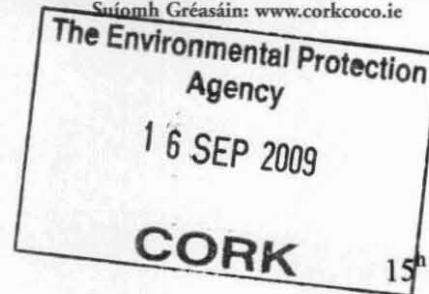


Comhairle Contae Chorcaí Cork County Council

Ms Ann Marie Donlon
Licencing Unit
Office of Climate Change,
Licencing and resource Use,
Environmental Protection Agency
Johnstown Castle Estate
County Wexford
Ireland

Environmental Directorate,
Inniscarra, Co. Cork.
Tel. No. (021) 4532700 • Fax No. (021) 4532727
Web: www.corkcoco.ie
An Stiúirthóireacht Comhshaoil,
Inis Cara, Co. Corcaigh.
Fón: (021) 4532700 • Faics: (021) 4532727
Suíomh Gréasáin: www.corkcoco.ie



15th September 2009

Subject : Wastewater Authorisation Regulations Applications- EIS Permission and conditions relating to Lower Harbour Scheme of Cork Harbour in the functional area of Cork County Council at Shanbally Co. Cork

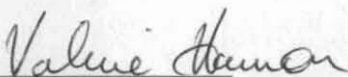
Dear Ms Donlon ,

Please find attached a copy of the An Bord Pleanála decision correspondence in respect of the proposed treatment plant for the Lower Harbour area of Cork county that is proposed for Shannbally, County Cork. Please be advised that the EIS approval relates to the following wastewater discharge authorisation applications submitted to the EPA as part of SI 684 of 2007 regulations

- a. Agglomeration of Passage West, Monkstown , Register Number D0129-01
- b. Agglomeration of Ringaskiddy village Register Number D0436-01
- c. Agglomeration of Cobh Register Number D0054-01
- d. Agglomeration of North Cobh Register Number D0140-01

Should you have any queries or clarification my contact details are supplied below
Phone no. 021-4532700/E mail valerie.hannon@corkcoco.ie

Yours Sincerely


Valerie Hannon,
A/Snr Executive Scientist,
Environment Directorate,
Cork County Council.

c.c. Kevin Sugrue , Senior Engineer Water Services South ,Cork County Council
c.c. Tim O'Herlihy Senior Exceutive Engineer WSIP office, Cork County Council

Our Ref: 04.YA0005

Claire Foley
Cork County Council
W.S.I.P. Project Office
Model Business Park
Model Farm Road
Cork

Date: 25 JUN 2009

Re: Proposed Wastewater Treatment Plant at Shanbally, County Cork.

Dear Madam,

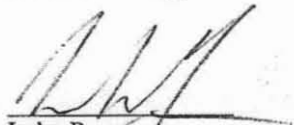
An order has been made by An Bord Pleanála determining the above-mentioned case. A copy of the order is enclosed.

In accordance with section 146(3) of the Planning and Development Act, 2000 the Board will make available for inspection and purchase at its offices the documents relating to the decision within 3 working days following its decision. In addition, the Board will also make available the Inspector's Report and the Board Direction on the decision on its website (www.pleanala.ie). This information is normally made available on the list of decided cases on the website on the Wednesday following the week in which the decision is made.

If you have any queries in relation to the matter please contact the undersigned officer of the Board.

Please quote the above-mentioned An Bord Pleanála reference number in any correspondence or telephone contact with the Board.

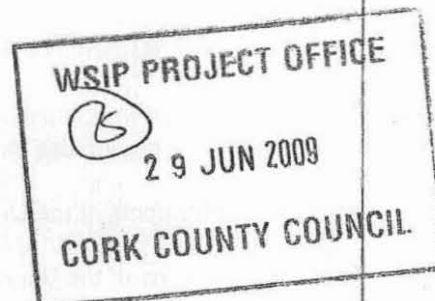
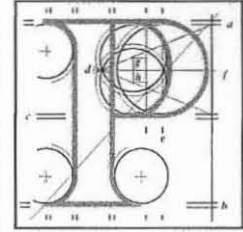
Yours faithfully,



Luke Ryan
Executive Officer

Encl:

An Bord Pleanála



64 Sráid Maoilbhríde,
Baile Átha Cliath 1.

Tel: (01) 858 8100
LoCall: 1890 275 175
Fax: (01) 872 2684
Web: <http://www.pleanala.ie>
email: bord@pleanala.ie

64 Marlborough Street,
Dublin 1.

An Bord Pleanála



PLANNING AND DEVELOPMENT ACTS 2000 to 2007

Cork County Council

APPLICATION by Cork County Council for approval under section 226 of the Planning and Development Acts 2000 to 2007 in accordance with plans and particulars, including an environmental impact statement, lodged with the Board on the 10th day of March, 2008.

PROPOSED DEVELOPMENT: Construction of a wastewater treatment plant as part of the development of Cork Lower Harbour Sewerage Scheme which includes upgrading of the existing waste water collection systems in the lower harbour area and construction of a marine pipeline crossing at Shanbally, Carrigaline, County Cork.

DECISION

GRANT approval for the above proposed development in accordance with the said plans and particulars based on the reasons and considerations under and subject to the conditions set out below.

MATTERS CONSIDERED

In making its decision, the Board had regard to those matters to which, by virtue of the Planning and Development Acts and Regulations made thereunder, it was required to have regard. Such matters included any submissions and observations received by it in accordance with statutory provisions.

REASONS AND CONSIDERATIONS

Having considered the submissions and observations made in respect of the proposed development, and having regard also to:

- (a) the requirements of the Urban Wastewater Directive (91/271/EEC),
- (b) the provisions of the Water Framework Directive (2000/60/EC),
- (c) the provisions of the Cork Area Strategic Plan 2001 – 2020,

4. The odour level emanating from the site of the proposed wastewater treatment plant shall not exceed 3 Ou M/ m³ at the 98th percentile of hourly averages at the site boundary of the wastewater treatment plant and at all sewage pumping stations.

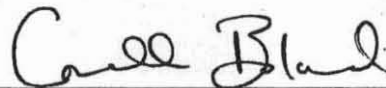
Reason: To mitigate odour impacts.

5. A suitably qualified archaeologist shall be engaged to:
- (a) carry out monitoring of all site investigation and excavation works in relation to the wastewater treatment plant, and pumping stations and the pipeline routes including the marine pipeline route,
 - (b) provide satisfactory arrangements for the recording and removal of any archaeological material which may be considered appropriate to remove,
 - (c) advise on such measures as may be necessary to ensure that any damage to remaining archaeological material is avoided or minimised.

Reason: To conserve the archaeological heritage of the area likely to be affected by the proposed works and to secure the preservation of any remains there.

6. The South Western Regional Fisheries Board shall be consulted in relation to all crossings of watercourses by pipelines and the marine pipeline crossing as part of the detailed design of the works.

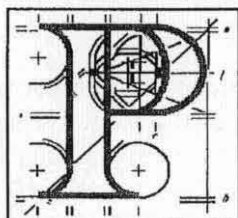
Reason: To protect aquatic ecology.

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**Member of An Bord Pleanála
duly authorised to authenticate
the seal of the Board.**

Dated this 24th day of June 2009.

An Bord Pleanála



Board Direction

Ref: 04.YA0005

The submissions on this file and the Inspector's report were considered at a further Board meeting held on 17th June 2009.

The Board decided to approve the proposed development, generally in accordance with the recommendation of the Inspector, as per amendments set out on the attached copy of the draft order.

Note: the Board noted the Inspector's proposed Condition 1 and concerns expressed in section 5.11 of his report in relation to the separation of foul and surface water flows in Cobh. However the Board was satisfied that the proposals of Cork County Council (as set out in the EIS and further information received by ABP on 15th September 2008) would lead to compliance with the published guidelines in relation to storm water overflows. In this regard the Board noted the undertaking by Cork County Council to the provision of a separate surface water collection system in Cobh. Therefore imposition of the proposed Condition 1 was not deemed necessary.

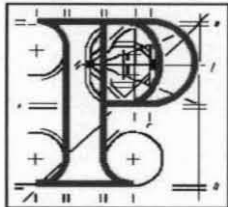
Board Member

Conall Boland

Date 18th June 2009

Copy of Direction Sheet to issue with Order.

An Bord Pleanála



Board Direction

Ref: 04.YA0005

The submissions on this file and the Inspector's report were considered at a further Board meeting held on 17th June 2009.

The Board decided to approve the proposed development, generally in accordance with the recommendation of the Inspector, as per amendments set out on the attached copy of the draft order.

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Board Member _____ Date 18th June 2009
Conall Boland

Copy of Direction Sheet to issue with Order.

An Bord Pleanála



PLANNING AND DEVELOPMENT ACTS 2000 to 2007

Cork County Council

APPLICATION by Cork County Council for approval under section 226 of the Planning and Development Acts 2000 to 2007 in accordance with plans and particulars, including an environmental impact statement, lodged with the Board on the 10th day of March, 2008.

PROPOSED DEVELOPMENT: Construction of a wastewater treatment plant as part of the development of Cork Lower Harbour Sewerage Scheme which includes upgrading of the existing waste water collection systems in the lower harbour area and construction of a marine pipeline crossing at Shanbally, Carrigaline, County Cork.

DECISION

GRANT approval for the above proposed development in accordance with the said plans and particulars based on the reasons and considerations under and subject to the conditions set out below.

MATTERS CONSIDERED

In making its decision, the Board had regard to those matters to which, by virtue of the Planning and Development Acts and Regulations made thereunder, it was required to have regard. Such matters included any submissions and observations received by it in accordance with statutory provisions.

REASONS AND CONSIDERATIONS

Having considered the submissions and observations made in respect of the proposed development, and having regard also to:

- (a) the requirements of the Urban Wastewater Directive (91/271/EEC),
- (b) the provisions of the Water Framework Directive (2000/60/EC),
- (c) the provisions of the Cork Area Strategic Plan 2001 – 2020,

- (d) the Cork County Development Plan 2003,
- (e) the Sludge Management Plan for County Cork 2000,
- (f) the characteristics of the development site and immediate environs,

it is considered that the proposed wastewater treatment plant at Shanbally would not, subject to compliance with the mitigation measures set out in the environmental impact statement and with the conditions set out below, have significant adverse effects on the environment or on the amenities of the area, and would be in accordance with the proper planning and sustainable development of the area.

CONDITIONS

1. All mitigation measures set out in the Environmental Impact Statement accompanying the application shall be implemented in full including monitoring requirements.

Reason: In the interests of environmental protection and orderly development.

2. A Local Liaison Committee shall be established by Cork County Council at the detailed design stage to act as a forum for disseminating information on planning and construction work in relation to the Waste Water Treatment Plant and the major pumping stations. The Committee shall be representative of the Local Authority, their consultants and Contractors when appointed, and one representative of residents from the immediate vicinity of each of the major pumping stations and of the Waste Water Treatment Plant. The results of all odour monitoring shall be made available to this committee.

Reason: To provide a consultative forum for local residents likely to be affected by construction activities and by potential noise and odour emissions from the development.

3. The following treated effluent discharge standards shall be achieved:

Biochemical Oxygen Demand	25 mg / l on a 95 percentile basis
Chemical Oxygen Demand	125 mg / l on a 95 percentile basis
Suspended Solids	35 mg / l

Reason: To protect the aquatic environment, pending the establishment of discharge limits by the Environmental Protection Agency for the wastewater treatment under the Wastewater Discharge (Authorisation) Regulations 2007.

4. The odour level emanating from the site of the proposed wastewater treatment plant shall not exceed 3 Ou M/ m³ at the 98th percentile of hourly averages at the site boundary of the wastewater treatment plant and at all sewage pumping stations.

Reason: To mitigate odour impacts.

5. A suitably qualified archaeologist shall be engaged to:
- (a) carry out monitoring of all site investigation and excavation works in relation to the wastewater treatment plant, and pumping stations and the pipeline routes including the marine pipeline route,
 - (b) provide satisfactory arrangements for the recording and removal of any archaeological material which may be considered appropriate to remove,
 - (c) advise on such measures as may be necessary to ensure that any damage to remaining archaeological material is avoided or minimised.

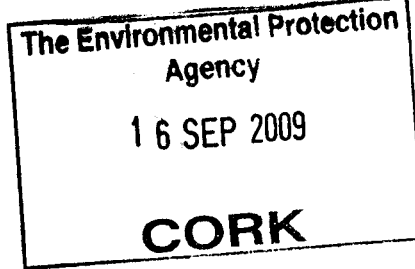
Reason: To conserve the archaeological heritage of the area likely to be affected by the proposed works and to secure the preservation of any remains there.

6. The South Western Regional Fisheries Board shall be consulted in relation to all crossings of watercourses by pipelines and the marine pipeline crossing as part of the detailed design of the works.

Reason: To protect aquatic ecology.

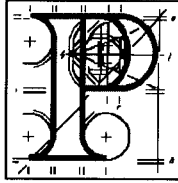
**Member of An Bord Pleanála
duly authorised to authenticate
the seal of the Board.**

Dated this day of 2009.



Cork County Council

An Bord Pleanála



Inspector's Report

Board Reference: 04.YA0005

Proposed Development: Proposed Wastewater Treatment Plant at Shanbally, County Cork

Local Authority: Cork County Council

Inspector: Daniel O'Connor

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**PROPOSED WASTEWATER TREATMENT PLANT AT SHANBALLY,
CARRIGALINE, COUNTY CORK**

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1.0 STATUTORY REQUIREMENTS

Cork County Council, by letter of 7th march 2008, applied to An Bord Pleanála for approval to the proposed Wastewater Treatment Plant in the townland of Shanbally, Co. Cork. The proposed Wastewater Treatment Plant is to cater for Cobh, Passage West, Monkstown, Ringaskiddy, Crosshaven and Carrigaline. The application included 3 copies of the Environmental Impact Statement which is in 3 volumes. The application is stated to be made under Section 175(3) and 226 of the Planning and Development Act 2000 and in accordance with Art 118 in part 10 of the Planning and Development Regulations 2001.

A copy of the notice published in the Irish Examiner on 29th February 2008 was also enclosed. Prescribed bodies were notified and the a copy of the letter of notification is enclosed. This states that the EIS has been issued to the prescribed bodies and was issued on 6th March 2008.

The prescribed bodies notified are given as follows:

- An Chomhairle Ealaíon
- Fáilte Ireland
- An Taisce *The National Trust for Ireland*
- Minister for Environment, Heritage and Local Government
- Heritage Council
- Cobh Town Council
- Passage West Town Council
- South Western Regional Fisheries Board (SWRFB)
- Córas Iompar Éireann
- EPA Headquarters
- HSE Head Office
- Minister for Communications, energy and Natural Resources
- Minister for Agriculture Fisheries and Food
- Railway Safety Commission

The requirements of Article 121 of the Planning and Development Regulations (SI 600 of 2001) appear to have been complied with in relation to the notification of the Prescribed Bodies.

1.1 Responses / Submissions from Prescribed Bodies

The prescribed bodies which responded were The Railway Safety Commission (RSC), the South Western Regional Fisheries Board (SWRFB), HSE-Southern Region, the Development Applications Unit of DEHLG and the Department of Agriculture, Fisheries and Food (Coastal Zone Management Section). Submissions were also received from 3rd parties namely Mr Kevin Loftus and Mr Michael Barry. The submissions are described in Chapter 4.0 below.

1.2 Additional Information

By letter of 25th August 2008 the Board requested additional information form the Local Authority in relation to the following:

- Extent of combined and separate sewerage systems in Cobh
- Residence time of sewage in rising mains

Cork County Council

- Robustness of cost comparisons in light of rising energy costs
- Locations of existing outfalls and discharges
- Consultation with River Basin District group
- Water Quality data clarification.

The Local Authority submitted the information by letter dated 12th September 2008 and the responses are dealt with in paragraphs 4.9 to 4.15 below.

1.3 As the provisions of Regulation No 44 of the Wastewater Discharge (Authorisation) Regulations apply in this instance, the views of the EPA were sought by the Board in relation to the development by letter of 11th December 2008. The EPA responded by letter of 17th December 2008 and noted that pursuant to WWDA Regulations 2007, Cork County Council had submitted applications in respect of the following (existing) discharges:

- D0057-01 Ringaskiddy / Carrigaline
- D0129-01 Passage West / Monkstown
- D0140-01 Cork North
- D0054-01 Cobh

The EPA letter stated that the above applications were being assessed and that no application had been made in respect of the (proposed) Shanbally development.

The views of the EPA in relation to the efficacy of the proposals as far as storm overflows is concerned is therefore not available at this time.

1.4 Cork County Council submitted Volumes 1, 2 and 5 of the Preliminary Report for the Cork Harbour Main Drainage Scheme as additional information as requested by the Board by letter of 19th January 2009. The request for this documentation was to have clarity in relation to the proposals of the Local Authority in relation to stormwater discharges and on separation of foul and storm water within the sewer network. The assessment of this information is under **Section 4.16 below**.

1.5 I carried out a site inspection on 11th August 2008.

2.0 PROPOSED DEVELOPMENT

The proposal is to construct a Wastewater Treatment Plant at Shanbally, approximately 2 kilometres west of Ringaskiddy on locally elevated ground. The proposed design capacity is for a plant of 80,000 p.e. and the proposal is to use an existing IDA outfall off Ringaskiddy towards Carlisle Fort on the east side of the outer harbour mouth.

It is proposed to use the Design / Build / Operate form of procurement.

The proposal also includes 4 No. major pumping stations at West Beach (Cobh) Carrigaloe, Monkstown and Rafeen operating effectively in series together with the diversion of the rising main from the existing Carrigaline (Church Road) pumping station to the proposed WWTW. It also includes construction of a number of new smaller pumping stations and the incorporation of others into the network discharging to the proposed WWTW.

In total there would be over 20 small and 5 large pumping stations in the expanded network. Stormwater tanks would be provided at individual pumping stations and the proposal is to pump forward 6-7 times dry weather flow from each pumping station with excess flows being held in storm tanks during heavy rainfall events. Emergency overflows are planned at pumping stations to allow for power outages etc.

The proposed method of procurement of the project is by DBO and the EIS is not in a position to give details of actual proposed layout or systems. There are two different indicative layouts described in the text and outlined in figures 2.5 – 2.8 of the EIS. The estimation is that construction would take 2 years and there is a commitment that the maximum height of any building would be 12 metres above existing ground level. The location of the high voltage overhead power lines dictate the general layout of the plant and it is noted that there are less buildings and structures involved in the Sequencing Batch Reactor type layout.

Control mechanisms to be provided are a Construction Environmental Management Plan, an Operational Environmental Management Plan and an Energy Management Plan.

The provision of an extensive surface water system which would remove surface water from combined sewers is referred to in the EIS but is not detailed.

3.0 IMPACTS IDENTIFIED

3.1 The EIS describes the impacts under 8 main headings as follows:

- Human Beings
- Terrestrial and Marine Ecology
- Water Quality
- Soils, Geology and Hydrogeology
- Material Assets
- Air Quality, Odour and Climate
- Noise and Vibration
- Cultural Heritage
- Landscape and Visual impacts.

The EIS also describes interactions .

3.2 Human Beings

Land uses adjacent to the proposed WWTP site include a site with permission for residential development, the proposed realigned N28 and tourism and recreational uses. The harbour uses also include tourism and recreational uses. Construction activities identified include excavation, pipe-laying construction of the WWTP and pumphouses and a proposed Marine Crossing.

The EIS states that the loss of 7.36 hectares of agricultural land for the WWTP would not be a significant impact. Raffeen and West Beach pumping stations would be built on reclaimed land.

The prediction in the EIS is that there would be positive impacts for future development arising from the construction and operation of the WWTP. Traffic impacts are anticipated to be slight in the operational phase.

The 2006 census figures are given as 32,411 for the catchment to be served and the plant design is for 80,000 p.e. The EIS states that the plant would facilitate increased residential and commercial development in the environs of the Lower Harbour.

3.3 Terrestrial and Marine Ecology

Cork harbour is described as being connected to the Atlantic Ocean by a narrow inlet between Roches Point and Crosshaven and that inter-tidal flats are often muddy in character. The proposed Plant is located within 2 kilometres of the Great Island Channel SAC which stretches from Little Island to Middleton.

Habitats are described in the EIS and are mainly rated as of local importance. However the habitat types “Estuaries and sea inlets and bays” , “Infralittoral gravels and sands” , “Mud Shore” and “mixed sediment shore” are rated of international importance. It is noted that the location of emergency storm outfalls is not determined.

The EIS notes that Cork Harbour is an area of international importance for wintering waterfowl and sections of the harbour are designated SPA, SAC and NHA. Near the proposed WWTP there is reference to a badger sett and mitigation is proposed. The harbour is stated to be an important nursery ground for juvenile fish before they return to sea. Adult mullet are noted grazing on algal films and the impact of the proposed WWTP is stated to be likely to impact on mullet. The EIS describes the impact on mullet arising from the removal of sewage outfalls as neutral. Oyster sites in the harbour currently have a 'B' Classification.

Impacts arising from the Marine Crossing are described as not being particularly invasive and would be less so with tunnelling. It states in the EIS that the construction impacts on mussels and other fauna would be more than compensated by the cleaner conditions following on the development.

During operation, disturbance to mammals are described as minimal. Restrictions on edibility of fish are predicted to ease considerably. The WWTP would be subject to licence from EPA under Wastewater Discharge (Authorisation) Regulations 2007.

The EIS states that excavation work on the foreshore would ensure that the top layer of sediment would be reinstated. The EIS notes permanent loss of habitat at the WWTP site which it does not consider significant.

3.4 Water Quality

Modelling was carried out covering an area including the Old Head of Kinsale and extending to the city waterworks on the river Lee in Cork City. The west passage of the river Lee is noted as being designated "sensitive" but the lower Harbour is not so designated. The status of Lower Cork Harbour is described as being eutrophic in Lough Mahon (2003), north channel at Great Island is now improved to Intermediate; Lee estuary is intermediate, Cork Harbour disimproved to intermediate and the Owenacurra Estuary disimproved to eutrophic.

Faecal coliform concentrations are given for 2005-2007 period in the EIS. These indicate peak values for December 2006 at low tide of over 1,000 coliforms per 100 ml. The peak for high tide is 44 and both peaks are isolated. The EIS predicts faecal coliform levels at 15 points in the Lower Harbour. Tables in the EIS also show the predicted levels of various parameters for treated effluent. The EIS conclusion is that as wastewater from the lower harbour area is only one factor contributing to water quality the positive impact of the proposed WWTP would be moderate.

Table 3.3.7 and 3.3.10 in the EIS compare predicted coliform counts for treated and untreated scenarios. For Cobh at neap tide untreated effluent has a predicted average level of 154 faecal coliforms per 100 ml while for treated the level is 0.05. For the remaining chosen 14 points there is a general significant reduction predicted. The differences between the treated and untreated scenarios are most marked in the case of predicted coliform maximum counts, rather than averages.

The EIS notes that there are no statutory regulations to give effect to the requirements of the Water Framework Directive and notes the requirement for a River Basin

Management Plan. Reference is made to a DEHLG publication from 1995 entitled “ Procedures and Criteria in relation to Stormwater Overflows” and notes that the treatment of overflows would be subject to EPA Licence under the Wastewater Discharge (Authorisation) Regulations 2007.

Reference to the EPA website indicates that Cork County Council applied in 2007/8 for licence h for the following:

- Cobh direct discharges ref D0054-01
- Passage / Monkstown direct discharge ref D0129-01
- Ringaskidy direct discharge ref D0057-01
- North Cobh WWTP at Ballynoe ref D0140-01

It is noted that the North Cobh treatment plant is not referred to in the EIS. The licence application states that the plant would be decommissioned when the Shanbally plant was put into operation and the flows from Ballynoe would be transferred to the new system. Separate foul and surface water systems are stated to be provided in this catchment and there is reference to a p.e. of 4,000 for the plant.

EIS prediction is that following mitigation, there would be positive impact on water quality which would also positively impact on ecology, aquaculture, recreation, economic activity and development.

3.5 Soils, Geology and Hydrogeology

The depth of overburden at the proposed WWTP site is given as between 8 and 20 metres and therefore blasting of rock is not anticipated. A survey of November 2007 suggests that there is an absence of groundwater up to 15 metres below ground level. Karstification of limestone is referred to and a depression on the site is potentially a karst feature. The prediction in the EIS is that with mitigation there would be no significant residual negative impacts on the soils or geological / hydrogeological environment.

3.6 Material Assets

Assets of human origin are listed as towns and villages and recreational facilities, public utilities and transport infrastructure. Impacts on roads arise from interference with the road surface in laying of pipelines. The drainage network is described as mainly being a combined sewerage system. The EIS notes that Cork Harbour is the second largest harbour in the world in terms of navigable area. The proposed marine pipeline is predicted to have significant temporary negative impacts on harbour traffic.

Consultation is proposed with the DAFF in relation to foreshore and in-stream works. The prediction is that pipelaying would result in slight temporary negative impacts due to traffic disruption.

Positive impacts are predicted on towns and villages and on recreational facilities arising from the operation of the WWTP. It notes that there are no designated areas adjacent to the WWTP site and no mitigation is required in that regard.

The need for septicity control in the pumping mains is identified as a necessary mitigation measure arising from the long length of rising mains and the consequential long residence time of sewage effluent in the mains.

3.7 Air Quality, Odour and Climate

Air quality is predicted to involve slight negative impacts relating to NO₂ and PM₁₀ but would remain well within legislative limit values. Dust deposition is recognised as a construction phase risk and a Construction Environmental Management Plan is proposed to include measures to control dust and regulate traffic.

Odour dispersion modelling indicated that sensitive receptors would have a 98th percentile level of less than 1.5 odour units per cubic metre. It is noted that the odour predictions are based on a specimen design and as such do not relate to any specified process. It is also noted that no predictions are made in respect of pumping stations where odour problems associated with septicity are identified as a potential impact.

The conclusion in the EIS states that no odour impact would be perceived at sensitive receptors following the implementation of good design in terms of odour management.

3.8 Noise and Vibration

Construction phase noise impacts are identified as the most significant. In the case of the WWTP the nearest sensitive receptor is stated to be 134 metres distant. It is predicted that there would be negligible impact on sports activities in the area arising from construction at the WWTP. It predicts lower noise and vibration impacts for pumping stations generally but predicts a 70 dBA level at Monkstown and West Beach pumping stations. It predicts that there would not be significant operational noise impacts. The EIS envisages no significant residual noise impacts but notes that the achievement of the design criteria would be the responsibility of the contractor's design team.

3.9 Cultural Heritage

Ringforts in the vicinity of the pipeline route were identified and a total of 27 sites of archaeological or architectural significance are referred to in tables 3.8.4 to 3.8.6 of the EIS. The recommended mitigation measures include monitoring within the relevant zones of archaeological potential (ZAP) and fencing off of areas and creation of buffer zones. The EIS provides for specific archaeological monitoring of the proposed submarine pipeline between Carrigaloe and Monkstown.

The EIS predicts that with mitigation measures in place there would be no significant residual archaeological or architectural heritage impacts arising from the proposed development.

3.10 Landscape and Visual

The prediction regarding the WWTP is that the greater surrounding area is capable of absorbing the development without changing the character of the urban fringe landscape. The EIS notes that notwithstanding the rural character of the area the tell-tale signs of urban intensity are evident.

The EIS recommends a planting programme using native species for the area of the proposed treatment plant. It states that the plant would not converge with existing or proposed developments but would remain a small singular element within the urban fringe landscape.

The impacts of the main pumping stations are described in the EIS and the and note is taken of the architectural treatment proposed in order to minimise visual impacts.

Residual impacts are referred to in the EIS and it recommends an assessment be carried out at the WWTP after 7-10 years when the planting had matured.

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4.0 SUBMISSIONS AND ADDITIONAL INFORMATION

4.1 A number of submissions were received from prescribed bodies and from 3rd parties and these are described in paragraphs 4.2 to 4.8. Additional information submitted by the applicants on foot of a request from the Board is given in paragraphs 4.9 to 4.12.

4.2 Submission of RSC.

The Railway Safety Commission submitted that the development impacts on the Cork to Cobh railway line and requests that notification of works should be made to the Divisional Engineer at Limerick Junction Station.

4.3 Submission by SWRFB

The South Western Regional Fisheries Board, by letter of 15h April 2008 submitted that no reference had been made in the EIS to the crossing of freshwater watercourses and requested that it be a condition that the applicants would agree the timing and design of all crossings of watercourses and also of all foreshore and marine crossings.

An ongoing monitoring programme was also requested.

4.4 Submission by HSE – Southern Region

By letter of 1st May 2008 the Health Service Executive, South Lee Environmental Health Dept. submitted that mitigation measures were required for residents close to the proposed WWTW in relation to monitoring during construction and information regarding progress of the works. Assignment of a designated person by the Local Authority for support is recommended. Pest control measures are requested as mitigation during construction, continuing into operation. Noise monitoring is recommended as is the monitoring of agricultural use of sewage sludge.

4.5 Submission of DEHLG

The Development Applications Unit of the Department of Heritage, Environment and Local Government, by letter of 25th April 2008 made submissions in relation to archaeological monitoring . Specifically the DAU set out the requirements for monitoring for pipeline excavations including the proposed marine crossing. It also recommended that the route of the pipeline be redesigned if possible to avoid direct impact on the disused Victoria Baths in Cobh. The recommendation of the DAU is that if it is not possible to re-design the route the advice of a Conservation Architect should be sought.

4.6 Submission by Coastal Zone Management Division of DAFF

By letter of 7th May, 2008 the Coastal Zone Management Division of the Department of Agriculture, Food and Fisheries notes that the construction of a modern WWTP would result in improved water quality in the lower harbour area. It states that part of Cork Harbour would be officially designated as a Shellfish growing area under the Quality of Shellfish Waters Regulations (SI 268 of 2006).

It also notes the requirement for the County Council to acquire a lease / licence from DAFF in respect of the property aspect of the application.

4.7 Third party submission by Mr Kevin Loftus.

Mr Loftus, of 4 Elm Court, Douglas submitted a drawing indicating his proposals for integrating the works into development at Spike Island. Mr Loftus states the proposed plant is in close proximity to a residential area and he had previously proposed that the plant should be located at Ringabella as an alternative. He notes that the connection for Crosshaven would be more direct to that location. In relation to Spike Island, Mr Loftus states that a sewer corridor could be provided as part of the possible Spike Island Works which include the construction of a marina.

4.8 Submission by Mr Michael Barry.

Mr Barry made a submission dated 7th May 2008 on behalf of himself and his family and has an address of Ringaskiddy Shanbally. Mr Barry states that he objects on the strongest possible grounds to the development on a number of headings as follows:

- Due to height and scale, the development would be injurious to residential amenities in the area.
- Development is contrary to protection of established and zoned residential uses in the area
- Development would adversely impact on family's enjoyment of their farm.
- Development would result in a diminution of the value of the farm.

Mr Barry elaborates on the objections as follows:

1. The scale of the development should be taken in conjunction with proposed N28 road. This road is not a priority which indicates prematurity of the WWTW proposal. Construction would cause significant traffic hazard and the development is contrary to the various planning goals, objectives and aims set out by the Local Authority in the Development Plan.
2. Regarding zoning, Mr Barry states that the proposal is contrary to the use of the area by all other users and points out that he has thoroughbred horses who are very susceptible to noise and dust.
3. Regarding enjoyment of the land, Mr Barry submits that full regard be given to his family's fundamental right to expect that the use and enjoyment of their land would be protected.

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4. With reference to the diminution of the value of the land's enjoyment, Mr Barry submits that the outcome would be that the lands would be rendered totally useless.
5. Submitted that the development is contrary to proper and orderly planning and denies landowners rights.

Mr Barry requests other objections made in connection be circulated and any additional information from the applicant to be notified to him.

4.9 Additional Information submitted by Cork County Council

By letter dated 12th September 2008, Cork County Council submitted additional information requested by the Board (see para 1.2 above). The information covers the points raised in the Board's letter of 25th August 2008. Six separate issues were raised and the replies are outlined in para. 4.10 to 4.15 below.

4.10 Separation of foul sewage, Cobh.

In relation to a query on the extent of separation of foul and surface water in Cobh, the Local Authority stated that the existing system comprised 16 kms of combined sewer. There are plans to provide an extensive surface water collection system which would comprise 20 kms of surface water sewers. Estimated storm runoff for 2 year 30 minute storms are given for 5 existing outfalls.

The request for additional information referred to the DEHLG document "Criteria and Procedures in relation to Stormwater Overflows" produced in 1995. The response given is that the receiving waters are not designated as either sensitive or as bathing waters and hence the limit on permitted overflows per annum is not applicable. *(This issue is referred to in the Assessment chapter)*

4.11 Residence time in rising mains and size of Rafeen Pumping Station

The Local Authority estimated the residence time for flow from West Beach Pumping Station to Shanbally WWTP site at 9 hours and 44 minutes. It also stated that approximately 30% of flows in Cobh would be transferred through 4 pumping stations in series. Dimensions and other details of the proposed Rafeen Pumping Station were also submitted.

4.12 Energy Cost Fluctuations

The Local Authority gave details of a sensitivity analysis which is stated supports the choice of Option 2 with an assumption of fuel prices being raised by a further 20%

4.13 Location of outfalls and discharges

Figure 5.1 is included in the response from the Local Authority which shows the locations of 10 municipal outfalls, 7 wastewater treatment plants including Carrigrenan, Carrigtohill and Middleton, 9 No. IPPC discharges and 2 No. Section 4 (Water Pollution Act) discharges. Table 5.1 which draws on information in the Preliminary Report for the scheme gives details of the discharges including source and daily volume where available.

4.14 Consultations with South Western River Basin District Group

Details are given of the consultation relating to the RBD studies indicate that the consultants for the proposed WWTP at Shanbally are also the lead consultants on the RBD project. It notes that one of the basic measures is to comply with the Urban Wastewater Treatment Directive and that the requirement for supplementary measures was not known at the time of reply (Sept 2008)

4.15 Cork Lower Harbour baseline water quality data.

The response includes data for faecal coliforms in Cork Harbour from 2005-2007. The response notes that while the current outfalls do not discharge to designated bathing areas some of the locations are used for recreational purposes. It states that water quality data in the vicinity of the current discharge outfalls is not available but that it could be expected that microbiological and nutrient levels would be higher than in deeper water away from the shore. The response states that the proposed development would involve decommissioning of 9 No. outfalls but that some would be used as Storm Water Overflows in accordance with DEHLG publication of 1995.

The response states that a comprehensive model does not exist in relation to the overall nutrient and microbiological contribution to Cork Harbour and that what was done was to identify the inputs into the harbour. It states the inputs from the current discharges were modelled and compared with the future scenario and it is contended that the data presented provides an accurate representation of the relative improvement in water quality following from the scheme.

4.16 Preliminary Report

Volumes 1 and 2 of the Preliminary Report cover the description of the existing and proposed infrastructure and options for effluent disposal and sludge treatment. Volume 5 contains Appendices G-H. It is noted that infiltration studies were carried out for each major sub catchment. Some areas are described as having significant infiltration levels. It also notes a shortage of gullies in some areas leading to rainwater running over roads which is described as not being an appropriate solution to the conveyance of stormwater.

On page 142 of Volume 1 it is stated that parts of the Lee Estuary are now designated as sensitive waters and that overflows in the passage West/Monkstown area (on the east of the channel from Cobh) would have to be limited to 20% of the rainfall run-off

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volume. In relation to the Cobh catchment, it is noted that a previous preliminary report (1997) assumed a wastewater treatment plant local to the catchment and this report discusses different possibilities for storm overflows. It notes that it would not be feasible to totally separate the collection system.

It is clear that the Preliminary Report has comprehensively examined the collection system and the extent of new storm sewers is noted. For Cobh, the relevant drawings are figures 3.3.2 – 3.3.6.

The concern would be the achievement of a satisfactory level of storm overflow control to ensure compliance with current and future statutory controls. The DEHLG document “Procedures and Criteria in relation to Storm Water Overflows” is dated 1995 and the requirements for compliance have not been set out in detail for this development.

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5.0 ASSESSMENT

- 5.1 Alternatives :** The consideration of alternatives involved evaluation of alternative sites and of combinations of sites for locating the treatment plant. The examination is considered to have been very comprehensive. Provided the issues of satisfactory stormwater overflow control can be addressed in a satisfactory manner, the choice of a single treatment plant for the entire catchment is considered satisfactory.
- 5.2 Outfall:** The location of the outfall is considered satisfactory and has been evaluated with respect to hydraulic modelling. Use of the existing IDA outfall has obvious advantages in relation to minimising construction related impacts.
- 5.3 Treatment Levels:** The outfall location is to an area of the harbour which is not designated as “sensitive”, nor is it close to any such designated area. The proposal involves treatment of effluent to standards required by the Urban Wastewater Treatment Regulations and are considered appropriate. Nutrient removal is not proposed but the EIS states the plant can be designed to allow easy retrofitting of nutrient removal facilities in the future. The proposals are considered satisfactory. It is noted that the provisions of Regulation 42 of the Wastewater Discharge (Authorisation) Regulations of 2007 are that an interim situation pertains relating to discharge standards.
- 5.4 Storm Overflows:** The majority of the catchment is on a combined sewer system, where storm flows in wet weather conditions could be expected to exceed 6 dwf on a regular basis and by a considerable multiple. The current situation during wet weather conditions is not discernibly different than dry weather in relation to pollution load and in fact might even appear better when the dilution factor of the rainwater is taken into account.

The situation post development would be different in that in times of dry weather or where rainfall amounts do not involve more than 6 times dwf, the position regarding impact on water quality would be greatly improved. However if the storm overflows came into use, the apparent position would be noticeably worse, although in practice a smaller volume and strength of effluent would be involved in comparison with the pre-development situation.

In particular the flows from Cobh, which has the oldest sewer system, are planned to be pumped 4 times in series before reaching the proposed treatment plant as all flows must pass through the pumping stations at West Beach, Carrigaloe, Monkstown and Raffeen. There would appear to be an increased risk of more frequent overflows in this particular regime. The statement in the EIS (para 2.11.1, page 49) that future collection systems would be separated as far as reasonably possible would appear to be somewhat aspirational. However, the additional information supplied by the applicant on 15th September

2008 states clearly that 20 kms of a proposed dedicated surface water system is planned in order to remove surface water from the combined system and hence it would appear that the success of this operation is based on the ability of the proposal to limit storm water overflows to levels which would be acceptable in regard to certification or licencing by EPA under the Wastewater Discharge Regulations.

Therefore, the proposed separation of foul and surface water flows in Cobh is considered critical to the success of the scheme in relation to water quality impacts. A programme of works which would ensure compliance with the DEHLG and EPA requirements in relation to the operation of storm overflows would need to be agreed prior to the commitment to detailed design of the proposed pumping of all effluent to Shanbally. A condition is recommended in this regard.

Volumes 1, 2 and 5 of the Preliminary Report for Cork Harbour Main Drainage Scheme indicate that very comprehensive analysis of the network has been carried out but the actual potential achievement of a satisfactory control of overflows is not demonstrated.

5.4 Impacts on Air:

In relation to the proposed WWTP at Shanbally, although the treatment process is not established, it is reasonable to accept the predictions in the EIS in relation to impacts arising from the construction and more particularly the operation of the WWTP. It is considered that the plant would not give rise to significant impacts on air quality and that odour levels should not cause problems. A condition is recommended in relation to odours.

The pumping stations, particularly those which receive sewage effluent which has already passed through a rising main have much greater potential to result in persistent odour problems. Septicity in rising mains has been the cause of many long term difficulties in respect of odour and there is somewhat of a shortage of details in the EISA in relation to odour control. It is also noted that the residence time from Cobh to Shanbally is estimated at over 9 hours and there are up to 4 major pumping stations involved in-series. It would also appear possible that some smaller pumping stations could contribute to the generation of odours.

Notwithstanding the reservations on pumping station odours, it is considered that an odour management system should be capable of being provided for the pumping stations. A condition is recommended in that regard. Compliance with odour management conditions is problematical as EIA approvals do not carry ongoing monitoring and enforcement possibilities. The most satisfactory method of providing for compliance would appear to be the requirement to publish an annual report on monitoring to be available at the Offices of the Local Authority and to establish a liaison forum from the commencement of construction.

5.5 Landscape and Visual Impacts

The provisions in the EIS in relation to the architectural treatment of individual pumping stations are considered appropriate.

Screening is proposed in the vicinity of the proposed WWTP. The conclusion in the EIS that the urban fringe landscape character would not be changed as the greater surrounding area is capable of absorbing the development is accepted. The review of planting in 7-10 years is considered appropriate.

5.6 Cultural Heritage Impacts

The EIS identifies 27 sites of either archaeological or architectural significance and sets out measures including fencing and monitoring. The mitigation measures proposed are considered appropriate and the conclusion in the EIS that there would not be significant residual archaeological or architectural impacts is accepted.

5.7 Ecological Impacts

It is noted that the marine and littoral habitats are rated mainly of local importance. Reference is made to mitigation in relation to one badger sett near the WWTP site and the effect on mullet is regarded as being a neutral impact overall. It is accepted that marine fauna should generally be positively impacted upon by a cleaner water regime. It is considered that there would not be significant ecological impacts arising from the development.

5.8 Socio -Economic impacts

The EIS predicts positive impacts on towns and villages in the catchment. It also predicts that it would facilitate further growth in the residential and commercial development in Cork Lower Harbour. It is arguable that there is not a direct link between a WWTP and positive socio-economic impacts as it is an accepted requirement that waste water be adequately treated irrespective of the level of development envisaged. From the description in the EIS it is considered that there would not be any significant negative socio-economic impacts associated with the proposed development provided adequate control can be exercised on effluent standards and on odour and noise generated.

5.9 Impacts on Soils

Having noted possible karstification in the area, with mitigation it is considered that the impacts are not likely to be significant in relation to soils, geology and hydrogeology.

5.10 Water Framework Directive – Discharge Regulations

Reference is made in the EIS (p143) to the South Western River basin District which was established in the context of the Water Framework Directive (WFD) which has the objective of achieving “good status” for water bodies by 2015. A stage in the process is the Programme of Measures and a draft River Basin Management Plan, which were published in December 2008. The Draft Plan is open for public comment until June 2009.

Further reference is made to the WFD in the additional information and indicates that within the overall harbour area, municipal discharges from Carrigrenan (Cork City, outfall south of Little Island), Carrigtohill (discharge to head of Slatty Water) and Middleton (described as a tidal tank discharging to the east channel of Great Island) could impact on water quality in the lower harbour and could be part of a cumulative impact on water quality. IPCC and Section 4 (Water Pollution Act) discharges, together with storm overflows could also impact on the overall situation.

While it would be preferable that the evaluation of the impact of the proposed development should be made in the context of all other relevant discharges in the potential area of influence, it can be concluded that the removal of more than 10 existing outfalls of raw sewage is beneficial. However, the overall impact of storm water outfalls, together with the other discharges identified in the submission of further information should preferably have been considered in the context of the Programme of Measures which was published at the end of 2008.

In relation to the Wastewater Discharge (Authorisation) Regulations (SI No 684 of 2005) it is noted that Cork County Council applied to the EPA for a Discharge Licence in respect of the existing outfalls and outlined the overall proposals for the proposed construction of a single WWTP and outfall.

5.11 Additional Information of 12 Sept 2008.

The additional information is described in paragraphs 4.9 – 4.15 above. The assessment of the submission is as follows:

- Taking note that Cobh has a largely combined system and given the age of the system, it is likely that transfer of surface water could pose problems in respect of older buildings. Therefore there would be concern, even if the 20 kms of surface water sewers are provided that sufficient separation might

not be achieved to allow effective control of storm overflows to comply with the likely requirements of an EPA discharge licence. If this proved problematical it would undermine the proposal to pump all flows to one central treatment plant. A further study would appear to be required to determine the feasibility of pumping all flows to Shanbally. Such a study would not invalidate the choice of Shanbally as a location for the WWTP but might reduce the overall capacity required if, for example, a second treatment plant were constructed on Great Island.

- The residence time of up to 9 hours in the rising main indicates that there would be a high risk of septicity in sections of the rising main. The most likely locations for odours to be problematic are the intermediate pumping stations as the effluent pumped from the upstream pumping station would mix in the well of the station before being pumped onwards. The issue is recognised in the EIS but no specific proposals are indicated. This part of the scheme appears to be likely to be directly provided by the Local Authority. Appendix 5B, EIS gives indicative odour contour lines for each of the main pumping stations and does not appear to make particular reference to the long residence time of the raw effluent in the rising mains. The prediction is for low odour generation but there are a considerable number of residential units in close proximity to a number of the pumping stations.

It is considered that in view of the potential for odour generation and the need to address any problems at the earliest possible stage, that a liaison committee to include representatives of residents should be established at construction stage and that the liaison committee be appraised of all monitoring of odours being carried out. Based on observations of other wastewater treatment plants where odours have been an issue, it is considered that the involvement of residents' representatives at an early stage would be important. A condition is recommended in this regard.

- The information submitted in relation to cost appraisal in a high energy cost scenario is considered to have addressed the issue raised.
- The information regarding existing outfalls and discharges is noted and is referred to in relation to the relevance of the Water Framework Directive under 5.10 above.
- Details of consultation with the South Western River Basin District project group were submitted and the information given is considered to address the question raised.
- Clarification was given in relation to the status of water quality data in Lower Cork Harbour. It was confirmed that the data supplied does not give an indication of overall water quality but illustrates the point that the impacts on water quality are lower with the scheme in place than in a do-nothing situation.

5.12 Submissions and Objections

The submissions by designated bodies including the Railway Safety Commission (RSC) the SWRFB, HSE, DEHLG and Coastal zone Management Division of DAFF are considered to be capable of being accommodated in consultation during detailed design and in the construction phase. The submissions of Mr Kevin Loftus and Mr Ml Barry (see 4.8 and 4.9 above) are not considered to give grounds for rejection of the development.

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6.0 CONCLUSION

The need to upgrade the existing sewerage system and for pumping effluent to a central treatment plant or plants is well established. The examination of alternatives was carried out very comprehensively. Residual impacts on material assets, noise, ecology, landscape and visual issues and cultural heritage are considered not to be likely to be significant. There is a concern regarding possible difficulties with storm water overflows, particularly in the Cobh area and concern also with the long length of rising mains coupled with the pumping of raw sewage in series through four major pumping stations. Conditions are proposed to address both concerns.

As the development is during the transition stage regarding the implementation of the Wastewater Discharge Authorisation Regulations a condition is recommended regarding final effluent quality. It is noted that the discharge point from the Shanbally outfall is not to sensitive waters.

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7.0 RECOMMENDATION

I recommend approval by An Bord Pleanála, subject to the conditions outlined below, of the construction of a wastewater treatment plant at Shanbally, Ringaskiddy Co Cork and the construction of four major pumping stations at West Beach (Cobh), Carrigaloe, Monkstown and Rafeen together with the modification of Church Road (Carrigaline) pumping station to result in an overall catchment network of 20 small and 5 large pumping stations and a single outfall off Ringaskiddy which is already in operation.

Reasons and Considerations

Having regard to the following:

1. The Cork County Development Plan 2003
2. Cork Area Strategic Plan
3. Requirements of the Urban Wastewater Directive
4. County Cork Sludge Management Plan
5. Mitigation Measures proposed in the Environmental Impact Statement
6. The provisions of the Water Framework Directive.

It is considered that the provision of a wastewater treatment plant at Shanbally will not have significant adverse effects on the environment and would be in accordance with the proper planning and development of the area.

Conditions

1. That a study be carried out in relation to the operation of storm overflows in the Cobh (Great Island) sewerage network to confirm the potential to comply with the requirements of the DEHLG publication "Criteria and Procedures in relation to Storm Water Overflows" as related to the Waste Water Discharge (Authorization) Regulations (2005). The results of the study shall be made available for inspection by the public at the offices of Cork County Council prior to the appointment of a Contractor for the development.

Reason: To confirm that it is practical to achieve sufficient separation of foul and surface water in the Cobh system to achieve satisfactory operation of storm water overflows.

2. That a Local Liaison Committee shall be established by Cork County Council at the detailed design stage to act as a forum for disseminating information on planning and construction work in relation to the Waste Water Treatment Plant and the major pumping stations. The Committee shall be representative of the Local Authority, their consultants and Contractors when appointed, and one representative of residents from the immediate vicinity of each of the major pumping stations and of the Waste Water Treatment Plant. The results of all odour monitoring shall be made available to this committee.

Reason: To provide a consultative forum for local residents likely to be affected by construction activities and from possible noise and odour emissions from the development

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3. The following treated effluent discharge standards shall be achieved:

Biochemical Oxygen Demand	25 mg / l on a 95 percentile basis
Chemical Oxygen Demand	125 mg / l on a 95 percentile basis
Suspended Solids	35 mg / l

Reason: To protect the aquatic environment

4. The odour level emanating from the site of the proposed Wastewater Treatment Plant shall not exceed 3 Ou M/ m³ at the 98th percentile of hourly averages at the site boundary of the Wastewater Treatment Plant and at all sewage pumping stations.

Reason: To mitigate odour impacts.

5. A suitably qualified Archaeologist shall be engaged to carry out monitoring on pipeline routes and during excavation work in relation to the wastewater treatment plant, pumping stations and the proposed marine crossing

Reason: To ensure that all archaeologically important items are located and evaluated.

6. That the South Western Regional fisheries Board be consulted in relation to all crossings of watercourses by pipelines and the marine pipeline crossing as part of the detailed design of the works.

Reason : To protect aquatic ecology.

D.G. O'Connor

Engineer Gd I
5th March 2009

APPENDIX 1: ENVIRONMENTAL IMPACT STATEMENT.

The Environmental Impact Statement is in three volumes as follows: -

- Volume 1 – Non Technical Summary.
 - Volume II – Environmental Impact Statement in four chapters.
 - Volume III – Appendices.
- 1.1 The **introduction** to the EIS sets out the legislative framework, the background, methodology used and the consultation carried out. It gives details of the responses of some of the consultees and notes that there was public consultation in 2006/2007 which included public open evenings at Ringaskiddy Community Hall.

1.2 Description of the development – (EIS, Pages 9 – 55)

The EIS states that the section would describe the existing drainage system and the characteristics of the proposed development. It states that the WWTP would be constructed using DBO Procurement System. It states that a contractor would be appointed to **design, build and operate** the WWTP for a period of 20 years to achieve the required standard within the defined design constraints.

In relation to the existing public sewerage scheme, the EIS states the existing infrastructure within the lower harbour area comprises sewers, pumping stations, overflows and outfalls. It states that some of the structures have been in existence for more than 50 years and in some cases are no longer adequate for their intended purpose due to structural damage, excessive infiltration and lack of capacity. Reference is made to Figure 2.1 showing the location of existing outfalls and the proposed outfall. The EIS describes the various systems as follows: -

1. **Carrigaline Collection System** – stated to be both combined and separate sewers. It states the effluent from the catchment is directed to the Church Road pumping station via interceptor sewers. It notes there are two smaller pumping stations in Carrigaline which pump the wastewater from the central low lying catchments on either side of the Owenboy River to the interceptor sewers.
2. **Ringaskiddy, Shanbally and Coolmore Collection System** - the EIS states that the main collection system serving the industrial section of Ringaskiddy catchment was developed by the IDA. It notes that the IDA sewer runs through the centre of the Shanbally / Coolmore residential development areas. It states Shanbally is served by a combined sewer system which gravitates to the Shanbally pumping station. Two smaller sub-catchments to the north and west of Shanbally are served by septic

tanks. The EIS states that Ringaskiddy village has its own combined collection system which discharges the untreated effluent directly north of the village and untreated effluent from Carrigaline is pumped from the Church Road pumping station to a foul manhole located on the IDA sewer upstream of the Shanbally connection.

3. **Crosshaven Collection System** – the EIS states that effluent originating from Crosshaven is currently pumped without treatment to the collection system at Carrigaline. (No indication of the pumping main or pumping station(s) are in drawing No 2.9, but it is noted that no alteration to the existing position is proposed)
4. **Passage West / Monkstown Collection System** – population equivalent in design year given as 11,500 p.e. The EIS notes that the collection system drains to three major outfall points in the catchment. It states the Cork Road pumping station in Passage West serves the low-lying catchments to the north-west of the town. It states all the flows from that area are directed to the passage outfall via a comminutor chamber near the old railway line in north Passage. It states all flows from central Passage, Glenbrook and Carrigmahon are directed to the Glenbrook comminutor and outfall adjacent to the Glenbrook ferry slipway. The EIS states the Coast Road Pumping Station takes the flow from the houses south of Monkstown village and pumps it to the pumping station on the Sand Quay in the centre of the village.
5. **Cobh Collection System** – design year population equivalent is 27,000. The EIS does not state whether the sewerage system is combined or separate for Cobh, but states that the wastewater discharges largely untreated into the tide with the exception of that from eastern Cobh which passes through a comminutor before discharging into the harbour via an outfall at White Point. The EIS states the collection system drains to five major outfall points serving different catchment areas within the town. The EIS describes the collection system for each outfall and notes that the majority of flows from west Cobh were directed to a major outfall at White Point. It notes there are also a number of smaller outfalls serving low-lying areas close to the shore.

Section 2.3 on Page 11 of the EIS deals with the **consideration of alternatives** and commences with an alternative wastewater treatment scheme. It notes that 19 potential WWTP sites were evaluated in the lower harbour area and the EIS sets out the criteria used. It notes the preliminary evaluation identified ten sites as being unsuitable and nine sites were considered in more detail. It notes that of the nine sites, five were identified as having good potential to accommodate wastewater treatment facilities for the entire catchment and those were subjected to a more detailed evaluation in terms of incorporation into the overall scheme. On Figure 2.2, these sites were No. 2 at Loughbeg, No. 3 at Loughbeg West, No. 8 at Coolmore, Site No. 18 at Shanbally (all four sites in the vicinity of Ringaskiddy) and Site No. 11 at Marino on the north-west of Cobh which was identified as suitable for wastewater only and not for sludge treatment.

Sites Nos. 1, 7, 16 and 19 were identified as having good potential for local WWTP facilities. It is noted that No 19 is the existing city plant at Carrigrennan on Little Island.

Options considered included the use of 1, 2, 3 or 4 WWTP's and from these ten separate options were considered. From these options, Option 2 involving a single WWTP at Shanbally and Option 3 using Shanbally and Marino (Sites Nos. 18 and 11) were considered further. On Page 15, the EIS concludes that Option 2 was the most advantageous location. Advantages were listed including lower environmental impact, discharge to the outer harbour, most cost effective and the location being central to the population centres being considered.

Section 2.4 describes procurement options and alternatives and lists the advantages and disadvantages of Design and Build (DB), Design/Build and Operation (DBO) and Design/Build/Finance/Operate (DBFO). The possibility of using a conventional contract was also examined and the conclusion was that the gravity sewers and rising mains including the pumping stations should be procured following the conventional route of detailed design by a Consulting Engineer, followed by open tendering. The EIS states however that pumping stations pumping directly to the WWTP would form part of the WWTP contract. The EIS concludes that the WWTP procurement should follow the DBO route.

Section 2.5 describes the **characteristics of the development** and lists the main items as follows:-

- Widening and upgrading of the site access road.
- Marine crossing.
- New wastewater pumping stations.
- Laying of rising mains, surface water sewers and gravity wastewater sewers.
- New wastewater treatment plant.

The EIS states the site is a greenfield site located approximately 11 kilometres south of Cork City and 2.24 kilometres west of Ringaskiddy in the townland of Shanbally. It states the village of Shanbally is located 625 metres to the north-east of the site and Carrigaline is approximately 1.06 kilometres to the south-west. It notes the (proposed) N28 National Primary Road linking Cork City to Ringaskiddy is less than 490 metres from the northern boundary and the proposals to improve the N28 would use lands immediately north of the proposed WWTP site.

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The EIS describes the site as consisting of two large agricultural fields located on sloping ground and currently used for pasture. The site has an area of 7.36 hectares at approximately 30 metres OD. It states that it is located between two overhead high voltage power lines to the north and south of the site and it is bounded on all sides by adjoining agricultural fields with the exception of a Bord Gais substation. The EIS notes the site is zoned for **utility and infrastructure** development by the Carrigaline Electoral Area Local Area Plan of 2005 (with adopted amendments, January 2007). The EIS notes that a significant portion of land in the vicinity of the site has been zoned for industrial development. It notes an area of 5.23 hectares located 134 metres from the site boundary is zoned residential. It notes that planning permission for residential development has been granted at that site. The proposed site is described as being 405 metres east of a minor road LS427 (Cogan's Road) which links to the N28 National Primary Route just east of Raffeen Bridge.

Section 2.5.3 describes the proposed design and refers to Table 2.2 which gives the base year and design year loadings. It notes that the effluent will be treated in accordance with the **Urban Wastewater Treatment Directive** and would have regard to the **Water Framework Directive**.

The EIS notes that the Cork Lower Harbour has not been designated as a sensitive or less sensitive area by the Department of the Environment. It states that nutrient removal would not be required at present. It states that in the event of a change of designation, the proposed WWTP would be designed to allow easy retro-fitting of nutrient removal facilities at a later stage should it be required. The EIS notes that the overall area of the two fields on the site is approximately 17.5 hectares, but because of the overhead high voltage cables, the area of 7.36 hectares is available between the power lines.

The EIS refers to the **Sludge Management Plan** for County Cork of March 2000 which recommends that all municipal sludge produced be treated in a hub centre located in the Ringaskiddy area. Region 19 which is involved consists primarily of the lower harbour towns including Cobh, Passage West, Monkstown, Ringaskiddy, Carrigaline, Crosshaven, Shanbally, Coolmore, Minane Bridge, Whitegate and Aghada.

The EIS states that in addition to treating the sludge arising from the population centres from the Cork Harbour main drainage scheme, sludges would also be imported from Minane Bridge septic tank which is 1,000 population equivalent. The EIS states that Whitegate and Aghada are located at the opposite side of Cork Harbour and domestic sludge is recommended to be treated at Middleton.

The EIS states that the Sludge Management Plan for County Cork recognises the potential for the co-treatment of municipal wastewater and biological industrial sludge at a hub centre located in the Ringaskiddy area. It states that no provision will be made in the design of the sludge treatment system for the Cork Harbour WWTP for the treatment of industrial sludges produced in the region. Reference is made to Section 2.5.4 for further discussion on this item.

Table 2.2 is reproduced on Page 24 of the EIS which gives the base year and design year loadings for the various components of the catchment.

Section 2.5.4 deals with alternative treatment options within the context of DBO. It lists criteria which will be applied and lists a number of elements of treatment which would be expected in a plant.

The EIS describes possible **preliminary treatment** and notes that there is a **strong potential for septic conditions** to arise in the collection and conveyance systems due to the length of the system and the distance from the population centres to the treatment plant. It notes that parts of the town of Cobh are approximately 12 kilometres in sewer length from the proposed wastewater treatment plant, with Passage West and Crosshaven being up to 11 kilometres from the plant. It states the resultant residence time in the sewer network and conveyance system would be expected to give rise to **septic conditions** in the wastewater.

The EIS states to overcome that problem, it was intended to provide septicity control in the form of chemical addition at critical pumping stations. The EIS states that the two principal methods used would be nitrate compounds or ferric sulphate. The EIS notes the use of chemicals as well as aeration. It notes a requirement that the inlet channels and chambers be covered, vented and connected to an odour control system.

The EIS describes screening and the requirements for same and also refers to grit removal. In relation **stormwater handling and disposal**, the EIS states the peak flows reaching the WWTP would correspond approximately to six times DWF and would be experienced when all of the duty pumps were operating simultaneously at full capacity. It states the variation in flows could be handled in one of two ways at the WWTP. It states that to accommodate six times DWF would result in operational difficulties and much larger tankage. It notes the alternative was to accommodate flows up to three times DWF with excess flows being taken to a storage tank where it would be allowed to settle. The EIS states that the stormwater settlement tanks typically used are either circular radial flow tanks or rectangular tanks. It states both options are comparable and either could be used at the Cork Harbour (Shanbally) WWTP.

In describing the **primary treatment** involved the EIS states an advantage of primary settlement is that it provides a simple means of removing approximately 30% of BOD and 60% of suspended solids. It states that the primary sludge can be odorous, but is ideally suited to treatment by anaerobic digestion with consequent energy recovery. The EIS states that because of the potential septic conditions in the sludge, the design of primary tanks should incorporate adequate odour control measures.

The EIS notes that there are some secondary treatment processes which can provide the necessary standard of treatment without primary settlement and therefore do not produce a primary sludge.

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The EIS describes the alternatives in relation to secondary or biological treatment and lists four main types of treatment and 16 alternatives in total. The EIS notes that as the plant would be constructed using DBO, it would be constructed with a type of treatment technology proposed by the successful contractor and agreed with Cork County Council. It states that regardless of the process, all structures would be restricted to a **maximum height of 12 metres** above the current ground level.

The EIS refers to sludge treatment and states that the towns to be served by the proposed new wastewater treatment plant would not generate sludges locally. It states the Ringaskiddy area is proposed as a more suitable location for the treatment hub-centre for Region 19 as defined in the Sludge Management Plan for County Cork, 2000. The plan is stated to identify 6,082 tonnes of dry solids to be generated annually in relation to non hazardous wastewater sludges in the county.

The EIS states that although it recommended that sludges from Whitegate and Aghada be diverted to the Middleton hub centre for treatment, they may also be transported to the proposed WWTP site. It notes that no provision has been made in the design of the sludge treatment system at the Cork Harbour (Shanbally) WWTP for the treatment of industrial sludges. The EIS notes that as the WWTP will be constructed using DBO procurement, the type of sludge treatment process will be selected by the successful contractor. It notes that the Sludge Management Plan for County Cork recommends advanced fluidised composting, which is a sludge destruction technology. It states that in the absence of an industrial sludge contribution, the ultimate end use of the bio-solids product would not be restricted to disposal to landfill and could include beneficial reuse and agriculture. It discusses the phosphorus balance in Cork and considers there is sufficient spare capacity in the county to facilitate the land spreading on agricultural land of the municipal wastewater sludge produced in the county.

On Page 32 of the EIS there is a list of acceptable sludge technologies and lists six processes, but notes that the type of technology to be used would not be limited to the list. It states the appointed contractor could also determine that it would be more economical to employ a solids destruction form of sludge treatment and dispose of the end product landfill. The EIS states that either option would be compatible with the general recommendations of the Sludge Management Plan for County Cork. The EIS notes that Regulation 14 of the UWWT Directive states the sludge arising from wastewater treatment should be a re-used whenever appropriate. It states the sludge and process tanks and structures such as pasteurisation tanks and digesters would depend on the sludge treatment process chosen, but in any event, these would be not more than 12 metres above current ground level.

The EIS states that thickening and de-watering facilities are likely to be provided, but also states the sludge drying may be included as a possible process.

In relation to sludge storage, it states that storage facilities will be provided on site and that all sludge holding tanks would be covered and the head spaces would be vented to an odour treatment facility.

The EIS refers to sludge reuse/disposal and states that it would likely be recycled to agriculture lands. It states also that it would be possible that the sludge could be used in energy recovery systems or other applications.

The EIS describes the operation of an energy recovery system and includes reference to gas storage and a gas flare.

The EIS lists a number of possible systems for order control and states that they would be installed external to buildings.

In relation to **buildings**, the EIS lists the various elements and notes that the number of buildings and the facilities accommodated would depend on the final process design selection. It puts a limit of 12 metres above current ground level and a limit of an overall plan area of buildings not to exceed 3,100m².

The EIS describes instrumentation, control and automation which will be incorporated into the WWTP. It states the treated effluent discharge would be directly to the nearby IDA sewer which gravitates to the Ringaskiddy outfall. It states the site discharge is higher than the IDA sewer which would eliminate the need for treated effluent pumping.

In relation to **the outfall location**, the proposal is to use the existing IDA outfall and this is stated to extend eastwards terminating at Dognose bank on the eastern side of the mouth of Cork Harbour.

Section 2.5.5 describes proposed WWTP options. Two different indicative designs are shown on Figures 2.6 and 2.8 and the treatment processes are shown schematically on Figures 2.5 and 2.7. Indicative Design No. 1 involves preliminary treatment, stormwater treatment, primary settlement, secondary treatment and settlement and also has sludge thickening and treatment.

Indicative Design No. 2 is described as an alternative treatment system and involves preliminary treatment as per indicative Design No. 1 with a variation on the stormwater treatment system. It notes that by the nature of the alternative treatment system primary settlement is not a requirement of the option. It describes the secondary treatment involving 4 no. SBR (Sequencing Batch Reactor) tanks and the EIS also describes secondary treatment, sludge thickening and treatment and it is noted that odour control would be common to both systems.

Section 2.6 describes the construction of the WWTP and notes that it would be expected to extend over a two year period. It notes also that blasting was not envisaged for the development. The EIS describes the construction sequence and notes that the quantity of surplus excavated materials would depend on the final process design. It states that the maximum estimated volume of surplus

material would be of the order of 10,000m³. It states that it is anticipated the tanks would not be excavated to depths greater than 5 metres below current ground level.

The EIS states that a detailed **Construction Environmental Management Plan (CEMP)** would be drawn up for all construction activities and it lists a number of provisions to reduce the environmental impact of the construction activities.

The EIS refers to the commissioning of the WWTP which it states would be expected to extend for approximately 12 weeks after start-up of the plant. In relation to licensing requirements, it notes that a waste licence from the EPA is necessary where storage is provided at the proposed WWTP for longer than six months prior to disposal to landfill or reuse on land.

It also notes that the new Wastewater Discharge (Authorisation) Regulations, 2007 (S.I. No.684 of 2007) would require a licence (certificate) from the EPA as the discharge was in excess of 500 p.e. The EIS recommends a pre-application consultation with the EPA.

Section 2.9 describes the operation of the WWTP and notes it would be operational at all times. It states that automatic control of the plant would be undertaken by a computerised control system with key information and alarms relayed to the relevant Cork County Council Office.

The EIS states that an **Operational Environmental Management Plan (OEMP)** and a maintenance manual would be produced for the site.

The EIS lists a number of safety measures which it is stated would minimise the risk to personnel, visitors and / or intruders. It lists also nine sets of regulations and directives relating to health and safety legislation which the contractor would be required to comply with. It states that all critical items of plant and equipment such as pumps, blowers etc., would be provided with standby facilities which would automatically be brought into operation upon failure of the duty unit.

Section 2.10 refers to **wastewater monitoring** and the requirements of the Fifth Schedule of the UWWT Regulations of 2001 (SI No. 254 of 2001) is quoted in relation to the requirements for Urban WWTP's with population equivalents of over 50,000. The EIS states that it is likely that additional monitoring would be conducted by the appointed contractors to ensure effective process control. It notes in advance of the WWTP becoming operational, the Council would arrange pre-application discussions with the EPA for a wastewater discharge license under the Wastewater Discharge (Authorisation) Regulation of 2007. The regulations apply specifically to the discharge itself and to stormwater overflows. (*Note: definition of "wastewater discharge" which includes discharges from stormwater overflows and emergency overflows and is on Page 12 of the Regulations*).

Section 2.11 describes ancillary developments including the sewerage collection and conveyance system. It notes in the EIS that the scheme includes for upgrading the existing sewer network and that it is expected that wastewater and stormwater collection will be separated as far as reasonably possible.

By way of overview, the EIS refers to Figure 2.9 which shows the associated development works and includes major pumping stations at: -

- West Beach Cobh.
- Carrigaloe.
- Monkstown.
- Raffeen.

It also notes there are minor pumping stations and the major pumping stations are shown on Figures 2.10 to 2.13. The EIS states that the potential impact on the receiving waters from emergency overflows from the major pumping stations is likely to be **more negative** than the current situation. It states that overflow discharges at those pumping would include the wastewater from Cobh and from Passage West in the case of the pumping stations at Monkstown and Raffeen. The EIS states that **as a minimum** an automated control operating system should be put in place to ensure that if a downstream pumping station fails to operate, the upstream pumping station would cease pumping. It notes also that noise and odour abatement measures would be included at the pumping stations.

On Page 51 of the EIS **stormwater overflows and emergency overflows** are described. It states that pumped forward flows will be in the range of 6-7 DWF as a result of the industry practice referred to as Formula A being adopted. It states this approach has been recognised by the DoEHLG as a core design principle on many sewerage schemes throughout the country. The EIS states that all wastewater from the population centres within the Cork Harbour Main Drainage Scheme is discharged directly to the lower harbour. It states that consequently the quality of the discharge from any future overflows will be a significant improvement on current practice.

It states that where overflows occur, their design will be refined at detail design stage to the extent that they will meet all accepted industry design parameters. It states that all pumping stations and associated overflows will be designed in accordance with the DoEHLG Guidelines including the guideline document issued entitled **“Procedures and Criteria in relation to Stormwater Overflows”** (issued with a circular letter to Local Authorities in 1995). The EIS states that emergency overflows would be located on the collection system at individual pumping stations and pumping stations would at a minimum incorporate a facility to allow the connection of standby

generators. The EIS states that all overflow arrangements would be designed to minimise nuisance and associated health hazards.

The EIS states that twin rising mains would cross the West Passage channel of Cork Harbour from Cobh to Glenbrook. It states the proposed route is downstream of the ferry crossing and there would be screening and grit removal associated with the crossing. The EIS states that the precise locations of the proposed pumping stations and the routes of the gravity sewers and rising mains have yet to be finalised. It states that in the event of relocation of any element of the collection system, an environmental assessment will be required to determine that the environmental impacts are the same or less than those anticipated in the EIS.

In Section 2.11.2 the EIS describes the access arrangement for the WWTP and the impact of the proposed upgrading of the N28 on the proposal. It notes the requirement for power, water and chemical inputs and refers to the choice of polyelectrolytes for sludge thickening.

In relation to **climate change**, the preliminary design of the collection system is stated to have a maximum tide level of 2.5 metres OD and the collection system was designed to eliminate direct connections between the tidal waterbody and the main collection system. It states that where possible, the contractor is recommended to utilise a number of measures to reduce the carbon footprint for both the construction and operational phases of the development. The EIS refers to the requirement for an **Energy Management Action Plan (MAP)**.

The EIS refers to sustainability and notes the other schemes in the area which were included in the Water Services Investment Programme of 2007 – 2009. It does not anticipate that the plant will be decommissioned in the future.

Figures and maps in the EIS are included in relation to Section 2 from Pages 56 – 70 inclusive.

1.2 Receiving Environment: - (EIS Pages 71 – 92) – (Impacts on Human Beings)

This section describes the impacts on **human beings**, together with the mitigation measures proposed. Figures referred to in the text are included in Pages 93 – 96.

The EIS sets out the methodology used including reference to population statistics obtained from the Central Statistics Office. Tables 3.1.1 – 3.1.3 are referred to in relation to assessment criteria for impact quality, magnitude and duration.

Section 3.1.3 describes the population and housing situation in relation to the existing environment and notes again the location of the proposed site at 11 kilometres south of Cork City and 1.06 kilometres north-east of Carrigaline and 2.24 kilometres west of Ringaskiddy. It refers to Table 3.1.4 which gives

the population of selected settlements in the Cork Lower Harbour area. This table gives the relative populations in 2002 and 2006 and Figure 3.1.1 indicates the District Electoral Division of Carrigaline. The statistics indicate that Carrigaline is the largest town at over 12,800 population. Figure 3.1.2 shows the proximity of residential dwellings and the EIS states that the nearest residential development is 261 metres to the east of the WWTP site along minor road L6470. It notes however that planning permission has been granted for a site approximately 134 metres to the east of the proposed WWTP site.

The EIS refers to employment and economic activity and states that there are over 100 pharmaceutical and chemical firms operating in the Cork Harbour area. It refers also to the oil refinery at Whitegate. The EIS describes Carrigaline and its economic activity and also refers to the activity in Ringaskiddy including reference to the ferry terminal. In relation to Cobh, it describes it as becoming a satellite town to Cork City. It notes that industrial and enterprise activity had diminished with the closure of both the steel and fertiliser plants with a variety of smaller industrial undertakings having grown up in redundant buildings formerly associated with Rushbrook Docks. Passage West, Glenbrook and Monkstown are referred to as residential centres with associated services and small-scale enterprises. It notes that Cross River Ferries Limited has been running a car ferry service from Glenbrook to Carrigaloe since 1993.

The EIS states that statistics show that in Carrigaline, clerical, managing and government occupational groups are the largest employment sector while in Cobh, manufacturing is the largest sector. These figures are shown on tables 3.1.5 – 3.1.7 which indicate the numbers employed in the various sectors.

The EIS refers to **land-use** and refers to Figure 3.1.3 which shows adjacent land uses to the WWTP site. The EIS notes the proposals in relation to the rerouting of the N28 National Primary Route and the planning application for residential development which has been granted in the area. It states that a number of tourism and recreational related land-uses occur in the vicinity of the proposed development site. It refers to a golf and country club to the north-west of the site.

The EIS refers to **tourism and recreation** and notes the harbour is a major asset to the Cork region with significant potential with respect to marine and leisure activities. The Car ferry terminal is again referred to and it is also noted that Cork International Airport is located approximately 6 kilometres south of Cork City and approximately 8 kilometres from the proposed development.

The EIS states the Cork Lower Harbour area has a number of beaches which include Fountainstown, Myrtleville, Church Bay, Roberts Cove and Ringabella Bay. The EIS also lists some of the recreational facilities including sports clubs, sailing clubs and marinas.

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The EIS in referring to health and safety states that some of the existing drainage infrastructure is no longer adequate for the intended purpose. It states that public health does not seem to be effected by the discharge of untreated wastewater into Cork Lower Harbour, but the discharge into the marine environment is not a desirable situation due to the high levels of bacteria and micro-organisms in untreated effluent, many of which are pathogenic.

The EIS describes the existing road network including the access to the site and Table 3.1.8 gives AADT for the N28 road at various locations. It notes that from the junction of the R610 to the west, an AADT of over 50,000 is recorded in 2003.

Table 3.1.9 gives the traffic turning data for the minor roads L2490 and LS472. Section 3.1.4 deals with impact assessment and reference are made to the **Cork Area Strategic Plan (CASP)** which is stated to be an initiative jointly sponsored by Cork City Council and Cork County Council. It states that this plan seeks to ensure that infrastructure, including transport and utility services are provided in advance or in tandem with housing and other development. It states that the Water Services Investment Programme (WSIP) identified Cork Lower Harbour Sewage Scheme as one of the projects for investment during the period 2007 – 2009.

The EIS describes the construction phase impacts and states that at the WWTP the works will involve normal construction activities such as excavation, pumping, pipe laying, concrete works and mechanical installation. In relation to the collection system, the provision of a marine crossing and new wastewater pumping stations including the laying of rising mains, surface water sewers and gravity wastewater sewers is noted.

In relation to impacts on economic activity and employment, the EIS states there would be a short term positive impact in relation to the WWTP and the collection system. In relation to the marine crossing the approval of the Department of Agriculture, Fisheries and Food (DAFF) is noted as being required as would consultation with other relevant stakeholders including the Port Authority and Cross River Ferries Limited.

In relation to impacts on land use, the existing use is noted as being agriculture pasture. The zoning of *utility and infrastructure* development is noted. The EIS states that the loss of 7.36 hectares of agricultural land for community purposes is not considered to be a significant impact.

The EIS states the construction of the pumping stations at Raffeen and Westbeach, Cobh would result in the permanent loss of reclaimed land. The impact is deemed neutral with respect to land-use, due to the extremely low ecological and economic value of the land as described in EIS.

Impacts in relation to tourism and recreation are described in the EIS and it is stated that if the development did not proceed that untreated discharge would continue to negatively impact on the lower harbour. It states that construction

of the WWTP should not have any impact on tourism in the area. In relation to the collection system, the impacts of the marine crossing are noted.

In relation to health and safety, the EIS states that the Safety, Health and Welfare at Work (Construction) Regulations 2006 would be implemented during construction. In relation to traffic, the EIS states there would be an increase in traffic volumes associated with the construction phase of the development. It states that the routes of the pipelines are primarily concentrated along existing road infrastructure. The EIS refers to the operational phase impacts on population and housing and states that the 2006 estimate of the population based on the census figures is 32,411. It notes the proposed capacity is for approximately 80,000 population equivalent. The EIS states this would facilitate the increased residential and commercial development in the environs of the Lower Harbour.

In relation to the collection system, the EIS states that the operational phase of the development would have a moderate positive impact due to the good quality water being discharged. It states that emergency operation of the stations is essential to minimise the risk of untreated effluent being discharged into Cork Harbour. The EIS states that it is essential that the pumping stations include for standby power arrangements to prevent overflow discharge of raw effluent to the harbour. The requirements for standby power arrangements, noted on Page 51 are repeated.

The impacts on employment and economic activity in relation to the WWTP are considered by the EIS to be significant positive long term impacts. It states the collection system would indirectly have positive impact on employment and economic activity due to the potential for increased housing and development in the area. In relation to land-use the loss of agricultural land is noted and the impacts of the pumping stations is also noted. Apart from Raffeen and Whitebeach, which are on reclaimed land, the other pumping stations are planned for areas of existing artificial surfaces.

The EIS states that the proposed WWTP would facilitate the improvement of water quality in Cork Harbour. It states that at present there are many wastewater outfalls to the receiving waters at locations used for recreational activities. Reference is made to figure 2.1 in the EIS which **indicates 15 outfalls** not including the proposed outfall. These include one outfall at Ringaskiddy, three at Passage West/Monkstown and eleven in Cobh.

The EIS states that the untreated wastewater contains high levels of bacteria and micro-organisms which are stated to be very dangerous and pathogenic and may be deleterious to human health. The EIS states that the proposed WWTP would have a neutral impact with regard to public safety. It states the existing pumping station at Carrigaline would be upgraded to accommodate future demand and the other new pumping stations would eliminate the existing regular discharges of untreated wastewater to Cork Lower Harbour.

In relation to traffic the operational phase would give rise to truck movements involving sludge removal. The EIS states that the new route for the upgraded

N28 would result in decommissioning of the northern section of the LS472 and access to the site from the N28 would be from the south via the L2490. It states this would cause a permanent increase in traffic movements along the L2490 and also along the southern section of the LS472. It states the impact is considered to be slight due to the low number of employees accessing the site and there would be a maximum of four HGV movements per day. The EIS states that following consultation with the NRA, it was agreed that a detailed Traffic Impact Assessment (TIA) was not necessary due to the minor increase in daily traffic movements during the operational phase of the development.

The EIS states that a do nothing scenario was not a desirable situation due to the high levels of bacteria and micro-organisms present in the untreated wastewater.

Section 3.1.5 describes mitigation measures and during the construction phase, the EIS states that the impacts would be restricted to daylight hours and would cease on completion of the construction phase. It states that a **Construction Environmental Management Plan (CEMP)** would be drawn up for all construction activities to be carried out on site. In relation to the collection system, the EIS states a detailed CEMP would be drawn up for all construction activities.

In relation to land-use, the EIS states that landowners whose lands are directly adjacent to the site would be consulted and any appropriate measures would be taken to minimise disturbance to livestock.

With regard to tourism and recreation, the EIS states the detailed CEMP would address activities likely to affect aspects of the environment. It also states that a Traffic Management Plan would be implemented to ensure the control of movements of materials, plant and labour to and from the site.

Mitigation measures during the operational phase are referred to. For the WWTP it states that preliminary treatment must include for septicity control in addition to screening and grit removal due to the length of the conveyance system. The EIS recommends that preliminary treatment facilities should be incorporated within a building with air extraction to an odour control system. It states that the pumping station should include for standby power arrangements to prevent overflow discharge of raw effluent to the harbour. It states there is a strong potential for septic conditions to arise in the collection and conveyance systems and it is essential that the inlet channels and chambers are vented and connected to an odour control system. It states that the appointed contractor would be required to comply with the Wastewater Treatment (Prevention of Odours and Noise) Regulations, 2005 (S.I. No. 787 of 2005).

The EIS states that mitigation is not required in relation to employment or economic activity or land-use. It lists requirements for health and safety and states that there would be no residual negative impacts on human beings to be anticipated from the proposed development provided that the development is

managed effectively during the construction and operational phases and all mitigation measures are implemented.

1.3 Terrestrial and Marine Ecology (EIS Pages 97-119)

The text of the EIS is supplemented by figures and maps which are contained in pages 120 – 124. The section of the EIS was prepared by Ecofact Environmental Consultants Limited on behalf of Mott McDonald Petit to address the potential impacts of the proposed WWTP and upgraded collection system on the ecology of the receiving environment. Reference is made to the full report which is in Volume III Appendix 2A.

The EIS sets out the methodology used and notes that shore or littoral and sub-littoral sampling was undertaken at 23 stations during low spring tides with a further four stations sampled from a boat. The study was carried out with reference as applicable to the EPA guidelines. The EIS notes that consultation was held with 11 statutory bodies including the NPWS, EPA, SWRFB, Marine Institute and Bird Watch Ireland. Consultation was also held with the Department of Agriculture, Fisheries and Food, Bat Conservation Ireland, The Irish Whale and Dolphin Group, the NRA, Botanical Society of the British Isles and Cork County Council.

Table 3.2.1 sets out the criteria used in assessing the ecological importance of features, while table 3.2 sets out the criteria for assessing impact type. Table 3.2.3 sets out the criteria for assessing impact magnitude.

Section 3.2.3 refers to the existing environment and states that Cork Harbour is a large sheltered bay system with several river estuaries. The main estuaries noted are those of the Lee, Owenboy, Douglas and Owenacurra. The harbour is described as being connected to the Atlantic Ocean by a narrow inlet between Roches Point and Crosshaven at the south of the harbour. The EIS states that Cork Harbour has a surface water area of around 100 km² and has a large sheltered natural deep water harbour. It states that the strong estuarine influences dominate the upper reaches and the coastline is mixed. It states that owing to the sheltered conditions, the inter-tidal flats are often muddy in character.

The EIS refers to the designated areas and these are shown in Figure 3.2.1. The Cork Harbour Special Protection Area (SPA) has the Site Code of 004030. This is an internationally important wetland site supporting in excess of 20,000 wintering waterfowl. It notes there are several species which occur and are listed on Annex I of the EU Birds Directive. It notes that the proposed works are associated with the development which is located within 2 kilometres of the Great Island Channel SAC which has the Site Code of 0001058. It notes that the Great Island Channel stretches from Little Island to Middleton.

Monkstown Creek Natural Heritage Area (pNHA) has a Site Code of 001979 and is indicated on Figure 3.2.1. The Owenboy River pNHA has a Site Code 001990 is also shown on Figure 3.2.1.

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The EIS states that following the Phase 1 Habitat Survey, the different habitat types were identified. The terrestrial habitats are listed in the EIS as follows: -

- **Improved agricultural grassland** – covers the proposed site and most of the proposed pipeline routes running through fields. – Described as of local importance.
- **Amenity grassland (GA2)** – near the site of the proposed Monkstown Pumping Station – rated local ecological importance.
- **Hedgerows (WL1)** – located around the field boundaries – of high local ecological importance.
- **Mixed broadleaved woodland** – present along the southern area of Cobh – includes Sycamore, Ash, Sessile Oak and Beech. – Stated to be possible wildlife corridor and nesting area for bird species – habitat rated high local ecological importance.
- **Tree lines** – near proposed Monkstown Pumping Station – rated local ecological importance.
- **Arable Crops** – fields of wheat located to the south of the WWTP – habitats generally modified and use of herbicides ensures plant diversity is at a minimum – habitat of local ecological importance.
- **Tilled land** – to the south of the WWTP site – rated of local ecological importance.
- **Stone walls** – important food source for terrestrial animals and rated of local ecological importance.
- **Artificial surfaces** – some pumping stations located on artificial surfaces and rated of low ecological importance.
- **Grassy verges** – located beside most of the proposed pipelines and rated as of local ecological importance.
- **Ornamental/non-native shrub** – habitat within garden areas and rated of a local ecological importance.
- **Spoil and bare ground** – low ecological importance.
- **Rare flora:** EIS states that habitats were assessed as to their potential suitability for rare plants and none of the species were recorded during the current survey and habitats were recorded as generally sub-optimal for those species.

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The EIS lists the Marine Habitats similarly and notes that the exact location of emergency storm outfalls is not finalised as the finalised design for the WWTP and collection system is not complete.

- **Estuaries and sea inlets and bays** – Cork Harbour and the River Lee Channel at Passage West are a continuum between the above habitats. The Owenboy and Monkstown Creeks are estuaries. The EIS states the salinity of the areas is variable due to riverine inputs and tidal currents and the habitat type corresponds loosely with the EU Annex I Habitats for Estuaries and Large Shallow Inlets and Bays and is of international importance.
- **Infralittoral gravels and sands** – present in the harbour at Haulbowline and along the IDA pipeline – habitat has links to the Annex I Habitat of Sand Banks which were slightly covered by seawater all the time and therefore of international importance.
- **Infralittoral muds** – occurring at Monkstown/Passage West and rated as high local importance.
- **Seawalls, piers and jetties** – rated local importance.
- **Shingle and gravel shores** – present at East Beach Cobh and is a moderately exposed shore with accumulations of mobile rocky material – evaluated as being of high local importance.
- **Mud shore (LS4)** – this habitat occurs immediately south of the proposed Raffeen Pumping Station, at Carrigaline, at Crosshaven, at Passage West and Rushbrook and White Point, both on Great Island. – Mud shores found to support communities of polychaete worms. Noted that these worms are usually present where there is significant freshwater influence. The EIS evaluates the habitat as being of national and international importance at the area south of the Raffeen Pumping Station, due to being within a pNHA and SPA. It states at all other sites, mud shores are evaluated as being of high local importance.
- **Sand shore (LS2)** – habitat occurs at Ringaskiddy on the east-facing beach – rated of high local importance.
- **Mixed sediment shore** – habitat occurring at Crosshaven, the Owenboy Estuary, south of Great Island, the eastern shore of Ringaskiddy and the margins of Loughbeg. – Supports some fucoids, carrageen and sea lettuce. Areas of this habitat are said to be present within the pNHA and SPA along the Owenboy Estuary and the habitat is evaluated as being of national and international importance. Other sites with mixed sediment shores are of high local importance.
- **Moderately exposed rocky shore (LR2)** – occurring at the eastern end of Cobh and at the east-facing beach at Ringaskiddy. The shores are stated to

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be dominated by communities of barnacles, molluscs such as periwinkles, with bivalves also present. The habitat is rated of high local importance.

- **Sheltered rocky shore (LR3)** – occurring at Passage West, White Point and the proposed West Beach Pumping Station. Noted that dense growths of fucoids occurred at these sites. Diverse range of macro-fauna with barnacles and keel worms were recorded. The habitat is rated of high local ecological importance.
- **Mixed substrata shore (LR4)** – occurring near the proposed Carrigaloe Pumping Station, at Crosshaven, Ringaskiddy and at Monkstown. The shore comprises a mixture of rock and sediment. This habitat is stated to be of high local importance.

The EIS refers to fauna and lists birds, mammals, reptiles and terrestrial invertebrates and crustaceans.

In relation to **estuarine birds**, Cork Harbour is stated to be an area of international importance for wintering waterfowl. Sections of the harbour are designated as an SPA and also as an SAC and pNHA. Regarding inland bird populations, the EIS states that the bird populations of the proposed WWTP site and areas affected by pipelines are of local importance. In relation to **mammals**, a badger sett within 30 metres of the proposed development is noted and no otter holes or evidence of otters was found in the immediate vicinity of the proposed outfall sites. It states that due to the presence of bats in the area, hedgerows and tree lines in the study area are likely to be used by bats for foraging and commuting.

It states that Cork Harbour is known to contain both resident and vagrant populations of common dolphins and the harbour porpoise has being recorded in Cork Harbour as well as common dolphin and killer whales. It notes that seals have been observed in Cork Harbour. In relation to reptiles, the viviparous lizard is stated to occur in County Cork but no direct observations were made in the study area.

In relation to **crustaceans** which include crabs and lobsters, a total of seven species were recorded. The EIS gives details of where each species was noted. It states that freshwater shrimp was recorded at four sites. In winter it states that most crustaceans migrate out to deeper water, so generally numbers are higher in estuaries in summer.

The EIS refers to **fish and fisheries** and states the harbour is deemed important as a nursery ground for juvenile fish before they return to the sea. It states adult mullet were seen grazing on algal films from the soft substrata at the Owenboy Estuary and also on the River Lee Western Passage. Reference is made to marine fisheries survey undertaken by the Central Fisheries Board in 2001. It states a total of 13 species were taken at the north most point of Ringaskiddy. Table 3.2.4 lists the fish species expected in areas affected by the proposed development.

In relation to **shellfish**, the EIS notes that Cork Harbour is a shellfish production area and Table 3.2.5 indicates the production area, boundaries, bed name, species and classification. The **classifications** where all the sites for oysters in Cork Harbour is given as **B**.

With reference to **water quality**, the EIS notes the growth of enteromorpha and ulva which arise from high concentrations of nutrients such as nitrates and phosphates. It states that a hydro-dynamic model found that the untreated discharge from the Cork Lower Harbour would contribute a concentration of 1,500 faecal coliforms/ml to parts of Passage West, Cobh and Ringaskiddy shores.

Section 3.2.4 deals with impact assessment and construction phase impacts in relation to the WWTP site are not regarded as being of ecological significance in relation to habitats. It states that there would be short-term negative impacts on the terrestrial mammals, such as badgers. The EIS states there are no bat roosts which would be affected by the proposed development. It states also that there are no potential nest sites or areas important to peregrine falcons that would be affected by the proposed development.

Disturbance of hedgerows in relation to collection system is stated to be of slight to moderate negative significance, but it is noted that the route of the pipeline network is mainly restricted to the existing road infrastructure. It states the potential impact on flora is rated as imperceptible negative. It states that the disturbance of improved agricultural grassland and other similar habitats would be of imperceptible negative impact.

The EIS states that works associated with the foreshore at the Owenboy River could result in a significant habitat loss for marine animals. It states in the EIS that estuarine habitats with very high natural levels of suspended solids the impact of pipeline laying would be negligible with suitable mitigation.

The EIS states that lower water clarity could affect the quantity, type and depth to which bottom-living microscopic algae and seaweeds can grow and could affect the feeding abilities of visual fish feeders such as mullet. The EIS states that mullet are recorded in the Owenboy River at Carrigaline and occur throughout the estuary, but their ability to relocate with ease would decrease the chances of a decline in their status.

The EIS describes the marine crossing impacts and states that this would be tunnelled or laid by open cut techniques. It states that the pipes would be lightly encased in concrete for protection in shallower sections. The EIS states that it is not envisaged that the construction of the marine crossing would involve particularly invasive underwater construction works. It states that localised sediment plumes could represent a small level of habitat disturbance to seals. It states that limpets would not be expected to be affected. It states the impact on mussels, starfish and other fauna would be more than compensated for by the cleaner conditions brought about by the proposed

development. The EIS states that should tunnelling be used rather than open cut, the impacts on the marine ecology would be significantly reduced.

The EIS states that the impacts on the foreshore of the Owenboy River could reduce the foraging areas for wintering birds. It states that one of the pipelines associated with the scheme would also run along the road bordering the Monkstown Creek pNHA and noise disturbance and runoff could have significant impacts in the absence of mitigation.

The EIS notes that pipeline construction would be in mainly older type roads which do not have pollution control used in modern highway systems. It states that during the construction phase, pollutants from chemicals could contaminate the area. It states that with mitigation, potential impacts would be reduced to imperceptible. It refers to sources of pollution listed in the Scottish Environment Protection Agency list of the main sources of pollution from construction sites.

The **operational phase impacts** regarding the WWTP are referred to on Page 113. It states that disturbance to local mammal communities arising from the operation of the WWTP would be minimal. It refers to the current nutrient inputs by foul sewage outfalls into the affected aquatic areas and notes that these would be significantly reduced during the operation of the proposed scheme. It states that phytoplankton blooms would be expected to be less frequent and that **restrictions on the edibility of shellfish** would ease considerably due to the reduction in associated bio toxins. (It does not state if the area would be reclassified). The EIS points out that a reduction in some species would not be a negative impact, because they would be replaced by other species.

Referring to water quality, the EIS states that the risk of large-scale eutrophication occurring would be extremely low in a modern well managed plant. It notes that the proposed WWTP would require a discharge licence from the EPA under the **Wastewater Discharge (Authorisation) Regulations 2007**. (*transitional arrangements regarding authorisation are discussed under the assessment chapter of this report*)

It states the normal operating quality of the proposed discharge in the Cork Harbour would be much improved from the existing discharges it would replace. It states that this would lead to a decrease in algal mats and would be a moderate positive impact. The EIS states the eco system around the outfall would continue to change until a sustainable balance was reached where organisms suited to the new environmental conditions would thrive. It states the value of Cork Harbour as a nursery for young fish would increase with improved water quality and the consequences would extend beyond the mouth of the harbour. It states that **adult mullet** would not be as concentrated around previously present outfalls. The EIS states this is considered to be a neutral impact. It states the reduction of nutrients into the affected aquatic areas would improve water quality, habitats and diversity and consequently add to the conservation status of Cork Harbour SPA, Owenboy River pNHA and Monkstown Creek pNHA.

The EIS states the hydrodynamic modelling conducted predicted that the concentration of faecal coliforms would be significantly reduced by 80 – 95% on the current scenario.

The EIS refers to the collection system and states that it has been designed to ensure that minimal maintenance of the collection system would be required. It states that a do-nothing impact would result in continuing discharge of untreated effluent into Cork Lower Harbour.

The EIS refers to mitigation measures in Section 3.2.5 commencing on Page 116.

In relation to flora and habitats, the EIS states that restrictions will be placed on the removal of scrub on a seasonal basis and also that landscaping works would use native species and this would be developed in consultation with an appropriately qualified ecologist.

The EIS states the badger sett located near the proposed WWTP would be fenced off during construction. Monitoring of the sett would be in accordance with criteria developed in consultation with the NPWS.

The **mitigation measures** in relation to the collection system include the timing of excavation works on the foreshore during August and September and the avoidance of the release of pollutants. The EIS states the appointed contractor would prepare detailed method statements prior to initiating construction works. The EIS states that construction of the marine crossing would be timed to avoid sensitive periods for fish such as spawning. Consultation with the statutory bodies in this regard is also proposed.

The EIS states that excavation works on the foreshore would ensure that the top layer of sediment would be reinstated. It refers to measures to prevent chemical pollution involving storage and bunding.

Mitigation measures in the operational phase include a management plan for the maintenance of hedgerows, lawns and tree lines. It refers to the monitoring of the badger sett near the site and notes that low level lighting would be selected for external lighting around the treatment plant to reduce any impacts on fauna.

The EIS proposes **continuous monitoring** and sampling and wastewater to control plant operations, but to comply also with the UWWT Regulations. The EIS states that it is not anticipated that the WWTP would be staffed 24 hours a day and automatic control of the plant would be undertaken by a computerised control system. The EIS states that key information on alarms would be relayed to the relevant Cork County Council office.

In relation to the **collection system**, the mitigation measures proposed include an automatic control operating system to ensure that if a downstream pumping station failed, the upstream pumping station would cease pumping.

Referring to residual impacts, the EIS states that there would be a permanent loss of habitat at the WWTP site which is not considered a significant impact. It states that improvement in water quality would result in long-term moderate positive impacts for marine flora, estuarine birds, marine invertebrates, mammals and fish species. It states that with moderate benefits for biodiversity following the improvement of water quality, the value of the designated areas would be expected to increase in Cork Lower Harbour.

1.4 Water Quality: - (EIS Pages 125 – 145)

The EIS states that the University College Cork were commissioned to conduct a detailed hydro-dynamic and water quality modelling study of the proposed discharge, to **assess the likely impacts** of the development on water quality. It states that a literature review was conducted to assess the baseline information.

A computer model referred to as OH-2 covering the old Head of Kinsale to the waterworks weir in Cork City was developed. It states the model assimilates the release, transport and decay of various micro organisms in Cork Lower Harbour. It states it was configured to assimilate the release of untreated waste from the towns in the lower harbour and secondly configured to assimilate the release of treated wastewater from the proposed WWTP and Ringaskiddy. It refers to Volume III, Appendix 3A for the detailed report.

Table 3.3.1, to 3.3.3 set out criteria for assessing the quality, magnitude and duration of impacts.

Section 3.3.3 describes the existing environment. It states that Cork Harbour is the second largest natural harbour in the world consisting of an upper and lower harbour. The EIS states that the west channel is the larger of the two channels joining the harbours and the majority of the tidal exchange volume occurs through the west channel.

The EIS states that the coastal zone is officially designated for protection which includes special areas of conservation and special protection areas for birds. It notes that within the lower harbour there are a number of protected conservation areas, including Cork Harbour SPA, Great Island Channel SAC and the Monkstown Creek NHA and Owenboy River pNHA. It notes that the west passage of the River Lee is designated as sensitive water under the Urban Wastewater Treatment Directive, but the lower harbour is not designated as sensitive water.

The EIS states there are no designated bathing areas within the study area with Fountainstown Beach being the closest at 5.25 kilometres from the existing IDA outfall. Table 3.3.4 gives the quality requirements for bathing water and refers to the 1976 Directive and the national limit values. It notes that the 2006 Directive is not yet transposed in Irish Law.

On Page 129 of the EIS, the existing water quality in Lower Cork Harbour is described. The EIS states that based on criteria levels of nutrient enrichment, the trophic status of water can be classified into eutrophic, potentially eutrophic, intermediate and unpolluted. The EIS discusses the trends in the Cork Harbour area and Table 3.3.5 gives water quality results for 2005 – 2007 for the following parameters: -

- **DIN** – Dissolved inorganic nitrogen – considered to represent bio-available nitrogen.
- **MRP** – Molybdate reactive phosphorus – represents bio-available dissolved inorganic phosphorus.
- **Chlorophyll** expressed as chlorophyll concentration.
- **DO%** saturation – dissolved oxygen relative to normal for ambient temperature and pressure.

The water quality results are broken down into summer and winter sampling.

The EIS notes the improvement which has occurred in the general area since the Carrigrennan WWTP, (which treats wastewater from Cork City) commenced operation in 2005. It states that the lower harbour is **classified as intermediate** and the only parameter which exceeded the criterion values were the winter levels of DIN.

The EIS states that the lower harbour is not designated as a sensitive bathing or shellfish water and it notes also there is no published data on concentrations of **norovirus** in Cork Lower Harbour and also that there are no legislative requirements to monitor norovirus in Ireland at present.

Figure 3.3.1 and 3.3.2 show **faecal coliforms** concentrations in Cork Lower Harbour at high tide and low tide for period 2005 – 2007. The graph indicates peaks of 44 mpn/100 mls for high tide and 1,120 for low tide, both in winter months. Table 3.3.6 gives the current outfall locations and their discharge rates based on 2001 data. On page 113, the EIS notes that the concentrations indicated in table 3.3.6 are not representative of the **actual water quality** in the Harbour, but of the concentrations in the Harbour due to the untreated discharges in the Lower Harbour area.

The total flow for dry weather conditions is estimated at 7,500 m³/day of which 4,000 relates to the Ringaskiddy outfall. Figure 3.3.3 gives the location of 15 points of interest within Cork Lower Harbour and at Table 3.3.7 gives the predicted average in maximum concentrations of faecal coliforms at these points for 2010 with untreated effluent. Table 3.3.8 gives the average and maximum concentrations of norovirus at the same locations with untreated effluent, while Table 3.3.9 gives the concentrations of nitrogen, ammonia and nitrate. The EIS notes that the maximum number of norovirus in the untreated

waste simulation range from 2 – 18,000 per cubic metre. Concentrations of ammonia range from 0.000655 to 0.008214 milligrams per litre.

Section 3.3.4 deals with impact assessment and commences with the construction phase impacts which relate mainly to accidental spillages and the construction of the marine crossing. Regarding the WWTP and the collection system, the EIS refers to the hydrodynamic modelling study which estimated the relative reduction following the construction of the proposed WWTP in relation to: -

- **Faecal Coliforms.**
- **Novovirus.**
- **Organic Nitrogen.**
- **Ammonia.**
- **Nitrate.**

The upgraded collection system is stated to result in a reduction in the number of outfalls to one single outfall in the deepwater channel near Dognose Bank.

The EIS states that wastewater from the lower harbour catchment area is only one of the many factors contributing to water quality in the harbour. It states that the positive impacts are moderate.

The EIS states that 90% of organic matter would be removed and this would have the effect of reducing faecal coliforms by a factor of 10 so that in the treated effluent, it would be equivalent to 1.0×10^{10} faecal coliforms or e-coli per cubic metre of treated effluent which would be equivalent to 1.0×10^6 per 100 ml. Table 3.3.10 gives the average and maximum concentrations of faecal coliforms in Cork Lower Harbour for the year 2010 with treated effluent. The highest levels predicted are upstream of the outfall and at Roches Point.

Table 3.3.11 gives the average and maximum levels of **intestinal enterococci** in the lower harbour in 2010 for treated effluent. This indicates the highest figures upstream of the outfall and at Roches Point.

The EIS states that there would be assumed to be 50 million novovirus/m³ in raw sewage and that the WWTP would remove 90%. The EIS states that comparison of the concentrations of norovirus in untreated and treated effluent would indicate there is an 80% relative reduction in the concentration of norovirus following secondary treatment in the entire harbour area with the exception of the area immediately adjacent to the outfall. Table 3.3.12 gives the concentrations of the 15 points of interest which indicates that upstream of the outfall, the maximum is over 3,000 per m³ while at Roches Point, it is

estimated to be 1,254. It is noted that the predictions for Cobh is that it would be 1,374 per m³.

The EIS states that in relation to **organic nitrogen, ammonia and nitrate**, concentrations in the harbour would decrease following secondary treatment of the effluent with the exception of organic nitrogen concentrations at Fountainstown, Myrtleville, and Roches Point and upstream of the IDA outfall. It states that the slight increases would be due to the discharge of all treated effluent through a single outfall, compared to the present scenario where there are numerous outfall points. It notes that the DIN levels in the harbour have exceeded the criterion value during winter sampling periods in recent years. It states the reduction in nitrate and ammonia in treated effluent from the proposed WWTP would have a moderate positive impact on water quality in Cork Lower Harbour in terms of DIN. Table 3.3.13 indicates that raw and treated sewage has the same concentration of organic nitrogen and nitrate, but that ammonia would be expected to reduce from 25 mg/l to 12.5 mg/l. Table 3.3.14 gives the maximum concentration for nitrogen, ammonia and nitrate in the lower harbour area for the 15 points of interest.

The EIS states that from the data presented, the water quality in Cork Lower Harbour would be expected to **moderately improve** with the operation of a WWTP. It states the potential impact on the receiving waters from emergency overflows from pumping stations could affect water quality, but the risk would be extremely low in a modern well managed plant as proposed. The EIS states that during storm events, the potential exists for stormwater overflows to be discharged directly to the harbour. It states that the large size of the harbour along with tidal currents would mean the receiving waters have a high resilience to such unlikely events and the risk of such an event happening with the proposed WWTP would be much lower than is currently the case.

The EIS refers to cumulative impacts and lists the other schemes being promoted by Cork County Council in the area. These include Little Island, Middleton and Carrigtohill.

The EIS refers to **Water Framework Directive** and its objectives and notes that at present the EPA proposed quality standards for surface water classification is open for public consultation. The EIS notes that the EPA will make recommendations to the Minister for the Environment, Heritage and Local Government for input into additional regulations which will give statutory effect to the measures for implementation of the WFD. The EIS states that at present, there are **no statutory regulations** with regard to a programme of measures and quality standards for the South-Western River Basin District (SWRBD).

The EIS states that Cork County Council are investing in several WWTP's and sewerage schemes in County Cork and contributing to the achievement of good ecological and chemical status in surface waters, with reversal of pollution trends and ceasing the discharge of priority hazardous substances. These are stated to be objectives of the WFD.

The EIS refers to a do-nothing scenario which would include deterioration of water quality arising from the effects of increased population. A worst-case scenario impact is described where the mitigation measures were not implemented correctly or failed.

Section 3.3.5 refers to **mitigation measures**. During the construction phase, good site management including bunding is referred to and arrangements for notification of the Irish Coastguard in case of spillage are also referred to. It states that if open cut techniques are employed on a marine crossing, the disturbed area would be protected so as to reduce potential bed erosion by tidal movements during construction. In relation to the operational phase, it states that emergency overflows would be located on the collection system at individual pumping stations to prevent localised flooding in the event of a power failure. It states that where overflows would occur, the design would be refined at detailed design stage to the extent that they would meet all accepted industry design parameters and would not have a significant impact on water quality. It states that they would be designed in accordance with the DoEHLG Guidelines including the guideline document issued entitled **“Procedures and Criteria in relation to Stormwater Overflows”**. The EIS states that an automated control operating system would be put in place to ensure that if a downstream pumping station failed to operate, the upstream pumping station would cease pumping. It states that provision of continuous monitoring and sampling of wastewater would be provided and to comply with the **Wastewater Discharge (Authorisation) Regulations of 2007**, a wastewater discharge licence would be required from the EPA. It also states that the WWTP would be designed so that it could be retro-fitted for nutrient removal, if required in the future.

Section 3.3.6 refers to **residual impacts** and states that following the implementation of mitigation measures, the impacts would include improved water quality in Cork Lower Harbour which in turn would have positive impacts for ecology, aquaculture, recreation, economic activity and development in Cork Lower Harbour.

1.5 Soils, Geology and Hydrogeology: - (EIS Pages 146 – 169)

In addition to the text, Figures 3.4.1 – 3.4.5 as well as Plate 3.4.1 are included after Page 169.

Section 3.4.2 sets out the methodology and lists the existing literature search. Tables 3.4.1 – 3.4.4 set out the groundwater and geology sensitivity, the definition of magnitude of impacts, significance criteria and duration of impacts.

Section 3.4.3 deals with the existing environment. It states the new WWTP will be constructed on a greenfield site in the townland of Shanbally. The EIS states the geology and soils play an important part in determining the environmental characteristics of the region and the nature of the rock has a

bearing on the nature of the soil formed which affects the natural vegetation and type of agriculture or horticulture that can be sustained.

The receiving environment is described as follows: -

- **Geomorphology** – the area is described as the development of a large number of broad u-shaped valleys and a number of buried valleys infilled with sand and gravel.
- **Topography** – the site is located in a coastal region of undulating terrain with the topography of the local area defined by ridgelines running east-west.
- **Drift geology** – noted that thick melt-water sands and gravels have been identified in the Cork Harbour region. Soil classification maps identify acid brown earths 70% - association 13. Walkover survey was carried out at the proposed WWTP in 2007 and no springs or areas of standing water were observed. A number of minor ground depressions with one noticeable feature were observed in the eastern field. A conical shaped depression of 3-4 metres diameter is illustrated in Plate 3.4.1. The EIS suggests that underlying limestone may be subjected to solution weathering. Table 3.4.5 gives borehole summary details and Table 3.4.6 gives trial pit summary details. The EIS refers to a geophysical survey.
- **Bedrock geology** – Table 3.4.7 gives the bedrock geology summary for the WWTP site and the pumping stations.
- **Marine geology** – survey carried out in the West Passage in 2005 – demonstrates the extension of bedrock across the West Passage and the nature of sediment to depths greater than 20 metres.
- **Structural geology** - complexity in the structure noted. Cork Harbour is stated to lie in a fold thrust terrain characterised by a series of horizontal upright east-west anticlines and synclines. Bedrock in Shanbally is stated to form part of the Ringaskiddy anticline and Cloyne syncline.
- **Karstification** – EIS describes the process and refers to geophysical survey from Volume III. The EIS states that an area of possible faulting/fracturing or karstification was identified in the south-east corner of the site.
- **Radon** – Information indicates the site is within a moderate radon area.
- **Geological heritage** – EIS states there are no areas of geological heritage significance which could be impacted on by the WWTP site and collection system.
- **Hydrology** – no streams or rivers cross or are adjacent to the development site.

- **Hydrogeology** – main bedrock aquifers in Cork Harbour are intensely karstified limestones.
- **Aquifer classification and vulnerability** – Table 3.4.8 gives summary of GSI bedrock and aquifer data. The EIS states that the Cuskinny member beneath the proposed new WWTP site is considered to be a locally important bedrock aquifer and Waulsortian limestone is considered to be a locally important karst bedrock aquifer.
- **Groundwater chemistry** - hardness of the limestone and sand and gravel waters usually range from 200 – 400 mg/l. Groundwaters in most of the synclines have been identified as vulnerable to pollution. The SWRBD Group has characterised the groundwater body for the WWTP site as 1b which is “probably at significant risk” in their study in relation to the Water Framework Directive.
- **Contaminated land** – EIS considers the risk of encountering contaminated materials or soil as low.

The EIS considers impact assessment in Section 3.4.4. In relation to construction phase impacts on drift geology and topography, reference is made to the excavation for elements of structures and the access road. It notes there is a potential for construction activities to impact on soil erosion and also to cause to leaching of contaminants into the groundwater.

In relation to marine sediment, the EIS describes the pipeline route and the marine crossing. It states method statements would be generated in advance of any works on the marine crossing in consultation with the NPWS and the DAFF. (Dept of Agriculture, Fisheries and Food)

The EIS states the depth to bedrock beneath the WWTP is expected to range between 8 and 20 metres below ground level and no blasting is anticipated to be required.

In relation to marine bedrock geology, apart from the marine crossing which is previously discussed in the EIS, works on the foreshore are noted. It states that the foreshore works would have minimal disturbance to bedrock geology and would have negligible impact.

In relation to hydrology and hydrogeology, the EIS notes that karst groundwater becomes polluted more easily than water in non-karstic aquifers. It states that no groundwater discharges are proposed and that the site is located in an area where saline or brackish water would be anticipated. The EIS states that additional precautionary measures would be implemented to ensure any accidents or spillages would not negatively impact on the groundwater quality.

The EIS states that the survey of November 2007 suggests an absence of groundwater at 10-15 metres below ground level. It states that it is unlikely that direct contact with the watertable would be made.

On Page 165 the EIS considers the operational phase impact under the headings previously set out. It states that the soil classification in the Cork Lower Harbour area would not be impacted on by the operational phase of the development. It states that the operational phase should have a positive impact on soils arising from sludge management proposals.

The EIS states that it is not anticipated there would be any significant impact on the physical properties of the marine sediments during the operational phase.

Section 3.4.5 considers mitigation measures in both the construction and operational phases. During the construction phase, the EIS proposes to verify the ground conditions under the site in advance of construction. It states that surplus or unsuitable excavated materials would be disposed of to an appropriately licensed landfill site or permitted recovery facility. The EIS states the effects of soil stripping would be minimised by the removal of topsoil during dry conditions and the effects of soil erosion would be minimised by ensuring that all ground disturbances or excavations are completed and re-vegetated as soon as practical.

The EIS states the main threat posed to soils and groundwater arises from soil contamination from construction materials. It states that any spillages would be immediately contained and also that refuelling of vehicles would be undertaken in specific designated areas with interceptors in place. It notes that there would be an emergency response plan and training of on-site personnel.

The EIS states that during the operational phase no mitigation measures are recommended as there are no foreseeable impacts on geology.

Section 3.4.6 refers to **residual impacts** and their definition in the EPA Guidelines "*the degree of environmental change that will occur after the proposed mitigation measures have taken place*" It states that when the recommended mitigation is implemented, it is considered there would be no significant residual negative impacts on the soils or geological/hydrogeological environment.

1.6 Material Assets: - (EIS Pages 176 – 88)

The EIS defines materials as comprising physical resources in the environment which may be of human or natural origin. It sets out the methodology used and the criteria for assessing the quality, magnitude and duration of impacts. It lists assets of human origin as including towns and villages, recreational facilities, transport infrastructure and public utilities. Assets of natural origin

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are described as natural resources, natural amenities and natural heritage, while cultural assets are described as archaeological and built heritage.

The EIS describes the existing environment including the towns adjacent to the WWTP and the collection system. The recreational facilities mentioned include a Golf Club close to the site which includes facilities for other sports. It notes also that Hibernian AFC and Shamrocks GAA Club are located close to the site also. The EIS notes the marine based recreational facilities associated with the harbour.

It describes the transport infrastructure and notes that the widening of the access road into the site has a 10-metre right of way acquired. It notes the likely impact of the improvement of the existing N28. It also notes that the majority of the pipelines are to be installed along existing roads.

In relation to public utilities, the EIS notes that the drainage network is the most relevant. It states that the existing network for the Cork Lower Harbour area is primarily a combined system and covers the towns within the scheme.

In relation to natural resources, the EIS states that the surrounding topography is undulating with ridgelines running east to west. It states the development of a WWTP at the proposed site is consistent with the objectives of the Carrigaline Electoral Area Local Area Plan (2005) and the adopted Amendments of January 2007. In relation to natural amenities, it states that Cork Harbour is the second largest natural harbour in the world in terms of navigational area. It describes extensive bird life and woods in the area. The EIS states the Owenboy Estuary is designated as an area of visual/scenic importance. It states also that scenic routes designated under the Cork County Development Plan of 2003 include the road between the Carrigaline and Crosshaven from which the development is visible and the road between Passage West and Ringaskiddy from which it states that the proposed development site is not visible.

The EIS states there are **no conservation designations** immediately adjacent to the WWTP site. It states that Section 3.8 of the EIS deals with the cultural heritage and notes there are two recorded archaeological features outside the boundary of the WWTP. It also notes that 25 archaeological / architectural constraints were identified in relation to the pipelines and pumping stations.

Section 3.5.4 deals with impact assessment and commences with the construction phase impact which is stated would be short-term negative arising from increased noise, dust and construction traffic. It applies to both the towns and villages and the recreational facilities. It notes in relation to the collection system, the need to have a consultation with the Department of Agriculture, Fisheries and Food in relation to foreshore and in-stream work. In relation to transport infrastructure, the EIS notes there would be an increase in traffic volumes. It states that the laying of pipes would result in slight traffic negative impacts due to traffic disruption.

The EIS notes the requirement of the power source for most aspects of the facility for both the WWTP and the pumping stations. The EIS states that the loss of 7.36 hectares of agricultural land would be considered neutral in the light of the zoning of the area. The EIS states that in relation to natural amenities, there would be a slight negative impact on the scenic route between Carrigaline and Crosshaven. It notes the construction of the marine crossing would have moderate to significant temporary negative impacts on Cork Harbour, which would include disruption to harbour traffic. It states there would be no impacts on natural heritage arising from the WWTP, but there would be temporary negative impacts on the Owenboy River and Monkstown Creek. In relation to archaeological and built heritage, it states that one of the two features adjacent to the site could be impacted during construction. It states the majority of the potential impacts on collection systems are indirect.

In relation to operational phase impacts, the EIS predicts a moderate long-term positive impact of the WWTP on the towns and villages. In relation to recreational facilities, it predicts a positive impact arising from improved water quality and with respect to the collection system, the elimination of outfalls is stated to have a long-term positive impact on water quality. It notes that where outfalls are to be retained, they would operate only during storm conditions.

In relation to transport infrastructure, a slight negative impact on transport is predicted and in public utilities, the improvement in the wastewater collection system is listed as a significant positive impact. The WWTP and collection system is predicted to have a significantly positive impact on water quality in Cork Harbour. The pumping station at West Beach in Cobh is predicted to have a slight negative visual impact on the cultural town of Cobh and it requires a sensitive design of the structure.

The EIS refers to a do-nothing scenario which would increase the amount of untreated discharges in the harbour and the worst-case scenario which would arise where mitigation measures were not implemented correctly or failed.

Section 3.5.5 deals with **mitigation measures** for both the construction and operational phase. For the construction phase, a detailed Construction Environmental Management Plan (CEMP) would be developed to address effects such as noise, dust, odour, traffic, run-off, spillages, etc. It states a Traffic Management Plan would be implemented to ensure the control of movements of material plant and labour. No mitigation measures are deemed necessary in relation to public utilities and in relation to natural resources and natural amenities, the EIS states that a drilling programme is recommended to verify the ground conditions under the site.

It states that as there are no designated natural heritage areas located adjacent to the WWTP, no mitigation measures are deemed necessary and prior to any works within or directly adjacent to pNHAs, there would be consultation with the NPWS.

In relation to the operational phase, the EIS refers to the need for septicity control in addition to screening and grit removal due to the length of the conveyance system which was previously referred to in the description of the development. It notes the requirement for stand-by power arrangements at pumping stations and an automated control system to ensure that if a downstream pumping station fails to operate, the upstream pumping station would cease pumping.

It states there are no mitigation measures proposed for a transport infrastructure, natural heritage or the archaeological and built heritage.

In Section 3.5.6 relating to residual impacts, the EIS states that if the proposed mitigation measures are implemented, no significant negative residual impacts are expected to occur as a result of the proposed development.

1.7 Air Quality, Odour and Climate: - (EIS Pages 189 – 216)

In addition to the text, Figure 3.6.1 – 3.6.10 are included and these indicate monitoring locations and predicted odour emissions.

The EIS sets out the methodology used and notes that 12 sample locations were chosen to represent the baseline air quality which was assessed between July and August 2007. The locations are listed in Table 3.6.1 and presented in Figures 3.6.1 – 3.6.6 which includes the locations in the vicinity of the WWTP and the pumping stations.

The EIS sets out the methodology in relation to odour and deals with dispersion modelling and the factors influencing the site.

The EIS states that in the case of the proposed scheme, all significant odour sources capable of generating offensive odours would be enclosed, sealed and negatively ventilated to an odour control systems. It states that only aeration tankage, secondary settlement tankage and stormwater tankage within the works would be open to atmosphere. It also states that for all pumping stations, an Odour Management System would be implemented to ensure that no uncontrolled release of fugitive odours occurred.

The EIS sets out the Odour Impact Assessment carried out which includes use of 99.5th percentile (%-ile) of hourly average and a 98th %-ile of hourly averages used in predicting odour envelopes. It states that all sensitive locations and areas of amenity should be located outside the 1.5 odour unit per cubic metre at the 98th percentile of hourly averages over a meteorological year. The EIS refers to the **hedonic tone** which refers to the pleasantness or unpleasantness of odours as measured by VDI at 3883:1997, Part 2.

Section 3.6.3 sets out the existing environment and refers to air quality and the BTEX concentrations which include the parameters benzene, toluene, ethyl benzene, and Para and Ortho- xylene. Reference is made to the air quality regulations, SI 271 of 2002 which relates to EU Directive 2000/69/EEC. The

average concentrations for NO₂ as related to Schedule 2 of the Regulations is given in Table 3.6.3 and similarly figures for SO₂, CO, PM₁₀ are given in Tables 3.6.4 – 3.6.6.

The EIS refers to dust deposition and refers to the different standards available. It states there are no statutory limits for dust deposition in Ireland, but the EPA Guidance suggests a rate of 10mg/m²/hour as being considered to pose a nuisance and that a maximum level of 350mg/m²/day is a recommended limit value.

The EIS stated that the area was monitored for hydrogen sulphide and the data is given in Table 3.6.8. It is noted that for one site, a level of 7.5 ug/m³ was recorded which is at the recommended limit, the EIS suggests that concentrations can be attributed to traffic movement on a nearby main road. It states hydrogen sulphide is generated from side product reactions of exhaust emissions with catalytic converters on diesel engines.

The EIS refers to speciated VOC's which include alkanes, mercaptans, organic acids, aromatics and nitrogen containing organics and these can lead to the formation of odours. The EIS states that samples were collected at two locations across the proposed WWTP site locations A6 and A7 and at one location in the vicinity of each of the five pumping stations. The results of main VOC constituents are given in Tables 3.6.9 to 3.6.15.

The EIS states there are no statutory limits in Ireland for total volatile organic compound concentrations (VOC) but research data is said to suggest a concentration of less than 250 ug/m³ is required to limit odour impact. The EIS states that the overall background level of speciated VOC's is generally low in the vicinity of all site locations.

The EIS states that in terms of odour the existing background would be dominated by the influence of the rural environment and to a lesser degree to coastal location. It states that no background concentrations of mercaptans or sulphur containing organics were detected and it states that the absence of such compounds suggest in general that odour air quality is good in the vicinity of the site.

The EIS refers to climate and refers to a report from the EPA on climate change.

Section 3.6.4 of the EIS deals with impact assessment and this refers in the first instance to air. Construction phase impacts are stated to be mainly windblown dust and a number of sources of dust from construction are identified. The EIS refers to a do-nothing situation and a worst-case scenario.

In relation to odour, the EIS states that odour impacts are not predicted during the construction phase. For operational phase impacts, the EIS states that a contractor would be required to meet the following criteria: -

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- All sensitive locations located outside the $1.5 \text{ Ou}_e\text{m}^{-3}$ at the 98th percentile of hourly averages.
- All sensitive locations located outside the $3.0 \text{ Ou}_e\text{m}^{-3}$ at the 99.5th percentile of hourly averages.
- Hedonic tone should not be considered pleasant on a scale greater than -2.

The EIS states that an odour modelling assessment was carried out for the WWTP and pumping stations **based on the specimen design**. In relation to the WWTP, the stated requirements are repeated and the EIS states they were chosen to ascertain the level of proposed impact to the surrounding residential and industrial population in the vicinity of the works.

Figure 3.6.7 and 3.6.8 give the plotted odour concentrations for the 1.5 and 3.0 odour units' standard. It notes that in terms of the 99.5th percentile, the overall odour plumes have a radial spread of 75 metres in an northerly and easterly direction, while the 98th percentile contour is the predicted spread of 80 metres from the boundary of the facility in a northern direction.

The EIS refers to Figures 3.6.9 and 3.6.10 and states these give the odour plume spread for individual grouped odour sources to include odour control units and tankage odour sources. It states all other offensive odour sources would be covered, sealed and negatively ventilated and odorous air directed to odour controlled units. It states that odour control units would not exceed $2,314 \text{ Ou}_{ES}^{-1}$ and the total odour emission should be $6,611 \text{ Ou}_{ES}$. This is indicated also on Table 3.6.16. In Table 3.6.17 the predicted overall odour emission rates from the five major pumping stations in odour units per second are given and it is noted that the highest rate is from the West Beach Pumping Station in Cobh at 360 odour units per second.

The EIS describes climate and states in conclusion that due to the nature and scale of the development, it is considered that there are no impacts arising which could affect the general climate of the area, either regionally or locally.

Section 3.6.5 deals with **mitigation measures** and in relation to air during the construction phase the Construction Environmental Management Plan is referred to which would include a traffic management and dust minimisation measures. It refers to speed restrictions and a speed limit of 20km per hour and also to stockpiling of materials and material handling systems. The EIS states that it is envisaged the proposed development would not have a significant impact on the surrounding air quality. It states that if the level of dust is found to exceed $350\text{mg}/\text{m}^2/\text{day}$ in the vicinity of the site, further mitigation measures would be incorporated into the construction of the proposed site.

During the operational phase, the EIS states that it is not anticipated that dust would be a significant problem and that there would not be a significant impact on the surrounding air quality.

The EIS states the construction phase would not give rise to odours while the operational phase, the EIS recommends a number of measures: -

- Odour management, minimisation and mitigation procedures at the WWTP and the pumping stations.
- Maximum allowable odour emission rate to be $6,611 \text{ Ou}_{\text{ES}}^{-1}$ with limits on odour emission rates from control units and requirements as to hedonic tone of the odour.
- Odour management systems at the pumping stations to be sufficient to prevent any uncontrolled fugitive odours.
- Maintenance of good housekeeping practices within the WWTP and the pumping stations.
- Avoidance of accumulation of floating debris in channels and holding tanks.
- Enclosure and sealing involved primary treatment, wet wells and sludge handling processes.
- Eliminate overloading and under loading in the WWTP.
- Odour scrubbing technologies to be implemented.
- Dispersion modelling to be provided by the contractor to demonstrate that emission values are being complied with.

In relation to climate, the EIS states it is envisaged that the facility would have no impacts on the regional or local climate.

Section 3.6.6 deals with residual impacts. In relation to air, the construction phase requires good working practices and mitigation measures are outlined. In the operational phase, reference is made to traffic impacts it states that the net impact of the development would be a slight negative impact in relation to NO_2 and PM_{10} , but air quality would remain well within the Irish and EU legislative limit values.

In relation to odour, the EIS states that a worst-case odour emission scenario was modelled. It states that no odour impact would be perceived at sensitive receptors in the vicinity of the proposed scheme WWTP and it states that all residents and industrial neighbours would receive /experience an odour concentration at or less than 1.5 odour units per cubic metre for the 98th percentile and less than 3 odour units per cubic metre for 99.5th percentile.

In relation to the pumping stations, the conclusion in the EIS is that no odour impact would be perceived at sensitive receptors following the implementation

of good design in terms of odour management. It states that many of the pumping stations are located in populous areas and it states that for that reason the design of the collection system would include best practice and adequate odour management system to prevent odour complaint and impact.

1.8 Noise and Vibration: - (EIS Pages 227 – 246)

In addition to the text, Figures 3.7.1 – 3.7.8 are included after Page 246. Section 3.7.1 gives an introduction which is followed by the methodology and refers to the maximum permissible construction noise levels at the façade of dwellings during construction. These range between 60 and 70 dB on a one-hour average noise level. Table 3.7.2 gives the gradation of adverse noise impact as a function of construction noise level. It notes the EPA Guidelines set a nighttime limit of 45 dBA and a daytime of 55 dBA at noise sensitive locations. The EIS refers to noise impact descriptors (*reference to severity, perception categories*) and the consideration of indoor noise levels at nighttime. It also sets out the criterion for continuous plant and process noise emissions which it states would be at 45 dBA at 20 metres from the plant boundary. In relation to the criteria for daytime work activity noise emission, this is calculated to be 45 dBA at 134 metres to the east which is the nearest noise sensitive location.

Section 3.7.3 refers to the existing environment and states that at the WWTP site, the noise environment was determined primarily by distant traffic, agricultural machinery, and wind noise with a contribution from aircraft noise during daytime. Eight locations were chosen and these are listed in Table 3.7.3 which indicates noise levels (L_{aeq}) between 44 and 62 by day with the highest level, reference N8 being close to the existing N28 road.

Table 3.7.4 gives the daytime and nighttime noise surveys for the sites of the proposed major pumping stations. These range for daytime between 55 and 63. The level of 63 dBA at Carrigaloe has a daytime noise level due to local road traffic, ferry traffic and has a steady underlying background noise level of 49 dBA during daytime and 39 dBA at nighttime. It also states that minor pumping stations noise levels range from 44 to 69 dBA, depending on the local traffic flows. Table 3.7.5 gives the daytime short-term orientation noise surveys at the 20 proposed minor pumping stations and Table 3.7.6 gives the same data for nighttime.

Section 3.7.4 deals with impact assessment. The construction phase impacts at the WWTP are stated to be associated with site clearance and excavation. It states during the construction of the plant facility and equipment, noise emissions would be considerably lower. It states that the construction noise level in the sports field to the north-east of the site would be expected to be in the range of 50 – 55 dBA and would have negligible impact on outdoor activities in the area. In relation to excavation work for sewer lines, the EIS states that for houses set back 10 metres from the sewer line, noise levels could exceed 70 dBA for the short period during which works are in progress

immediately adjacent to the house. It states that beyond 50 metres, the noise levels would be less than 60 dBA. The EIS states that the construction noise would be audible above the existing ambient noise, but would not be considered intrusive in the context of the limit of duration of the works.

The EIS refers to the channel crossing at Carrigaloe and states that final details would not be available at this planning stage. It states that noise emissions from the works would be subject to the construction noise limits set out in Table 3.7.1 which refers to the maximum permissible construction noise levels.

The EIS states that the construction works at the pumping stations would be at a significantly reduced scale compared with the construction of the WWTP. It states that for Monkstown and West Beach, the noise level would be calculated to be 70 dBA at the nearest houses, while at Raffeen and Carrigaloe they would be comfortably within the 70 dBA criterion. These results are shown in Table 3.7.8.

The EIS states that vibration impacts would be comfortably within the vibration limits for protection against cosmetic damage. It states that construction traffic would have only a slight impact.

Referring to operational phase impacts, the EIS refers to Table 3.7.9 for predicted levels of noise from the WWTP and states they would be comfortably below the EPA daytime noise limit of 55 dBA. The EIS states that nearest lands zoned are residential to the east of the site, the ambient noise level is calculated to increase by 2dB. It states that the noise impact at that location would be considered to be negligible. The EIS states that at the existing houses to the east, north, south and west, the calculated additional WWTP noise would be 8-14 dB lower than existing steady background noise level and would be inaudible.

In relation to night-time operations, the EIS states the additional noise levels are all comfortably in compliance with the EPA night-time noise limit of 45 dBA. Table 3.7.9 gives the predicted noise levels from the WWTP and the noise impact assessment. The assessment ranges from negligible to none.

The EIS states that based on noise surveys carried out by ANV Technology at other WWTP's, it was found that there is no perceptible ground vibration beyond the site boundaries associated with the operating equipment. It states that at the proposed site, the nearest sensitive location is 134 metres to the east and the EIS states there is unlikely to any significant potential for audible ground-borne vibration over that distance.

The EIS states that noise sources would be effectively enclosed in pumping stations, but at Monkstown and West Beach (Cobh) it would be prudent to consider the potential for generation of ground-borne vibration in the audio frequency range.

The EIS states that in the operational phase, estimates of likely site traffic are relatively low and the additional traffic would not add detectably to the average traffic noise level.

Describing a do-nothing impact, the impact of the proposed realignment of the N28 road is noted as being relevant if no development took place.

Section 3.7.5 deals with mitigation measures. It states that during the construction phase of the WWTP, no special mitigation measures are likely to be required and it refers to BS5228 in relation to noise impacts relating to the pumping stations and sewer lines. A number of site management measures are noted also in the EIS.

Referring to the operational phase, it states that achieving the noise level design criteria would be the responsibility of the developer's design team and also that no significant residual impacts are envisaged.

1.9 Cultural Heritage: - (EIS Volume II, Pages 255 – 285)

Included in the text are tables indicating the archaeological constraints inventory of recorded monuments. In addition to the text, Figures 3.8.1 – 3.8.14 indicate townland boundaries, RMP sites and aerial photographs. Plates 3.8.1 – 3.8.5 are also attached at the end of the section.

The cultural heritage assessment was carried out by Aegis Archaeology Limited and a specialist report is in full in Volume III, Appendix 7A.

Section 3.8.2 sets out the methodology used including the review of published material and the field assessment including on-shore, off-shore and the marine crossing. It notes that an underwater dive assessment was undertaken across the River Lee at Monkstown covering a width of approximately 390 metres. It states that for the marine crossing, the maximum seabed coverage was obtained using a diver-towed survey methodology and that the current was in excess of five knots during both the filling and ebb tides and during the tide change, this reduced to approximately two knots. It notes the maximum water depth of 16.68 metres was recorded for the central channel. The EIS states that the proposed inter-tidal/foreshore locations were field-walked to assess their archaeological potential and a photographic record was made.

Section 3.8.3 describes the existing environment. It describes the historical overview of Cork and the lower harbour and commences with the early Mesolithic period commencing at 8000 B.C. and continuing through to the Neolithic, Bronze Age and Iron Ages. It notes that an archaeological site dating to the Neolithic and Bronze Ages was excavated on Foaty Island in 1992 which is outside the study area, but which revealed the pre-historic complex of human occupation and possible burial pits.

The medieval and later medieval periods are covered and the EIS describes two ringforts located in the vicinity of the pipeline route, reference CH1 and

CH16 while **CH3** is a ringfort at Parkgarriff. It states that References **CH9** and **CH10** are probable examples of ringforts situated near the proposed location of the WWTP site. It refers also to Holy Wells and one at Ballyfouloo reference **CH4** was not located.

The EIS refers to the early modern period between 1700 and 1900 A.D. and refers to Martello Towers, stating that none of the towers or their zone of archaeological potential are predicted to be impacted. It refers to limekilns at Monkstown and Shanbally which are located within the pipeline route. The EIS also refers to flour mills built within the harbour area and the Cork, Blackrock and Passage Light Railway. The EIS states that the railway serving Crosshaven through Passage West to Carrigaline ceased functioning in the 1930's, but the remnants of the line are embankments and small bridges which are outflows of smaller creeks to the harbour and are cultural heritage features of the study area. One feature forms part of an amenity walk from Carrigaline to Crosshaven.

Table 3.8.1 gives details of the townlands within the study area.

The EIS states the field assessment was carried out in five sections for the on-shore section and these were Passage West and area, Carrigaline, Shanbally, Ringaskiddy and Cobh. The desk-based assessment included a list of finds recovered from the townlands within and adjacent to study area and these are given in Table 3.8.2.

In relation to the off-shore/inter-tidal assessment, the EIS states there are no archaeological sites listed in the RMP for the immediate vicinity of the marine pipeline crossing. It says the history of maritime activity within the area is well established and there is a list of vessels in a ship wreck inventory for that stretch of coastline. The EIS describes the area including the remains of the **Royal Victoria Baths** which it states have been derelict since 1929.

The EIS describes the Owenboy River and states that to the east of Carrigaline it becomes a tidal with extensive mudflats flanking the river at low water. It states there is a possibility that the mudflat sediments would retain isolated archaeological features such as log-boats (dug-out canoes) or other craft. Table 3.8.3 gives a list of RMP for the foreshore pipeline corridor. The EIS states the Royal Victoria Baths has a historic rather than an archaeological significance and the pipeline corridor at the Owenboy River is also described as having a poor archaeological potential.

Section 3.8.4 describes the environmental impacts and in relation to on-shore impacts, it refers to the vibration in the vicinity of the WWTP, but states that the impact would be imperceptible following the implementation of mitigation measures. The EIS states that impacts to known sites of archaeological value would be as follows: -

- Digging of trenches adjacent to zones of archaeological potential – CH9 and CH18. Reference Figures 3.8.10 – 3.8.14.

- Seventeen sites and their zones of archaeological potential may be indirectly impacted by the proposed pipeline.
- Digging of trenches in greenfield areas could potentially result in the permanent destruction of subsurface archaeological features.

In relation to **landscape** and in the context of cultural heritage, the EIS draws attention to the town of Cobh and refers to the visual impact from major pumping stations and states that the pumping station proposed for the West Beach at Cobh should be designed sensitively.

The inventory of recorded monuments predicted to be impacted is given in Table 3.8.4 and an architectural constraints inventory is listed on Table 3.8.5. The EIS notes that some wayside monuments were noted during the inspection and these refer to in Table 3.8.6 entitled "Further Potential Architectural Constraints within the Study Area".

Off-shore impacts are described in Page 282 of the EIS and it is recommended that direct impacts to the northern wing of the Royal Victoria Baths be avoided. The EIS recommends archaeological monitoring under licence to the DoEHLG during all riverbed / seabed disturbances associated with the construction of the marine pipeline between Cobh and Monkstown. It states the insertion of a pipeline along the upper foreshore of the Owenboy River does not represent a significant impact to the existing foreshore environment. The EIS notes that this foreshore has already undergone extensive modern alteration with the placement of flood protection measures and a concrete encased pipeline.

Section 3.8.5 describes mitigation measures and the EIS refers to the measure identified in Tables 3.8.4 – 3.8.7 and states these would be subjected to archaeological monitoring under licence by an archaeologist. The EIS notes that it is the remit of the National Monuments Section and the National Museum of Ireland to legally recommend any one or a combination of measures or to make additional recommendations in relation to mitigation.

The EIS details the recommended operation of the recommended monitoring programme and states that if the mitigation measures are implemented, there would be no residual impacts of significance arising from the proposed development.

1.10 Landscape and Visual Assessment: - (EIS Pages 305 – 321)

In addition to the text, Figures 3.9.1 – 3.9.3 are included as well as Plates 3.9.1 – 3.9.4.

The EIS sets out the methodology used including the criteria for assessing impact quality, magnitude and duration. It gives a description of the existing environment and defines the topography in the local area as having ridgelines that typically run east – west and forms rolling landscape. It states the local landscape is heavily influenced by the existing pharmaceutical complexes in Ringaskiddy and the Loughbeg area and to the west of the site there is a substantial ESB Substation and Bord Gais Pumping Station. It states the site is accessed by a gravel laneway that leads to the Bord Gais facilities. The EIS states that this lane passes between the ESB Substation to the north and a small industrial complex with two warehouses to the south.

The EIS states the site in an agricultural landscape, but the surrounding area contains historical references. The EIS refers to the landscape at Coolmore, but states that the WWTP would not have any direct or indirect impact on the character of Coolmore House and its grounds. A similar comment is made in relation to Raffeen.

The EIS states that the development has the potential to impact on two areas of amenity or recreation and refers to the **playing pitches at Shanbally** and the **public walks along the Owenboy River** which has direct views to the site for a short distance at Frenchfurze.

The EIS states the site is contained within a large zoned area which is referred as “suitable for large stand-alone industry with suitable provisions for buffer tree planting, minimum 20 metres wide along the northern boundary to residential areas and provision for public open space and to include three playing pitches”.

The EIS states there are areas surrounding the site which are designated as scenic landscape and it refers to the Cork County Development Plan objectives and policies in this regard. Policies quoted are ENV 3 – 4 regarding the objective to preserve visual and scenic amenities, ENV 3 – 5 to preserve the character of all important views and prospects. Specific routes mentioned are Scenic Route A – 54 Passage West to Ringaskiddy which do not have views of the site and Scenic Route A – 56 from Carrigaline to Crosshaven which has long range views of the site.

The EIS deals with visual envelopes and refers to views of the site. It refers to areas which have views of the site as follows: -

- **Strawhall** – Junction of the R610 Road – views to the site distinguished by the overhead power lines.
- **Loughbeg** – not possible to look into the site, possible that higher elements of the development would be visible.
- **Currabinny** – south-east – site screened by existing vegetation, but possible that higher elements would be visible.

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- **Coolmore** – 2.3 kilometres to the south-east – intervening topography generally limit views to small glimpses of the overhead power lines.
- **Barnahely** – power lines visible but views of the site are screened by topography and vegetation.
- **Frenchfurze** – 3 kilometres to south – site partially visible from the Myrtleville Road.
- **Carrigaline** – views in the direction of the site generally screened by existing vegetation and buildings.

The EIS describes landscape character and states that any description should be cognisant of the strong identity of the harbour. It quotes a study on behalf of Cork County Council which states that notwithstanding the rural character, the tell-tale signs of urban intensity are evident everywhere through the prevalence of infrastructure such as roads, bridges and electricity power lines and the frequency of urban clusters.

On Page 312 there is a description of the development which it is noted were given in detail in Section 2.5 of the EIS.

Section 3.9.4 deals with impact assessment and notes the requirement during construction to provide compounds, stockpiles, upgrading access roads and construction of pipelines and pumping stations.

The EIS states the construction of the WWTP would give rise to an appearance of disruption over the proposed site. It states the construction of the collection pipelines would result in short-term impacts on the landscape and that impacts to hedgerows would be longer in duration as replacement planting would take 3-4 years to establish. It states that in the short-term there would be slight negative impacts as a result of the construction of the pipelines.

Table 3.9.4 gives a summary of construction impacts on the landscape which range from **slight to significant negative** and most of the impacts are described as temporary in nature.

The operational phase impacts are referred to on Page 314. It states that the greater surrounding area is deemed capable of absorbing the development without changing the character of the urban fringe landscape. In relation to the scenic landscape on the Owenboy River, the EIS states that initial slight negative impacts would be reduced to imperceptible impacts as planting matured.

Table 3.9.5 gives a summary of the operational impacts on the landscape and notes that in relation to land cover, pasture land would be replaced with buildings and structures which would be in keeping with the mixture of

industrial development in the Cork Harbour area. It states the overall quality of the Cork Harbour area would remain intact.

On Page 316, the visual impacts of the WWTP on the various locations surrounding the site with distant views are noted. It states that if the proposed N28 is realigned, the visual impact from the road could be expected to be slight negative to imperceptible. In relation to the proposed housing to the east of the site, the EIS states that impacts would be expected to be slight negative initially reducing to imperceptible.

The EIS refers to cumulative impacts on states that consideration had been given to the impact of the proposed WWTP in conjunction with the proposed realignment of the N28, the proposed development of housing and the existing pharmaceutical complexes. It states that cumulative impacts would be avoided as a Waste Water Treatment Plant would not converge with existing or proposed developments, but would remain as small singular element within the urban fringe landscape.

On Page 318, the visual impacts of the pumping stations are described. These are as follows: -

- **Carrigaloe Pumping Station** – largely below ground with a small building at ground level. – Proposed to be finished in the style of a boathouse. The EIS states that on completion, the visual impact would be neutral, as the building would neither cause a deterioration nor improvement to the local view.
- **Monkstown Pumping Station** – largely underground with a small single storey building at ground level. The building is stated not to result in the loss of any views and would over time become an accepted element in the townscape.
- **Raffeen Pumping Station** – reclaimed land is involved and works would not change the existing shoreline. Design of the pumping station would be likely to resemble a boathouse in keeping with the boatyard which is 200 metres to the north. The EIS states that on completion, visual impact would be moderate negative, as the building would continue to disrupt views across Monkstown Creek, but would be in keeping with the adjacent boatyard.
- **West Beach Cobh Pumping Station** – located in reclaimed land between the piers along the shore front. Impacts to be mitigated by the appropriate design of the building and the paved open space over the holding tanks. The EIS states the overall aim of the design would be to enhance the West Beach promenade area and maintain public access to the waterfront.

Section 3.9.5 refers to mitigation measures and states these would be to reduce visual impact through minimising negative impacts and to assist a visual

integration of future development into the surrounds with an appropriate scale of planting for the WWTP.

The EIS states that the mitigation measures associated with the WWTP site are to plant native woodland around the perimeter of the site with particular reference to the north and to the west. The EIS states that within 7-10 years, the planting would form a 10-12 metre high dense cover, thus screening the majority of the buildings.

In describing residual impacts, the EIS states that these should be assessed when the proposed planting has reached the level of maturity after 7-10 years. It states the boundary planting would represent a noticeable change in the landscape, but the selection of native woodland species would be in keeping with woodlands at Monkstown Creek and Currabinny and cause neutral impact to the surrounding rural fringe landscape.

1.11 Interactions: - (EIS Pages 329 – 342)

This section includes reference to the various interactions and also includes a list of references applicable to the EIS.

Section 4.1 deals with human being interactions with water quality, material assets and air quality and odour. These interactions are listed in Table 4.1 and range from moderate to significant negative during the construction period for landscape and visual assessment to positive for water quality in the operational phase.

Terrestrial and marine ecology interactions are referred to in Section 4.2 and in Table 4.1, these range from slight negative during the construction phase to positive for material assets and water quality in the operational phase.

Soils, geology and hydrogeology interactions are dealt with in Section 4.4 and there are also sections covering material assets, air quality, noise, cultural heritage and landscape and visual. Table 4.1 gives the range of these impacts with the moderate to significant impacts occurring for cultural heritage and landscape and visual during the construction phase and imperceptible negative for most other interactions.

1.12 Appendices – Volume III of the EIS

Appendices are grouped in eight separate groups as follows: -

- No. 1 – Consultation and Proposed Design Layout.
- No. 2 – Terrestrial and Marine Ecology and Hydrodynamic Modelling Reports.

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- No. 4 – Geophysical Survey, Bedrock Geology, Geological Heritage and Well Search Results.
- No. 5 – Air, Odour and Climate Reports.
- No. 6 – Noise and Vibration Reports.
- No. 7 – Cultural Heritage Report.
- No. 8 – Landscape and Visual Assessment Report.

APPENDIX 1

Appendix 1A gives the consultation letter and consultee addresses.

There is also a copy of the request to the statutory consultees for a written opinion on the information in the EIS.

Included in this appendix is a written request to An Bord Pleanála in relation to information to be contained in the EIS. The appendix includes the response by An Bord Pleanála.

Responses from the Department of Communications, Marine and Natural Resources, the NRA, South Western Regional Fisheries Board, Bat Conservation Ireland, Bird Watch Ireland, Commission for Energy Regulation, Department of the Environment, Heritage and Local Government, Eircom, EPA, Cork County Council, Irish Aviation Authority, Irish Whale and Dolphin Group, Marine Institute, the OPW, Port of Cork, Radiological Protection Institute of Ireland, Bord Gais and the South-West Regional Authority are included.

Appendix 1B gives a summary of the preliminary assessment of the potential environmental impacts at the two short-listed development sites which is dated 2004.

Appendix 1C gives land use zoning maps and proposed design layout.

APPENDIX 2

Appendix 2A is the terrestrial and marine ecology reported, dated January 7th, 2008. This report contains 95 pages and includes a number of tables, figures and photographs. In the executive summary, the EPA is quoted as stating that the **water quality in Cork Harbour is only moderate** and this is reflected in high nutrient levels associated with the occurrence of algal blooms. It also states that algal mat growths are recorded and there are anoxic conditions on some mudflats which are adjacent to sewage outfalls.

The report sets out the methodology used and gives details of the sampling stations with an extensive description of habitats. Table 11 gives surveys of core sampling taken at 19 stations.

The fish species mentioned for the harbour include the Atlantic salmon, river and sea lampreys and the European eel. Table 12 lists the fish species expected in areas affected by the proposed development and Table 13 refers to designated areas for bivalve mollusc production areas (oysters).

Water quality is discussed from Page 43 to 45 and on Table 15 there is an assessment of the trophic status of the main waterbodies of Cork Harbour for the period 1999 – 2003. It is noted that this ranges from unpolluted for the Lee River, intermediate for the Lee Estuary, Owenacurra River, North Channel of Great Island and Cork Harbour, while Lough Mahon and the Owenacurra Estuary are described as being eutrophic.

The report describes the characteristics of the proposal and in Section 3.2.5 describes the environmental impacts. These are divided into operational and construction phase impacts and elaborate on the information in the main volume of the EIS.

Section 3.2.6 deals with mitigation measures and under the section on residual impacts, these are predicted to be minor negative and moderate positive. Photographs include the area of the plant, and locations where the pipelines would traverse. There are also photographs of the littoral and inshore areas.

In Appendix II to the report, the site synopsis for the Great Island Channel, Cork Harbour SPA, Monkstown Creek NHA and Owenboy River NHA are included together with maps of the designated areas. Other appendices include plant species lists, bird counts from Cork Harbour and marine habitat and macro-fauna assessment. Table A 6.5 – 6.9 refers to numbers and weights of macro-fauna recorded at the 15 sites investigated.

APPENDIX 3

Appendix 3 A – Hydrodynamic and Modelling Report.

The authors of the report are Professor J. P. J. O’Kane and Kevin Barry of the Department of Civil and Environmental Engineering of University College Cork. The report contains seven chapters and extends to 169 pages. It is dated December 2007. In the executive summary, the report refers to the **norovirus** which is the **winter vomiting bug** and is stated to be related to the consumption of raw oysters in some cases. It refers to the simple nitrogen cascade exerted on the harbour eco system by organic nitrogen, nitrate and ammonia.

Chapter 1 of the report gives details of previous studies and outlines the model assumptions.

Chapter 2 gives data sets which includes the bathymetric data, water levels, hydrodynamic outputs, river flows and the complete list is given in Table 2-1.

Chapter 3 refers to the “Old Head_2” model which is the larger of the two models and the boundaries of both models are indicated in Figure 3.1.

Chapter 4 gives the faecal coliforms results for the scenarios where there is no treatment and where there is treatment for the years 2010 and 2030. In this chapter, the maximum concentrations of faecal coliforms are indicated in Figures 4.1 – 4.5. The exercise is repeated for different tidal conditions.

Section 4.4 refers to the 15 points chosen for examination and it is noted that for Cobh, the difference between treated and untreated scenarios was the greatest, while the highest concentrations in the treated situation exist at the proposed outfall. Chapter 4 also includes sensitivity analyses for faecal coliforms and the 24hour decay sensitivity is given in Figures 4.46 – 4.60. Intestinal enterococci and escherrichia coli concentrations are also referred to.

Chapter 5 deals with the norovirus concentrations predicted for the different scenarios. The conclusion was that with treatment in place, there would be less than 20% of the maximum concentrations that would happen with no treatment for the entire harbour area (with the exception of the area immediately adjacent to the outfall). It states that for areas of the inner harbour, the improvement was much greater with the maximum concentrations been less than 5% of the untreated scenario.

Chapter 6 of the report deals with nitrogen results and refers to the kinetics of the cascade model. It notes that assumptions are made at the rate at which ammonia is nitrified to nitrate also notes concentrations of ammonia and nitrate can accumulate throughout the harbour and disperse within and outside the harbour.

Tables 6-2 to 6-4 give the maximum and averaged nitrate concentrations with the 15 points of interest and Figures 6.1 – 6.15 give plots for organic nitrogen, ammonia and nitrate for both treated and untreated conditions.

Section 6.6 of the report deals with sensitivity analyses which considers a more conservative nitrogen removal efficiency of the treatment plant and the results are given in tables and Figures 6.21 – 6.35. The conclusion in Section 6.7 states that the proposed scheme would reduce considerably the forcing and primary production in the inner harbour and in the North Channel behind Great Island. It states there would also be an improvement throughout the outer harbour with the possible exception of the immediate vicinity of the diffuser itself.

Chapter 7 is titled “Discussion and Conclusion” and summarises the conclusions in relation to faecal coliform results, norovirus results and nitrogen results. In Section 7.5, the report states that a large area outside the mouth of the harbour between Ballycotton and Oysterhaven gradually accumulates material discharged from the outer harbour on successive ebb

tides. The report states that a large anti-clockwise eddy was simulated outside the mouth during the ebb. It notes that it was not possible to indicate with confidence and precision what affect the proposed scheme would have on the concentrations of coliforms and norovirus in the coastal waters between Ballycotton and Oysterhaven. It states that the model does show a reduction in concentration.

Appendix A of the report deals with the calibration of the RP_2 Model.

APPENDIX 4

Appendix 4 A – Geophysical Survey

This report by Minerex Geophysics Limited is a 10-page report with a number of maps and figures included.

The geophysical survey is for the site at Shanbally and it describes the geology of the report and the methodology used. It stated that 2D- Resistivity profiles were located to give coverage of the site. 16 survey locations are referred to in Table 1 of the report.

The summary interpretation given in Section 3.3 of the report describes a four layered earth model below the site with very thick overburden overlying clean limestone and mudstone bedrock lithologies. It states that layer 1 consists of a thin loose/soft overburden/topsoil deposit of about 3 metres thick. It states layer 2 is between 3 and 22 metres thick is interpreted as overburden rather than rock. It states that layer 3 is similar to layer 2 and has a thickness from 2 to 15 metres and likely to be made up of gravely clay, but could be fractured or broken mudstone or limestone. It states that layer 4 has high seismic velocities and the values indicate clean limestone.

The report recommends a number of boreholes to be drilled. Map 1 indicates the location of the geophysical survey and Map 2 gives the ground conductivity contour map. Figures 1 – 3 give the results and interpretation of the 2D – Resistivity and seismic profiles.

Appendix 4 B – Bedrock Geology Summary

This report is titled “Geology of South Cork” and is a publication by the Geological Survey of Ireland.

Appendix 4C – Geological Heritage Correspondence

Contains correspondence from GSI and a table referring to 3 sites.

Appendix 4 D – Well Search Results

This report is in spreadsheet form and is based on a GSI groundwater database. The boreholes are referenced with a note on the aquifer, details of the drilling where available and reference to yield.

APPENDIX 5

Appendix 5 – Air, Odour and Climate

This appendix is divided into three sections, namely Appendix 5 A on air quality, 5 B on odour and 5 C on climate change.

Appendix 5 A – Air Quality

Outlines the baseline air quality examined with reference to a number of parameters and states that currently the air quality is averaged good with levels of criteria and baseline odour below relevant Irish and EU limits. Figure 11.7.1 gives the overview of the monitoring locations in the vicinity of the WWTP, while further figures show the locations of the monitoring carried out at the pumping stations.

Appendix 5 B – Odour Report

Carried out by Odour Monitoring Ireland and comprises 49 pages. The scenarios referred to included construction of the WWTP using the specimen design with the incorporation of odour mitigation protocols and a second scenario with the odour emission rate from the proposed five pumping stations, including the incorporation of odour management systems.

The study concluded that the overall emission rate from the new drainage scheme would not be greater than that required under the impact criterion. This was calculated at 6,611 odour units per second.

In Section 3 of the report, the methods employed including calculations of odour emission and modelling overview are set and tables indicate odour annoyance criteria and the ranking of environmental odours including the hedonic scores for different operations.

The results of the odour dispersion modelling are discussed and this is in greater detail than that given in the main volume of the EIS.

Section 7 sets out the recommendation which include odour management systems and the maintenance of good housekeeping practices, as well as the avoidance of accumulation of floating debris. It also lists the requirement to seal all primary treatment processes and that monitoring should be carried out to confirm compliance with requirements.

Section 8 of the report gives indicators of odour plume dispersion for different conditions and different levels of odour from the plant and also from the five pumping stations.

Section 9 is an appendix which gives the background information on odours pertaining to the impact assessment. It refers to odour emissions at wastewater treatment plants and details of standard practice for odour management plans. It also sets out general rules for reduction of odour emissions for wastewater treatment plants and also odour abatement and management systems and procedures. The report also gives tables which indicate checking procedures and recording for odour controls.

Appendix 5 C – Climate Change Report

This report was carried out by Odour Monitoring Ireland and is dated October 2007. It deals with expected climate change in Ireland and the impact of climate change in hydrology. It refers to the possibility of inundation with sea level rises.

The summary to the report states that there will be a significant decrease in summer precipitation and could lead to long term depletions of groundwater storage. It states that mean sea level is expected to rise by 0.9 metres, but that storm surges could occur more than once yearly.

APPENDIX 6

Appendix 6 A – Noise and Vibration Report

This report has 43 pages of text and was prepared by ANV Technology.

The report refers to the noise sensitive locations examined and details the methodology used. Figure 2 gives the layout of the drainage scheme showing the sewerage network and the major pumping locations. It states that the proposed WWTP site is located within a predominantly rural area and that the main contribution to the existing ambient noise level is from traffic noise on the N28.

Section 2.3.1 deals with existing noise environment in the vicinity of the WWTP site and refers to sites N1 – N8 which are given in overview in Table 3 with expanded details given in Table 4 and 5. Table 6 and 7 gives the daytime and night-time noise surveys for the major pumping stations and the comments in relation to the locations include reference to local traffic, church bells ringing, construction noise, ferry crossing and noise from nearby streams.

Figure 3 on Page 16 of the report plots the measured noise levels at positions at the WWTP site and notes that the L_{aeq} figures are generally between 40 and 60 dBA. Table 8 gives short-term noise surveys at the sites of proposed minor pumping stations by day and Table 9 gives the same information for night-time.

The noise impacts of the development are described and this is divided into construction and operational phases. Figures 6 and 7 show noise contours for day and night-time operations.

The report also deals with mitigation and notes that no special mitigation measures are likely to be required for the construction phase. It states that the design noise criteria namely 55 dBA at 20 metres from the boundary for daytime and 45 dBA during night-time should be adhered to.

APPENDIX 7

Appendix 7 A – Cultural Heritage Report

Aegis Archaeology Limited prepared this report in 2007 and there are approximately 150 pages of text over nine chapters and also includes an appendix involving the underwater/Intertidal study. There are 24 figures and 51 photographs also attached.

The report covers the introduction, legislative framework and methodology of the study and notes that it was not known at the time of the assessment what side of the roadway the pipelines might take or if the pipes going to be placed in existing culverts or new service trenches. It also noted that due to the scale of the proposed development, only those recorded archaeological sites whose zone of archaeological potential is predicted to be directly impacted by the route have been included in the assessment.

Describing the existing environment, the report subdivides into five sections and aerial photographs and maps of each section are included in the report. The area is divided as follows: -

- **Monkstown and Passage West** - this includes five Cultural Heritage (CH) sites with Zones of Archaeological Potential (ZAP) impacted. Figure 19 on Page 102 gives the detail on an aerial photograph.
- **Carrigaline and environs** – six CH impacted and Figures 21 and 23 on Page 103/5 show the aerial photographs for the area.
- **WWTP at Shanbally** – three CH features on the periphery of the site are noted.
- **Ringaskiddy** – four CH features noted.
- **Cobh and environs** – Figure 20 shows seven CH figures and a separate number is allocated for the town of Cobh which is CH 26.

Cork County Council

From Page 39 to 48, 51 photographs relate to the cultural heritage features on the pipelines and also give a view of the fields in which the WWTP is proposed.

Chapter 4 of the report gives the archaeological and historical background of the various sections of the study area, including reference to transportation, activities, construction features of note and buildings. It also includes reports on recent archaeological excavations in the study area.

Section 4.3 refers to townland and barony boundaries and there are figures included indicating these boundaries.

Section 4.4 describes the protected structures and Table 4 gives a list of the protected structures in the vicinity of the pipeline excluding Cobh Town. Two of these are listed as being close to the proposed pipeline.

Chapter 5 of the report refers to constraints inventory, predicted impacts and suggested mitigation. Table 5 gives an inventory of the various cultural heritage sites. Tables 6 deals with the architectural constraints inventory.

Chapter 6 has discussion and overview and Chapter 7 is titled "The Conclusions and Suggested Mitigation Summary". The report states that visual impact in relation to pipelines is predicted not to be permanent, as they are to be buried. It states pumping stations and the WWTP are predicted to have permanent visual impacts on a number of CH sites and suitable screening is suggested in those cases. Tables 5 – 7 indicate the specific impact information for each site. The report states that in the event of the mitigation measures as detailed being implemented, there would be no residual impacts arising from the proposed development.

The appendix to the report is the ADCO Report which assesses the Intertidal/underwater locations in the study area at the Owenboy River and the ferry terminal crossing between Passage West and Carrigaloe. This report was produced by the Archaeological Diving Company Limited and is dated 20th October 2007.

The report states that the insertion of a pipeline between Cobh and Monkstown would result in a direct and significant impact to the existing riverbed/seabed environment. It states no archaeologically significant material, structures or deposits were encountered during the survey. It states that the pipeline along the upper foreshore at the Owenduff River does not represent a significant impact to the existing foreshore environment. Archaeological monitoring is recommended. As an appendix, a list of shipwrecks is given from before 1800.

Figure 6 and 7 at the end of the report indicate the locations in which a number of photographs were taken and these are also attached.

APPENDIX 8

Appendix 8 A – Landscape and Visual Assessment Report

This report sets out the methodology used and the impact assessment criteria and describes the receiving environment. It lists the scenic landscape objectives and the designated scenic routes. It notes the views of the site in the same order as given in the main volume of the EIS. The visual impacts of the treatment plant are also dealt with from the various points at which views are available. The report also deals with visual impacts at pumping stations and notes that in relation to residual impacts, they should be assessed after 7 to 10 years when planting has reached a level of maturity. It states that as there are no short-range views from the south, then distant views would result in barely noticeable glimpses of the treatment plant.

In an appendix to the report, landscape specifications are given and a larger scale drawing of the visual envelope and photo locations is included which is similar to that in the main volume of the EIS. A number of photographs are also included indicating the impact of the proposed WWTP site.

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