An Bord Pleanála Oral Hearing

Irish Water

Greater Dublin Drainage

Project Description; Consideration of Alternatives

&

EIAR Process

Ciarán O'Keeffe

GDD Oral Hearing
Brief of Evidence of Ciarán O'Keeffe
Project Manager Opening Brief

Qualifications and Role on the Proposed Project

1 My name is Ciarán O'Keeffe; I am a Chartered Engineer and a Senior Water Consultant with Jacobs Engineering. I am the Project Manager for the Proposed Project which is the subject of this Oral Hearing. My involvement in the Proposed Project began in 2011, when Jacobs were appointed by Fingal County Council to commence the Proposed Project and continued in 2014 when Irish Water took over water services generally and for the Proposed Project in particular.

2 I graduated from University College Galway (now NUIG) in 1978 with an Honours degree in Civil Engineering, and became a Chartered Engineer registered with Engineers Ireland in 2013.

3 I have approximately 30 years' relevant experience in the planning, design and construction of a variety of major water projects in Ireland. Most recently I was the Project Manager and Design lead for the Lower Liffey Valley Regional Sewerage Scheme, which entailed a major upgrade to, and rehabilitation of, the sewerage infrastructure in Leixlip, Maynooth, Kilcock and Celbridge, including the construction of 7km of new foul and surface water sewers, rehabilitation of 4.5km of existing foul sewer and the construction of 3 new pumping stations.

4 I am the Project Manager and Design lead on the Proposed Project, and have managed the Site & Route Selection, Preliminary Engineering Design, Environmental Impact Assessment and the Natura Impact Statement processes. I authored Chapter 3 The Need for the Proposed Project, Chapter 4 Description of the Proposed Project, Chapter 5 Consideration of Alternatives, and Chapter 22 Risk of Major Accidents and/or Disasters. I have the benefit therefore of being involved in the entire evolution of the Proposed Project's from its inception in 2011, through its reconsideration for Irish Water in 2016/2017 and during all of the preparation for the lodgement of the planning application for permission.

5 In this statement of evidence, pursuant to the Board's oral hearing agenda, the following elements are described:

- Description of the Proposed Project;
- Consideration of Alternatives; and
- Responses to various relevant issues raised in relation to these elements.
- EIAR Process

The Need for the Proposed Project

6 Mr Laffey has explained the need for the proposed project in his evidence this morning.

Description of the Proposed Project

7 The Proposed Project will comprise the following interlinked elements:

- Proposed WwTP to be located on a 29.8-hectare site in the townland of Clonshagh (Clonshaugh) in Fingal;
- Proposed SHC to be co-located on the same site as the proposed WwTP;
- Proposed orbital sewer route from Blanchardstown to the proposed WwTP at Clonshagh;
- Proposed Odour Control Unit (OCU) at the interface between the rising main and gravity sewer elements of the proposed orbital sewer route at Dubber;
- Proposed North Fringe Sewer (NFS) diversion sewer to the proposed WwTP;
- Proposed Abbotstown pumping station to be located in the grounds of the National Sports Campus (NSC);
- Proposed outfall pipeline route from the proposed WwTP to the outfall point approximately 1km north-east of Ireland's Eye; and
- Proposed RBSF to be located on an 11.4ha site at Newtown, Dublin 11.

Proposed Project Location

8 The Proposed Project will be located along the southern fringe of Fingal in north County Dublin, between Blanchardstown and Baldoyle, and in the marine environment off north County Dublin between Baldoyle Bay and Ireland's Eye. An overview is presented in Diagram 1.

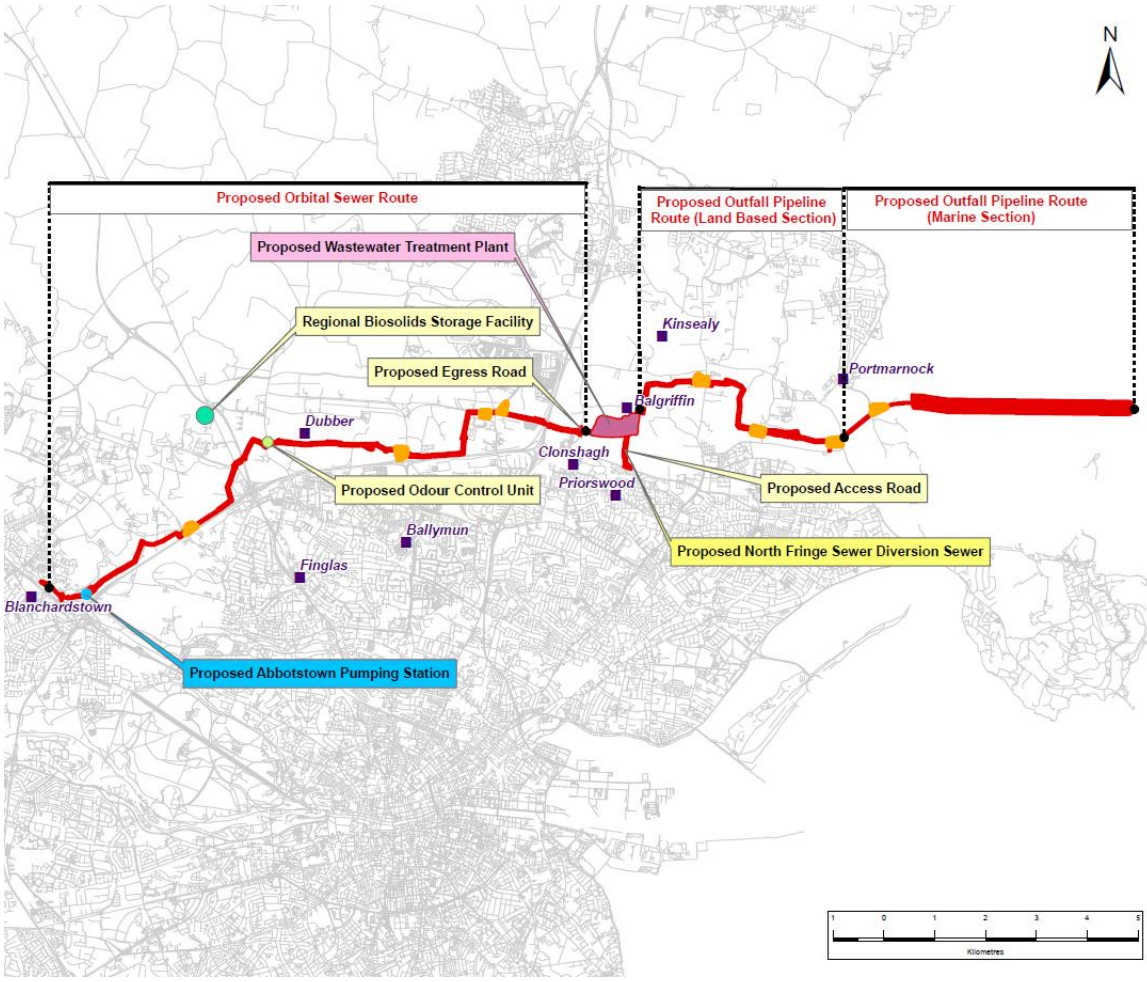

Diagram 1: <u>Overview of the Proposed Project and Location</u>

9 The proposed site for the proposed WwTP is in the townland of Clonshagh, Fingal. It is situated in open agricultural land approximately 2.4km south-east of Dublin Airport (Terminal 2) and approximately 500m north of the R139 Road. The Cuckoo Stream (a tributary of the Mayne River) lies immediately north, with the Mayne River itself approximately 400m south.

10 The proposed orbital sewer route, which will run from Blanchardstown to Clonshagh, will transfer flows from the existing Blanchardstown drainage catchment, which includes Blanchardstown and its environs, and towns and villages in Meath, to the proposed WwTP at Clonshagh. The proposed orbital sewer route will commence in the grounds of Waterville Park, Blanchardstown, where it will intercept the existing Blanchardstown main sewer line. From this point, it will be routed through the grounds of Connolly Hospital and the grounds of the NSC to the proposed Abbotstown pumping station, located adjacent to the M50 Motorway. From the proposed Abbotstown pumping station, the proposed orbital sewer route will be routed north of, and generally parallel to, the M50 Motorway to Clonshagh, and will pass south of the Dublin Airport complex. The lands along the length of the proposed orbital sewer route are generally open fields, and agriculture is the main land use pattern. The total length of the proposed orbital sewer route will be approximately 13,700m. There are no environmentally designated sites within the proposed orbital sewer route. The proposed OCU will be located adjacent to the R122 Road at the interface between the rising main and gravity sewer elements of the proposed orbital sewer route at Dubber.

11 The proposed NFS diversion sewer will transfer flows in the NFS upstream of the point of interception to the proposed WwTP. It is proposed to intercept the NFS near the junction of the proposed access road to

the proposed WwTP with the R139 Road. The proposed NFS diversion sewer will then be routed to the proposed WwTP along the proposed access road. The total length of this diversion sewer will be 600m.

12 The proposed outfall pipeline route will consist of a land based section (Clonshagh to Baldoyle), a marine section (Baldoyle to Ireland's Eye) and a multiport marine diffuser. The proposed outfall pipeline route (land based section) will commence at the proposed WwTP and will be routed in an easterly direction towards the coast between Baldoyle and Portmarnock.

13 The proposed outfall pipeline route (marine section) will commence at the R106 Coast Road, north of Baldoyle, and will be routed in a north-easterly direction across Baldoyle Estuary to the public car park immediately north of Portmarnock Golf Club, where it will turn in an easterly direction and will terminate approximately 1km north-east of Ireland's Eye.

14 The proposed multiport marine diffuser will be located on the final section of the proposed outfall pipeline route (marine section) and will consist of a number of vertical risers from the proposed outfall pipeline (marine section) to above seabed level. Diffuser valves will be attached onto the vertical risers to allow the treated wastewater to achieve the required initial dilution on discharge to the marine environment.

15 The total length of the proposed outfall pipeline route will be approximately 11,400m, with the land based section comprising 5,400m and the marine section, including the multiport diffuser, comprising 6,000m.

16 The coast in the vicinity of the proposed outfall pipeline route (marine section) is characterised by sandy beaches. Water depths in this area range from 0m to 25m Lowest Astronomical Tide. The seabed is gradually sloping eastward and the bottom is sandy in nature with a varying depth to bedrock.

17 The proposed outfall pipeline route (marine section) will terminate within the Irish Sea Dublin (HA 09) Coastal Water Body as defined under the Water Framework Directive (WFD) (2000/60/EC) .

18 Designated areas within the vicinity of the proposed outfall pipeline route (marine section) are illustrated on Figure 4.2 Designated Areas in the Vicinity of the Proposed Project in Volume 5 Part A of the EIAR and include:

- Baldoyle Bay candidate Special Area of Conservation (cSAC) (000199);
- Baldoyle Bay Special Protection Area (SPA) (004016);
- Rockabill to Dalkey Island cSAC (003000);
- Ireland's Eye cSAC (002193);
- Ireland's Eye SPA (004117);
- Malahide Shellfish Waters; and
- Dublin Bay UNESCO Biosphere

19 The proposed outfall pipeline route (marine section) will cross under the estuary habitats of Baldoyle Bay cSAC (site code: 000199) and Baldoyle Bay SPA (site code: 004016) and will terminate within the Rockabill to Dalkey Island cSAC (site code: 003000).

20 The proposed RBSF will be located in the townland of Newtown, Dublin 11. The proposed site is 11.4ha in area, situated adjacent to the R135 Finglas Road and north-east of Huntstown power station. Fingal County Council (FCC) has partially developed the proposed site (i.e. road infrastructure, drainage, power,

boundary treatments, access/egress gates to the R135 Finglas Road and some administration buildings) for a waste recycling centre, in accordance with planning permission PLO6F.EL.2045. The land is zoned for waste activities.

21 There are no environmentally designated sites within or adjacent to the proposed RBSF site.

Proposed Project Elements

Proposed Wastewater Treatment Plant

22 The proposed site for the proposed WwTP is located in the townland of Clonshagh in Fingal, as shown in Figure 4.3 Proposed Wastewater Treatment Plant Site in Volume 5 Part A of the EIAR.

23 The proposed WwTP will be situated on 29.8ha of open agricultural land, approximately 2.4km south-east of Dublin Airport and approximately 500m north of the R139 Road. The Cuckoo Stream (a tributary of the Mayne River) lies immediately north of the proposed WwTP site, with the Mayne River itself lying approximately 400m to the south of the proposed WwTP site.

24 The southern boundary of the proposed WwTP site is defined by a future road, the Malahide Road to Stockhole Lane section of the proposed East–West Distributor Road, as set out under Road Construction and Improvement Measures (Objective MT41, Table 7.1 and Drawing 11) in the Fingal Development Plan 2017 – 2023 (FCC 2017).

25 The lands slope in a west-east direction from 45.00 metres above Ordnance Datum (mOD) to 39.00mOD with a central elevation of approximately 42.30mOD.

Proposed Treatment Capacity

26 The wastewater treatment capacity to be provided under the Proposed Project is 500,000PE.

Proposed Design Basis

27 Table 1 tabulates the Design Basis using the following typical unit loads: 60g Biochemical Oxygen Demand (BOD) per head per day (BOD/hd/d); 70g Total Suspended Solids (TSS)/hd/d; 12g Total Kjeldahl Nitrogen (TKN)/hd/d; 9g Ammoniacal Nitrogen (AmmN)/hd/d; and 2.5 g/hd/d Total Phosphorus (TP). A maximum week peaking factor of 1.5 is applied to the average daily loadings.

Table 1: Proposed Design Basis

Design Parameter	Design Value	Unit of Measurement
Population equivalent (PE)	500,000	PE
Domestic per Capita Design Flow (G)	0.225	m^3/hd/day
Dry Weather Flow (DWF)	112,500	m^3/d
Flow to Full Treatment (FFT)	281,250 3.26	m^3/d m^3/s
Average Dry Weather Flow (ADWF)	140,625	m^3/d
BOD	30,000	Kg/d
TSS	35,000	Kg/d
Ammonia (N)	4,500	kg/d
TKN	6,000	kg/d
TP	1,250	kg/d

Proposed Treatment Standards

28 It is proposed, subject to the granting of a wastewater discharge licence by the EPA, that the final treated wastewater produced at the proposed WwTP should conform to the standards outlined in Table 2.

Table 2:Final Wastewater Emission Limits for the Proposed WwTP

Parameter		Emission Limit
pH		6 – 9
Temperature		25°C (max)
BOD_5[1]	95th Percentile	25mg/l O_2
	Not to be exceeded	50mg/l O_2
Chemical Oxygen Demand (COD)	95th Percentile	125mg/l O_2
	Not to be exceeded	250mg/l O_2
TSS	95th Percentile	35mg/l
	Not to be exceeded	87.5mg/l

29 The extensive modelling studies undertaken on the expected discharge have confirmed that, for the identified proposed outfall location and the emission limit values (Table 2), the receiving water will meet good status criteria and will meet the environmental quality objectives for coastal water nutrients levels.

30 The modelling studies have also confirmed that:

- The Proposed Project will assist in achieving the goals of the WFD (i.e. reaching good status in all water bodies);
- The proposed discharge location will not negatively impact any designated bathing waters;
- The Proposed Project will have a negligible impact on the quality the coastal waters off County Dublin

31 In its report on the application, Fingal County Council raised issues in relation to the modelling of ecoli concentrations in the treated effluent. In response to those submissions, MarCon carried out revised modelling, assuming a higher level of coliform concentrations in the effluent than modelled in the original application (300,000cfu/100ml instead of 39,000 cfu/100ml for the flow to full treatment scenario). That modelling, which Alan Berry of Marcon will give evidence on this afternoon, showed that the level of concentration fluctuated with the ebb and flow of tides, providing equal time for uptake/accumulation and subsequent clearance/removal of any coliforms by the shellfish and on that basis concluded that there was not predicted to be any impact on the shellfish water quality as a result of the Proposed Project. This is detailed in the Response.

32 Subsequent to the Response and having regard to the submissions made by Fingal County Council and members of the public including fishermen, Irish Water asked us to carry out some further analysis, which my colleague Marja Aberson, who is a marine ecologist specialising in shellfish, completed. Her advice was to the effect that as an abundance of caution to ensure the protection of the shellfish, additional treatment should be applied to the effluent. Irish Water has determined that it will apply UV treatment to all effluent discharges. The utilisation of UV treatment does not require any additional structures or changes to planned structures.

[1] *BOD 5 day limit*

Design

33 The proposed WwTP will be designed, built and operated to achieve the required emission limit values listed in Table 2 or as conditioned by the EPA, and a design has been undertaken to assess the environmental impacts of the Proposed Project in this context. .

34 The proposed WwTP will consist of several buildings and tanks of various shapes, sizes and heights, part below ground and part above ground. The maximum height of buildings will be 18m above ground level.

35 Three layouts for the proposed WwTP have been developed for the site based on a conventional Activated Sludge Plant (ASP), a Sequencing Batch Reactor (SBR) plant and an Aerated Granular Sludge (AGS) plant, as shown on Planning Drawing Nos. 32102902 – 2120, 32102902 - 2138 and 32102902 - 2139 respectively.

36 The EIAR has taken full account of the design and layout required for the type of treatment process envisaged by the WwTP. However, the final number of tanks will depend on the final structure design and precise treatment process used to meet the required environmental standards.

37 The EIAR has taken full account of the possible maximum environmental impacts from the type of treatment process envisaged by the WwTP.

38 Each of layouts have been broken into three zones, as illustrated in Figure 4.5 Zonal Arrangement of the Proposed WwTP in Volume 5 Part A of the EIAR, with the western zone (Zone 1) containing the inlet works, which includes the preliminary unit treatment processes, and the primary sedimentation tanks. The middle zone (Zone 2) contains the biological treatment tanks and final settlement tanks (clarifiers). The sludge treatment facilities are contained in the eastern zone (Zone 3).

39 Typical unit treatment processes will include:

- Preliminary Treatment (Zone 1), which is a physical/mechanical process which is designed to remove gross suspended and floating materials from the raw wastewater before they damage/clog the pumps or downstream treatment processes. Preliminary treatment involves screening (coarse and fine screens) to remove papers and plastics as well as fats, oils, grease and grit removal, prior to sedimentation;

- Primary Sedimentation (Zone 1) which is a settling process where the larger solids in the wastewater are settled out by gravity in large tanks (settlement or sedimentation tanks). The settled solids are removed from the tanks by mechanical scrapers and transferred to the sludge treatment facilities;

- Biological Treatment (Zone 2) where organic matter in the wastewater is broken down through the action of bacteria which is facilitated by the addition of air (aeration). Sludge produced during this process is removed from the tanks and transferred to the sludge treatment facilities;

- Final Settlement (Zone 2) where any organic matter carried over from the biological treatment is settled out in large tanks, removed from the tanks by mechanical scrappers and transferred to the sludge treatment facilities; and

- UV disinfection of final treated wastewater (Zone 2) prior to discharge.

- Testing of final treated wastewater (Zone 2) prior to discharge.

40 The maximum height for any building at the proposed WwTP site will be 18m as shown in Planning Drawing Nos. 32102902-2120 to 2139.

Proposed Sludge Hub Centre

41 The proposed SHC will be co-located with the proposed WwTP on the site at Clonshagh. The proposed SHC will occupy the eastern zone (Zone 3) of the proposed WwTP site.

42 The proposed SHC will have the capacity to provide sustainable treatment for municipal wastewater sludge and domestic septic tank sludges generated in Fingal to produce a 'biosolid' end-product. In addition, the proposed SHC will be designed to accept sludge from private property owners within the area of Fingal who are currently served by septic tank or individual domestic wastewater treatment systems.

43 The sludge treatment capacity to be provided under the Proposed Project is 18,500 tonnes of dry solids (TDS)/annum to provide for a projected 750,000PE at the design year horizon of 2050. This figure caters for the import of sludge from other municipal WwTPs in Fingal.

44 The construction of the proposed SHC will include all the necessary buildings, tanks, ancillary structures, and mechanical and electrical plant that will be required to provide the required design treatment capacity. The maximum height of buildings in the proposed SHC will be 18m above ground level.

45 The wastewater sludges generated at other municipal WwTPs, septic tanks and individual domestic wastewater treatment systems will be transported to the proposed SHC via the road network in tankers and/or covered skips.

46 In accordance with the NWSMP, it is proposed to treat the sludge using advanced anaerobic digestion to produce a 'biosolid' end-product suitable for reuse in agriculture, with the biogas produced during the treatment process used on-site for energy recovery.

47 The 'biosolid' end-product will be transported to the proposed RBSF via the road network in covered trucks for seasonal storage.

48 Standard unit processes in the proposed SHC include:

- Buffer tanks;
- Dewatering (centrifuges);
- Thermal hydrolysis (providing pasteurisation) tanks;
- Mesophilic anaerobic digestion tanks;
- Sludge/biosolid operational storage building; and
- Biogas storage.

Landscape Treatment for the Proposed WwTP and SHC

49 Visual screening (organic embankments) of the proposed WwTP site will be provided for boundaries adjoining the rural context to the east, north and west of the proposed WwTP site. Embankments will be planted with dense bands (approximately 15m to 20m wide) of hedgerow tree species and will rise to a maximum height of 4m. This will be achieved using a buffer zone width of approximately 60m. Between the mounds, specimen trees will be provided rising from a more open wildflower meadows context. The dense but linear bands of hedgerow vegetation topping the mounds will reference the hedgerows and tree-lined

field boundaries of the agricultural fields in the vicinity. The meadow and specimen trees between the dense sections of hedgerow planting will reference the parkland aesthetic of the nearby demesne landscapes to the east.

Diagram 2: <u>WwTP – Landscape Plan</u>

50 In deliberate contrast to the organic and semi-rural boundary treatments of all other site boundaries, the southern boundary will be presented as a bold architectural landscape treatment in order to tie in with the future development of the lands to the south (future IDA Business Park). The buildings along this boundary of the proposed WwTP site will be aligned to provide a consolidated facade to front the future East–West Distributor Road between the proposed WwTP site and the IDA Business Park lands. The buildings will be set back to a sufficient degree in order to reduce their perceived height and bulk within the future street scene. This area will incorporate geometric blocks of dense ornamental shrubs and a 'bosque' or grid of tall narrow specimen trees such as poplars. A plinth wall and system railing will be provided and will be an attractive, subtle and secure physical boundary.

51 Semi-mature tree planting (minimum 14cm to 16cm girth) will be used for all planting along the southern boundary to aid early establishment. Mixed-age classes ranging from semi-mature (minimum 14cm to 16cm girth) down to feathered whips (approximately 1.25m tall) will be utilised for perimeter berms in order to establish a dense screen over a longer period of time. It is envisaged that it will take up to seven years for all planting to reach a maturity that will afford the intended screening effectiveness.

Access

52 Construction and operation access for the proposed WwTP will be from the R139 Road (formerly the N32 National Road) with egress to the Clonshaugh Road. A comprehensive Traffic Management Plan will be put in place for the Construction Phase and it will incorporate a left turn in/left turn out policy i.e. entry to site would be limited to left turn only from the R139 Road and egress from the site would be limited to left turn out only to the Clonshaugh Road.

Odour Control

53 An odour control system will be implemented to ensure that odour does not give rise to any nuisance beyond the boundary of the proposed WwTP. The system will involve extracting air from within the various buildings and tanks on a continuous basis. Fans located outside, adjacent to the OCU, will draw air though ducting to the OCUs comprising an organic filer media. The treated air will be emitted to the atmosphere through vertical stacks which will extend to a maximum height of 24m above ground level.

Construction Methodology

54 Construction of the proposed WwTP will involve:

- Excavation for building foundations and tanks;
- Reinforced concrete works;
- Erection of structural steel/concrete building frames;
- Erection of building walls (concrete/blockwork)
- Erection of prefabricated cladding panels to walls and roofs of buildings;
- Erection of prefabricated steel tanks;
- Mechanical and electrical fit out of buildings and tanks;
- Installation of below and above ground pipework;
- Construction of screening berms;
- Construction of access/egress roads to/from site; and
- Internal circulation roads, car parks and footpaths, landscaping and final planting.

Proposed Orbital Sewer Route

55 The proposed orbital sewer route (Blanchardstown to Clonshagh) will commence at the proposed point of interception/diversion (Waterville Park, Blanchardstown). From here, it will be routed for 1km in an easterly direction through the grounds of Connolly Hospital towards the proposed Abbotstown pumping station, which will be located adjacent to the M50 Motorway in the grounds of the NSC at Abbotstown.

56 At the proposed Abbotstown pumping station, the proposed orbital sewer route will turn north-east to run generally parallel to the M50 Motorway for approximately 3.6km before diverting in the townland of Kildonan, in a northerly/north-easterly direction, to avoid the electricity substation located at the junction of the M50 Motorway and the N2 National Road. The proposed orbital sewer route will cross the N2 National Road immediately north of the electricity substation.

57 At chainage 6,000m, the proposed orbital sewer route will turn eastwards again and will continue in an easterly direction for 2.4km, crossing north of Dubber Cottages to chainage 8,400m in the townland of Silloge.

58 At this point, the proposed orbital sewer route will turn in a south-easterly direction, passing through North Point Business Park, to chainage 9,100m in the townland of Ballymun, at the M50 Motorway/R108 Road interchange.

59 Between chainage 9,100m and chainage 10,200m, the proposed orbital sewer route will run parallel to and immediately north of the M50 Motorway through the Dardistown Local Area Plan lands.

60 At chainage 10,200m, in the townland of Turnapin Great, the proposed orbital sewer route will turn north and will be routed through Ballystruan townland and immediately east of the proposed Metro North Depot, until chainage 11,100m at the 'Old Airport Road' in the townland of Collinstown.

61 At chainage 11,100m, the proposed orbital sewer route will then turn in an easterly direction for the final 2.6km to the proposed WwTP site at Clonshagh. En route, this section will run parallel to the southern edge of the Old Airport Road, crossing the R132 Swords Road at Collinstown Cross (chainage 11,650m). The proposed orbital sewer route will then run immediately north of and parallel to the northern boundary of Dardistown Cemetery, crossing the M1 Motorway (chainage 12,700m) and the Clonshaugh Road (chainage 13,390m) before entering the western side of the proposed WwTP site (chainage 13,700m) in the townland of Clonshagh.

62 The topography along the proposed orbital sewer route will rise from Tolka River Valley, at approximately the 40mOD contour, to in excess of 84mOD in the vicinity of the R122 Road (chainage 6,200m), before gradually dropping towards the proposed WwTP site at Clonshagh at a ground level of the order of 44mOD.

63 Between chainage 0,000m and chainage 1,000m, the proposed orbital sewer route will operate as a gravity sewer. Between chainage 1,000m and chainage 6,250m, the proposed orbital sewer route will operate as a pumped rising main. Between chainage 6,250m and chainage 13,700m, the proposed orbital sewer route will again operate as a gravity sewer.

64 An OCU is proposed to be installed at chainage 6,250m adjacent to the R122 Road at the interface between the rising main and the gravity sewer at Dubber to mitigate against the potential for odours that may be released from the proposed orbital sewer route at this location.

Proposed North Fringe Sewer Diversion Sewer

65 The proposed NFS diversion sewer will transfer flows in the NFS upstream of the point of interception to the proposed WwTP. It is proposed to intercept the NFS near the junction of the proposed access road to the proposed WwTP and the R139 Road in lands within the administrative area of Dublin City Council. From this point, the proposed NFS diversion sewer will be routed in a northerly direction to the proposed WwTP along the proposed access road. The length of the proposed NFS diversion sewer from the point of interception to the proposed WwTP will be 600m, with a required diameter of 1,500mm.

66 Within the proposed WwTP site, the proposed NFS diversion sewer will be routed in a westerly direction to the proposed inlet works. The length of this section of the proposed NFS diversion sewer will be 570m, with a required diameter 800mm.

67 The topography along the proposed NFS diversion sewer will generally be a rising profile from 36.30mOD at the point of interception to 40.20mOD at the main gate of the proposed WwTP site and 44.50mOD at the inlet works.

68 The proposed NFS diversion sewer will operate as a gravity sewer between the point of interception and the proposed WwTP, and as a pumped rising main within the proposed WwTP site.

Proposed Abbotstown Pumping Station

69 The proposed Abbotstown pumping station site will be located in the grounds of the NSC, Abbotstown, adjacent to the M50 Motorway as indicated on Planning Drawing No 32102902 - 2140.

70 The estimated pumping capacity required for the proposed Abbotstown pumping station is indicated in Table 3: .

Table 3: Pumping Requirement for Abbotstown Pumping Station

Scenario	Peak Pumped Flow	Rising Main Diameter	Rising Main Length	Static Lift	Friction and Form Losses	Pump Power Requirements
Pumped Flow @ 3 times the dry weather flow (DWF)	2.5m³/s	1,400mm	5,200m	46m	14m	2,300kW

Proposed Abbotstown Pumping Station Arrangement

71 The proposed Abbotstown pumping station will consist of a single one-storey building over basement. The above ground building will have a floor area of 305m^2 and maximum height above ground level of 10m and will house the control room, welfare facilities, back-up diesel generator, surge vessels, odour control equipment, septicity control dosing equipment and storage facilities.

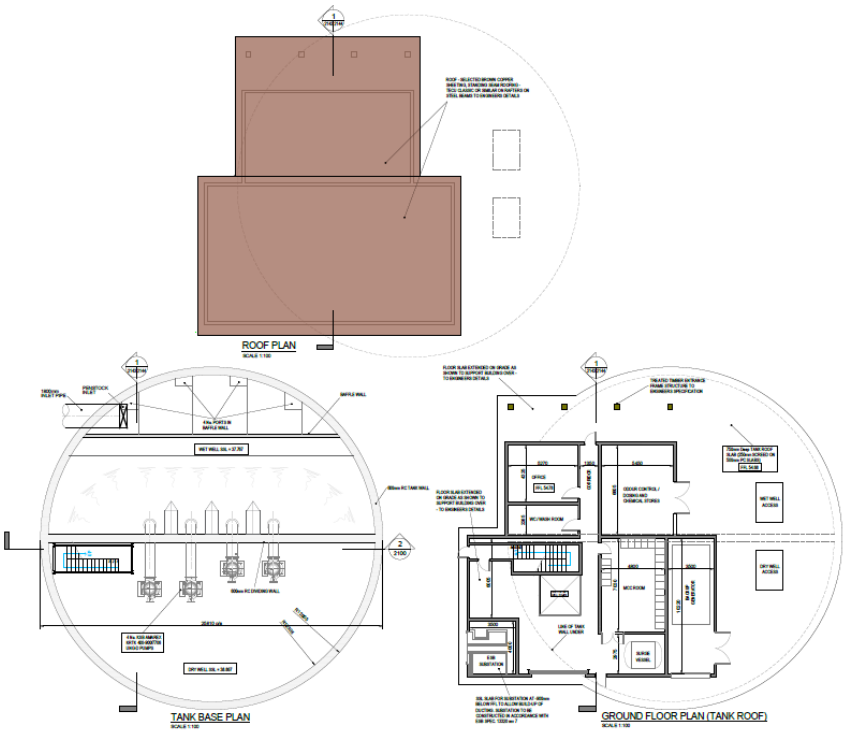

Diagram 3: <u>Abbottstown Pumping Station</u>

72 The basement will be 17m in depth with floor area of 524m^2 incorporating the wet/dry wells housing the pumps in duty, assist, standby configuration, suction pipework and rising main manifold pipework.

73 The proposed Abbotstown pumping station will be constructed in reinforced concrete with finishes as shown on Drawing No 32102902 - 2144

Architectural Treatment

74 The proposed Abbotstown pumping station site will be located in the grounds of the NSC. The nearest building will be St. Francis' Hospice, a timber and brick building embracing nature through large glass windows.

75 The planning and architectural response to this will be to design a modern interpretation of a timber Victorian garden gazebo, set in a carefully designed landscape. In visual terms, this design seeks to integrate itself into the architectural curtilage of St. Francis' Hospice.

76 The building is designed with attractive but robust finishes over a hardened concrete shell to prevent potential vandalism and to minimise noise and odour impacts, as illustrated on Planning Drawing Nos. 32102902 – 2141 to 32102902 - 2145.

77 In order to provide for correct operation and maintenance, the proposed Abbotstown pumping station will require the following ancillary facilities all of which will be housed within the above ground structure:

- A control room to provide for the required power and control instrumentation;
- Welfare facilities;
- A back-up diesel generator;
- Surge vessels;
- Storage for spare parts and equipment;
- Odour control and treatment; and
- Septicity control dosing equipment.

78 Construction and operation access for the proposed Abbotstown pumping station will be through the grounds of the NSC, as shown on Planning Drawing No. 32102902 – 2140.

79 An odour control system will be implemented to ensure that odour does not give rise to any nuisance beyond the boundary of the proposed Abbotstown Pumping Station site.

80 The system will involve extracting air from the wet well and dry well on a continuous basis. Fans located in the odour control room, will draw air though ducting to the OCU comprising an organic filer media. The treated air will be emitted to the atmosphere through vertical stacks which will extend to a maximum height of 10m above roof level of the building.

Construction Methodology

81 The preliminary design of the proposed Abbotstown pumping station indicates that the invert level of the inlet sewer is approximately 17m deep, and as a result, the base slab for the wet well and dry well will be constructed significantly below the existing ground level.

82 Construction of the proposed Abbotstown pumping station will be undertaken using conventional construction methodologies and will involve deep excavation for basement wet well/dry well, reinforced concrete works, erection of reinforced concrete building frame, erection/building walls (concrete/blockwork); erection of prefabricated cladding panels to walls and roofs of building, mechanical and electrical fit out of building, construction of access road car park and footpaths, landscaping and final planting.

83 Preliminary site investigation indicates rock at approximately 2.5m below ground level. The rock shall be excavated to the required invert level in such a manner as to minimise noise generation. Overburden above the rock will most likely be retained using a temporary concrete retaining wall. All excavated material will be removed off site to an appropriately licenced facility.

Proposed Outfall Pipeline Route (Land Based Section)

84 Commencing at the northern boundary of the proposed WwTP, the proposed outfall pipeline route (land based section) will be routed in a northerly direction for 0.7km to chainage 0,700m in the townland of Baskin. At this point, the proposed outfall pipeline route (land based section) will turn eastwards for 1.95km to chainage 2,650m in the townland of Kinsaley (Kinsealy), crossing the R107 Malahide Road (chainage 1,870m) en route. At chainage 2,650m, the proposed outfall pipeline route (land based section) will turn in a southerly direction for 0.75km to chainage 3,400m in the townland of Saintdoolaghs. At this point, the proposed outfall pipeline route (land based section) will again turn in an easterly direction for approximately 2km and will be routed parallel to and north of the R123 Moyne Road before reaching the R106 Coast Road (chainage 5,400m) in the townland of Maynetown. En route, the proposed outfall pipeline route (land based section) will cross the R124 Road (chainage 3,900m) and the Dublin – Belfast Rail Line (chainage 4,570m) in the townland of Drumnigh.

85 The topography along the proposed outfall pipeline route (land based section) is generally a falling profile from 39.00mOD at the boundary fence of the proposed WwTP to 9.00mOD at the R106 Coast Road.

86 The proposed outfall pipeline route (land based section) will operate as a pressurised gravity sewer.

Proposed Orbital Sewer Route (Marine Section)

87 The proposed outfall pipeline route (marine section) (Baldoyle to Ireland's Eye) will commence at chainage 0,000m in the townland of Maynetown in open fields immediately west of the R106 Coast Road and approximately 90m north of R123 Moyne Road.

88 From here, the proposed outfall pipeline route (marine section) will be routed in a north-easterly direction for approximately 1km across Baldoyle Estuary to the grassed area (chainage 1,010m) adjacent to the public car park (refer to Diagram) in the townland of Burrow, immediately north of Portmarnock Golf Club. En route, the proposed outfall pipeline route (marine section) will cross the R106 Coast Road (chainage 0,090m), and the Golf Links Road (chainage 0,850m). From this grassed area, the proposed outfall pipeline route (marine section) will turn in an easterly direction and will be routed out to sea for approximately 5km before terminating at the discharge location (chainage 5,940m), located approximately 1km north-east of Ireland's Eye.

Diagram 4: Grassed Area North of Portmarnock Golf Club

89 The topography along the proposed outfall pipeline route (marine section) is generally a falling profile from 9.00mOD at the R106 Coast Road to 2.80mOD in the green area at section chainage 1,010m, and -22.84mOD at the discharge location north-east of Ireland's Eye. The proposed outfall pipeline route (marine section) will operate as a pressurised gravity sewer.

Chambers on the Proposed Pipeline Routes

90 Access chambers, manholes, air valves, scour valves and vent stacks are required to be constructed for the proper functioning, maintenance and operation of the proposed orbital sewer route and the proposed outfall pipeline route. A brief description is included in Table 4.

Table 4: Chambers, Manholes, Air Valves and Scour Valves

Air Valves	Scour Valves	Manholes	Access Chambers
Air valves in pumped rising main systems serve two primary functions: the regular release of accumulated air from the pressurised system, and to discharge large volumes of air from the pumped rising system when the pipeline is initially filled. They are generally located at high points along rising main length.	Scour valves are required at the low points on pumped rising main systems to facilitate the drain down of the pumped rising main system during maintenance.	Access manholes will be constructed to facilitate access to the gravity sections of the proposed orbital sewer route (chainage 6,250m to 13,700m) for maintenance purposes. Manholes will be located at bends, changes in gradient and at approximately 200m centres along the proposed orbital sewer route.	Access chambers will be constructed to facilitate access to the proposed outfall pipeline route (land-based section) for maintenance purposes.

Proposed Construction Corridor and Proposed 20m Wayleave

91 A proposed construction corridor will be temporarily acquired for the construction of all proposed pipeline routes, including the proposed orbital sewer route, outfall pipeline route and the NFS diversion sewer.

92 The proposed construction corridor will be a temporary corridor, approximately 40m wide along all land based elements of the Proposed Project, and 250m wide for the dredged section of the proposed outfall pipeline route (marine section) which commences at the low tide mark.

93 The proposed 20m wayleave will lie within the proposed construction corridor and a permanent right of access for maintenance during operation will be acquired.

94 In addition, proposed temporary construction corridors will be required for the proposed temporary construction compounds along all proposed pipeline routes and at the proposed Abbotstown pumping station site and proposed WwTP site.

95 Fencing will be provided on both sides of the proposed construction corridor along all proposed pipeline routes. A typical arrangement of construction activities within the proposed construction corridor is illustrated in Figure 4.6 Typical Detail of the Proposed Pipeline Route Construction Corridor in Volume 5 Part A of the EIAR.

Access and Proposed Temporary Construction Compounds

96 Access to the proposed pipeline routes for construction and operation will be via the public road network and along the permanent wayleave, where practicable. However, in certain circumstances it will not be possible to access the proposed pipeline routes along the proposed construction corridor, and in these circumstances, access will be along permanent wayleaves acquired through third party lands.

97 To facilitate the construction of the Proposed Project, proposed temporary construction compounds will be required at various locations (e.g. at the proposed Abbotstown pumping station site, various locations along the proposed pipeline routes, trenchless crossing locations, etc.). The proposed temporary construction compounds will be in place for periods of 1 to 12 months, depending on their location and the construction activity taking place at that particular location.

98 The proposed temporary construction compounds will have a site office, welfare facilities, parking and a materials storage area. The proposed locations for the proposed temporary construction compounds are identified on Planning Drawing Nos. 32102902 – 2001 to 32102902 - 2011.

Proposed Construction Methodology for Proposed Pipeline Routes

99 The Outline Construction Environmental Management Plan (CEMP) provides a construction methodology for the Proposed Project, with key elements summarised in the following paragraphs.

100 The construction methodology for the proposed land based pipeline routes will be a combination of open cut and trenchless methods, which are well-tried and understood. A conventional open cut methodology will be employed for the majority of the proposed land based pipeline routes. A typical work sequence for a conventional open cut methodology is as follows:

- Fence pipeline wayleave;
- Fence proposed temporary construction compound area;
- Establish the proposed temporary construction compounds;
- Strip topsoil carefully and store to one side of the proposed construction corridor for later reinstatement;
- Import pipes and string along the proposed construction corridor;
- Excavate pipeline trench and store to side of the proposed construction corridor (opposite side to topsoil storage) for later reinstatement;

- Import granular pipeline bedding material and place in excavated trench;
- Place pipeline on bedding material in excavated trench;
- Import granular pipeline surround material and place around pipeline in excavated trench;
- Test pipeline for watertightness;
- Backfill pipeline trench with suitable excavated material;
- Remove excess excavated material off site;
- Reinstate land drains; and
- Reinstatement of the proposed construction corridor to pre-construction condition (e.g. replacement of topsoil, seeding and replanting as appropriate) in accordance with the Outline CEMP for the Proposed Project.

101 Open cut methodology will not be suitable for all of the proposed pipeline routes, as a number of areas will require the use of trenchless techniques. In particular, the crossing of physical, natural and manmade obstructions, such as significant watercourses, major roads, railways and major infrastructure, will necessitate the use of trenchless techniques.

102 Suitable trenchless techniques include pipe jacking and microtunnelling methods. Trenchless techniques require drive shafts to be constructed at the start of each trenchless section and reception shafts at the end. These shafts will be constructed within the proposed temporary construction compounds located within the proposed construction corridor.

103 At watercourse crossings, the drive and reception shafts will be located a minimum of 20m from the watercourse to avoid impacting the watercourse.

104 Locations where trenchless techniques will be employed are indicated on Planning Drawing Nos. 32102902 – 2100 to 32102902 - 2107.

105 The proposed outfall pipeline route (marine section) will be constructed using microtunnelling and subsea pipe laying (dredging) techniques.

106 Microtunnelling techniques will be used between section chainage 0,000m and chainage 2,000m, from the open fields immediately west of the R106 Coast Road to approximately 600m offshore terminating below the low tide water mark.

107 The microtunnelled section will have an internal diameter of 2m and will be constructed at depths between 15m and 20m below ground level using a microtunnelling machine, with pipe sections installed as the microtunnelling machine progresses.

108 The microtunnelled section will require two proposed temporary construction compounds onshore, in the open field immediately west of the R106 Coast Road (proposed temporary construction compound no. 9) and in the grassed space adjacent to the public car park off the Golf Links Road, immediately north of Portmarnock Golf Club (proposed temporary construction compound no. 10).

109 At proposed temporary construction compounds no. 9 and no. 10, the drive/reception shafts will be constructed, tunnelling equipment will be located, and the tunnel materials will be stored temporarily.

Waste material from the tunnel will be removed and disposed of in accordance with waste management legislation.

110 Preliminary analysis estimates that microtunnelling will progress at a rate of approximately 60m per week and that the tunnelling will take in the region of 12 months. Microtunnelling will operate on a continuous 24-hour/7-day basis for the duration of the tunnelling works.

111 On completion of the construction works, proposed temporary construction compounds no. 9 and 10 will be dismantled and the ground will be reinstated to its original condition.

112 The proposed area for temporary construction compounds no. 9 and no. 10 will require a plan area of approximate dimensions of 150m x 100m and will contain the following plant and facilities:

- Office area including car parking;
- Launch (Jacking) shaft with Jacking station;
- Tunnelling equipment including:
    - Tunnel Boring Machine (TBM);
    - Control unit;
    - Hydraulic pump units;
    - Generators;
    - Bentonite mixing plant; and
    - Water separation plant;
- Storage area for jacking pipes, fuel, bentonite;
- Crane; and
- Excavator.

113 Subsea pipe laying (dredging) techniques will be used between chainage 2,000m and the final outfall location (chainage 5,940m).

114 A 5m deep trench of trapezoidal section will be excavated using a combination of backhoe dredger in the shallower areas and trailer suction hopper dredger (TSHD) where the water depths are beyond the limits of the backhoe dredger.

115 Excavated material from the backhoe dredger will be placed in a barge and subsequently deposited and stockpiled parallel to the proposed outfall pipeline route (marine section) trench, within the 250m wide proposed construction corridor. Where the TSHD is used it will deposit and stockpile in the same location.

116 The stockpiled material will be subsequently reused to refill the trench over and around the pipe once it is installed.

117 Long length large diameter (LLLD) polyethylene pipe will be utilised on this dredged section of the proposed outfall pipeline route. These pipes will be constructed at the factory in the required diameter in continuously extruded strings up to 650m long.

118 The assembled pipeline strings will then be towed to the proposed outfall pipeline route (marine section) location and surface positioned over the dredged trench. The pipeline will then be installed in the dredged trench in a continuous operation involving:

- Surface to seabed transfer utilising the polyethylene pipe's flexible properties (the 'S-bend' installation method);
- Submersion by water filling/air evacuation; and
- Connecting the pipeline strings together, using mechanical joints, as the installation progresses.

119 Once the pipe is confirmed to be in place at the bottom of the trench, the previously excavated material will be replaced around and over the pipe.

120 The diffuser valves will be installed (bolted) on the vertical risers using marine divers. These valves are integral to the final section of the proposed outfall pipeline route (marine section). Preliminary analysis indicates that the construction period for the subsea pipe-laying element would take six months. However, it should be noted that all marine operations are weather dependent.

Proposed RBSF

121 The purpose of the development of the proposed RBSF is to provide a facility, serving the Greater Dublin region, for the storage of treated wastewater sludge (biosolids) prior its reuse on agricultural lands. The sources of biosolids to be stored at the proposed RBSF are the Ringsend WwTP and the Proposed Project WwTP.

122 The location for the proposed RBSF is at a site in Newtown, Dublin 11. It comprises approximately 11 hectares of partially developed land and is situated off the R135 Road, on the western side of the N2 National Road. It is approximately 1.6km north of Junction 5 (Finglas) on the M50 Motorway and 1.5km west of Dublin Airport. The location of the proposed RBSF is shown in Diagram .

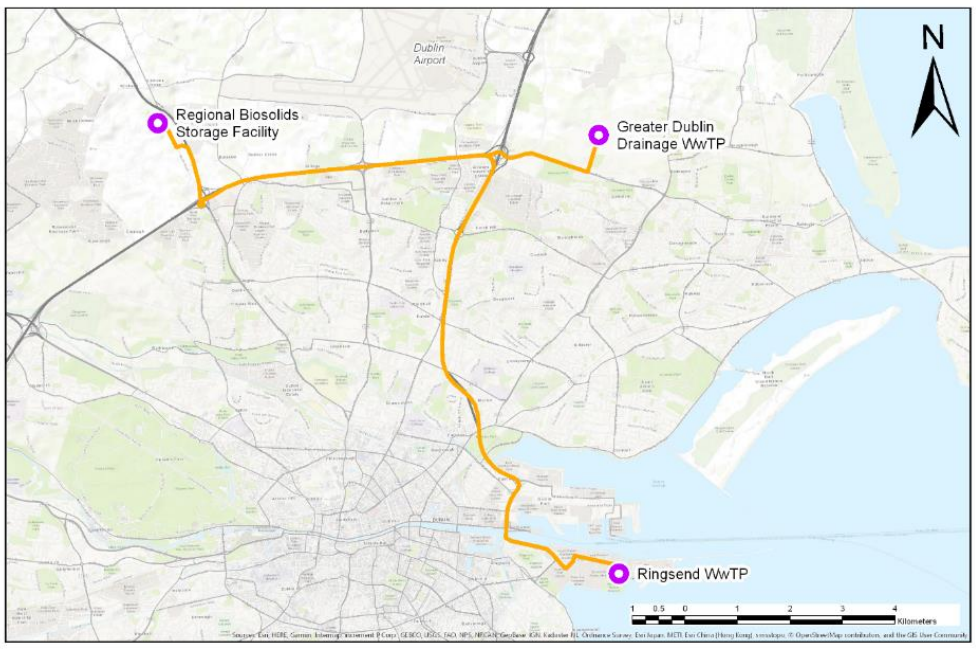

Diagram 5: Location of the proposed RBSF and Biosolids Sources

Description of Biosolids

123 Organic and inorganic matter in the wastewater (both solid and dissolved) end up in a sludge arising from the treatment process which is subject to further separate treatment on the relevant WwTP site. The sludge is treated to recover gas (the energy from which is used to run the plant), to reduce its volume, and to kill pathogens (bacteria and viruses). The treatment process results in 'biosolids', a biologically stable product with pathogens (viruses, bacteria) reduced to the extent that renders it safe for use in agriculture, and containing high levels of plant nutrients, e.g. nitrogen and phosphorus. The level of pathogen reduction from the treatment process is such that the treated sludge material can be transported and stored without any further health protection measures being necessary, subject however to compliance with all applicable waste regulations.

124 The treated sludge is also dewatered or dried to give two products for transport to storage: a 'cake' (approximately 26% dry solids) or a dry granular material (approximately 92% dry solids). Both of these materials are high in nutrients and are used as soil conditioners and fertilisers in agriculture. Both are generically termed 'biosolids', i.e. a fully treated sludge product which is biologically stable, has a low odour with pathogens reduced to the extent that renders it safe for use in agriculture. The cake material is known as "biocake" and the drier granular material is known as "biofert".

Storage Requirements

125 Irish Water seeks planning approval for the development of the proposed RBSF based on a 20-year design horizon (up to 2040). The facility will have the capacity to store already treated wastewater sludge from Ringsend WwTP and the Proposed Project WwTP, giving a total requirement of approximately 3 million PE. The site has capacity for further storage facilities should they be needed and subject to planning permission being obtained.

126 The estimated quantities of biosolids generated at the Proposed Project WwTP and Ringsend WwTP based on the estimated wastewater load (including headroom), from each source is provided in Table 5. Table 5:

Table 5: Storage Volume Requirement for Biosolids

Year	Source	Biosolids Type	Annual		Storage Period	
			Dry Tonnes (tDS)	Wet (Tonnes)	Wet (Tonnes)	Volume (m^3)
2021	Ringsend WwTP	Biocake	11,400	43,700	14,000	13,340
		Biofert	15,300	16,650	5,400	12,200
	Total					**25,540**
2025	Ringsend WwTP	Biocake	7,700	29,640	9,500	9,100
		Biofert	15,300	16,650	5,400	12,200
	Proposed Project WwTP	Biocake	4,880	19,520	6,250	6,000
	Total					**27,300**
2040	Ringsend WwTP	Biocake	10,900	42,000	13,460	12,800
		Biofert	15,300	16,650	5,400	12,100
	Proposed Project WwTP	Biocake	7,900	31,700	10,200	9,700
	Total					**34,600**

127 Fertilisers, such as biosolids, are not permitted to be spread on land between 15 October and 12 January in the areas of the country where there is the most likely demand. So biosolids will be required to be stored at the proposed RBSF at certain periods. Storage volumes will be provided at the proposed RBSF to cater for a 4-month period to allow for the non-growing periods in winter and summer.

128 Table 5 shows that the total storage required at the proposed RBSF by 2040 is estimated at 35,400m^3. Storage will be provided in two buildings at the proposed RBSF site and will be provided on a phased basis, as described in more detail in the following sections.

Site Layout

129 The proposed RSBF site is owned by Fingal County Council and was granted approval by An Bord Pleanála in 2006 for a waste recovery facility. The planned activities included recovery of construction and demolition waste, wastewater sludge treatment, biological waste treatment and waste transfer for municipal waste. The site is zoned for waste activities.

130 The site is accessed from the R135 Road. Vehicles arriving to the site from the M50 Motorway approach from the south and turn left into the site. The road outside the site includes a clearly marked left turning slip lane for the site. Vehicles leaving the site turn left on to the R135 Road for all routes.

131 The site comprises mainly sections of grassland separated by a road network. The development works that were completed by Fingal County Council include a road network, boundary fencing, administrative building, weighbridge areas, drainage systems, and other site services. An Electricity Supply Board (ESB) 110kV overhead transmission line and a 38kV underground cable both cross the southwestern corner of the site.

132 The proposed RBSF will be located in the northern part of the site as shown in Diagram . There is no development proposed in the southern part. This area is reserved for possible future requirements, which would require planning consent under a separate application before it could proceed.

133 The required storage volume requirements will be provided in two storage buildings. Each building will be approximately 105m long and approximately 50m wide.

134 The storage capacity of the buildings is related to the quantities of biocake and biofert expected be stored at the facility. Biocake can be stacked between 3m to 4m high and biofert can be stacked approximately 7m high, thus making the storage of biofert more efficient.

135 The two storage buildings could store over 48,000m^3 of biofert. On the other hand, the storage buildings will have an approximate capacity of 26,200m^3 if all biosolids were in the form of biocake.

Diagram 6: Overview of the Proposed RBSF Site

Access Road - R139 Road Upgrade

136 Construction and operation access for the proposed WwTP will be from the R139 Road (formerly the N32 National Road) with egress to the Clonshaugh Road. During the Construction Phase, a left turn in/left turn out policy will be incorporated, i.e., entry to site would be limited to left turn only from the R139 Road and egress from the site would be limited to left turn out only to the Clonshaugh Road.

Construction Programme

137 The total construction period for the overall Proposed Project will be approximately three years. However, individual activities, such as pipe laying will have much shorter durations. Land-based pipelaying will take approximately 18 months in total. The pipeline will be laid in sections and therefore will result in shorter durations of construction work on individual sections. The programme identifies the critical path activities (proposed WwTP construction and commissioning of the Proposed Project) and the estimated duration of the other activities.

Diagram 7: Outline Construction Programme for Orbital Sewer, Abbotstown Pumping Station, WwTP & Outfall Pipeline

The Benefits of the Operation of the Proposed Project

Increased Wastewater Treatment Capacity

138 The projected utilisation of the treatment capacity to be provided at the proposed WwTP out to year 2050 is set out in Table 6.

Table 6: Development of Required Treatment Capacity at the Proposed WwTP

Catchment	Design Year			
	2025	2031	2040	2050
9C Sewer, including Load Transferred from Leixlip WwTP	363,385	376,151	392,697	411,939
NFS Sub-Catchments West of proposed WwTP	75,036	79,089	84,703	89,973
Total Treatment Capacity Required	438,421	455,240	477,400	501,912

139 The proposed 500,000 PE treatment capacity at the proposed WwTP will provide the projected treatment capacity requirements out to the design year horizon of 2050. The sludge treatment capacity to be provided under the Proposed Project is 18,500 tonnes of dry solids per annum to provide for a projected 750,000 PE at the design year horizon of 2050. This figure caters for the import of sludge from other municipal WwTPs in Fingal.

Consideration of Alternatives

140 The process of the consideration of alternative options over the lifetime of the project is described in the following sequence of progression of the Proposed Project:

- Do Nothing;
- Alternative Non-Project Approaches to the provision of additional wastewater treatment;
- Alternative strategic drainage scenarios to the provision of the required additional wastewater treatment capacity;
- Alternative Sites Assessment (ASA) and Route Selection;
- Consideration of potential for reuse of treated wastewater; and
- Alternative construction methodologies for outfall pipeline (marine section)

Non-Project Approaches

141 The GDSDS which was issued in 2005 took a high-level view of the wastewater drainage and treatment requirements of the GDA. The GDSDS also considered alternative non-project options to address the shortfall in wastewater treatment capacity and concluded that the alternative approaches, even when combined, would not remove the requirement for the provision of new wastewater treatment capacity. It also determined that expanding each of the existing WwTPs to full capacity, the projected combined growth of the GDA would still be greater;

Do Nothing

142 The SEA of the GDSDS which was issued in 2008 assessed the key findings of the GDSDS. The SEA assessed a 'Do Nothing' scenario under Scenario 8 of the strategic drainage scenarios considered. This scenario was assessed as having five major negative impacts under the environmental objectives of biodiversity, population and human health, water, air quality and material assets. These major negative impacts reflected the significant future environmental, economic and sanitary problems that would arise without the provision of additional wastewater treatment capacity and therefore the 'Do Nothing' scenario was considered as not being feasible.

Multiple vs Single WwTP

143 The SEA also assessed the alternative of a range of smaller WwTPs (Scenarios 5A, 5B, 6A, 6B, 7A and 7B). Scenarios 5A, 6A and 7A were assessed as likely to have Major Negative effects on Biodiversity, Flora & Fauna and Water. These scenarios primarily rely on discharges of effluent to Dublin Bay and the Rivers Liffey, Tolka and Broadmeadow across the study area. The aforementioned water bodies are well documented as being under pressure from existing pollution sources. The additional pollutant load from these strategic drainage scenarios would likely result in significant negative environmental effects. These effects would conflict directly with the WFDs 'good water status' objective and, coupled with climate change considerations (e.g. reduction in 'base flows' in rivers), were not considered to be sustainable future strategies. Scenario 6B was assessed as having Major Negative impacts for Air Quality, Climatic Factors Material Assets, Cultural Heritage and Landscape due to the number of community-scale WwTPs required. Scenario 5B relies on the development of multiple WwTPs across the study area to serve individual growth areas and, as such, was not favoured as a coherent integrated strategic approach. Scenario 7B were assessed as having significant negative environmental effects, particularly under Climatic Factors, due to the likely extensive pumping requirements associated with them, in addition to the complex engineering

design considerations. The SEA concluded that a single WwTP (Scenario 4) was the preferred strategic drainage scenario, as it offers the most environmentally, economically and technically advantageous strategic drainage scenario of the 16 that were considered in the SEA process.

Alternative Site Assessment

144 Alternative locations for the WwTP site, routing of the orbital sewer and outfall pipeline were considered in the Alternative Site Assessment and Route Selection Phase of the Project, which was undertaken between 2001 and 2013 having regard to the recommendations set out in the SEA on the GDSDS and comprised of four distinct phases as set out in Section 5.6 of Chapter 5, Volume 2A of the EIAR.

- ASA– Phase 1 resulted in the publication of the ASA Phase One – Preliminary Screening Outcomes Report in October 2011. Phase 1 involved a preliminary screening of the study area to identify a short list of potential alternative land parcels of suitable size to accommodate the proposed WwTP and also identify potential marine outfall locations and transfer pipeline corridors. Nine land parcels and associated marine outfall locations and transfer pipeline corridors were identified at the end of the Phase 1 process and were brought through to Phase 2;

- ASA– Phase 2 resulted in the publication of the ASA and Route Selection (Phase 2): Emerging Preferred Sites and Routes report in May 2012. The nine previously identified land parcels and associated marine outfall locations and pipeline transfer corridors were taken through and eight-week consultation period with the public. The feedback received from public consultation, along with an assessment of each option by environmental and technical specialists against environmental and technical criteria (as outlined in Table 1 in the ASA Phase 2 Report) resulted in three sites emerging as the preferable options out of the original nine;

- ASA– Phase 3 involved an eight-week public consultation period (14 May to 6 July 2012) to gather public opinion and additional knowledge on the three emerging preferred options. Full details of this Phase are outlined in the Public Consultation Report on Alternative Site Assessment Phase Two: Emerging Preferred Sites and Routes (October 2012);

- ASA – Phase 4 resulted in the publication of the Alternative Site Assessment and Route Selection Report (Phase 4). The individual components of each of the three emerging preferred options (i.e. WwTP, orbital sewer, outfall pipelines and marine outfall location) were assessed to determine the most and least favourable in relation to the findings of ASA Phase 2, submissions received during ASA Phase 3 and the further findings of the investigative studies carried out as part of ASA Phase 4. The further investigative studies were completed for aspects such as ecology, cultural heritage, landscape and visual, soils and geology, hydrology, hydrodynamic modelling, engineering design, traffic ad access, planning policy and cost estimates. The Clonshagh option was assessed as being 'more favourable' under a greater number of the Environmental and Technical criteria.

Re-use of Treated Wastewater

145 During the public consultation periods undertaken to date for the Proposed Project, a number of submissions were received requesting consideration be given to the potential for reuse of treated wastewater, specifically mentioning that the reuse of treated wastewater from the proposed WwTP could reduce the volume of treated wastewater discharged to the marine environment and also reduce the future water needs of the GDA.

146 An assessment of the potential for reuse of treated wastewater from the proposed WwTP was therefore undertaken. Full details of this assessment are available in the report entitled *Assessment of Potential for*

Reuse of Treated Wastewater from Proposed Regional WwTP (Jacobs Tobin 2017), which was included in the EIAR as Appendix A5.1.

147 This report provided an overview of treated wastewater reuse policy, practice and aspects in the European and global context and concluded that, in the context of the potential for reuse of treated wastewater from the proposed WwTP:

- EU and resulting Irish legislation and policy currently lacks explicit direction or guidelines with regards to treated wastewater reuse. However, there are global examples of reuse projects in water-deprived regions (e.g. Middle East and North Africa) which could be used as reference if a water reuse scheme was considered viable. However, prior to consideration of any water reuse scheme, standards and guidelines for water reuse would have to be developed with the EPA and other key stakeholders;

- While treated wastewater from the proposed WwTP of secondary-treatment quality is of suitable quality for marine outfall discharge to the Irish Sea, it will not be suitable for potential reuse applications without additional treatment, with the possible exception of limited industrial reuse applications. At a minimum, disinfection is likely to be required, and in most reuse applications, advanced treatment will be necessary;

- Significant investment in treated wastewater distribution networks and associated infrastructure would be required; and

- Public perception is likely to limit the potential for any reuse scheme with a key public element, and significant public education and stakeholder engagement would be required.

Alternative Methodologies for Construction of Outfall Pipeline (Marine Section)

148 The marine based section of the outfall pipeline will be laid underground below the Baldoyle Estuary, Portmarnock Golf Club, the foreshore and sea bed to the predetermined line, level and gradient to the outfall point located approximately 1.0km north east of Ireland's Eye.

149 Consideration of the environmental constraints pertaining to the Baldoyle Bay cSAC and technical constraints pertaining to Portmarnock Golf Club's groundwater irrigation system require that this section of the outfall pipeline, that is from the fields to the west of the Coast Road (section 4, chainage 0.00m) to a point below the low water mark (section 4, chainage 2,000m approximately) will be constructed in tunnel. The ultimate size or diameter of this tunnel depended on the construction methodology adopted for the section of outfall pipeline between the low water mark and the final discharge point, a distance of c.4,000m.

150 Two potential construction methodologies were investigated for the subsea element of the outfall pipeline as follows:

- Continuation in tunnel; or

- Subsea laying of the outfall pipeline in a trench excavated (dredged) in the sea bed;

151 Construction of the outfall pipeline by tunnelling the complete length, 6,000m, would require a large bore tunnel, with an approximate outer diameter of 4.5m, constructed in the rock layer using a Tunnel Boring Machine (TBM).

152 Construction of the final section of the outfall by subsea laying methods would require the construction of a smaller diameter tunnel, with an approximate outer diameter of 2.0m, using micro-tunneling techniques under Baldoyle Estuary and Portmarnock Golf Club. This tunnelled section would connect to the section laid by subsea laying techniques below the low water mark.

153 Extensive investigations were carried out in the marine environment, in order to determine the feasibility of either option. This included;

- Geotechnical investigations along pipeline corridor including rotary core boreholes, vibrocores, lab testing of rock and sediments and geophysical surveys;
- Archaeological surveys along pipeline corridor including geophysical surveys and follow on dive surveys
- Ecological surveys, including dive surveys at Ireland's Eye to assess reef habitat, bird surveys and harbor porpoise surveys (visual and passive acoustic monitoring)
- Tide and current surveys

154 Analysis of the findings of the above marine investigations determined that construction by subsea laying of the outfall pipeline in a trench excavated (dredged) in the sea bed is technically feasible and has minimal environmental impact. Further details are provided in Chapter 18.

155 The geotechnical investigations indicate the presence of a southeast – northwest trending fault west of Ireland's Eye and also identified areas of highly weather rock both of which increase the technical difficulty and environmental risk of constructing the outfall pipeline completely in tunnel. As a result the construction by subsea laying techniques is deemed to be the preferred option on technical and environmental reasons.

Conclusion

156 It has been established above that the Proposed Project in its entirety has been the subject of a systematic, authoritative and comprehensive consideration of alternatives. A significant range of alternatives has been considered during strategy development, strategic environmental appraisal and site selection. The consideration of these alternatives was informed, authoritative, rational and robust. The assessment took account of land use, planning and environmental impacts at appropriate stages.

157 The proposed WwTP will require to acquire and comply with a wastewater discharge licence to be granted by the EPA under the Waste Water Discharge (Authorisation) Regulations 2007 (S.I No. 684 of 2007) prior to commissioning of the proposed WwTP.

158 Section 4.4.4 in Chapter 4 in Volume 3 Part A of the EIAR also summarises the work undertaken in examining existing treatment standards for treated wastewater from the proposed WwTP to be discharged into the marine environment of the Irish Sea off the coast of North County Dublin which was reported on in the Key Wastewater Treatment Standards Report (Jacobs Tobin 2018a) and which was appended as Appendix A4.1 in Volume 2 Part B of the EIAR.

159 This report proposed, subject to the granting of a wastewater discharge licence by the EPA, that the final treated wastewater produced at the proposed WwTP will conform to the standards provided in Chapter 4 Description of the Proposed Project in Volume 2 Part A of the EIAR, which conforms to a 'secondary treatment' standard.

Response to Issues Raised in Submissions/Observations

The Need for the Proposed Project

160 Submissions:Ten submissions related to the need for the Proposed Project, with one questioning whether the Proposed Project would still be required once the Ringsend WwTP upgrade is complete and the remaining queried the need to include the treatment of waste from the areas of County Meath and Kildare. These are outlined in Section 4.3 of Irish Water's Response to Submissions January 2019 document.

Response:

161 The engineering need for the Proposed Project is addressed in Chapter 3 The Need for the Proposed Project in Volume 2 Part A of the EIAR.

162 The upgrade works proposed at Ringsend WwTP have been factored into the assessment for the need for the Proposed Project. Section 3.5.2 to Section 3.8.3 of Chapter 3 The Need for the Proposed Project in Volume 2 Part A of the EIAR indicates that even with the proposed upgrades to Ringsend WwTP to its ultimate capacity, additional wastewater treatment capacity will be required, and that this additional treatment capacity is best provided by the Proposed Project.

163 The contributing catchment to the Ringsend WwTP currently includes the Meath towns and villages of Ashbourne, Ratoath, Kilbride, Dunboyne & Clonee. These towns and villages are connected to the Ringsend WwTP via the main Blanchardstown trunk sewer, known as the 9C Sewer. These towns and villages are the only areas in County Meath that are proposed to be diverted to the proposed WwTP at Clonshagh.

164 Irish Water currently has works at contract stage to transfer excess flow and load from Leixlip WwTP to the Blanchardstown (9C Sewer) catchment as a result of a projected treatment capacity arising at Leixlip WwTP between 2016 and 2025 and an inability to further expand Leixlip WwTP beyond its current 150,000PE treatment capacity. Leixlip WwTP serves the Lower Liffey Valley Catchment which includes Kilcock, Maynooth, Straffan, Celbridge and Leixlip. These towns and villages are the only areas in County Kildare that are proposed to be diverted to the proposed WwTP at Clonshagh. These works will be completed before the Proposed Project goes to tender.

165 The Proposed Project will intercept the 9C Sewer downstream of the above connections and divert these flows to the proposed WwTP at Clonshagh.

Dublin Airport Issues

Submission:

166 The Dublin Airport Authority [DAA] sought clarification that the future additional demands generated by increased growth at Dublin Airport can be catered for in the proposed drainage strategy.

167 The loading and predicted future treatment capacity requirements for Dublin Airport have been considered in Section 3.5.2 of Chapter 3 in Volume 2 Part A of the EIAR. Dublin Airport was considered to fall under the category of industrial source for which a headroom allowance of 20% of the sum of the residential and commercial loads is provided in the design, from which capacity can be made available for future industrial loads.

Light Pollution/Dunsink Observatory

Submission:

168 One submission by Donna Cooney, as outlined in Section 5.3.1 of Irish Water's Response to Submissions January 2019 document raised concerns that lights used at the sewage plant may cause light pollution and impact on Dunsink Observatory.

Response:

169 The lighting proposed at the proposed Abbotstown pumping station and the proposed WwTP will be cowled and directional to minimise light spillage to the boundaries of the proposed Abbotstown pumping station and the proposed WwTP. There will therefore be no light pollution and no impact on Dunsink Observatory.

Planning Permission for ESB power station

Submission:

170 A submission by Philomena Fitzsimons, as outlined in Section 5.3.2 of Irish Water's Response to Submissions January 2019 document, raised the issue that planning permission has not been sought for the proposed ESB power station required for the proposed WwTP.

Response:

171 As discussed in Section 4.9 of Chapter 4 Description of the Proposed Project in Volume 2 Part A of the EIAR, power and energy sources for the proposed WwTP will be provided through a combination of electricity, natural gas and biogas. Electricity and natural gas will be supplied from suitable connection points off the national grid, which are in close proximity to the proposed WwTP site. Biogas generated on-site during the anaerobic digestion of sludge will be used to generate electricity and recover heat through the Combined Heat and Power system. A new ESB power station is not required for the proposed WwTP.

Consideration of Alternatives

One Large versus Small Localised Wastewater Treatment Plants

Submissions:

172 29 submissions questioned the need for one large facility rather than a network of smaller localised WwTPs, as outlined in Section 6.2.1 of Irish Water's Response to Submissions January 2019 document.

Response:

173 The feasibility of a network of smaller localised WwTPs was addressed in Section 5.5 of Chapter 5 Consideration of Alternatives in Volume 2 Part A of the EIAR. Of the 16 strategic drainage options identified as part of the GDSDS and its Strategic Environmental Assessment (SEA), 6 options covered a range of networks of smaller localised WwTPs and are summarised as follows:

Strategy Scenario	Summary Description of Additional Strategic Drainage Scenarios Considered by the Strategic Environmental Assessment of the Greater Dublin Strategic Drainage Study
5A	This scenario envisages seven sub-regional WwTPs which would provide treatment to foul flows from specific catchments on a foul-catchment-by-foul-catchment basis. The treated effluent from these plants would be discharged to the nearest surface water or groundwater bodies. These WwTP sizes range from 40,000 PE to 150,000 PE.
5B	This scenario has a similar range of WwTPs as Scenario 5A, but instead of having groundwater and/or surface water discharge, it proposes to have a regional treated effluent pipeline with a coastal discharge to the Irish Sea.
6A	This scenario considers the development of a network of community WwTPs (e.g. 850 no. WwTPs with a treatment capacity of 1,000 PE (approx.), each discharging to the nearest surface water or groundwater bodies. This scenario also requires a series of sludge treatment centres.
6B	Similar to Scenario 6A, this scenario has a network of community WwTPs. However, instead of discharging locally to groundwater or surface water bodies, this scenario will differ in that each WwTP will discharge into a common treated effluent pipeline which ultimately discharges to the Irish Sea.
7A	This scenario envisages 15 sub-regional WwTPs which would provide treatment to foul flows from specific catchments on a foul-catchment-by-foul-catchment basis. The treated effluent from these plants would be discharged to the nearest surface water or groundwater bodies. These WwTP would range in size from 20,000 PE to 65,000 PE.
7B	This scenario has a similar range of WwTPs to Scenario 7A, but instead of relying on discharges to groundwater/surface waters, it proposes to have a regional treated effluent pipeline with a coastal discharge to the Irish Sea.

174 The SEA assessed the potential impacts of these options and concluded that Options 5A, 6A and 7A were likely to have Major Negative effects on Biodiversity and Water.

175 Option 6A was also considered likely to have Major Negative effects on Population and Human Health due to the potential impacts on Dublin Bay, various recreational assets in the study area and public health or nuisance risks.

176 Option 5B relies on the development of multiple WwTPs across the study area to serve individual growth areas discharging to a regional treated wastewater pipeline with a coastal discharge to the Irish Sea, was not favoured as a coherent integrated strategic approach. Furthermore, the majority of the flow arriving at the proposed WwTP is from developed catchments on northern and western areas of the Ringsend WwTP Catchment where, given the heavily urbanised nature of these catchments, it would be impossible to locate sufficient open space(s) on which to site multiple WwTPs without significant impact on the population and environment in these catchments.

177 Option 6B relies on the construction of an extensive network of community based WwTPs (e.g. 850 no. WwTP with a treatment capacity of 1,000 population equivalent) linking to a treated effluent orbital pipeline. This scenario was assessed as having a number of distinct disadvantages which would render it impractical, e.g. excessive pumping and energy consumption requirements, protracted design and strategy delivery process, sludge management and transportation complexities, operational control and environmental risks. This scenario was assessed as having Major Negative impacts for Air Quality, Climatic Factors Material Assets, Cultural Heritage and Landscape due to the number of community-scale WwTPs required (850+).

178 Option 7B was assessed as having significant negative environmental effects, particularly under Climatic Factors, due to the likely extensive pumping requirements associated with them, in addition to the complex engineering design considerations (e.g. reversal of flows through the Sutton submarine pipeline and unnecessary works on the Grand Canal Sewer).

179 The SEA concluded that a single, regional WwTP was preferable to a series of sub-regional WwTPs, as a single plant offers the greatest planning, procurement, engineering, cost, flexibility and future operational benefits in comparison to a network comprising multiple WwTPs.

180 Irish Water prepared the Greater Dublin Drainage Strategy – Overview and Future Strategic Needs (May 2018) which confirmed that they had reviewed the GDSDS and its SEA in framing its Water Services Strategic Plan in 2015. The WSSP is the Applicant's strategic national plan for the delivery of water and wastewater services over the next 25 years. It was determined that the conclusions of the GDSDS and its associated SEA remained valid, and that the additional wastewater treatment capacity was required, and that this additional treatment capacity was best provided by a single regional WwTP.

Tertiary Treatment

181 Submissions:

182 36 submissions raised concerns about the use of secondary treatment and not tertiary treatment at the proposed WwTP, as outlined in Section 6.2.2 in Irish Water's Response to Submissions January 2019 document.

183 The decision to apply secondary treatment rather than tertiary treatment is addressed in Section 4.4.4 – Proposed Treatment Standards of Chapter 4 Description of the Proposed Project in Volume 2 Part A of the EIAR.

184 Section 4.4.4 in Chapter 4 in Volume 2 Part A of the EIAR summarises the work undertaken in examining existing treatment standards for treated wastewater from the proposed WwTP to be discharged into the marine environment of the Irish Sea off the coast of North County Dublin which was reported on in the Key Wastewater Treatment Standards Report (Jacobs Tobin 2018a) and which was appended as Appendix A4.1 in Volume 2 Part B of the EIAR. This report confirmed that, subject to the granting of a licence from the EPA, the Proposed Project will conform to a secondary treatment standard.

185 The release of treated wastewater following secondary treatment has been extensively modelled and this modelling has confirmed that, for the identified proposed outfall location and the proposed emission limit values, the receiving water will meet 'good' status criteria and will meet the environmental quality objectives for coastal water nutrients levels. The modelling studies have also confirmed that:

- The Proposed Project will have a negligible impact on the water quality of the coastal waters off County Dublin;
- The Proposed Project will have no impact on achieving the goals of the Water Framework Directive (i.e. reaching good status in all water bodies);
- The proposed discharge location will not negatively impact any designated bathing waters; and

186 In response to these submissions, MarCon carried out revised modelling, assuming a higher level of coliform concentrations in the effluent than modelled in the original application (300,000cfu/100ml instead of 39,000 cfu/100ml for the flow to full treatment scenario). That modelling, which Alan Berry of Marcon will give evidence on this afternoon, showed that the level of concentration fluctuated with the ebb and flow of tides, providing equal time for uptake/accumulation and subsequent clearance/removal of any coliforms by the shellfish and on that basis concluded that there was not predicted to be any impact on the shellfish water quality as a result of the Proposed Project. This is detailed in the Response.

187 Subsequent to the Response and having regard to the submissions made by Fingal County Council and members of the public including fishermen, Irish Water asked us to carry out some further analysis, which

my colleague Marja Aberson, who is a marine ecologist specialising in shellfish, completed. Her advice was to the effect that as an abundance of caution to ensure the protection of the shellfish, additional treatment should be applied to the effluent. Irish Water has determined that it will apply UV treatment to all effluent discharges. The utilisation of UV treatment does not require any additional structures or changes to planned structures.

Site Selection

Submissions:

188 64 submissions questioned the location of the proposed Wastewater Treatment Plant and the site selection process, as outlined in Section 6.2.3 of Irish Water's Response to Submissions January 2019 document.

189 The site selection process is addressed in Section 5.6 of Chapter 5 Consideration of Alternatives in Volume 2 Part A of the EIAR. This summarised the ASA and Route Selection study, which was undertaken in four distinct phases between 2011 and 2013 and ultimately concluded that the Clonshagh site option (proposed WwTP site, southern marine outfall and orbital sewer) was the most environmentally, technically and economically advantageous option. The Clonshagh site option was therefore recommended as the final preferred site option and was brought forward for further assessment under the EIA and AA processes.

190 A review of the ASA and Route Selection Report was undertaken by the project team in December 2017. The purpose of this review was to examine each element of the Proposed Project against the findings of each Phase of the ASA and Route Selection in light of the development of the Proposed Project since 2013 to assess whether the recommendations of the ASA and Route Selection Report remain valid. This review concluded that the methodology, findings and recommendations of the ASA/Route Selection process remain valid.

The Environmental Impact Assessment (EIA) Process

191 The Proposed Project is subject to Environmental Impact Assessment (EIA) in accordance with the Environmental Assessment Directive 2014/52/EU and Schedule 6 of the Planning and Development Regulations 2001 (as amended).

192 EIA is the process for anticipating the effects (both positive and negative) from a proposed development or project on various environmental receptors. If the anticipated effects are significant, design measures or other relevant mitigation measures can be taken to reduce or avoid negative effects.

Environmental Impact Assessment Screening

193 Screening is the first stage of the EIA process. Screening allows for a decision to be reached as to whether an EIA is required for a project. The prescribed classes of development which require EIA are outlined in Schedule 5 of the Planning and Development Regulations 2001 (S.I. 600 of 2001, as amended).

194 The Proposed Project is development within Class 13, Part 1 of Schedule 5 of the Planning and Development Regulations (as amended), specifically: "Waste water treatment plants with a capacity exceeding 150,000 population equivalent as defined in Article 2, point (6), of Directive 91/271/EEC5". Paragraph 11(c) of Part 2 includes plants with a lower capacity of 10,000 Population Equivalent. During screening it was determined that the Proposed Project will exceed these thresholds and therefore an EIA was required.

Environmental Impact Assessment Scoping

195 Following screening, 'scoping' was undertaken to determine the content and extent of matters that should be covered in the environmental information submitted to the competent authority. Scoping considered of the nature and likely scale of the potential environmental impacts likely to arise from a project.

196 The scoping stage for the Proposed Project was informed by consultation with stakeholders including relevant local authorities, government departments, semi-state organisations, business interest groups, national specialist interest group and companies.

Environmental Impact Assessment Report (EIAR)

197 The EIAR reports the findings of the EIA carried out on a project. The main objectives of the report are to:

- Describe the baseline conditions prior to any work commencing on the Proposed Project;
- Describe the assessment methodologies used to assess the predicted environmental impacts of the Proposed Project;
- Describe environmental issues and any likely significant effects which may arise during the construction and operation of the Proposed Project; and
- Propose measures to mitigate these effects.

198 The EIAR has been undertaken having regard to the Environmental Protection Agency (EPA) Guidelines on information to be contained in Environmental Impact Statements (EPA 2002), and the EPA published draft guidelines on information to be contained in EIARs (issued in 2017), and Advice Notes on Current Practice in preparation of Environmental Impact Statements (EPA, 2003, Draft 2015) guidelines the European Commission document "Guidance on EIA, EIS Review" (2001).

199 In addition to these overarching guidance documents, each environmental aspect (e.g. air quality) has been assessed in accordance with specific guidance and best practice for the environmental aspect. The specific guidance which has been used is detailed under each environmental aspect in the main EIAR chapters.

200 The EIAR presents the environmental impacts predicted for the Proposed Project. The EIAR sections describe the Proposed Project with respect to the environmental headings as outlined in the EPA Guidelines and taking account changes arising from Directive 2014/52/EU (as described in Section 2.1 of Chapter 2 The EIA Process in Volume 3).

201 The EIAR describes the environmental impacts predicted for the Proposed Project. These are provided within Chapter 25 of the EIAR, Residual Impacts.

Consultation

202 Consultation with key stakeholders, interested parties and the public was an important aspect of the development of the Proposed Project. The consultations served three main purposes:

- To establish a sufficiently robust environmental baseline of the Proposed Project and its surroundings;
- To identify, early in the process, specific concerns and issues relating to the Proposed Project in order that they can be discussed and appropriately accounted for in the design and assessment; and
- To ensure the appropriate involvement of the public and authorities in the assessment and design process.

203 To date, at critical points in the development of the Proposed Project, feedback has been sought from statutory bodies, members of the public and potentially affected landowners to assist in shaping the Proposed Project. An overview of the consultation process to date and consultation proposed as part of the development of the EIAR.

204 A number of pre-application consultations have taken place with ABP, between 2013 and 2018 where a number of key topics were discussed.

205 My colleague Dan O'Boyle will address Consultation in further detail later today.

Scrutiny and Consent

206 Irish Water submitted this Strategic Infrastructure Development to various prescribed bodies, when submitting to An Bord Pleanála (as defined under the Planning and Development Act 2000 (as amended)).

207 This stage also involved the publication of the EIAR for the purpose of obtaining submissions and observations from interested members of the public. Submissions received were examined and responses were provided in Irish Water's Response to Submissions January 2019 document which was submitted directly to An Bord Pleanála and made available to the public both online, and at Dublin City Council's Office in Wood Quay and Fingal County Council Offices in Swords and Blanchardstown.

Conclusion

208 In this statement of evidence, I have provided an overview of key planning and environmental aspects of the Proposed Project including the description of the Proposed Project and the consideration of alternative sites and processes and the EIAR process. The EIAR and its supporting documentation have adequately assessed the issues raised in submissions in relation to these elements of the Proposed Project and the conclusions of the EIAR and the Response Document (January 2019) remain robust and valid.

209 It is important to emphasise the importance of the Proposed Project which is required to unlock essential residential, commercial and community development in the GDA. The Proposed Project will allow for this essential growth of the GDA while maintaining and enhancing the inland and seaside amenities so valued by the community, in a sustainable manner.