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An Bord Pleanála Oral Hearing

Irish Water

Greater Dublin Drainage

Brief of Evidence

Waste

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Qualifications and Role on the Proposed Project

1 My name is Damien Grehan. I am a Chartered Engineer and I hold an Honours Degree in Engineering (1992) and a Masters Degree in Engineering Science (1994) from University College Dublin. I joined TOBIN Consulting Engineers as an Environmental Engineer in January 1995. I have over 24 years' experience in the planning, detailed design and project management of large infrastructural and utilities projects primarily in the fields of waste management, energy, extractive industries and water services schemes. I have been an expert witness at a number of EPA and An Bord Pleanála Oral Hearings and have led the multidisciplinary teams of experts at these hearings.

2 I am the TOBIN Consulting Engineers Project Director for the purpose of the preparation of the TOBIN elements of the Planning Application and Environmental Impact Assessment Report for the Greater Dublin Drainage Project.

3 The purpose of this Brief of Evidence is to address the matter of the management of waste from the Construction and Operational Phases of the Proposed Project.

Summary of Likely Significant Effects & Mitigation Measures

4 The environmental impacts of waste arising from both the Construction and Operational Phases of the Proposed Project are described and discussed in Chapter 20 in Volume 3 Part A of the Environmental Impact Assessment Report (EIAR). The total Construction Phase of the Proposed Project will last approximately three years.

Potential Impacts

5 The potential impacts of the Proposed Project as a result of waste associated with the Construction Phase of the Proposed Project are presented in Section 20.4 of the EIAR.

6 Waste generated during the Construction Phase will largely be surplus excavated material (soil and stone materials) arising from the laying of the proposed orbital sewer route and outfall pipeline route and the construction of the proposed Wastewater Treatment Plant (WwTP) and Abbotstown pumping station. Preliminary site investigations along the proposed pipeline routes and at the proposed WwTP and Abbotstown pumping station sites indicate that the surplus excavated material will be clean, inert material that may be suitable for off-site reuse. It is estimated that there will be approximately 220,400m^3 of surplus excavated material generated across the Proposed Project during construction. This is broken down as follows:

Proposed orbital sewer route	100,600m^3
Proposed Abbotstown pumping station	9,050m^3
Proposed Wastewater Treatment Plant	48,500m^3
Proposed outfall pipeline route (land based section)	49,200m^3
Proposed outfall pipeline route (marine based section)	8,500m^3
Proposed North Fringe Sewer diversion sewer	4,500m^3

7 The majority of waste associated with the Proposed Project will arise due to excavation materials (soil and stone) along the proposed pipeline routes. The proposed orbital sewer route and outfall pipeline route (land based section) construction methodology combines open cut and trenchless methods.

8 General construction waste, in the form of concrete, packaging, and hazardous liquids such as oils, paint, and cleaning agents, will also be generated during construction. Concrete waste arising during construction will be either returned to the supplier, where possible, or crushed and screened on site for use as

aggregate and sub-base material where suitable. Any concrete waste that cannot be returned or reused will be taken from site by a licensed waste collector and transferred to an authorised facility for recovery or disposal.

9 Packaging waste will be segregated on site and sent to licenced facilities for recycling.

10 Paints, oils and cleaning agents, and any other hazardous wastes will be placed in covered, carefully labelled containers and stored in a separate storage area. This waste will be removed and disposed of in accordance with current legislation.

11 It is noted that this is a very developed design and for that reason there is great confidence in the robust nature of the material balance figures presented in the EIAR. The majority of excess material generated throughout the Proposed Project will be soil, clay and rock as a result of excavation. Where possible, materials will be reused on-site. Of the materials generated:

- Subsoil arisings along the pipeline will be reused as reinstatement and backfill, where possible;
- Topsoil material at the proposed WwTP site and at the proposed Abbotstown pumping station site will be reused for landscaping purposes at these locations; and
- Excavated rock will, where further testing confirms its suitability, be reused for sub-base, drainage trenches and engineered fill.

12 A breakdown of excavated materials and surplus materials arising from the Proposed Project is given in the construction materials balance in Table 20.13 in Section 20.4.3 of the EIAR. Surplus material arising will be excess excavated material where the pipe, bedding and surround are placed. It will be dealt with in accordance with the waste hierarchy and the relevant legislation. Currently, 97% of equivalent material is recovered in Ireland, and it will be a condition of the contract(s) awarded that waste recovery or reuse will be required, wherever possible.

13 The potential impacts of the Proposed Project as a result of waste associated with the Operation Phase of the Proposed Project are presented in Section 20.4 of the EIAR.

14 The main source of waste arising during the Operational Phase of the proposed Wastewater Treatment Plant will be sludge. A regional Sludge Hub Centre is proposed to be developed at the site, which will receive and process the sludge generated. A 'biosolid' end product, suitable for reuse in agriculture, will be produced, and biogas produced during the treatment process will be used on-site for energy recovery. The 'biosolid' end product will be transported to the proposed Regional Biosolids Storage Facility where it will be stored prior to reuse in agriculture. In some instances, waste products will not be suitable for reuse, and these will be disposed of to waste to energy, or alternatively to landfill.

Mitigation Measures

15 Mitigation measures are set in Section 20.6 of the EIAR which minimise the effect of the Proposed Project on the environment, reduce the amount of waste sent for disposal and promote sustainable waste management practices. Any waste generated from the Proposed Project will be managed in accordance with the principles of the waste hierarchy as outlined in the current version of the European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011), as amended, i.e. prevention, preparing for reuse, recycling, other recoveries and disposal. The preferable outcome from an environmental, transportation and resource efficiency perspective is to maximise the reuse of material generated from the Proposed Project.

16 Construction Phase Mitigation Measures are outlined in Section 20.6.1 of the EIAR. Throughout the design of the Proposed Project, care was taken to minimise the waste arising from the Proposed Project. This included comparing construction methodologies employed for different elements throughout the Proposed Project. An Outline Construction Environmental Management Plan (CEMP) has been prepared for the proposed works which identifies construction methodologies that will be used for the Proposed Project including the mitigation measures outlined in the EIAR.

17 The majority of the proposed orbital sewer route will be constructed by conventional open cut methods. Trench boxes, as shown in Diagram 20.2 of the EIAR (reproduced below) will be used for deep excavations to avoid the necessity for battering or sloping of the sides of the trench.

18 The majority of suitable excavated material will be used for backfill along the proposed outfall pipeline route (land based section). This means a reduction of the amount of waste produced as a result of excavation as only the bedding and surround material will have to be imported, as shown in Diagram 20.3 of the EIAR (reproduced below).

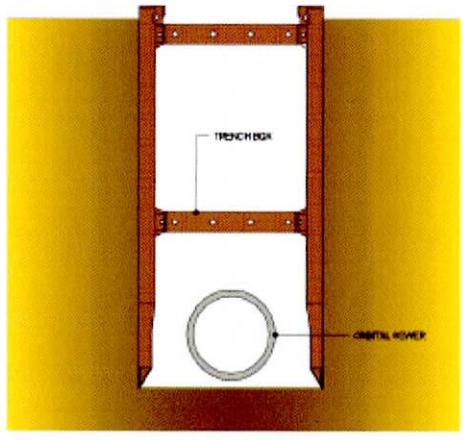


Diagram 20.2: Trench Box Installed and Pipe Laid

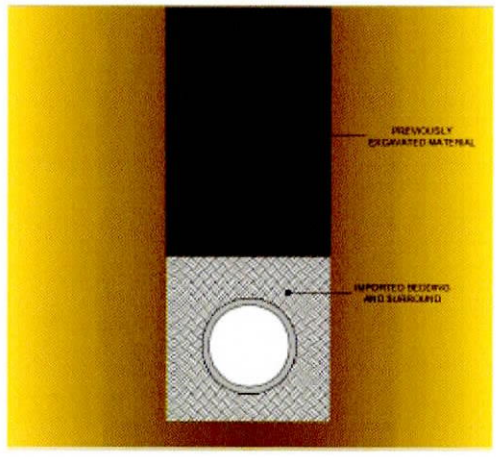
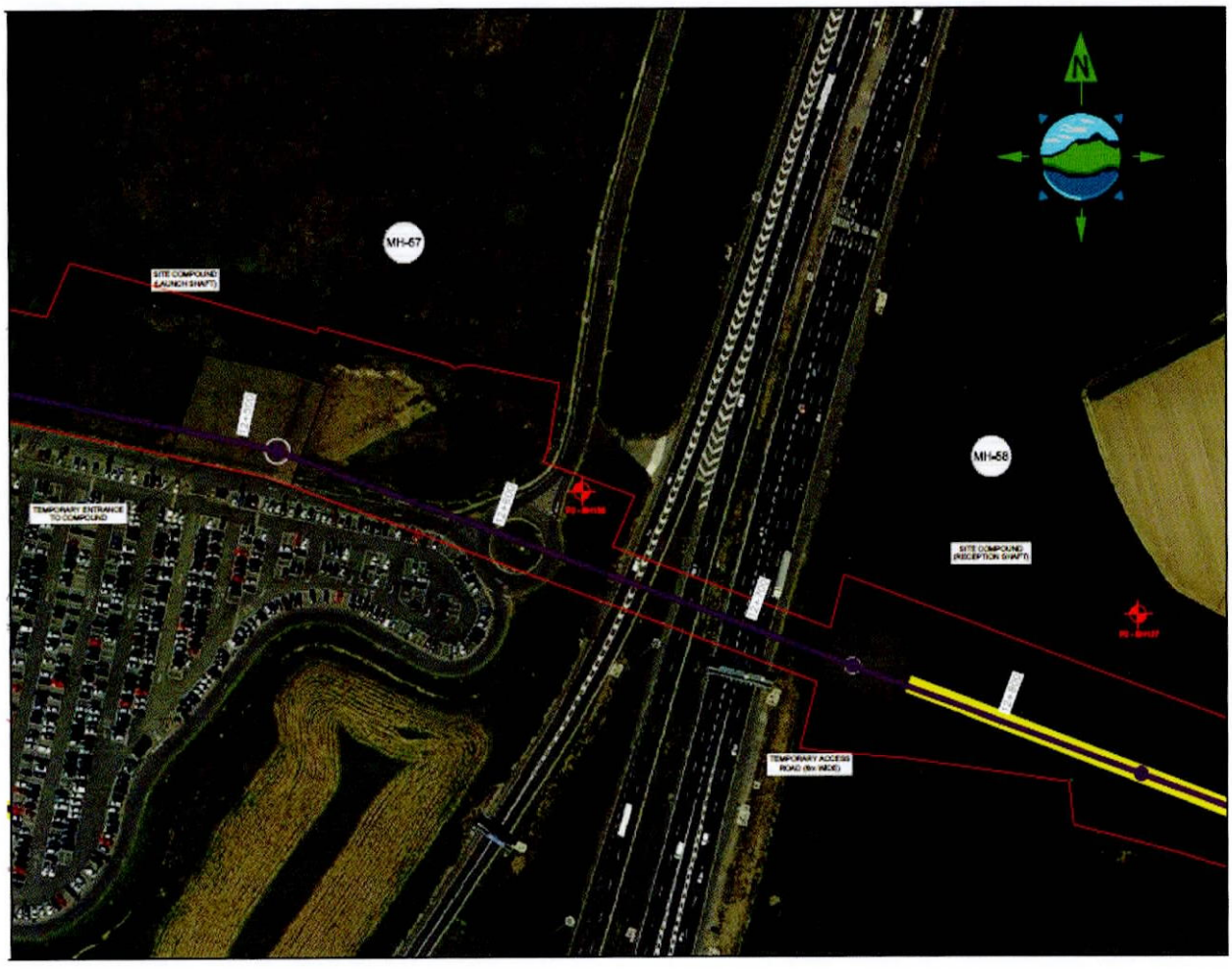


Diagram 20.3: Bedding and Surround Imported and Trench Backfilled

19 Sections of the proposed orbital sewer route which would otherwise result in a significant generation of waste will be constructed using trenchless methods. These sections include physical, natural and manmade obstructions. The crossings of main concern that occur along the proposed orbital sewer route are the road and rail crossings as described in the Engineering Specialist Report for Crossings included

with the Planning Application documentation. The proposed methodology for the trenchless crossings is a microtunnelling pipe jacking technique.

20 An example of where this technique is employed is at the crossing of the M1 Motorway. Details of this proposed crossing are provided on Drawing No. 32102902-2111. A screenshot taken from this drawing, presented below, shows the location of the Site Compound (Launch Shaft) to the west of the M1 and the Site Compound (Reception Shaft) located to the east of the M1. These trenchless techniques are extremely effective in significantly reducing the potential waste arisings at the crossings along the route.



21 For the Proposed Abbotstown Pumping Station, site investigation indicates rock at approximately 2.5m below ground level. Given 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, the majority of the waste arising will be primarily rock. This material will be reused off-site as fill in third party construction projects which represents a good use of the resource and reduces the quantity of virgin material required for construction.

22 For the Proposed Wastewater Treatment Plant, the excavated material will be reused on-site in construction of the screening berms and landscaping thereby ensuring that there will be a reduction in excess material that will have to be removed from site.

23 The proposed outfall pipeline route (marine section) is divided into two main sections. The first section will involve a tunnel from the western side of the Baldoyle Estuary to a point offshore of Velvet Strand. From this point, the tunnel will connect to a pipeline that will be laid by subsea pipe laying methods to a point approximately 1km north-east of Ireland's Eye. Subsea pipe laying methods generate a significantly lower

volume of excess material when compared to the option of tunnelling the full length of the proposed outfall pipeline route (marine section).

24 Operational Phase Mitigation Measures are outlined in Section 20.6.2 of the EIAR. The majority of waste associated with the proposed WwTP will be produced as sludge during the Operational Phase as a result of the wastewater treatment process. Advanced anaerobic digestion will be utilised in the sludge treatment process to recover energy from the sludge and reduce the volume of sludge, following which the material can be dewatered and treated to produce a 'biosolid' end product suitable for reuse in agriculture

Response to Issues Raised in Submissions/Observations

25 One submission has been received by An Bord Pleanála with regard to waste. Mr. Peader Farrell raised issues around a perceived lack of detail regarding the treatment of excavated material from tunnelling operations and how leaching from stockpiled material would be prevented.

26 The excavation of materials during tunnelling has been assessed under Sections 20.4.2, 20.4.3, and the relevant mitigation measures are presented in Section 20.6.1 of Chapter 20 Waste in Volume 3 Part A of the EIAR.

27 It is estimated that approximately 14,000m^3 of material, mainly rock cuttings, stone, sands and gravel, will be excavated from tunnelled sections for the proposed orbital sewer route and outfall pipeline route (land-based section). There will also be smaller quantities of silt and bentonite and water in the excavated material. These materials will be pumped to the launch shaft of the tunnel and will be passed from here through a separation plant. All suitable material from the tunnels on the proposed orbital sewer route will be reused in the works as backfill or aggregate, where possible. Unsuitable or surplus material will be disposed of off-site at licenced landfills.

28 It is estimated that approximately 17,000m^3 of excavated material will be excavated from the tunnelled sections on the proposed outfall pipeline route (marine section). This material will be stored on-site and used, where possible, as backfill material for the tunnel shafts and reinstatement. Again, any surplus or unsuitable material will be disposed of off-site at licenced landfill facilities.

29 As outlined in Section 20.6.1 in Chapter 20 in Volume 3 Part A of the EIAR, for material that cannot be reused, the disposal options will depend on whether the spoil is regarded as hazardous, non-hazardous or inert. Non-hazardous and hazardous wastes are required to be disposed of at appropriately licensed landfills or other appropriately licensed facilities. Similarly, inert wastes must be reused, recycled or disposed of at appropriately licensed facilities. All material arising from the Proposed Project will be managed sustainably and in accordance with best practice as set out in the Eastern Midlands Regional Waste Management Plan 2015-2021.

30 It is not envisaged that hazardous waste will be encountered, but any hazardous materials would be treated in accordance with the National Hazardous Waste Management Plan 2014-2020.

31 If the options to reuse the material either on or off-site cannot be achieved, the excess material will be sent for recovery at a facility with a waste authorisation in place. As outlined in Section 20.4.3 of the EIAR, 97% of equivalent material is recovered in Ireland, and it will be a condition of the contract(s) awarded that waste recovery or reuse will be required, wherever possible. Disposal of the excess material generated will therefore only be considered when all other options to reuse or recover the material have been exhausted.

32 The locations of soil recovery facilities relevant to the Proposed Project are shown in Figure 20.1 Location of Active Landfills in the Study Area in Volume 5 Part A of the EIAR with the details, including remaining capacities, of these facilities presented in Table 20.5 in Chapter 20. There are also a number of non-hazardous municipal landfill sites in the region which have an ongoing requirement for soil and stone

material for daily cover, capping and other remediation activities at the sites. The facilities relevant to the Proposed Project are shown in Figure 20.1 Location of Active Landfills in the Study Area in Volume 5 Part A and details of these facilities are presented in Table 20.6 in Chapter 20 in Volume 3 Part A of the EIAR. In addition, there are also a number of materials recovery facilities/waste transfer stations in operation in the region which are suitable for the acceptance of Construction and Demolition wastes should they be required. The locations of the facilities relevant to the Proposed Project are again shown in Figure 20.1 in Volume 5 Part A of the EIAR and the details of these facilities are presented in Table 20.7 in Volume 3 Part A of the EIAR.

33 Any material that is transported off-site for recovery undertaken by a haulier holding a valid waste collection permit. The traffic impact assessment carried out in Chapter 13 Traffic and Transport in Volume 3 Part A of the EIAR assumes the worst-case scenario being the disposal of all material.

34 With regard to leaching from stockpiled material, site investigations along the proposed pipeline routes do not indicate the presence of any contaminated soil. Topsoil and subsoil will be stockpiled at all construction sites in a manner that will encourage rain water to runoff rather than infiltrate the soil. Waste will be stored and managed in accordance with the CIRIA Guidance Document: "Control of Water Pollution from Construction Sites (C532)". Material will not be stockpiled to heights greater than 2m and silt fences of geofabric or similar material will be placed around open or exposed ground and stockpiles. Coverings on the stockpiles will also be incorporated to reduce the potential for infiltration through the stockpile.

Conclusion

35 The issue raised around the reuse or disposal of material excavated during tunnelling operations is dealt with in Sections 20.4.2 and 20.4.3 in Chapter 20 in Volume 3 Part A of the EIAR, and mitigation measures are set out in Section 20.6.1 and are as described above.

36 Subsoil investigation indicates that the material that will be excavated and stockpiled along the proposed pipeline routes or within the proposed WwTP and Abbotstown pumping station construction sites will be inert. No contaminated soil was detected during these investigations. Therefore, the risk of contamination of ground through leaching of stockpiled excavated material is remote. Any stockpiled material will be protected from rainwater washing through it, in order to ensure that the material remains suitable for re-use in backfilling or landscaping operations.

37 As outlined in Section 20.7 of the EIAR the mitigation measures that have been established for the Proposed Project will result in a reduction in the waste that will be generated, thereby reducing the residual impacts resulting from the Proposed Project. The implementation of a WMP will result in higher levels of reuse and recycling throughout the Proposed Project to assist with national and European targets. Economical design and construction methodologies employed as described in Section 20.6.1 of the EIAR including the use of trench boxes, tunnelling etc. will result in further waste reduction. The reuse of materials in operations such as backfilling and reinstatement will aid in the reduction of waste produced and surplus material arising will be sent off-site to permitted/licensed recovery facilities.

38 During the Operational Phase, the implementation of the mitigation measures will ensure resource efficiency and waste reduction. The implementation of these mitigation measures will also result in a reduction in the volume of traffic generated as a result of the Proposed Project.

39 The application of these mitigation measures will ensure that there will not be significant residual impacts on the environment as a result of the Construction Phase and Operational Phase of the Proposed Project.