docklands Master Plan 2003

The overall objective of the Master Plan is as follows:

"The overall objective of the Master Plan must be to secure the sustainable social and economic regeneration of the Area, with improvements to the physical environment being a vital ingredient."

The scope of the Master Plan is set out in Section 1.3.2 as follows:

- i. the economic, social and other issues relevant to the regeneration of the Area, and proposals to address those issues;
- ii. identifies those parts of the Area where detailed proposals and plans for development, redevelopment, renewal or conservation of land in that Area are appropriate;
- iii. identifies those parts of the area where Planning Schemes under Section 25 would be appropriate;
- iv. sets out urban design guidelines for the Area, including guidelines relating to conservation and building conservation, street furniture and landscaping;
- v. includes proposals for appropriate renewal, preservation, conservation, restoration, development, redevelopment of the streetscape layout and building pattern of appropriate parts of the Area;
- vi. includes proposals for the development of existing and new residential communities in the Area, including the development of housing for people of different social backgrounds;
- vii. includes proposals for a programme of development or redevelopment of derelict sites or vacant sites in the Area;
- viii. includes proposals relating to the architectural heritage of the Area;

- ix. includes transport proposals consistent with A Platform for Change – Strategy 2000-2016, which updated the original DTI Strategy;
- x. includes an estimate of the costs of the implementation of the Master Plan and an indication of possible funding options; and
- xi. estimates the implications for employment, training and education in the Area and for employment, training and education of those residents in that Area, of measures proposed in that Plan.

Section 4.8.1 of the Master Plan states that the Point Depot remains a significant attraction and is the largest events and concerts venue in the inner city.

Section 4.9.1 of the Master Plan states that “the retailing requirements of the Docklands cannot be viewed in isolation and retail policies must have due regard to the future provision elsewhere within Dublin City and Region. In the Greater Dublin Area Retail Planning Strategy 2001, it is estimated that the city centre, including the Docklands, could accommodate between 29,000 – 51,400m² of additional comparison retailing floorspace. A district shopping centre has been designated in the Master Plan at the Point Village and this is reaffirmed in the Dublin Retail Strategy. In the masterplan it is proposed that this district centre would include, along with the comparison element, a superstore (more than 2,500m² of gross floor area) or a supermarket (no more than 2,500m² gross floor area) and a mix of uses in order to attract multiple purpose trips. It is worth noting that this Amendment seeks the expansion of food or convenience retailing up to 3,500m² net consistent with the cap for Dublin in the Retail Planning Guidelines. The Masterplan states that it envisaged that this district centre would be accessible by both private car and public transport.

Section 24 (2)(b)(i) of the Dublin Docklands Development Act 1997 stipulates that the Master Plan shall incorporate transportation proposals (including those in relation too pedestrians), consistent with the DTI Strategy or any strategy revising and updating that strategy. The Master Plan contains objectives for public transport, roads, traffic management, parking, cyclists and pedestrians. Paragraph 5.1.5 highlights that parking charges for the 700 space public car park should be structured to deter commuters.

The Master Plan states that the proposed extension of the Luas line from Connolly station to the Point Depot has the potential to act as a catalyst for regeneration, stimulating redevelopment in the North Lotts area.

In regard to urban design, the Master Plan highlights the fact that the Docklands Area comprises an irregular form. However, the North Lotts area is characterized by a strong orthogonal grid pattern, which would provide the basis for this area’s future development. The Master Plan sets out the urban design principles under headings such as variety, permeability and legibility. With regard to building height and scale, the Master Plan identifies a number of sites where landmark tall buildings could be developed including at the Point Village. The Master Plan seeks a coherent architectural expression on either side of the Liffey corridor.

Provision has been made for the Master Plan to identify parts of the Dublin Docklands Area where Planning Schemes would be appropriate under Section 25 of the Dublin Docklands Development Act 1997. Such Planning Schemes indicated the manner in which the DDDA considers the area should be redeveloped and set out policies in relation to land-use, distribution and location of development, over all design, transportation, the development of amenities, and conservation.

North Lotts Planning Scheme 2002

The principal aim of the approved Planning Scheme is to provide a more detailed framework for the planning and development of the area. The Scheme addresses the following issues:

- The nature and extent of proposed development;
- The proposed distribution and location of uses;
- Proposals relating to the overall design of the proposed development, including the maximum heights and external finishes of structures;
- Proposals relating to the development of amenities and the conservation of architectural heritage or other features; and
- Proposals relating to transportation, including roads layout, the provision of parking places and traffic management.

Section 5.3.4 of the approved Planning Scheme provides for a landmark, tall building, up to height of 60 metres on the axis of Mayor Street at the Point Square. The architecture of that building under the approved Scheme would be required to display particular beauty and grandeur.

The Planning Scheme 2002 recognizes that the area possesses a significant entertainment and events venue in the Point Depot. It states that this function should be reinforced with the development of additional entertainments and events venues, improved leisure and associated facilities such as retail and hotel use.

The extension of the Luas is identified by the approved Planning Scheme as an important factor in the development of the Point Village.

A district shopping centre is provided for in Section 4.4 of the 2002 Planning Scheme. It is stated that retail use at Point Square should serve the existing and future population of the area and that the convenience element should not exceed 3,000m². The total amount of floorspace, the number of units and the phasing should respond to market conditions.

It is envisaged that the Point Village would be a vibrant new urban quarter playing host to a mix of uses such as residential, commercial, retail, entertainment and tourism, etc. A residential density of 325 units per hectare at the upper level is provided for here and it is stated that the public open space at the Point Square should incorporate public seating and landscaped areas and should be designed to accommodate the proposed Luas stop.

Managing Intensification and Change, A Strategy for Dublin Building Height 2000

In response to growing development pressure for increased densities and higher buildings, Dublin City Council commissioned a framework policy document that would anticipate planning applications for such development and proactively direct them to particular sites or locations within the city.

This Strategy takes a comparative approach between Dublin and how this issue has been managed in other cities around the world. The Strategy identifies areas of high development potential where intense change could be accommodated. This Strategy adopts an advisory approach rather than a regulatory approach to the management of

the changing density and height of Dublin. In conclusion, Dublin is categorized as a low to mid-rise European city with certain areas providing suitable locations for tall buildings.

City Canals Plan 1999 and the Royal Canal Corridor Study, 1995

The City Canals Plan, 1999, by Duchas and Dublin City Council identifies key policies and issues for the development of the canals. The intention of the plan is to set out a planning framework for the corridor to bring together environmental, commercial and social issues. The proposals which related specifically to the Royal Canal at Spencer Dock are:

- The full restoration of the canal basin south of Sheriff Street
- The creation of the linear park alongside the canal

The Royal Canal Corridor Study, 1995, included objectives for the rejuvenation of the Royal Canal at Spencer Dock. At North Wall Quay the Study recommended the improvement of physical access to the river, the enhancement of the river frontage using appropriate planting and the provision of mooring facilities on the Liffey. Between Scherzer Bridge and Sheriff Street Bridge, the Study recommended the redevelopment of the east bank to include offices, business, residential and private recreational facilities and the provision of public access to the Canal along both banks, with a link to the International Financial Services Centre (IFSC).

3.0.0 ALTERNATIVES CONSIDERED

3.1.0 DEVELOPMENT OPTIONS AND ALTERNATIVES

The DDDA considered a number of options. The first being that the original Planning Scheme of 2002 be proceeded with. It was felt that this would not be appropriate in terms of delivering the undoubted potential of this important landmark site.

A number a very simple potential layouts for the development of zone 7 of the original planning scheme were considered incorporating most of the following:

- An increased Point Square
- Open / Built on space to the east of the Point
- Cater for existing goods railway line
- Consider an east and west side location of performance area in any extended Point.
- Varying the extent of new uses (of a civic / amenity nature) at the eastern end of the Campshires as a point of arrival.
- The merits of dual towers versus a single tower.
- The possibility of 1st floor pedestrian routes.
- Different arrangements of truck parking / management for theatre sets.

The various potential layouts were summarised into 3 basic options.

Option A

1. Point with stage on east side
2. Retail / commercial use at lower levels west of the Point.
3. Residential / commercial units on top of 2 above
4. Extended quayside with civic use building and pedestrian overpass
5. Large Point Square
6. Single tower with ground / first floor retail and leisure / conference use immediately north
7. Retail centre in NE corner
8. Residential in NW corner



Option B

1. Line of goods railway retained
2. Tower on axis with Mayor Street on podium building (retail / leisure / conference)
3. NE corner and part of NW corner retail
4. NW corner residential

5. SW corner commercial / retail
6. Point with stage on west side
7. High level pedestrian linkage to the Campshires



Option C

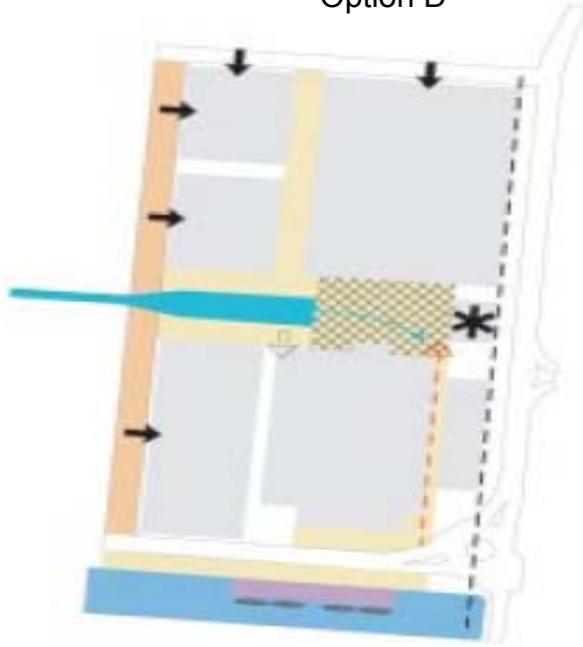
1. Point with stage on west side
2. Ground east of point open to allow tower relationship with quays and 'entrance' façade from Toll Bridge
3. Extended use of the Campshires
4. Shard truck access for Point and commercial / retail use to the west
5. Dual towers at a smaller Point Square (relative to Options A and B)
6. NE corner retail
7. NW corner residential



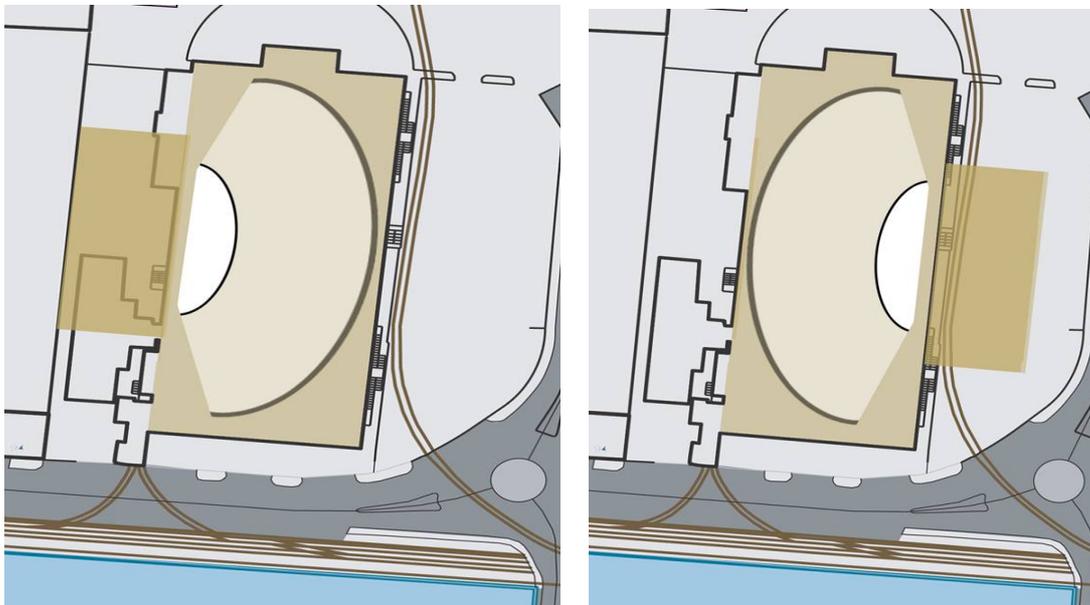
Option D

1. Point with stage to west.
2. Access to Point theatre from north, south and east.
3. Retention of landmark tower on Mayor Street Axis.
4. Main retail centre is consolidated north eastern block.
5. Spine building between Point Depot and East Wall Road.
6. Mixed use in western blocks.
7. Luas aligned to south.

Option D



The orientation of the Point was reconsidered to maximise its potential as a major concert venue. The two basic options with regard to the reorientation of the Point are set out in the figure below.



THE PREFERRED OPTION

The preferred option (D) was selected for the following reasons:

1. It reflected the purposes of the Amendment.
2. It constituted an amendment as opposed to a new planning scheme.
3. The policies of the Master Plan were taken into account.
4. The retention of the tall building on the Mayor Street axis was seen as critical in urban design terms.
5. A block layout allowed for development potential to be maximised, set a good urban design framework with the provision of streets and a public square.
6. Took into account land holdings.
7. Allowed for the development of the Point Depot.
8. Alignment of LUAS allowed for an onward extension to the south east and facilitated public use of the square.

4.0.0 SPECIFIED INFORMATION AND FORECASTING

4.1.0 DIFFICULTIES IN COMPILING SPECIFIED INFORMATION

Given that an EIS has already been undertaken for the agreed Planning Scheme and that the proposed changes are relatively confined and confirmed to zone 7 of North Lotts a certain amount of relevant data was available. The contents of this previous EIS were considered in the formulation of each of the constituent reports of this Statement. Where the baseline data is of a static nature in general, as in the case of the archaeological heritage of the site, the original EIS has been closely followed.

4.2.0 FORECASTING METHODS

The constituent forecasting methods used in subsequent chapters of the statement to forecast the effects of the proposed amendment on the environment are tried and tested methods and employed in accordance with best practice in each of the relevant fields of expertise. The particular methodologies adopted are detailed in each of the technical reports.

5.0.0 EFFECT ON THE ENVIRONMENT: HUMAN BEINGS

5.1.0 INTRODUCTION

5.1.1 The EIS identifies and proposes mitigation measures against any adverse impacts on human beings. This Section assesses the impact of the proposed Amendment on human beings under the following headings:

- Population
- Employment
- Community

5.2.0 RECEIVING ENVIRONMENT

Dublin city experienced a slower rate of population growth than the State in the years 1996 to 2002. Within this period, population growth in the Docklands was stagnant relative to the rest of the city. Comparative growth levels between Dublin City and the State, Leinster and Dublin County are shown below in Table 5.2.1.

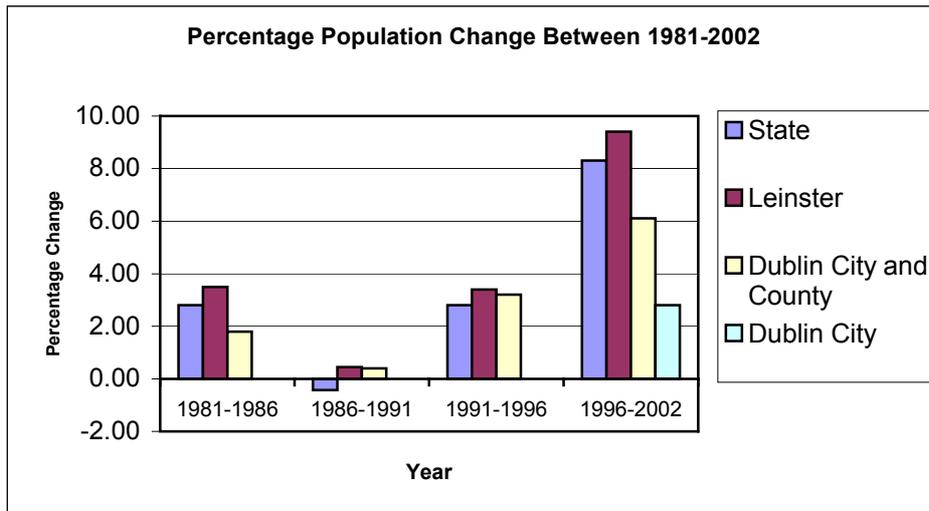
Table 5.2.1 Population Change at State, Province, Dublin City/County and Dublin 1981 – 2002 (1,000's)

	1981	1986	1991	1996	2002
State	3,443.40	3,540.60	3,525.70	3,626.00	3,917.30
Leinster	1,790.5	1,852.60	1,860.90	1,924.70	2,105.60
Dublin City and County	1,003.1	1,021.4	1,025.3	1,058.2	1,122.8
Dublin City				481.8	495.7

[Source: Census of Population 1981 to 1996, Results 2002]

From table 5.2.2 below, it is clear that for the capital city, the rate of growth in Dublin in comparison to the county, the province of Leinster and the rest of the State was actually quite modest.

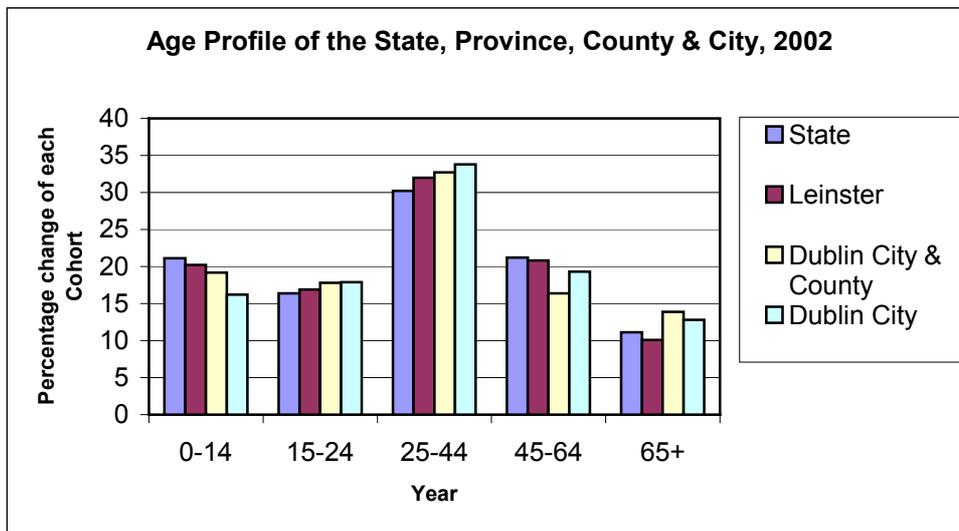
Table 5.2.2 Percentage Change at State, Province, Dublin County and Dublin City levels 1981-2002



[Source: Census of Population 1981 to 1996, Results 2002]

From Table 5.2.3 below it is clear that the age profile for the city of Dublin in the cohorts 15-44 is considerably more prominent than for the rest of the State.

Table 5.2.3 Age Profile



[Source: Census of Population 2002]

It is extremely important to point out that there are no dwellings in the Amendment area at present. The existing residential population in the vicinity, which can be considered to be the North Wall community, numbers approximately 100. The who;e docklands area however has recently and is experiencing further substantial population growth on the back of substantial new residential development.

5.2.1 Impacts of Proposed Amendment

Within the Dublin Docklands Area, the population is projected to increase to 25,000 by 2012. The proposed residential densities for the Amendment area contained in the North Lotts Planning Scheme 2002 at 325 units/ha and the residential development for the area contained in the proposed Amendment would generate a population in the Amendment area of over 1,000 upon completion of development.

When considering population growth in the future, it is worth bearing in mind that national and regional planning policy seeks to consolidate population growth in established settlements where public transport exists and/or is planned. A determining factor of where future significant population growth will be located will be the fact that Dublin is expanding at an unsustainable rate and that there is a focus on prioritising development in central areas of the city accessible to a variety of forms of public transport as in this case.

The population increase within the Amendment area will contribute towards achieving the population target set out in the Dublin Docklands Master Plan for the entire docklands area. The concentration of population within the Amendment area represents a sustainable pattern of development, located, as it is, close to the city centre and linked to proposed public transport infrastructure. The increase in population would establish a demand for residential amenities and facilities, many of which would be provided in the proposed District Shopping Centre and in the vicinity of the proposed Point Square. Such amenities and facilities would be to the benefit of both the existing and future community.

The Regional Planning Guidelines project an increase in households for Dublin City in the period 2002 to 2010 of some 29,705 households. A substantial proportion of this

can be accommodated within the docklands area and within the North Lotts area in particular.

5.2.2 Mitigation

No mitigation measures are considered necessary.

5.3.0 EMPLOYMENT

5.3.1 Receiving Environment

Table 5.3.1 shows a general decrease in numbers on the Live Register in recent years (2003- 2005). Live Register figures for the local welfare office serving the Amendment Area indicate that unemployment has decreased at higher rate than the national trend.

Table 5.3.1

	Feb. 2000	Feb. 2001	Feb. 2002	Feb. 2003	Feb. 2004	Feb. 2005
State	152,871	133,691	154,944	166,105	161,972	158,649
Dublin	44,356	32,491	39,291	43,852	44,597	39,708
Local Area Welfare Office	1,418	978	1,344	1,529	1,410	1,171

(Source: Live Register Monthly Analysis)

5.3.2 Impacts of Proposed Amendment

The proposed amendment would provide for additional construction related employment in the surrounding area during the construction phase of the proposed developments. The proposed amendment provides for 184,644m² of commercial floor space, comprising office, retail, hotel, entertainment and other uses such as restaurants and cafes, etc. This will provide significant levels of employment for the Docklands area and city as a whole and, given the integration of commercial and residential land-uses, represents a sustainable form of development. It is anticipated that a range of skilled and unskilled, part-time and full-time jobs would be provided. The impact upon the local economy would therefore be positive and the overall effect would be to assist in redeveloping the North Lotts area into a thriving urban quarter.

5.3.2 Mitigation

The proposed amendment would have a beneficial impact upon employment in the North Lotts area and surrounding Docklands. Therefore, no mitigation measures are required.

5.4.0 COMMUNITY

5.4.1 Receiving Environment

The existing community within the immediate hinterland of the Amendment Area (there is no existing residential community in the Amendment Area) numbers approximately 100 as previously stated. There is currently a scarcity of community facilities in this part of the Docklands including the East Wall area such as shops, pharmacies, medical facilities and recreational facilities. The closest concentration of such facilities is in the vicinity of George's Dock and the IFSC.

5.4.2 Impact

The mix of uses in the proposed amendment would provide a variety of facilities to serve the existing and future populations of the Amendment Area and wider Docklands including a large supermarket, a significant amount of comparison retail floorspace, smaller shops, restaurants, health facilities, childcare centres and leisure facilities, etc. The impact of the proposed amendment on the community would be to provide for the needs of the projected population of the Docklands area and to improve the provision of community facilities to the existing population.

5.4.3 Mitigation

No mitigation measures are considered necessary as the proposed amendment would have a beneficial impact upon the community (both existing and future) in the North Lotts area and surrounding Docklands. In the interests of spreading the benefit of such facilities, a high level of integration and accessibility will be provided as part of the proposed amendments.

6.0.0 EFFECT ON THE ENVIRONMENT: FLORA AND FAUNA

6.1.0 INTRODUCTION

This flora and fauna impact assessment has been prepared by *Robertson & Associates*. It qualitatively assesses the redevelopment of land around the Point Depot in the Dublin North Lotts Planning Scheme Area, within the context of the potential direct, indirect, secondary and cumulative impacts upon the flora and fauna presently existing on-site, and in the immediate environs.

The subject lands comprise a parcel of land which is located in on the north side of the River Liffey to the east of the city centre. The subject site encompasses an area principally bounded by the River Liffey to the south, East Wall Road to the east, Sheriff Street Upper to the north and a western boundary currently running north-south currently through an area of warehousing. The adjacent landuses are predominately commercial to the north east and west. The subject lands are in use as a music and events centre (Point Depot), retail and warehousing.

Detailed habitat descriptions are provided later under section 6.3.0, Receiving Environment below.

6.2.0 METHODOLOGY

A strategic baseline study of the subject site was previously carried out for the purposes of a previous EIS prepared in 2001. This has been followed by a more detailed and more recent visit on 21st March, 2005 undertaken by Paul Scott of Robertson and Associates. During these site visits, a detailed account of the floral and fauna composition of the site and its immediate environs was recorded. The following sources were used in the compilation of this section of the EIS:

- O.S. maps for Co. Dublin
- Site layout plans
- National Parks and Wildlife Service Database, The Department of the Environment, Heritage and Local Government.
- Data recorded in a previous EIS submitted relating to the same site (2002).
- Dublin Docklands Authority Strategic Environmental Assessment of the Draft Master Plan 2003.

The proposed development site was surveyed using methodology outlined in the Joint Nature Conservancy Council's *Phase I Habitat Survey Techniques* (JNCC, 1993). The principal habitats present within the site were identified and classified using the Heritage Council's *A Guide to Habitats in Ireland* (Fossitt, 2000). The dominant species were noted and a species list compiled for each habitat represented.

Floral nomenclature follows *An Irish Flora* (Webb, Parnell & Doogue, 1996) for Latin names and the *Census Catalogue of the Flora of Ireland* (Scannell & Synnott, 1987) for common names. Nomenclature for horticultural species follows the Royal Horticultural Society's *Encyclopaedia of Garden Plants* (Brickell, 1998).

Faunal identifications were confirmed using the following sources:

- *The Macmillan Guide to Birds of Britain & Europe*, Macmillan 1998,
- *The Complete Guide to Ireland's Birds* (2002), Dempsey E. & O'Cleary. M. Gill & Macmillan.

- *Exploring Irish Mammals*, Dúchas The Heritage Service 2001.

As opposed to floral investigations, the surveying of faunal usage of subject lands cannot be based upon direct sightings alone. The presence of fauna is substantiated through the detection of field signs such as tracks, habitats, markings, feeding signs, and droppings, as well as by direct observation. Likewise, bird species present on site are recorded along with any notable avifauna habitats, droppings, or tracks. The likely species were assessed in relation to the habitats present within the site.

Designated areas and protected species

The subject lands are not under any designation as per the *European Communities (Natural Habitats) Regulations, 1997* (S.I. No. 94 of 1997) or under the EU Birds Directive (*Council Directive 79/409/EEC on the Conservation of Wild Birds*).

The nearest designated site is the Royal Canal proposed Natural Heritage Area, designated under the *Wildlife (Amendment) Act 2000*. This is located 1km west of the area under study.

The North Dublin Bay cSAC and SPA covers the inner part of north Dublin Bay, the seaward boundary extending from the Bull Wall lighthouse across to the Martello Tower at Howth Head. This site is an excellent example of a coastal site with all of the main coastal habitats represented. It holds good examples of ten habitats that are listed on Annex I of the E.U. Habitats Directive; one of these is listed with priority status. Several of the wintering bird species have populations of international importance, while some of the invertebrates are of national importance. The site contains a numbers of rare and scarce plants including some which are legally protected. Its proximity to the capital city makes North Dublin Bay an excellent site for educational studies and research.

Any potential impact upon this designated area has been considered by this assessment.

6.3.0 RECEIVING ENVIRONMENT

The proposed development site is located on the eastern side of Dublin city centre, on the north bank of the Liffey in the docklands area. It is entirely urban in character, with major transport routes to the Dublin Port area running along two sides. Remaining land use includes the Point Depot, a major entertainment venue, and associated car parking space. Warehousing and wholesale buildings are also found in the study area.

6.3.1 Habitats

Overall the site is heavily anthropogenically influenced by human activities. There is a low diversity of habitats within the site as well as a low diversity of plant species.

The habitat types identified during the survey include predominantly artificial surfaces and a small area of grassland. According to Fossitt (2000) these are described as "Grassland and Marsh Habitat" and "Built land". The River Liffey is included in the study area and is therefore included in this section as a "Tidal River".

Floral species lists for each habitat are given in Appendix 6.1. Appendix 6.2 illustrates all habitat types present within the study area.

Grassland and Marsh Habitat

Grassland habitat takes up a small area surrounding the former petrol station in the form of typical amenity grassland.

- **Amenity Grassland (GA2)**

This small area of grassland surrounds the site of the former petrol station north of the Point Depot on the corner of the East Wall Road and Sheriff Street Upper.

It is primarily composed of grasses such as cocksfoot (*Dactylus glomerata*) broadleaved herbs such as daisy (*Bellis perennis*), dandelion (*Taraxacum* spp.), clovers (*Trifolium* spp.) and ribwort plantain (*Plantago lanceolata*). Thistle (*Cirsium* spp.), chickweed (*Stella media*) are also found in the area.

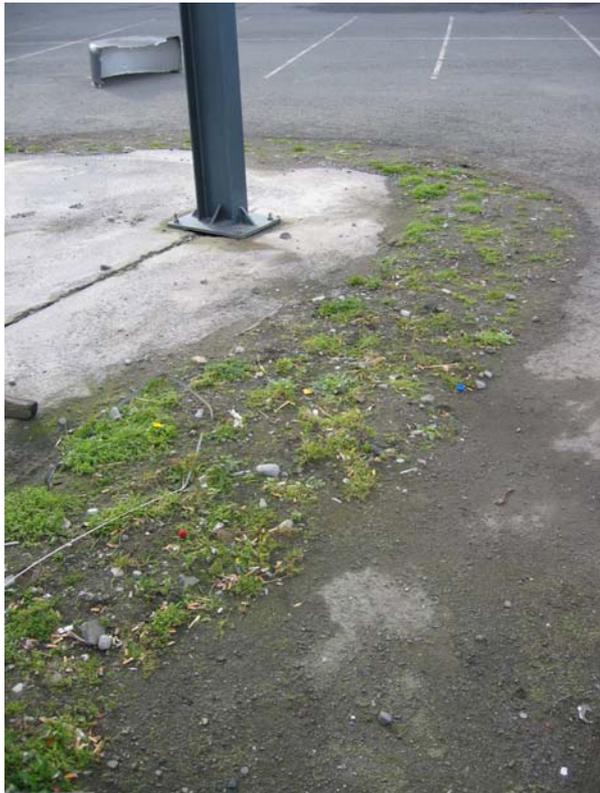
Ornamental species area found fronting the East Wall Road such as holly (*Ilex* spp.), privet (*Ligustrum*), rhododendron (*Rhododendron* spp), dogwood (*Cornus sanguinea*) and cotoneaster (*Cotoneaster integrifolius*).

Several trees have also been planted alongside the boundary with the Point Depot. These are mostly cherry (*Prunus* spp), birch (*Betula* spp) and lime (*Tilia* spp).

Cultivated and Built Land

- **Buildings and Artificial surfaces (BL3)**

This habitat accounts for 90% of the study area and includes buildings, parking areas, roads and loading docks for the industries in the area. As would be expected, floral diversity and abundance is very low. Vegetation is found growing in the cracks in pavement, in blocked roof gutting and in cracked stone walls.



Vegetation at pavement margins © RA 2005

Flora species present include chickweed, dandelion (*Taraxacum spp*), butterfly bush (*Buddleja davidii*), pineapple weed (*Matricaria discoidea*), nettle (*Urtica dioica*), herb Robert (*Geranium robertianum*) and charlock (*Sinapsis arvensis*). Ragwort (*Senecio spp*) is also found and the rarer Oxford Ragwort (*S. squalidus*) is also present around the Point Depot. This species is restricted to the larger cities in Ireland such as Cork and Dublin.

Coastland

- **Tidal rivers (CW2)**

The Liffey is strongly influenced by its opening into the Irish Sea and is therefore classified as a tidal river. Whilst there is little vegetation visible at high tide, various *Fucus spp* are visible on the quay walls at low tides.

EPA water quality data collected since 1971 shows an increase in pollution recorded upstream at the nearest monitoring point at Lucan Bridge. Whilst the river is much larger passing through the docks and is heavily marine-influenced, it is still blighted by cumulative emissions from industry and contaminated stormwater run-off. Data collected in 2000 suggested that the river water quality had a “Q” value of 2-3 suggesting moderate levels of pollution.

Fauna

Overall the habitats on site provide poor foraging and shelter opportunities for fauna species.

- **Mammals**

No direct sightings of mammals were made during the walkover survey. Due to the poor floral species diversity, open exposed nature, and levels of disturbance they are unlikely to provide suitable habitat for many mammals, except for perhaps the rat (*Rattus norvegicus*) and house mouse (*Mus musculus domesticus*).

The buildings along the northern and southern boundaries were inspected from a distance for their suitable use by bats. It was not possible to inspect the buildings for evidence of bat activity, in the form of droppings, urine stains, feeding signs, scratchings or bat corpses.

Despite this limitation, a small number of buildings were deemed to be suitable for bats as they are sheltered and also have old roofs with obvious access points. These include the Liffey Trust Enterprise Centre Building that is located on the north-west corner of the study area and warehousing along the North Wall Quay.

Common Seals (*Phoca vitulina*) have been recorded swimming in the lower reaches of the Liffey and are found in nearby Islands.



Old roofs along Sheriff Street

© RA 2005

- **Avifauna**

Very little avifauna activity was observed within the site and was comprised of single individuals of the following species; hooded crow (*Corvus corone*), grey wagtail (*Motacilla cinerea*), house sparrow (*Passer domesticus*), and magpie (*Pica pica*). A single common gull (*Larus canus*) and three cormorant (*Phalacrocorax carbo*) were noted in flight over the Liffey adjacent to the site.

Habitats in the Surrounding Area

Apart from the Liffey to the south of the area, the surrounding lands are entirely urban in character with similar habitats to those described above.

Evaluation of Habitats

The vast majority of the area of the proposed development is not ecologically important. The areas of significance are potential bat roosts in a small number of buildings and the Liffey Estuary. Due to its interaction with offshore islands and particularly the North Bay SAC, the Liffey represents the most sensitive ecological component in the study area.

6.4.0 CHARACTERISTICS OF THE PROPOSAL

The North Lotts Planning Scheme¹ proposes a range of development types to be constructed in the area of the existing buildings. The Planning Scheme aims to develop the "Point Village" as a retail, leisure and business development. This will involve the demolition of the entire single storey facade of 91-94 North Wall Quay, possible upgrading of the Point Depot and widening of the East Wall Road into the eastern portion of the site. Due to the strategic nature of the scheme, the precise details of demolition, construction and infrastructure provisions will be determined by future development proposals.

6.5.0 POTENTIAL IMPACT OF THE DEVELOPMENT

Construction Phase

Direct Impact

The overall development of the area is likely to have direct negative impacts upon fauna and flora. Direct negative effects will be manifested in terms of the removal of some opportunistic vegetation but this will not be of any significance. Partial demolition of buildings and works affecting roof areas will have relatively limited potential to impact upon bats that may be roosting there. The significance of such impacts depends upon the species that may be resident and the status of the roost (e.g. maternity roost).

¹ Docklands North Lotts Planning Scheme (Amending Planning Scheme No 1) 2005. Draft Amending Planning Scheme. May 2005.

Indirect Impact

Indirect impacts may occur outside of the site during construction. Fugitive emissions of sediment or contaminated run-off from the site into the Liffey will cause a decline in water quality and effects may potentially be felt as far downstream as Dublin Bay if contamination is significant.

Operational Phase

Direct Impact

Positive impacts will be achieved by effective landscaping including planting a range of flora in open spaces that will increase the overall abundance and diversity of vegetation in the area.

Indirect Impact

The construction of new drainage networks will provide positive indirect impacts upon the Liffey which is prone to the adverse effects of contamination from old surface water drains.

Neither of these impacts are regarded to be anything more than locally significant.

6.6.0 AVOIDANCE AND REMEDIAL MEASURES

Mitigation by Avoidance

Direct negative impacts upon vegetation are not regarded as being significant and do not require mitigation. Avoidance of impacts on bats and their roost sites will be avoided by undertaking bat surveys prior to the demolition of any structure, or prior to undertaking any works affecting roofs or eaves. These will be undertaken by a qualified bat specialist at appropriate times during the year to address different stages of bat activity. Appropriate relocation procedures will be instigated under licence from the Department of Environment, Heritage and Local Government should any bats be found.

Mitigation by Remedy

Should any bat roosts be found in the existing structures that will require demolition replacement roost sites in the form of bat bricks or bat boxes² will be installed at locations to be advised by a qualified bat specialist. Loss of vegetation, though insignificant, will be remediated by planting native species within the overall landscaping strategy.

6.7.0 PREDICTED IMPACT

Taking the above mitigation measures into account, the following predicted impacts will apply.

² Further details may be obtained from stockists such as Alana Ecology www.alanaecology.com

Construction Phase

Direct Impact

The loss of the vegetation found within the area cannot be avoided but is regarded as being insignificant. Impacts upon bats will be avoided by pre-demolition surveys and appropriate relocation measures.

Indirect Impact

Indirect impacts upon the Liffey are likely to be positive due to improved drainage and control of run-off.

Operational Phase

There will be no significant ecological impact arising from the operation of the proposed development; however the incorporation of native species planting within the landscaping proposals should be seen as a small benefit to the site's ecology.

6.8.0 MONITORING

Should artificial bat roosts be installed in the area, they should be checked for occupancy by a qualified and licensed bat specialist for six months following their installation. If necessary they may be moved to increase chances of occupancy.

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APPENDIX 6.1

Floral Species List

Amenity Grassland (GA2)

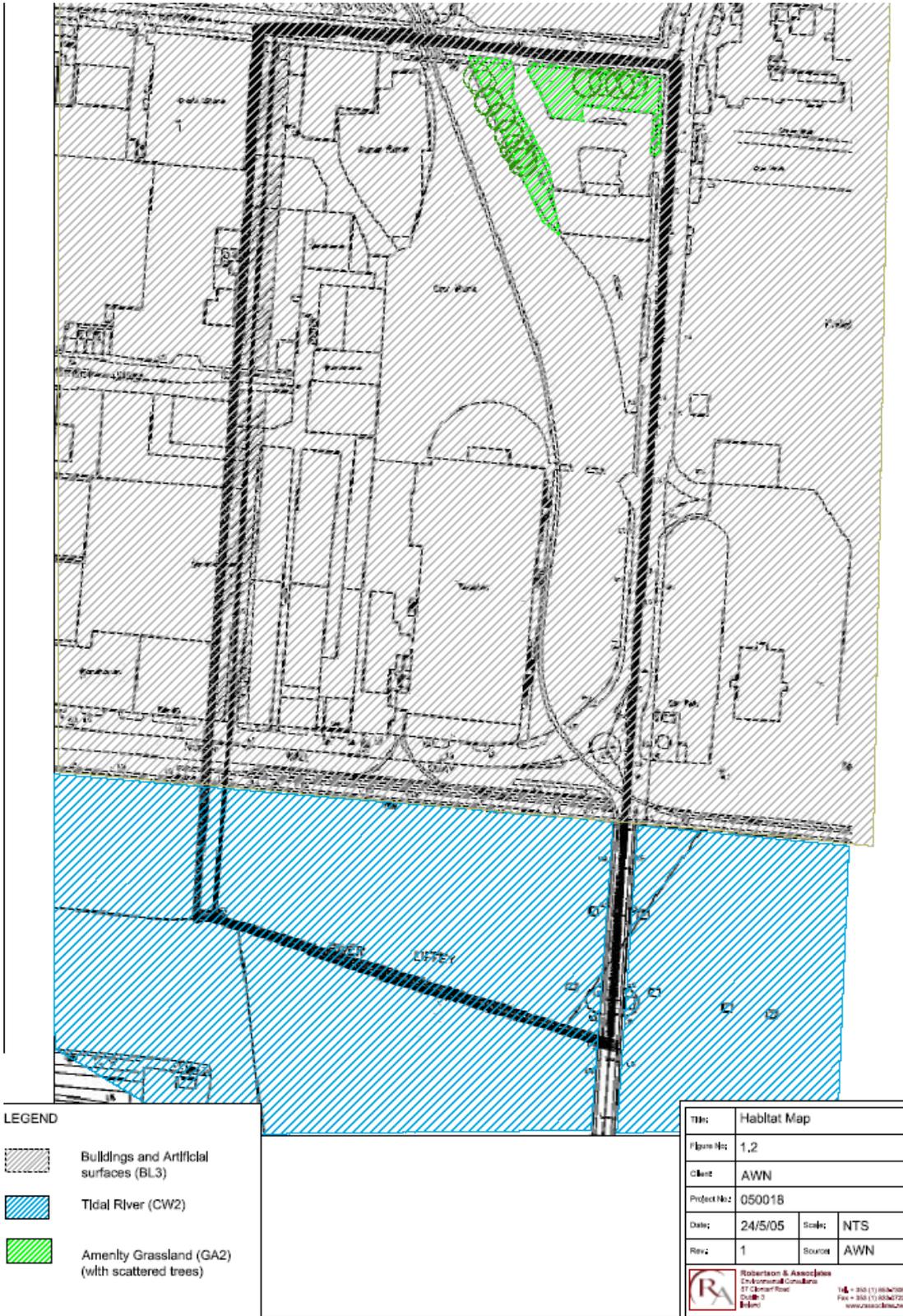
<i>Anagallis arvensis</i>	Scarlet pimpernel
<i>Betula spp</i>	Birch
<i>Bellis perennis</i>	Daisy
<i>Cirsium spp</i>	Thistle
<i>Cornus sanguinea</i>	Dogwood
<i>Cotoneaster integrifolius</i>	Cotoneaster
<i>Dactylus glomerata</i>	Cocksfoot
<i>Epilobium angustifolium</i>	Rosebay Willowherb
<i>Ilex spp</i>	Holly
<i>Ligustrum</i>	Privet
<i>Matricaria discoidea</i>	Pineapple weed
<i>Plantago lanceolata</i>	Ribwort plantain
<i>Rhododendron spp</i>	Rhododendron
<i>Rubus fruticosus agg.</i>	Bramble
<i>Rumex obtusifolius</i>	Broad leaved dock
<i>Senecio jacobea</i>	Ragwort
<i>Stella media</i>	Chickweed
<i>Taraxacum spp.</i>	Dandelion
<i>Trifolium repens</i>	White clover
<i>Prunus spp</i>	Cherry
<i>Tilia spp</i>	Lime
<i>Urtica dioica</i>	Nettle

Buildings and Artificial surfaces (BL3)

<i>Matricaria discoidea</i>	Pineapple weed
<i>Rubus fruticosus agg.</i>	Bramble
<i>Rumex obtusifolius</i>	Broad leaved dock
<i>Senecio jacobea</i>	Ragwort
<i>Taraxacum spp.</i>	Dandelion
<i>Urtica dioica</i>	Nettle

Tidal rivers (CW2)

<i>Ascophyllum nodosum</i>	Knotted wrack
<i>Focus vesiculosus</i>	Bladder wrack



7.0.0 EFFECT ON THE ENVIRONMENT: GEOTECHNICAL, SOILS AND GROUND CONDITIONS

7.1.0 HISTORICAL BACKGROUND

Dublin Docklands Area Master Plan (2003) outlines that the reclamation of the North Docklands occurred between 1717 and 1729 with the eventual construction of North Wall. By the end of the 1750s the North Lotts and East Wall area were fully reclaimed and laid out in its distinctive grid street pattern.

Construction on the Royal Canal commenced in 1789 and was completed by 1806. By the mid-nineteenth century the North Lotts area included such uses as vinegar works, saw mills and timber yards. In 1867, the passenger and freight rail system reached North Wall Quay and reinforced the warehousing and light industrial function of the area. Local authority housing was constructed in the East Wall area in the 1930s and 1940s.

The Dublin Docklands Area Strategic Environmental Assessment of the Draft Master Plan (2003) summarised that much of the Docklands Area is made up of reclaimed land taken directly from the estuary in the eighteenth century. The upper layers of fill may be as a result of landfill taken from local building and industrial site activities.

The geology underneath the layers of fill comprise alluvial deposits including interbedded silts, sands and gravels underlain with glacially deposited boulder clay with sands and gravels over a limestone bedrock.

Previous desktop studies taken within the Docklands Area of former land uses within the together with site investigation data from development proposals within the Area, indicates a variety of soil conditions and that some sites have been contaminated by former industrial uses or by the use of contaminated materials as part of land reclamation. This is consistent with Dockland areas internationally, reflecting the nature and character of such areas.

7.2.0 AREA PREPARATION

As with all proposed developments to be built on fill materials, the size, height, scope and use of the buildings or infrastructure will dictate the foundation loads and probable load bearing strata. In the past foundations have either been constructed through any fill layers by deep or piled footings.

However there now exists many advance techniques for remediation and improvement of the engineering qualities of fill materials which may save on substructure costs as well as reducing off-site disposal of materials.

With taller and heavier buildings there may be no option but to site foundations on the stronger bands of stiffer and denser sub-soils. Again however there are numerous variations of piled foundation techniques possible. Further with the increase in inclusion of deep basements below major developments in many cases the fill material is completely excavated to form the basement box while advantage may be taken of utilising deep raft foundations directly on the exposed harder ground.

7.3.0 GROUND CONDITIONS

Dublin Docklands Area Strategic Environmental Assessment of the Draft Master Plan (2003) outlines the general geology of the docklands area. Much of the subsoil is

made up of reclaimed land taken directly from the estuary in the eighteenth century. The upper layers of fill may be as a result of landfill taken from local building and industrial site activities.

The geology underneath the layers of fill comprise alluvial deposits including interbedded silts, sands and gravels underlain with glacially deposited boulder clay with sands and gravels over a limestone bedrock

Information obtained from previous site investigations during the above mentioned study in the general area of the proposed development indicates the following typical geo-technical characteristics of the various layers.

Figure 7.3.1 Geotechnical Characteristics

Layer Description	Layer Characteristics	Probable Depths of Layer
Filled Ground	Gravelly clay fill with fragments of glass, clay, brick, plastics, metal, timber, ash and ceramics	From existing ground to 5 metres
Soft Black Silty Clay	Alluvial deposits ranging from 1 to 2 metres thick and generally soft flow shear strength	1 to 2 metres
Glacial Boulder Clay	Stiff to hard with occasional interbedded gravel layers	3 to 10 metres
Limestone	Varies from weak to moderately strong and strong to very strong	7 to 20 metres

Recent site exploratory work undertaken specifically in the North Lotts Area of the docklands on the sub-soils has unearthed the following.

Generally the top 3 to 5 metres consists of fill material, underlain by 2m of soft silts containing shells. This is on top of 6 to 8 metres of medium dense coarse gravels which overlays hard stiff boulder or 'port' clay. The 'port clay' is a highly laminated boulder clay reasonably unique to this area and hence the description. The limestone bedrock may be as deep as 30 to 40 m due to the steep incline of the bedrock towards the River Liffey basin. The variations in subsoil conditions emphasises the necessity for site specific soil investigations, surveys, sampling, laboratory and field testing.

7.4.0 GROUND WATER

From recent boreholes and ground water monitoring carried out specifically within the boundary of the North Lotts Area, it was noted that the groundwater flow and levels are directly influenced by the tidal cycles of the River Liffey with little or no time lag. Therefore any potential development in this area will have an effect on the River and any potential groundwater water pollution will be transferred directly to the Liffey.

Intensive site investigation surveys, sampling and testing of the subsoils and the groundwater must be undertaken for each stage of any proposed future development on all sites in the area. These will be even more important where there are proposals to build basement structures as part of the overall development.

It is recommended that all site investigation procedures testing and reports are undertaken in accordance with the guidelines of BS 5930:1999 Code of Practice for

Site Investigations to the approval of Dublin City Council and Dublin Docklands Development Authority. This is in order to establish the engineering and environmental information on the sub-soil stratum and groundwater conditions.

In addition to the above on-site pumping tests to establish the permeability of the ground and potential for both migration of potential contaminants from the site and leaching of existing contaminants are assessed. These tests will also provide design dewatering of sites during construction phases if lowering of the ground water table is required, i.e. deep foundation or basement construction.

Where potentially groundwater may be affected in any way, the guidelines and approval of the Environmental Protection Agency should be sought.

Groundwater changes will be reflected as global warming produces drier summers and wetter winters. However predictions are catchment specific and would therefore need to be derived from a detailed analysis on a site by site basis this is particularly important where groundwater changes affect the performance of land drainage using infiltration techniques eg soakaways and SuDs schemes.

7.5.0 CONTAMINATION

Dublin Docklands Area Strategic Environmental Assessment of the Draft Master Plan (2003) stated that a desktop study of former land uses within the Docklands Area suggests that some contamination of the groundwater may have occurred in the past.

Some recent site investigations involving the sampling of both soils and ground water in the North Lotts Zone did not display signs of any large levels of contamination which would be of environmental concern. This may be reflective of the history of only light industry having occupied the site.

However the extent of contamination will only become evident on the carrying out of site-specific surveys. As with the geological aspects contamination testing is highly recommended in all sites for each stage of development. Again these should be undertaken in accordance with BS5930:1999 'Code of Practice for Site Investigations' and BS10175:2001 'Investigations of Potentially Contaminated Sites – Code of Practice.'

The Dublin City Council Development Plan 2005-2011 insists that developers will be responsible for the following:

- Undertaking a detailed site survey and analysis to establish whether contamination has occurred
- Providing a detailed written report of survey and assessment (including recommendations for treating the affected ground) to Dublin City Council
- The decontamination of sites prior to new development works taking place, and the prohibition of development until Dublin City Council is satisfied that the affected ground has been satisfactorily treated.

Any unearthed contamination will require some form of intervention depending on the levels observed, prior to any development taking place. Further the development of some sites may require design against landfill gas omissions. These remediation measures may require a licence granted by the Environmental Protection Agency under the Waste Management Act 1996 for treatment and or removal to disposal sites under strict internationally accepted standards.

7.6.0 WATERWAYS

Dublin Docklands Area Strategic Environmental Assessment of the Draft Master Plan (2003) reported that available data indicates that the water quality of the waterbodies in the Docklands Area is generally acceptable. They felt that upgrading of the sewerage treatment plant at Poolbeg, the Dublin Bay Project, would result in an improvement in water quality in the River Liffey.

There are two main water bodies possibly affected by development of this area i.e. the River Liffey and Spencer Dock with its connection to The Royal Canal.

River Liffey

The water quality of the River Liffey was outlined in Dublin Docklands Area Strategic Environmental Assessment of the Draft Master Plan (2003) as that of typical lowland, urban river with moderate pollution levels. The quality of the water was found to deteriorate as the river becomes tidal. The part of the river near the Docklands Area is affected by the tide and there is a discernible increase of salinity and pollutants such as suspended solids, ammonia and heavy metals at this location. This is due to the sediments being disturbed and the plug effects of the tide, which have pushed materials from the sewage outfall at Poolbeg back up the river. The upgrading of the treatment plant, including forms of secondary and tertiary treatment, should result in an improvement in water quality in the river.

Spencer Dock/Royal Canal

The Dublin City Council Development Plan 2005-2011 proposes that the Royal Canal should be opened up as a linear park – a ‘green’ lung, a vital connector to the River and as a generator of a network of linked public spaces. Little data is recorded on the water quality within the Spencer Dock area but the similar Grand Canal Dock on the south bank of the Liffey is described in the Dublin Docklands Area Strategic Environmental Assessment of the Draft Master Plan (2003) as having a long retention time and the low throughput of water which makes this water body somewhat similar to a small lake and hence it is susceptible to pollution through leaching or direct discharge of both solid and liquid material from the sites around it.

Extensive sampling of the water in the dock and canal area over at least a yearly cycle to assess its quality should be undertaken.

Tides and Flooding

Due to its location, there are obvious concerns regarding the possibility of flooding in the area particularly following the flooding realised recently in February 2001 in the Ringsend area. It is proposed by the Greater Dublin Strategic Drainage Study (2005) that most new buildings should have a ground level of +4.0 m OD (Malin Head) in order to ensure that they are protected from the threat of flooding arising from rising sea levels and increased rainfall intensities due to global warming.

The Dublin Docklands Area Master Plan (2003) recognised that following the floods of February 2002 the docklands area was susceptible to flooding due to its proximity to the mouths of the Rivers Liffey, Dodder and Tolka. The North Lotts area will be more directly affected by the rise in the River Liffey and hence changes in sea levels and tidal flows in addition to heavy rainfalls and strong winds.

Figure 7.6.1 below gives the highest recorded tides on the River Liffey and refers to Malin Head Datum given in the Dublin Docklands Area Strategic Environmental Assessment of the Draft Master Plan (2003)

Figure 7.6.1 Highest Recorded Tides

Date	Tide Level
27 december 1924	2.60 OD
13 December 1981	2.55 OD
17 December 1945	2.54 OD
12 January 1874	2.44 OD
February 2002	2.95 OD

The Dublin City Council Development Plan 2005-2011 outlines the scope and progress of two major studies which will deal with policies on climate change and flood design levels. The Greater Dublin Strategic Drainage Study (2005) has been published and the Dublin Coastal Flooding Protection Project is in production due for issue in 2005. Their findings will be incorporated into the development plan.

The Dublin Coastal Flooding Protection Project is examining the causes of the 2002 coastal flooding in the Dublin Area and is identifying the coastal flood protection measures to be implemented. The Greater Dublin Strategic Drainage Study (2005) provides a technical overview and recommendations of the relevant issues for drainage engineers for the Dublin region in order to define suitable policies to take account of the changes in the climatic conditions that are likely to take place over the next 100 years in Ireland.

There are two key features that are of particular interest to drainage engineers in setting their criteria and designing appropriate solutions. These are the rise in both rainfall and sea level caused by global warming and hence rising temperatures.

The Greater Dublin Strategic Drainage Study (2005) recommendation regarding criteria for flooding related to sea level rise is to use a 200 year criterion on the basis that flooding from the sea tends to be catastrophic. Based on the parametric study and the recent flood levels attained the following are the main conclusions from the study in relation to design flood levels.

- The 200 year return period should be used for coastal flooding design and this level is 3.4m Malin AOD. Strategic long term Dublin area planning and highly sensitive areas (Ringsend WwTW) to use 4.0m AOD.
- Present day design rainfall depths are to be increased and factored by 10% (1.1)

The pavement levels at the boundary of the site range between approximately 2.5 OD and 4.4 OD. As some of these levels are below the flood level recorded in 2002 there will be vulnerable to localised flooding or surcharge from sewers. Larger flooding would require the sides of the Liffey walls to be breached. Notwithstanding this fact, a minimum ground floor threshold of +4.0 OD will be encouraged for all development to satisfy insurance requirements and potential for rising flood levels as a result of future changes in the global climate.

7.7.0 SERVICES AND UTILITIES

Dublin Docklands Area Master Plan (2003) cautioned that provision of adequate infrastructure in the Docklands is critical to the development of the Area.

Both the existing sewerage disposal network and the mains water supply infrastructure in the North Lotts Area have been deemed by Dublin City Council to be inadequate to cater for the proposed development. A major upgrading of existing services is required

which will include the following recommendations by both Dublin City Council and Dublin Docklands Development Authority :

Water Supply

Dublin Docklands Area Strategic Environmental Assessment of the Draft Master Plan (2003) stated that to date, water supply in the Area has been catered for by the existing pipe network. In order to cater for anticipated development in the Area, particularly in the Docklands North Lotts Area, the provision of new watermains to supply water demand will be essential.

It will be necessary to ensure an adequate level of water supply within the area in the interests of public health and fire safety. The watermain network shall be designed and installed to the Dublin City Council standards.

Storm and Foul Water

The existing foul water network taken from the Dublin City Council drainage department records shows the area to be bounded by a number of old culvert sewers. There is also a new pumped main flowing towards the river crossing.

A new pumping station sited at the North Wall with a rising main to the Ringsend treatment works will be required to serve the sewage disposal needs of both the development anticipated in the Docklands North Lotts Area and the adjacent area. The Dublin Docklands Area Master Plan (2003) states that the sewage treatment plant at Ringsend will provide for the needs of Area and region.

Dublin City Council Development Plan 2005-2011 states it is the policy of Dublin City Council to implement the findings of the Greater Dublin Strategic Drainage Study (2005) on the drainage network for the Dublin region. The main issues which will apply to the North Lotts area are outlined below:

- Separation of foul and storm Drainage (Existing Policy to be maintained)
- Future discharge of the all storm water into the existing combined sewer network will not be permitted by Dublin City Council.
- Possible surface water may be discharged directly into the River Liffey with approval from Dublin City Council.
- It is the policy of Dublin City Council to make mandatory the use of sustainable drainage systems, which balance the impact of urban drainage through the achievement of control of run-off.
- Basements in new developments to include surcharge risk assessment and hydraulic isolation of basements from drainage systems to avoid flooding of basements.

The brief for the Greater Dublin Strategic Drainage Study requires the development of policies appropriate to the provision of future drainage services in the region. These policies would assist Local Authorities comply with their legal responsibilities, their planning and development objectives and would, in so far as practicable, conform to good international practice. A particular requirement from the study is that policies adopted across the region should facilitate a uniform and consistent approach to urban drainage infrastructure planning, design, construction and operation.

7.8.0 MITIGATION MEASURES

Making allowance for future flood levels

Dublin City Council had previously recommended that in order to accommodate future flood levels arising from the consequences of global warming ground floors need to be

built to a minimum level of +3.3 OD (Malin Head). This also related to the entrances to all off-street basements particularly large openings to car parks. However this has recently been revised as part of the Greater Dublin Strategic Drainage Study (2005). It proposes that all ground floors should be built at +4.0m OD which equates to approximately 500mm above the level of the highest future predicted flood in order to allow for raising of the sea level and higher intensity storms.

8.0.0 EFFECT ON THE ENVIRONMENT: WATER

8.1.0 INTRODUCTION

- 8.1.1 This section of the EIS assesses the impact of the proposed mixed-use residential and commercial development at North Lotts on local water supply and foul and surface water drainage systems, and also on groundwater during the construction and operational phases of the proposed development and addresses and mitigates impacts associated with each phase.
- 8.1.2 The Dublin Docklands North Lotts Planning Scheme was prepared in 2002, under Section 25 of the Dublin Docklands Development Authority Act 1997. The Authority proposes to amend this planning scheme for part of the area to which it relates. This section of the EIS is prepared in support of amendments to this planning scheme for part of the area to which it relates.
- 8.1.3 The area of the amended scheme includes the Point Depot and surrounding lands between Sheriff Street Upper, North Wall Quay and East Road, incorporating an area of approximately 6 hectares.

8.2.0 STUDY METHODOLOGY

- 8.2.1 The assessment of the potential impact of the proposed development on the water environment was carried out according to the methodology specified by the Environmental Protection Agency (EPA)^{1,2}.
- 8.2.2 The Geological Survey of Ireland (GSI) geological maps³ and records for the area were inspected, with reference to hydrogeology. EPA and Local Authority data were consulted with regards the watercourses in the area.
- 8.2.3 An EIS was prepared on behalf the Dublin Docklands Development Authority for the development proposals contained in the Dublin Docklands North Lotts Planning Scheme in August 2001. The findings of the EIS for the North Lotts Scheme are referred to in this section of the EIS⁴.
- 8.2.4 A site inspection was carried out on the 6th June 2005 by AWN Consulting to assess the water environment in the vicinity of the site.

8.3.0 RECEIVING ENVIRONMENT

8.3.1 Surface Water

The main hydrological feature in the vicinity of the site is the River Liffey, which flows east along the southern boundary of the site. Figure 8.1 illustrates the hydrological environment in the vicinity of the site.

The River Liffey rises between the mountains of Kippure and Tonduff in County Wicklow and flows for a distance of around 120 km before reaching the sea in Dublin Bay.

The water quality of the River Liffey is monitored continuously by the EPA ⁵. Table 8.3.1 presents the biological water quality for the River Liffey at the UCD Boat Club in Islandbridge (Station No. 2400), the closest monitoring station to the site (located approximately 6km upstream of the site), for the period 1971 - 1991. Table 8.3.2 explains the terminology used in Table 8.3.1.

Station No.	Sampling Station	Q Value										
		1971	1973	1974	1977	1978	1981	1983	1986	1988	1991	
2400	Islandbridge: UCD Boat Club	3	3	3	3	3	3	3	2-3	2-3	3	

Table 8.3.1 EPA Biological Monitoring Data 1971-1991

Quality Ratings	Quality Class	Pollution Status	Condition
Q5, Q4-5, Q4	Class A	Unpolluted	Satisfactory
Q3-4	Class B	Slightly Polluted	Unsatisfactory
Q3, Q2-3	Class C	Moderately Polluted	Unsatisfactory
Q2, Q1-2, Q1	Class D	Seriously Polluted	Unsatisfactory

Table 8.3.2 EPA Biological Q Ratings

Q Values are used to express the biological water quality by the EPA, based on changes in the macro invertebrate communities of riffle areas brought about by organic pollution. Q1 indicates a seriously polluted waterbody, Q5 indicates unpolluted water of high quality.

The data presented in Table 8.3.1 indicates historical data for the Liffey. More recent physiochemical data for the Liffey, which is presented in Table 8.3.3 below, indicates that the quality of water in the river appears to be improving. The most recent physiochemical water quality data published by the EPA is for 1999 – 2004 ⁵. The closest EPA water quality monitoring station to the site is located at the Islandbridge Weir, located some 5.5 km upstream of the proposed development site (0.5km downstream of the UCD Boat Club monitoring station). The EPA water quality monitoring data for the River Liffey for the Islandbridge Weir monitoring site is presented in Table 8.3.3.

Parameters	Units	1999	2000	2001	2002	2003	2004
Temperature	°C	10.28	13.15	12.14	13.36	10.11	5.80
pH	pH units	8.17	8.16	8.32	8.28	8.19	8.10
Conductivity	µS/cm	550.78	548.36	514.55	517.12	494.24	482.00
BOD	mgO ₂ /l	2.50	-	-	-	-	-
Ammonia as N	mg N/l	0.10	0.05	0.06	0.06	0.11	0.09
Phosphate as P	mg P/l	0.16	0.15	0.08	0.05	0.04	0.05
Total Oxidised Nitrogen	mg N/l	2.32	1.94	2.00	1.89	2.24	2.04

Table 8.3.3 EPA Water Quality Monitoring Data for the River Liffey (1999 – 2004)

It can be seen from Table 8.3.3 above, that the River Liffey is of reasonable quality at the Islandbridge Weir with Ammonia and Total Oxidised Nitrogen levels well below the Surface Water Limit Values outlined in Appendix 8.1 of this section of the EIS. The pH

and conductivity of the river was well within the recommended values for A1 waters, of 5.5 – 8.5 and 1000 $\mu\text{S}/\text{cm}$, respectively.

In particular the installation of phosphate removal technology on sewage works discharging to the River Liffey has had a considerable positive impact on background phosphate concentrations in the water. Table 8.3.3 shows a marked decrease in phosphate levels in the Liffey at this monitoring location from 1999 to 2004, the phosphate levels declining from 0.16 mg/l in 1999 to 0.05 mg/l in 2004.

No water quality data is available for the Liffey in the immediate vicinity of the site. The sea influences the River Liffey, in the vicinity of the site and it is expected that the conductivity of the river would be quite high as a result.

8.3.2 Tide Levels and Sea Level Rise

Sea Level Rise

According to an EPA report 'Climate Change – Scenarios and Impacts for Ireland' Environmental RTDI Programme 2000 – 2006, a sea level rise of 0.5 metres is expected during the period 1990 – 2100, i.e. an average rise of 0.45 cm per year ⁶.

A UK DEFRA report 'Climate Change' from November 2000 estimates an increase in sea level of between 21 cm (Western Scotland) and 41 cm (East Anglia) by 2050, i.e. an average rise of 0.62 cm per year ⁷.

High Tide

The Highest Astronomical Tide recorded in Dublin since 1923 (the year records started), is 2.95 m O.D. Malin Head. This occurred in February 2002, and the next highest was 2.6 m O.D. Malin Head in 1924 ⁸.

An EIS was prepared on behalf the Dublin Docklands Development Authority for the development proposals contained in the Dublin Docklands North Lotts Planning Scheme in August 2001 ⁴. Section 5.7 of the aforementioned EIS detailed the highest tides recorded on the River Liffey and noted that the December 1924 tidal event is equivalent to a Malin Datum level of 2.6m OD and the pavement level along North Wall Quay averages 3.5m OD, hence compared with the 2002 level of 2.95m, the North Wall Quay ground level is still above the 2002 level.

However, it is important to note the above comments with respect to sea level rise and for the detailed design phase of the development and selection of final finished floor levels, reference should be made to the recently produced Dublin Bay Hydrological Model, produced by Posford Haskonning Consultants to Dublin City Council, in late 2004. This model allows prediction of probable high tide events to the year 2025 for the Dublin Bay area.

8.3.3 Groundwater

Groundwater can be defined as water that is stored in, or moves through, pores and cracks in sub-soils. Aquifers are rocks or deposits that contain sufficient void spaces and which are permeable enough, to allow water to flow through them in significant quantities. The potential of rock to store and transport water is governed by permeability of which there are two types, intergranular and fissure permeability ³.

Intergranular permeability is found in sediments, sands, gravels and clays and fissure permeability is found in bedrock, where water moves through (and is stored in) cracks, fissures, planes and solution openings. The major aquifer underlying the site is a

bedrock aquifer and therefore the primary characteristic of this aquifer is defined by fissure permeability.

A report carried out on the hydrogeology and geology of Dublin shows the Calp limestone in the Dublin Basin has good permeability, and is suitable for domestic supplies, as permeability is higher near the surface⁹. Therefore the limestone bedrock beneath the site is provisionally classed by the GSI as a minor aquifer, being moderately productive in local zones (LI). Figure 8.3.3 shows the draft bedrock aquifer map for the area. However, due to the proximity to the coast, drinking water supplies would not be abstracted from this area, due to high saline content. Industrial and commercial activities over the centuries in Dublin City centre may have also led to contamination of the aquifer.

The GSI, EPA and the Department of Environment and Local Government (DoELG) have developed a programme of Groundwater Protection Schemes, with the aim of maintaining the quantity and quality of groundwater in Ireland, and in some cases improving groundwater quality, by applying a risk assessment approach to groundwater protection and sustainable development.

The Groundwater Protection Scheme divides a chosen area into a number of Groundwater Protection Zones, according to the degree of protection required for the aquifer. These zones are based on both aquifer vulnerability and the degree of importance the aquifer holds; regional, local or not important.

A review of the GSI records indicates that a groundwater protection scheme has not yet been prepared for the Dublin area. This protection scheme will outline the degree of vulnerability of the aquifers in the county, and guidelines as to how to protect these aquifers.

Well card data from the GSI shows the wells in the vicinity of the site (Table 8.3.4). There are a large number of wells in the area, but only a few show yield and depth to bedrock information.

AWN Well Ref.	GSI Well Name	Townland	DTB m BGL	Usage	Yield m ³ /day	Yield Class	Geology
W1	2923SEW012	Parnell Street	9.1	Unknown	163.6	Good	Limestone
W2	2923SEW013	Ormond Quay	9.1	Unknown	114.5	Good	Limestone
W3	2923SEW038	Lansdowne	7.5	Unknown	22	Poor	

Table 8.3.4 GSI Well Card Data in vicinity of the site

Table 8.3.4 above indicates that the depth to bedrock is at least 7.5 to 9.1m below ground level. The 2001 EIS prepared for the DDDA for the North Lotts area⁴, provides data from previous site investigations in the area which indicates that the depth to bedrock varies from 7 to 20m BGL across the North Lotts area. The well card data indicates that wells, W1 and W2, extend into the limestone bedrock and abstract groundwater from the bedrock aquifer. These wells have a good yield of 163.6 and 114.5 m³/day, respectively. However, the use of these wells is unknown. As outlined

above, it is unlikely that these wells area used for a drinking water supply due to the high saline content of the groundwater in the area.

There was no data on the water bearing stratum was available for well W3 and therefore, it is unknown if this well abstracts water from the bedrock aquifer or quaternary aquifer. However, the depth of the well is 45m which would indicate that abstractions are from the bedrock aquifer.

Based on our experience of other sites in the North Lotts area, groundwater at the subject site is hydraulically connected to the River Liffey and will be saline in nature. Groundwater levels will also fluctuate with the tidal cycle and this must be taken into account when designing basement structures and a dewatering regime for excavations. We have noted fluctuations of 0.2m to 0.3m between high and low tides on other sites in the general vicinity of the proposed development site. Site specific groundwater levels were not available for the North Lotts site, however the likely depth to groundwater, based on our experience of nearby sites, will be in the region of 2.5 – 3.5m below ground level (BGL).

8.3.4 Surface Water Drainage

The surface water drainage environment is characterised by natural drainage by overland and sub-surface flow to the water bodies bordering the site and by discharge to the Dublin City Council combined sewer system in the area.

8.3.5 Foul Water Drainage

An existing Dublin City Council 450mm diameter combined sewer is located on East Wall Road.

8.3.6 Potable Water

An existing water main runs along North Wall Quay and Mayor Street Upper.

8.3.7 Contamination

A significant portion of Dublin city is built on reclaimed or infilled land. This reclamation began back in the 18th Century. North Lotts and East Wall were reclaimed by the end of the 1750s. By the mid nineteenth century, the North Lotts area included a Vinegar works, saw mills, timber yards, warehousing and light industrial activities. By 1867, the rail system was extended to the North Wall Quay.

Traditionally the material used for reclamation in Dublin included construction and demolition waste, waste topsoil and municipal and industrial wastes. The 2001 EIS prepared for the North Lotts area⁴ noted that the made ground in this area comprised gravely clay fill with fragments of glass, clay, brick, plastics, metal, timber, ash and ceramics.

A desktop study of former land uses within the Docklands North Lotts area carried out as part of the EIS mentioned above, indicated the some areas might be contaminated.

During the site visit conducted by AWN Consulting in June 2005, it was noted that there is a former Shell garage at the eastern boundary of the site. In addition, there were 2 no. large diesel tanks located to towards the western boundary at the Henry Crosbie Transport site, and while no evidence of contamination was noted in the

vicinity of these installations, it would be prudent to conduct soil contamination monitoring for hydrocarbons, prior to any construction works commencing .

In summary, a comprehensive contamination site investigation at the site would be necessary to determine the nature and extent of the contamination as a result of the existing and former land uses at the site.

8.4.0 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development site includes the Point Depot and surrounding lands between Sheriff Street Upper, North Wall Quay and East Road, incorporating an area of approximately 6 hectares.

The proposed development will consist of a mixed-use development, with residential and commercial units. The subject site has been zone into the proposed land uses. This zoning is illustrated as follows:

Zone 1

100% Commercial

Gross Area of Commercial 82,171m²

Zone 2a

60:40 of residential: commercial

Gross Area of Residential/Commercial 24,676m²

Zone 2b

60:40 of residential: commercial

Gross Area of Residential/Commercial 24,056m²

Zone 2c

20:80 of residential: commercial

Gross Area of Residential/Commercial 51,959m²

Zone 3

100% Commercial

Gross Area of Commercial 8,628m²

Zone 4

100% Commercial (Point Depot)

Gross Area of Commercial 16,240m²

Zone 5

100% Commercial (Hotel – Landmark Building)

Gross Area of Commercial 16,000m²

It is proposed to extend the LUAS light rail line through the subject site with a LUAS stop adjacent to the Point Depot Building, in the centre of the site.

The characteristics of the proposed development with specific regard to the water environment are outlined in this section.

8.4.1 Construction

The proposed development will involve excavation of material from the site to accommodate foundations and basement construction.

It is not expected that construction will involve excavation of bedrock, due to the depth of overlying quaternary deposits. However piling will be necessary to form foundations for some of the more significant buildings, and this piling will extend to bedrock. Groundwater may also be encountered during the excavations and dewatering may be required during the construction phase.

8.4.2 Operation

The operation of the development will include residential and commercial use. Surface water and foul water drainage will be discharged from the site to local watercourses and Local Authority maintained sewers respectively.

The 2001 EIS for the North Lotts area ⁴ states the existing drainage and water supply infrastructure in the North Lotts area is inadequate for the proposed development. Therefore, it will be necessary to upgrade the existing services to accommodate the development. The proposals for upgrading the services are outlined in the aforementioned EIS as follows:

- A new pumping station sited at the North Wall with a rising main to the Ringsend treatment works will be required to serve the sewage disposal needs of both the development anticipated in the Docklands North Lotts Area and the adjacent area. The Dublin Docklands Area Master Plan (2003) states that the sewage treatment plant at Ringsend will provide for the needs of the area.
- Surface water will be discharged directly to the River Liffey. 6 hours surface water storage will be provided based on a 1 in 5 year storm return period.
- New water main infrastructure will be provided to accommodate the proposed development.

The Dublin City Council Development Plan 2005-2011 states it is the policy of Dublin City Council to implement the findings of the Greater Dublin Strategic Drainage Study (2005) on the drainage network for the Dublin region. The main issues which will apply to the North Lotts area are outlined below:

- Separation of foul and surface water drainage.
- Future discharge of all storm water into the existing combined sewer network will not be permitted by Dublin City Council.
- Surface water may be discharged directly into the River Liffey with approval from Dublin City Council.
- It is the policy of Dublin City Council to make mandatory the use of sustainable drainage systems, which balance the impact of urban drainage through the achievement of control of run-off.
- Basements in new developments to include surcharge risk assessment and hydraulic isolation of basements from drainage systems to avoid flooding of basements.

8.5.0 POTENTIAL IMPACTS OF THE PROPOSAL

The potential impacts of the proposal for the construction and operation phases of the development on the soil and geology, and the water and hydrogeology environments are outlined in the following paragraphs.

8.5.1 Potential Impact of the Proposed Development - Construction

Surface Water

The River Liffey is sensitive water course. If the site is found to be contaminated, the remediation of the site will entail excavation of contaminated materials and handling and movement of these materials on site. Mitigation measures put in place will ensure that the risk of contamination of the surface waters is kept to a minimum and that the impact of the construction phase on surface waters is short term and neutral.

Surface Water Drainage

Surface water generated during the construction phase, from excavations and from run off at the site, could potentially be contaminated and could impact on the receiving water environment. Surface water generated on the site will be collected on site and tested prior to discharge to the foul sewer, to ensure any related impacts are short term and neutral during the construction phase.

Groundwater

Some dewatering of excavations may be required, which may involve pumping groundwater from the site. This water is potentially contaminated and will be tested prior to discharge to the foul sewer. A Trade Effluent Discharge Licence, from Dublin City Council, will be required prior to discharge of potentially contaminated waters to the foul sewer, and treatment of water may be required, in order to comply with the requirements of the licence, which will contain limits for such parameters as, *inter alia*, pH, heavy metals, hydrocarbons, suspended solids and BOD. The impact of the construction phase on groundwater is classed as positive as contaminated water will be removed from the site and the removal of contaminated soil will have the effect of reducing the contaminant flux to the groundwater. The predicted impact on the groundwater is therefore long term and positive.

Foul Drainage

Contaminated ground and surface water may require discharge to the foul sewer system; this would be subject to a licence for discharge of Trade Effluent from Dublin City Council. The discharge may require treatment and as a precaution a grit chamber and a 3 chamber hydrocarbon interceptor will be used to treat any ground or surface water prior to discharge.

Welfare facilities will be provided for construction operatives, these facilities will be connected to the foul sewer. The overall predicted impact during the construction phase is short term and neutral.

Potable Water

Water will be required during the construction phase but demand will be relatively insignificant and any impacts will be short term and neutral

8.5.2 Potential Impact of the Proposed Development – Operation

Surface Water

It is possible that drainage water leaving the site at the moment and entering the surrounding water bodies through overland or subsurface flow or the existing drainage system, is contaminated due to contaminants in the soil. If the site is found to be contaminated, the remediation of the site will lead to a long-term positive impact on the surface water bodies bordering the site.

Surface Water Drainage

Surface water drainage from the site will be diverted from the existing combined sewer system to a separate surface water discharge outfall to the River Liffey, via a non-return valve to prevent tidal ingress. The pipes will be sized such that additional capacity is provided during a high tide and storm event, when the valve may be closed by a high tide and heavy rain falling on the site may require storage until the tide has dropped. Drainage from the basement and any roads or other spaces where traffic may be present will be treated through a Class 1-3 chamber coalescing hydrocarbon interceptor, designed to EN 858. The overall predicted impact on surface water drainage is therefore long term and positive.

Groundwater

If the soil is found to be contaminated, the removal of contaminated soil from the site will lead to a long-term positive impact on the groundwater environment.

Foul Drainage

The existing foul drainage infrastructure will be upgraded to provide sufficient capacity for the foul effluent from the site.

Overall the predicted impact on the foul drainage system is long term and positive due to the removal of surface water discharge from the foul sewer system.

Potable Water

The supply will be met by upgrading the existing Dublin City Council water main infrastructure from the Dublin City water supply system. The water supply system in the development will be designed in compliance with current Dublin City Council guidance and Bye Laws. The overall predicted impact on the potable water supply system is neutral and long term.

8.6.0 REMEDIAL AND MITIGATION MEASURES

8.6.1 Construction

These mitigation measures are designed to address the impacts associated with the construction phase of the development.

It is not expected that bedrock will be encountered during construction of the proposed development; however piling will extend to bedrock.

The construction works will involve disturbance and removal of natural and made ground. It has been noted that ground contamination may be present in some areas of the site and it will therefore be necessary to prepare a detailed Site Remediation Strategy and set appropriate target values for contaminants in soil, given proposed site use, using a site specific risk assessment, which can be conducted using the RISC Human Model 3.0 or the UK CLEA Model.

Further site investigation works will also be required on site to define in detail potentially contaminated areas and leachate testing will be required on soils to be removed from the site, to determine the most appropriate disposal route. Soil gas monitoring should also be conducted as part of the site investigation works. Previous experience of the nearby sites indicates that methane, carbon dioxide and hydrogen sulphide could be encountered in the made ground in the area. If encountered, it will be necessary to conduct a soil gas risk assessment and, if deemed necessary as a result of the soil gas risk assessment, protection measures will be integrated into the design of the proposed development, to ensure the risk of ingress of gas is minimised,

Some of the excavated soils will be classed as contaminated and possibly hazardous. All excavated materials will require disposal at appropriately licensed disposal facilities, in compliance with the Waste Management Acts of 1996 (as amended in 2001) and 2003 and associated regulations. The classification of the excavated materials at the site will be as per Directive EU/33/2003, which provides for classification of materials as inert, non-hazardous and hazardous, and the EPA Hazardous Waste Classification Tool.

Classification will take place where possible prior to excavation, to minimise the amount of material stockpiling at the site, through the use of soil sampling, contaminant testing and leaching tests. Material will be transported from the site using appropriately permitted waste contractors, holding permits from Dublin City Council or other authorities permitted to issue permits for waste collection in Dublin City. Material will be transported to an appropriately licensed facility for further treatment or disposal.

Excavated materials will be handled appropriately to minimise the risk of run off from wet excavated materials or from rainwater falling on the material, entering the surrounding water bodies. This requirement will be need careful attention during the formulation of the Site Remediation Plan.

Surface and groundwater water generated on the site will be collected on site and tested prior to discharge to the foul sewer, to ensure any related impacts are short term and neutral during the construction phase. Any discharge will be within limits set by Dublin City Council, as part of a trade effluent discharge licence. As an additional mitigation measure, the discharge will be treated through a 3 chamber hydrocarbon interceptor and grit trap and other treatment measures, such as carbon adsorption or flocculation, if necessary.

To minimise any impact on the underlying subsurface strata, and the surface water and groundwater environment from material spillages, all oils, solvents and paints used during construction will be stored within specially constructed dedicated temporary bunded areas or suitable bunded lockable storage containers. Oil and fuel storage tanks shall be stored in designated areas, when not in use and these areas shall be bunded to a volume of 110% of the capacity of the largest tank/container within the bunded area(s) (plus an allowance of 30 mm for rainwater ingress). Filling and draw-off points will be located entirely within the bunded area(s). Drainage from the bunded area(s) shall be diverted for collection and safe disposal.

Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in a designated area of the site. Spill kits and hydrocarbon adsorbent packs will be stored in this area and operators will be fully trained in the use of this equipment.

If vehicles cannot be moved to the dedicated refuelling area a mobile double skinned tank accompanied by trained personnel and a spill kit will be used to deliver fuel to the vehicle.

All associated hazardous waste residuals, such as oil, solvent, glue and solvent based paint containers will also be stored within appropriate covered skip containers prior to removal by an appropriate Local Authority or EPA approved waste management contractor for off-site treatment/recycling/disposal.

The combined application of these measures will ensure that inputs to, and subsequent contamination of, the soil and groundwater environment do not occur at the site during the construction phase.

8.6.2 Operation

Surface water drainage from the site will be diverted from the existing combined sewer system to a separate surface water discharge outfall to the River Liffey, via a non-return valve to prevent tidal ingress. The pipes will be sized such that additional capacity is provided during a high tide and storm event, when the valve may be closed by a high tide and heavy rain falling on the site may require storage until the tide has dropped. Drainage from the basement and any roads or other spaces where traffic may be present will be treated through a Class 1 - 3 chamber coalescing hydrocarbon interceptor, designed to EN 858.

A regular inspection and maintenance/desludging programme will be implemented whereby any oil/solids/debris trapped within the interceptors will be removed and disposed of off-site by an appropriately licensed Local Authority or EPA approved waste disposal contractors.

All waste materials generated on site during the operational phase, including cooking oils which have the potential to contaminate ground and surface waters will be stored in an appropriately designed area, with a bunded container for cooking oil storage and a connection to the foul drain, to ensure any leakages from waste containers and wash down water from waste washdown is controlled and diverted to foul sewer.

8.7.0 MONITORING

Regular monitoring of surface and ground water to be discharged from the site will be conducted in compliance with the requirements of Dublin City Council, during the construction phase. Monitoring of excavated fill material generated at the site will be required as part of the Site Remediation Plan, which shall be agreed with Dublin City Council prior to commencement of work on site.

Monitoring of surface water discharges will be carried out periodically as required during the operational phase of the development.

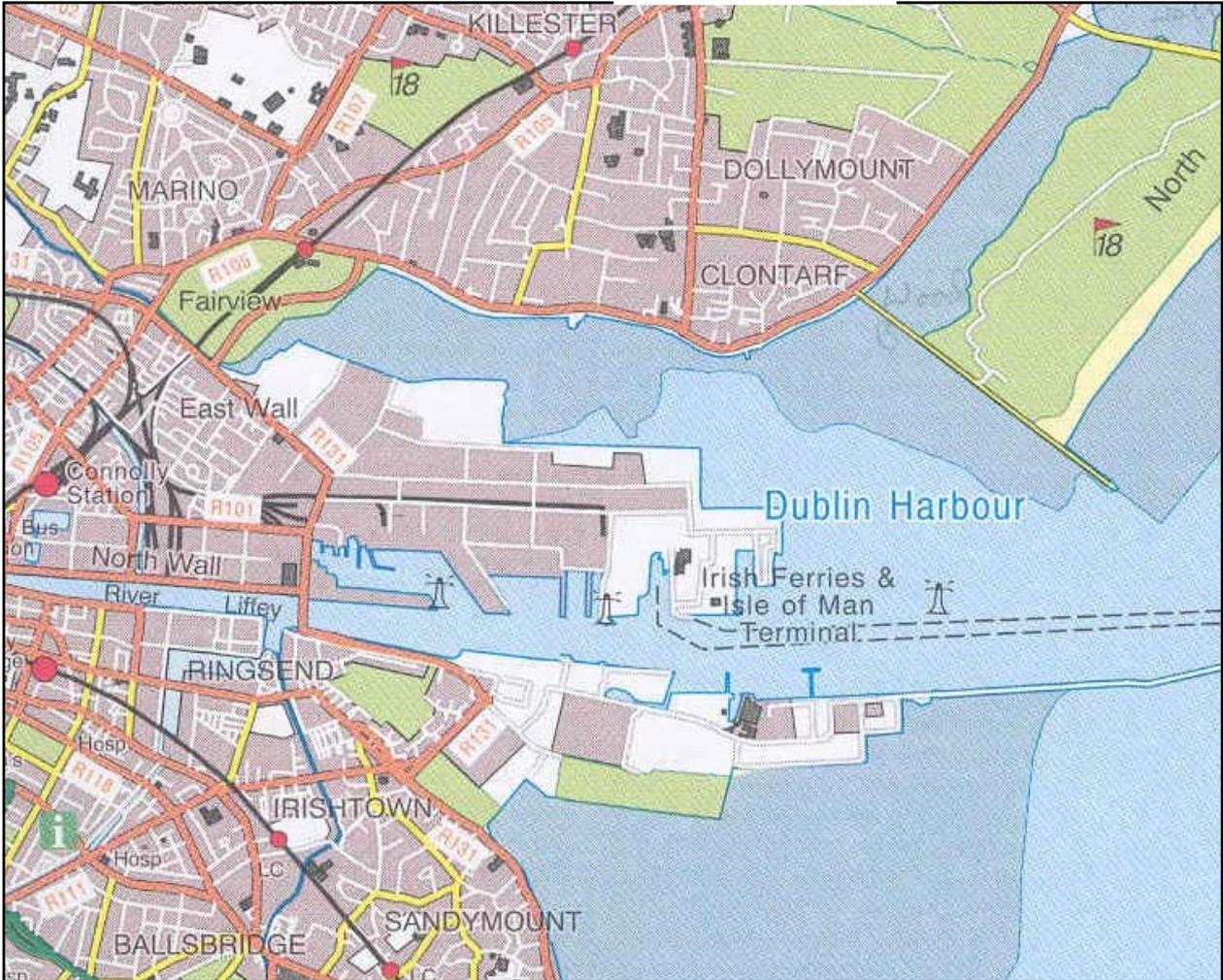
8.8.0 REINSTATEMENT

No reinstatement is necessary

REFERENCES

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3. Geology of Kildare – Wicklow, Sheet 16. McConnell, B. and Philcox, P., Geological, Survey of Ireland, 1994.
4. Dublin Docklands Development Authority, Environmental Impact Statement of Development Proposals contained in the planning scheme for Docklands North Lotts, 2001.
5. EPA, Water Quality Database, 2002, EPA, Johnstown Castle Estate, Wexford.
6. 'Climate Change – Scenarios and Impacts for Ireland' Environmental RTDI Programme, EPA, 2000 – 2006.
7. UK DEFRA 'Climate Change', November 2000
8. Dublin City Drainage Dept, 2003
9. The Geology and Hydrology of County Dublin with Particular Reference to the, Location of Waste Disposal Sites, Creighton J.R., Daly D. and Reilly, T. A., Geological Survey of Ireland, 1979.

Figure 8.1



Appendix 8.1 Surface Water Limit Values

Test Parameter	Limits from S.I. 294 of 1989 ¹	Limits from S.I. 294 of 1989 ¹	Limits from S.I. 294 of 1989 ¹	Limits from S.I. 293 of 1988 ²
	A1 Waters	A 2 Waters	A 3 Waters	
pH	5.5 – 8.5	5.5 – 9.0	5.5 – 9.0	6 – 9
Conductivity (µS/cm)	1000	1000	1000	N/A
Ammonium (mg NH₄-N/l)	0.2	1.5	4.0	<1
Oxidised Nitrogen as Nitrate (mg/l)	50	50	50	50
B.O.D. (mg O₂/l)	5	5	7	<5
Total Phosphorous (mg P/l)	N/A	N/A	N/A	0.062/0.124 ⁵
Orthophosphate (mg P/l) ⁴	0.03	0.03	0.03	N/A

1 Limits from The European Communities Quality of Surface Water Intended for the Abstraction of Drinking Water Regulations (S.I. 293 of 1989)

2 Limits from the European Communities (Quality of Salmonid Waters Regulations) (S.I. 293 of 1988)

3 Limits from the Drinking Water Directive 1998

4 Limits from The Phosphorous Regulations 1998 (for waters classed as Q 3-4 the target value for orthophosphate (expressed as mg P/l) is 0.03

5 Parameters of Water Quality, pp 88-89, EPA, 2001

9.0.0 EFFECT ON THE ENVIRONMENT: AIR QUALITY AND CLIMATE

9.1.0 INTRODUCTION

9.1.1 Ministerial approval will be sought for the redevelopment of an area within the Docklands in Dublin city centre which is referred to as the North Lotts Planning Scheme Amendment No. 1. The development consists of a combination of residential and commercial properties including 25,000 sqm of retail, and café and restaurant amenities. The area comprises a parcel of land at the eastern side of the North Lotts Scheme, bounded to the south by North Wall Quay, to the north by Sheriff Street Upper and to east by the East Wall Road.

Air Quality

9.1.2 AWN Consulting Limited has been commissioned to conduct an assessment into the likely impact on air quality associated with the proposed development.

Macroclimate

9.1.3 AWN Consulting Limited has been commissioned to conduct an assessment into the likely impact on macroclimate associated with the proposed development.

Microclimate

9.1.4 RWDI-Anemos Consulting Engineers have been commissioned to conduct an assessment into the likely impact on microclimate associated with the proposed development.

9.1.5 A qualitative discussion of the likely wind conditions around the proposed development is discussed in detail in Appendix 9.3.

Ambient Air Quality Standards

9.1.6 In order to reduce the risk to health from poor air quality, national and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or "Air Quality Standards" are health- or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set (see Tables 9.1-9.5 and Appendix 9.1).

9.1.7 Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2002, which incorporate EU Directives 1999/30/EC and 2000/69/EC (see Tables 9.1 – 9.2). Although the EU Air Quality Limit Values are the basis of legislation, other thresholds outlined by the EU Directives are used which are triggers for particular actions. The various thresholds have been incorporated into the significance criteria for the development and will be appropriate for assessing the significance of the cumulative impact of the development plus the baseline environment (see Appendix 9.1).

9.1.8 The European Commission sponsored report "Second Position Paper on Particulate Matter – Final" (December 2004) has recommended that the principal metric for assessing exposure to particulates should be PM_{2.5} rather than PM₁₀ after 2010. The report also suggests that the annual average should be in the range 12 – 20 $\mu\text{g}/\text{m}^3$ which should be compared with the PM₁₀ annual limit value, to be complied with in 2005, of 40 $\mu\text{g}/\text{m}^3$. In relation to the maximum 24-hour limit value, a starting point for discussion has been set at 35 $\mu\text{g}/\text{m}^3$ as a 90th percentile. These indicative limit values will be reviewed in the light of further information on health and environmental effects, technical feasibility etc.

- 9.1.9 The impact of the development should also be assessed in terms of the relative additional contribution of the development, expressed as a percentage of the limit value. Although no relative impact, as a percentage of the limit value, is enshrined in EU or Irish Legislation, the USEPA has adopted relative impact criteria based on the applicable limit value. The criteria termed PSD (Prevention of Significant Deterioration) is used alongside the absolute limit values defined by the USEPA (NAAQS - National Ambient Air Quality Standards) (see Table 9.4). The PSD regulations have been formulated to ensure air quality remains good, while maintaining a margin for future growth. The PSD is generally applied to industrial facilities whereas the impact of road developments are compared with the absolute limits in the NAAQS. However, the PSD approach has been adopted for determining the relative impacts of the development in the current context. The significance criteria adopted in the current development are detailed in Tables 9.6 – 9.7, which take into account both the absolute and relative impact of the development.

Climate Agreements

- 9.1.10 Ireland ratified the United Nations Framework Convention on Climate Change (UNFCCC) in April 1994 and the Kyoto Protocol in principle in 1997 and formally in May 2002^(1,2). For the purposes of the EU burden sharing agreement under Article 4 of the Kyoto Protocol, in June 1998, Ireland agreed to limit the net growth of the six GHGs under the Kyoto Protocol to 13% above the 1990 level over the period 2008 to 2012^(3,4).

Air Quality Assessment Methodology

- 9.1.11 The assessment of air quality has been carried out using a phased approach as recommended by the UK DEFRA^(5,6). The phased approach recommends that the complexity of an air quality assessment be consistent with the risk of failing to achieve the air quality standards. In the current assessment, an initial screening of possible key pollutants was carried out and the likely location of air pollution “hot-spots” identified. A review of recent EPA and Local Authority data in Dublin⁽⁷⁻¹⁰⁾ has indicated that SO₂, smoke and CO are unlikely to be exceeded at locations such as the current one and thus these pollutants do not require detailed monitoring or assessment to be carried out. However, the review did indicate potential problems in regards to nitrogen dioxide (NO₂) and PM₁₀ at busy junctions in Dublin⁽⁷⁻¹⁰⁾. Benzene, although previously reported at quite high levels in Dublin⁽⁹⁾, has recently been measured at several city centre locations to be well below the EU limit value^(7,10).
- 9.1.12 The current assessment thus focused firstly on identifying the existing baseline levels of NO₂, PM₁₀ and benzene in the region of the proposed development, both currently (by monitoring and a review of existing data in the region) and when the development is opened (through modelling). The assessment methodology involved air dispersion modelling using the UK DMRB Screening Model⁽¹¹⁾ (Version 1.02 (Released November 2003)) and following guidance issued by the UK DEFRA⁽¹²⁻¹⁴⁾. The inputs to the air dispersion model input data consist of detailed information on road layouts, receptor locations, annual average daily traffic movements (e.g. AADT), annual average traffic speeds and background concentrations. Using this input data the model predicts ambient ground level concentrations at the worst-case sensitive receptors using generic meteorological data. This worst-case concentration is then added to the existing background concentration to give the worst-case predicted ambient concentration. The worst-case ambient concentration is then compared with the relevant ambient air quality standard to assess compliance with the ambient air quality standards.

9.2.0 DESCRIPTION OF THE EXISTING ENVIRONMENT

Meteorological Data

- 9.2.1 A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels)⁽¹⁵⁾. Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM₁₀, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than PM_{2.5}) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles (PM_{2.5} – PM₁₀) will tend to increase at higher wind speeds. Thus, measured levels of PM₁₀ will be a non-linear function of wind speed.
- 9.2.2 The nearest representative weather station collating detailed weather records is Dublin Airport, which is located approximately 10 km north of the site. Dublin Airport has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see Figure 9.1). For data collated during five representative years (1998-2002), the predominant wind direction is south-westerly with an average wind speed of approximately 3-5 m/s.